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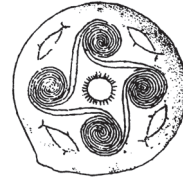
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AEGEAN ARCHAEOLOGY



# Of Odysseys and Oddities

Scales and modes of interaction between prehistoric  
Aegean societies and their neighbours

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Barry P.C. Molloy

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*Front cover: The MBA village of Punta Milazzese on Panarea. Photograph by Helen Dawson.*

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The 2013 Sheffield Aegean Round Table took place during a rather frigid January with snowfalls threatening to cut our plans short. Thankfully, we had a very fruitful meeting and a lively discussion over the course of three days. Most of those who engaged in the Round Table have been able to publish their papers in the volume, though the event was much enhanced by the oral contributions of John Bennet, Sue Sherratt, Sara Strack and Roger Doonan. We were also fortunate to have Kristian Kristiansen deliver a thought (and discussion) provoking keynote address and our meeting concluded with an eloquent final discussion by John Barrett.

The event took place during a Marie Curie Fellowship that the editor held at the University of Sheffield 2011–2013. I was very fortunate to work with and learn from Roger Doonan during this period. Along with acting as mentor for the fellowship, he co-organised the Round Table event with me and played a key role in designing the research agenda for the event and this publication. Thank you also to all of the student helpers who made the event run so smoothly. The Round Table is generously supported by the Institute for Aegean Prehistory, to whom we are most grateful.

The Sheffield Aegean Round Table is a type of event that is relatively rare these days, as it takes place in a relaxed atmosphere where people freely speak their minds. This is really made possible through the welcoming environment that is created by Debi Harlan, Valasia Isaakidou and John Bennet. The home baked fare that they so kindly made on the opening night (thanks also to Vuka Milić) set the guests up for a very comfortable and enjoyable event. Debi and John also hosted all of the guests at their home the next evening, making a very memorable climax to the convivial environment that makes the Round Tables such unique events.

The panel of reviewers, including many of the contributors, provided invaluable advice that was vital in bringing this volume to publication, for which we are grateful. I would finally wish to express my gratitude to the participants at the event and contributors to this volume who made the entire process so stimulating. It was indeed testimony to our aspiration to work across political and traditional boundaries that have influenced Aegean archaeology that we had participants representing eleven nationalities from institutions on three continents. A final note on behalf of the authors is that papers in this volume were submitted in 2013 and 2014, and as a consequence many will be missing citations to some important more recent publications.





# Chapter 11

## Trade and Weighing Systems in the Southern Aegean from the Early Bronze Age to the Early Iron Age: How Changing Circuits Influenced Changing ‘Glocal’ Measures

*Maria Emanuela Alberti*

Measuring systems are fundamental in all practical aspects of life and are attested in many types of society. They are one of the most basic and ‘embedded’ elements of any culture and change accordingly to the social, political and economic history of the societies using them (Kula 1986). Their transformations through time can thus provide insights into the major cultural and economic changes that occurred in a given area. In particular, if different cultural and geographical areas share a common measuring system, their economic interaction has to be considered significant, and indeed it is usually documented by other types of evidence also, especially concerning trade activities. There is a ‘special relationship’ between trade and measuring systems because measuring devices are not only an administrative and productive tool but a trade *medium* in themselves. The aim of this paper is exactly to explore this ‘special relationship’ among southern Aegean societies during the Bronze Age and Early Iron Age.

Among pre-coinage societies, such as those of Bronze Age Mediterranean, weighing systems played a fundamental role in economic transactions. This ensured that comparison between different valuables/reference goods was possible. In this way it was possible to establish the relative value of measured goods. The weight (or the volume) of a commodity corresponded to a certain value in a chosen *medium*. This was generally, but not exclusively, metal, especially silver. It was therefore possible to correlate a certain amount of wool as corresponding to a specific amount of other things such as silver or cereals. Through this process, the measure gives the value (Milano and Parise 2003; Sorda and Camilli 2003). Each time an economic/value assessment was required, all kinds of commodities, no matter how standardised in

shape or dimensions, were weighed or measured. The best examples in the Aegean are the Linear B texts of the series KN Oa (730–734), where both ingots (numbered) and their weight value (in talents) are recorded: indeed, no unequivocal direct relationship existed between weight value and ingots (Zaccagnini 1986). The system of measurement was the key for any economic transaction and we may expect that this would have been deeply embedded in the economy of a given society (Milano and Parise 2003; Sorda and Camilli 2003; Zaccagnini 2003; Clancier *et al.* 2005; Parise 2009; Gestoso Singer 2010; Ascalone and Peyronel 2011). If the economy of a certain region or state is strong and imposes itself on its neighbours, then this provides a mechanism whereby its own measuring system can expand abroad. Thus, when we study the weighing systems of pre-coinage societies, we can detect which were the strongest economies of certain periods and how they interacted. It is no surprise, therefore, that we see the trading history of the Bronze Age Mediterranean (that we know of from other sources) so systematically reflected in the history of regional and ‘international’ weighing systems. In this paper, I will primarily focus on the southern Aegean from the Early Bronze Age (EBA) – to the Early Iron Age (EIA), ca 2000–700, but reference will be made to the interconnections in the wider Aegean and around the Mediterranean.

According to recent scholarship, trading operated at different levels and through different modes or mechanisms contemporaneously in the Mediterranean during the Bronze Age. Within these, a large part of the exchange was carried out outside of the official system of ‘gift exchange’ and ‘administrated trade’ (Zaccagnini 1994; Liverani 1998, 58–64; Sherratt 1998; 1999; van Wijngaarden 2002). Palatial, elite, palace-sponsored, independent, ‘private’ trade enterprises operated alongside each other and overlaps existed to various degrees involving partnership, combination and independence (Milano and Parise 2003; Zaccagnini 2003; Sorda and Camilli 2003; Clancier *et al.* 2005; Routledge and McGeough 2009). When using Near Eastern written sources or Mediterranean archaeological evidence, it has not been possible to define a general formal schema or model of trade relationships because they are too complex and diversely articulated to allow for universal models, and so descriptions and definitions tend to work better on a case by case basis (Milano and Parise 2003; Zaccagnini 2003; Sorda and Camilli 2003; Clancier *et al.* 2005; Parise 2005; Peyronel 2008; Alberti 2011b).

## **Framing the analysis of southern Aegean interconnections**

A multi-level trade system is the outcome of the multivariate trajectories of the societies involved, where a complex of internal and external factors comes into play. These combine elements of both staple and wealth economies (Renfrew 1972; Brumfiel and Earle 1987; Sherratt and Sherratt 1991; Scarre and Healy 1993; Sherratt 2010). In this contribution, the focus will be especially on proper trade elements, such as the various aspects and levels of import/export activities, and the diverse transcultural

phenomena (spreading of various technologies, craftworks, administrative systems, architectures, languages, ideologies, religions, *etc.*), with particular attention to the history of weighing systems. However, trade interaction and networks are strongly linked to the type and dimensions of the economies of the various areas that come into play (Sherratt and Sherratt 1991; Sherratt 2010). In this sense, a full appreciation of the structure of trade systems in a given area and period should ideally also consider other elements, such as settlement patterns and infrastructures, scale of agriculture and craft-production, internal economic and social organisation (*e.g.* Kohl 2011; Faust and Weiss 2011; on a Mediterranean scale, Broodbank 2013). It is commonly agreed that the movement of people, things and ideas along trade routes strongly influenced social and economic trajectories in prehistoric societies, and played a fundamental role in the expanding Aegean economies (Knapp 1998; Sherratt 1999; Sherratt and Sherratt 1991; 1998; Broodbank 2000; 2004; Laffineur and Greco 2005; Broodbank and Kiriati 2007; Brodie *et al.* 2008; Macdonald *et al.* 2009; Parkinson and Galaty 2010; Maran and Stockhammer 2012; Alberti and Sabatini 2012; Broodbank 2013).

The history of trade in the Aegean has been largely and variously affected by the geographical configuration of the area. The study of winds and current patterns has underlined the different regimes of the northern and southern Aegean, and therefore their natural division (Agouridis 1997; Papageorgiou 2008; also Broodbank 2000; Sherratt 2001; Broodbank and Kiriati 2007; Davis 2008; Alberti 2012). This is a key point in Aegean history, where the two areas tended to normally follow different trajectories, with repercussions for the trading and interaction patterns in various periods. In particular, the NE Aegean (north of Samos and facing Anatolian coast, *i.e.* roughly ancient Lydia and Mysia) and the SE Aegean (between Samos and Rhodes and facing Anatolian coasts, *i.e.* roughly ancient Caria) seem to have belonged to quite different trade circuits throughout the Bronze Age: the former interacted more closely with ancient Thrace, Khalkidhiki and Thessaly, while the latter had a higher degree of interconnection with the central Aegean and Crete (Mountjoy 1998; Georgiadis 2003; Hope Simpson 2003; Broodbank 2004; Laffineur and Greco 2005: 129–278; Felten *et al.* 2007: 151–200, 257–360; Benzi 2009; Macdonald *et al.* 2009). Compare, for example, the divergent reception of Minoan and Helladic textile tools in the NE, SE and central Aegean sites (Pavúk 2012; Gleba and Cutler 2012; Cutler 2012). At present, the only known exception to this pattern is the evidence of significant Minoan materials in Samothrace from the MBA: much detailed information is needed to understand the phenomenon, though the hypothesis of a strategic initiative in connection with the exploitation of the metalliferous ores of the area is highly probable (Matsas 1991 and 2009; Girella and Pavúk 2015).

For the NE and SE Aegean respectively, the terms ‘Upper’ and ‘Lower Interface’ (with reference to an ‘East Aegean – Western Anatolia Interface’) were originally used (Mountjoy 1998) to define phenomena of the Mycenaean period, but can be usefully employed also for other periods, to underline the particularities of these areas (*e.g.* Davis and Gorogianni 2008). The same is true of for the terms ‘Western String’ (Keos,

Melos, Thera; Davis 1979) and ‘Eastern String’ (Kasos, Karpathos, Rhodes; Niemeier 1984), originally meant to identify dynamics in the late MBA – early LBA.

The distribution of land-masses and the wind and current patterns in the southern Aegean (Agouridis 1997; Papageorgiou 2008; Brodie *et al.* 2008: 83; Broodbank 2000: 1–105, 287–292; Alberti 2012) suggest that we should envisage a series of localised maritime circuits, which interfacted with one another, thus allowing the circulation of people, goods and ideas through a chain of segmented steps; longer voyages had to follow cyclical routes. Some major crossing routes assured stronger connections (see Figure 11.1; Alberti 2012 for further geographical details). From the perspective of the southern Aegean internal maritime routes, Miletus, Rhodes and Kythera lay at the articulation points with other external circuits (northern Aegean, eastern Mediterranean and southern mainland respectively): their strategic position can perhaps account for the particular intensity of their connections with Crete during the MBA and the early LBA (Broodbank 2004; Macdonald *et al.* 2009: 73–96, 121–166,

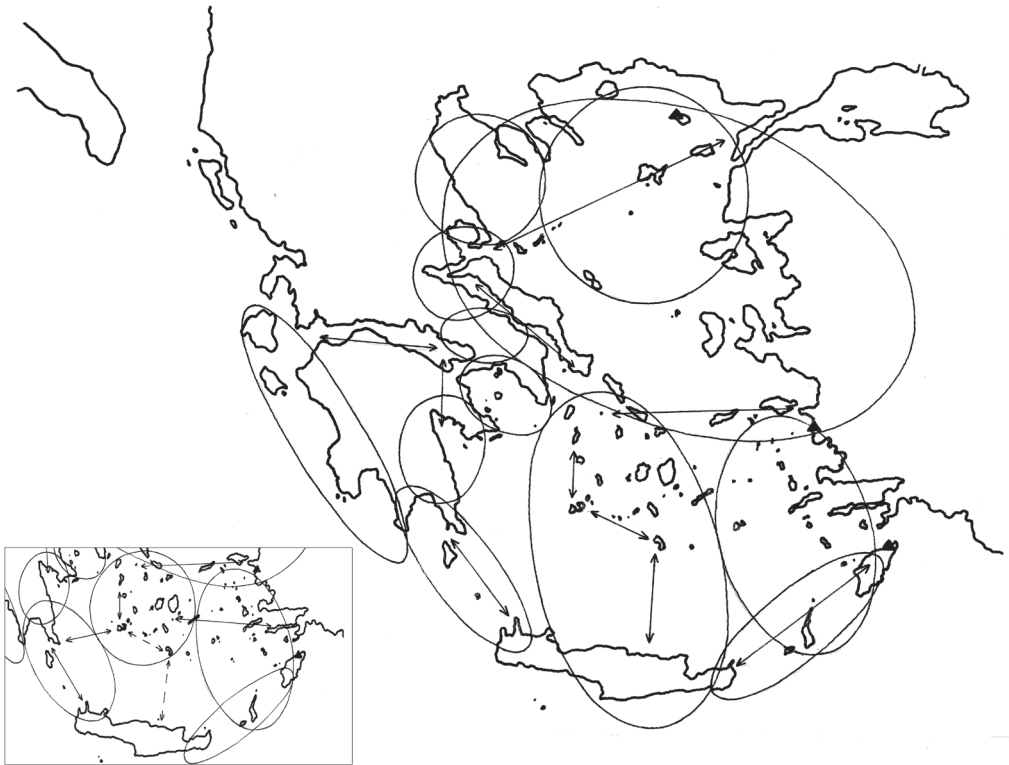


Figure 11.1: Aegean trade routes and circuits from MBA to LB I Early (LMIA) (main figure). During LB I Late, the direct connection between Crete and Thera gives place to a more indirect route from the Central Cyclades to Laconia and Kythera (box). (M. E. Alberti, F. Merlatti)

175–218; Warren 2009; Alberti 2012), in contrast with less involved neighbouring sites (e.g. Iasos in Caria or Seraglio on Kos, see respectively Momigliano 2012 and Vitale – Hancock 2012).

On the external side of Mediterranean maritime interaction, the principal currents and winds make an anticlockwise route more viable (Agouridis 1997; Sauvage 2012: 265–294; Broodbank 2013: 8–9). Taking a hypothetical point of departure in northern Syria, for a large part of the Bronze Age, the route continued to NE Cyprus, coastal Cilicia, Pamphylia and Lycia, Rhodes, Crete, then crossed the Mediterranean towards the Libyan coast, to return to the Nile Delta and coastal Syria – Palestine. In its full deployment during the advanced Late Bronze Age (see below), it also reached Sicily and Sardinia (Stampolidis and Karageorghis 2003: 15–117; Laffineur and Greco 2005: 313–472; Broodbank 2013: fig. 8.1).

Studies of Aegean trade and interconnection patterns are extensive: and it is increasingly acknowledged that interaction played a crucial role in forging the complex world of Aegean societies and in shaping their historical trajectories. Some analyses have underlined the importance of external contacts, within a ‘world-systems’ perspective (Sherratt and Sherratt 1991; Sherratt 2010). Other studies have focused on internal connections (Broodbank 2000; Felten *et al.* 2007; Berg 2007; Alberti 2012), either with a ‘world-systems’ approach (Berg 1999; Kardulias 2010; Parkinson and Galaty 2010) or stressing the role of ‘networks’ (Knappett *et al.* 2008; Knappett 2011: 123–145; Knappett and Nikolakopoulou 2014). For the present paper, internal and external interconnections are equally important, and a flexible approach is more desirable: different perspectives can provide useful insights, depending on the period and area under investigation and on the various scales of analysis (see, with much broader scope, Broodbank 2013; for a minimalist view, see Zurbach 2012).

Most recent reconstructions of the history of trade in the Bronze Age southern Aegean recognise the need to distinguish various chronological phases, each one showing a particular cultural flavour within different cycles of pulsing connectivity (Sherratt 2010; Broodbank 2013; Knappett and Nikolakopoulou 2014; phasing already in Sherratt and Sherratt 1991). This is especially linked to the spread of some cultural elements from the key economic area(s) in each period, such as fashions and technologies related to pottery, textile and prestige item manufacture, administrative equipment, and, more relevant for this paper, weighing systems. Other less tangible elements, such as iconographies, symbolisms, ideas and ideologies, and possibly cults, will not be taken into account here. As a result, there were diverse phenomena of reception, with wide evidence for selection, appropriation, re-elaboration, imitation and reverberation. Such aspects have been thoroughly studied in recent years, through the concepts of hybridisation and entanglement (Maran and Stockhammer 2012; also Voskos and Knapp 2008; Karageorghis and Kouka 2011; Stockhammer 2012a; 2012b). However, the co-occurrence of elements from both the external and the internal traditions in local assemblages is so multi-variate that again it is best to consider the evidence on a case by case basis. To give some examples related to pottery production,

typical synthetic outcomes of multi-cultural influences are the EB IIB Kastri Group/Lefkandi I assemblage (Rutter 2012), the MBA Lustrous Decorated ware of the coastal southern Peloponnese (Taylour and Janko 2008: 177–298; Kiriatzki 2010), the LoD/DoL pottery from LB I Keos (Vitale and Hancock 2012), and the early LH Mainland Polychrome (and related productions) and Lustrous Painted ('Mycenaean') wares (Taylour and Janko 2008: 185–187; Mathioudaki 2010; Rutter 2012).

Considering other classes of materials, the same can be said for the LB IIIB Mycenaean weighing system (see below). On the other hand, a selective process is probably implied in the diffusion of only one type of Minoan loom-weight throughout the Aegean between the MBA and LBA (Cutler 2012). When trying to define transcultural phenomena on the basis of the archaeological record, however, we should also consider the generally high level of heterogeneity proper to each cultural area *per se* (both synchronically and diachronically) and to related cultural environments: see *e.g.* the diverse versions of a common Keros/Syros 'package' in the EB IIA Cyclades (Broodbank 2000: 202–205), or the complex patterns of MBA ceramic productions in the Cyclades and southern mainland (Felten *et al.* 2007: 81–150, 257–360), and the elements of regionalism of the decorated LBA Mycenaean wares in certain periods (Mountjoy 1999).

One of the most debated cases of waves of cultural influence is undoubtedly the so-called 'Minoanisation', i.e. the spreading of Minoan cultural traits into the Aegean regions, especially in the southern Aegean. It is characterised by the circulation and often adoption of specific forms of fine and coarse ware ceramics, weaving, weighing and administrative tools, ritual paraphernalia, and frescoes. After much debate (Hägg and Marinatos 1984; Hardy *et al.* 1990; for a wide range of perspectives see Laffineur and Greco 2005: 129–286), it is now regarded as consisting of a dynamic multi-faceted and highly variable phenomenon, underlying many different historical realities, based often on second-hand transmission and local circuits, and variously linked with trade routes, economic factors, fashion, emulation, re-interpretation, affiliation and identity negotiation (Broodbank 2004; Whitelaw 2005; Berg 2006; Davis and Gorogianni 2008; Knappett and Nikolakopoulou 2008; Macdonald *et al.* 2009; Momigliano 2012). It is also possible to pose the question of 'Minoanisation in Crete itself' (Broodbank 2004: 51). The same dynamism, complexity and multi-faceted patterns characterise the previous and following phases of transcultural phenomena. On the other hand, these are related to both to the economic structure of the Aegean as a whole and to the economic fortunes of its key-areas (Sherratt 2010: 88; see below). The intensity of these phenomena seems to have been related (*inter alia*) to the efficiency of the transport means used in each phase, and thus to have been higher after the introduction of sailing crafts between the 3rd and 2nd millennia (Broodbank 2000: 287–291, 341–349; Sherratt 2010; Legarra Herrero 2011). As a result, features of 'Minoanisation' (and 'Mycenaeanisation') appear more strongly in the archaeological evidence from the southern Aegean than the 'international' elements of the previous phases, be they from the Cyclades or the NE Aegean (Knappett and

Nikolakopoulou 2014). It is with this dynamism and complexity in mind that the various historical, cultural and trading phases will be considered in the following pages and the terms ‘Minoanising’, ‘Mycenaeanising’, ‘Westernising’ and ‘Levantinising’ will be used (Sherratt 2010; Knappett and Nikolakopoulou 2014). Each of these (trans-) cultural phases is closely connected to the others, and so together they create a form of continuous osmosis, that underpins Aegean history (Melas 2009). Thanks to this, Aegean cultures acquired their own particular blend of practices, different from those in other Mediterranean worlds.

## General remarks on Eastern Mediterranean BA weighing systems

Beginning in the early third millennium at the latest, Near Eastern societies developed complex systems of measuring weight, volumes, lengths and land area. For the purpose of this present paper, I will concentrate on the measures of weight that were used to quantify metals, wool, textiles and other commodities. Larger units of weight measurement, such as the talent and the mina (and also the wool unit) are quite close, if not identical, in many areas, while the smaller units, called shekels in Anatolia, Syria and Mesopotamia, and *qdt* in Egypt, are more different to each other. In Anatolia and Syria-Palestine, there were various shekels, and these were linked to each other by mathematical proportion and thus easily convertible one into the other. This conversion system is documented in the third millennium at Ebla, Tell Brak, Tell Sweyhat, Tarsus and Troy (see L. Rahmstorf, this volume). Mesopotamian measures differed and were less easily convertible into the systems of Anatolia and Syria. Moreover, during the LBA Egypt adopted the Syrian (‘Ugarit’ series *s* = *qdt*) units (Milano and Parise 2003; Sorda and Camilli 2003; Clancier *et al.* 2005; Alberti and Parise 2005; Alberti *et al.* 2006; Ascalone and Peyronel 2007; Michailidou 2008a: 205–216; Alberti 2009; 2011a). The units used in the various areas can be summarised as follows (for each region, larger units are listed before the smaller ones):

### *Anatolia and Syria-Palestine:*

#### **multiples**

1 *talent* = 28,2 kg = 60 minas

1 *mina* 470 g = 40 *h* = 50 *s* = 60 *k* (‘western mina’)

#### **shekels**

1 shekel of Hatti 11.75 g (*h*)

1 shekel of Ugarit 9.4 g (*s*)

1 shekel of Karkemish 7.83 g (*kar*)

Conversion: 4 *h* = 5 *s* = 6 *kar* = 47 g

*Mesopotamia:*

- 1 **talent** 30.3 kg = 30 ‘double’ minas
- 1 ‘**double**’ **mina** 1,008 g = 30 minas
- 1 **mina** 504 g = 60 shekels
- 1 **shekel** 8.4 g (**mp**)

*Egypt:*

- 5 **dbn** 470 g = 1 ‘western mina’
- 1 **dbn** 90.95 g = 10 **qdt**
- 1 **qdt** 9.09 g = **s**

Aegean societies are also known to have had measures of weight, volume, land area. However, the evidence is not so consistently represented and we are generally limited to archaeological finds of balance weights. As we will see, in some periods weighing units of Near Eastern type were widely used in the Aegean, while in other periods it was local units that were mostly employed. The larger units of weights in the Aegean, the talent, the double mina, the mina and the half mina, were similar (in terms both of absolute and relative values) to those in use in the Near East. On the other hand, other Aegean units of lighter weight had no or only very problematic parallels in Anatolia and Syria, thus suggesting a possible Aegean origin for these units (see below). This is especially the case for the basic Minoan unit of 60–65 g, called **x**. Its fraction **k** of 20–22 g could more easily be converted into eastern shekels, but not without problems: actually, with some approximation it can be considered either twice the value of **s** (9.4 g) or **h** (11.4), but no correspondence is straightforward and the archaeological evidence not sufficiently abundant (see below; Michailidou 2004: 318; Alberti and Parise 2005; Alberti 2011a). During the Mycenaean period, the weighing system remains substantially the same as in Neopalatial times, with various modifications and an increased popularity of the **k** unit (possibly to be identified with the Linear B unit P, see below and Table 11.4), especially in the multiples of 10 and 20 (220 g and 440 g) (Petrušo 1992; 2003; Alberti 2003; Alberti and Parise 2005; Michailidou 2008; Parise 2009; Alberti 2009; 2011a):

*Aegean:***multiples**

- 1 **talent** ca 30 kg = 30 double minas (Linear B **L**)
- 1 **double mina** ca 1 kg = 2 minas (Linear B **M**)
- 1 **mina** ca 500 g = 8 **x**
- 1 **half mina** ca 240–260 g = 4 **x** (Linear B **N**)



**main unit**1 **x** 60–65 g**fraction**1 **k** 20 g (= 1/3 **x**) (Linear B **P**)

Most used during Mycenaean times:

10 **k** 220 g20 **k** 440 g

The following overview of the history of the Aegean weighing systems is based on analysis of the weights found in the same findspot/context (weight group): if they really constitute a working set, their weights should have recognisable ratios between them and thus constitute a series. In addition, the marks that some of the weights happen to bear can indicate their relative value: *e.g.* one or two incised strokes (or dots, or circles) would theoretically indicate the value of one or two units (on all these topics, see Alberti *et al.* 2006; on marks, see Petruso 1992 and Michailidou 2008; for a statistical, non contextual approach, see Pakkanen 2011).

### **Late EBA – Full MBA: Networks, regionalism and first ‘Minoanisation’; Near Eastern and Aegean weights**

During the EB I-II, even with conspicuous changes throughout the period, the Aegean trading system appears to be structured as a complex network of interconnections between east and west, from Troy to Lerna and from western Greece to the Adriatic regions (see Kouka and Rahmstorf, this volume). In the southern Aegean, the major sites involved seem to act as ‘peers’ on trade routes, creatively sharing cultural codes and prestige assemblages: especially Kolonna (Aegina), Ayios Kosmas (Attica), Manika (Euboea), Ayia Irini (Keos), Grotta (Naxos), Chalandriani (Syros), Daskaleio-Kavos (Keros) and Skarkos (Ios). The strategic role played by Cycladic communities in the maritime network fosters the diffusion of Cycladic goods and taste in the area (especially in EB I-IIA; Broodbank 2000: 247–309; 2013: 257–346; Brodie *et al.* 2008: 61–298; Alram Stern 2011). After an initial phase of interaction, Crete appears to become somewhat separated from the rest of the Aegean (Brodie *et al.* 2008: 237–270; Legarra Herrero 2011). Because of the main maritime transport means used in this phase (paddled long-boats), travel distances and trade intensity were considerably lower than in the following periods, and necessitated many more trading posts along the routes: in this sense, the EB I-II constitutes, for the Bronze Age southern Aegean, quite a distinct (long) phase and one of the few periods (compare with LB IIIC, see below) in which internal trade interconnections could be described in terms of networks, without strong evidence of ‘world-system’ dynamics (Broodbank 2000: 180–210; Broodbank 2013: 308, 322; Knappett and Nikolakopoulou 2014). At the same time, on the external side, the Aegean area as a whole shows evidence of strong contacts with

Anatolia, sharing some common cultural traits, among which are sealings, weighing (see Rahmstorf, this volume), the introduction of tin bronze and, in the later part of the EB II, pottery fashions (see above, on the Kastri Group/Lefkandi assemblage; see Rahmstorf 2006a; 2006b and this volume; Kouka, this volume). From this point of view, some presence of ‘world-system’ mechanisms in external interaction cannot be excluded (Broodbank 2013: 337).

As for the Aegean EBA weighing systems, recent work by Rahmstorf indicates that during this period of intense interconnection, the Aegean and the Eastern Mediterranean shared a common weighing system, with Near Eastern units and systems of conversion (see above; Rahmstorf this volume; 2003; 2006a; 2006b; 2008b; 2010; 2011a; 2011b). This could suggest the existence of an economic asymmetry, with Anatolia and Syria acting as the main pole of attraction. What is very important to stress for the subsequent metrological developments is the use of units of ca 10 g and the use of multiples counted according to the decimal system (see Rahmstorf 2006a: fig. 4, multiples of 5 and 10 units *s* from Tiryns; this volume for Tzoungiza).

Throughout the later EBA and the very beginning of the MBA, important transformations occur in the Aegean region. Thanks also to the advent of sailing crafts, the linkage between Crete and the rest of the Aegean became progressively closer (Broodbank 2000: 320–361; Sherratt 2010; Legarra Herrero 2011; Knappett and Nikolakopoulou 2014). The trade network of peer-ranked centres begins to be disrupted, and the chain of interactions that defines the island network becomes restricted, becoming limited to Attica, the Saronic Gulf, the central Cyclades and Dodecanese; the presence of ‘duck vases’ can be seen as one of the main indicators of this (Broodbank 2000: 352, 355; Sherratt 2010: 94). It is also notable that new, stronger, and apparently directional, links are forged between Crete, Kythera and the southern Peloponnese (as evidenced by Minoanising material found in those places: *e.g.* Broodbank and Kiriati 2007 on Kythera; Taylour and Janko 2008 on Ayios Stephanos).

During the MBA, two contrasting cultural tendencies can be detected, one based on regional identities and the other on varying degrees of Minoanisation; the diverse dynamics between these two tendencies shape the cultural identities of communities in different parts of the Aegean (Broodbank 2000: 349–361; Felten *et al.* 2007; Macdonald *et al.* 2009; Philippa-Touchais *et al.* 2010; Voutsaki 2010; Alberti 2012 for a detailed discussion). We could broadly divide the southern Aegean into the following regional units of interaction: the central mainland, the north-east, southern and western Peloponnese, the Saronic Gulf with Aegina, the central Cyclades, the southern Dodecanese ‘Lower Interface’ and Crete. The systematic linkage with palatial societies in Crete might be seen to provide the system with a gravitational core and a more directional structure (dendritic system), with the progressive stabilisation of three main S-N routes (Figure 11.1): the Crete – Kythera – southern Peloponnese route, the ‘Western String’ and the ‘Eastern String’ (Broodbank 2000: 356–359; Whitelaw 2004a; 2004b; Brodie *et al.* 2008: 305–348). The system was fully in place by the middle of the MBA: see *e.g.* the re-foundation of Ayia Irini IV (Keos), well after the beginning of the

MBA (Overbeck and Crego 2008), and the progressive expansion of Phylakopi (Melos) during the MBA (Whitelaw 2004b; 2005). Within this framework, trade activities are carried out through segmented geographical circuits, by a restricted number of leading major centres (in the south-central Aegean especially Akrotiri on Thera, Phylakopi on Melos, Ayia Irini on Keos and Kolonna on Aegina), while other sites and areas play a decidedly more secondary role. Protopalatial Crete is indeed now fully linked to the rest of the Aegean and to the Eastern Mediterranean, and, with its impressive ecological, agricultural, demographic and social assets, imposes itself as a major actor on the scene and acts as a filter between the Aegean and external maritime connections (Broodbank 2000: 349–361; Watrous 2001; Felten *et al.* 2007: 257–360; Macdonald *et al.* 2009; Philippa-Touchais *et al.* 2010: 826–943).

During the MBA interaction with Egypt and the Levant becomes increasingly evident: the distribution of Minoan and Minoanising artefacts overseas and of eastern imports in the Aegean underlines the filter role played now by Crete and the existence of a circular 'long route' from Syria to Cyprus, Crete and Egypt (Cline and Harris Cline 1998: 13–27; Karetsou 2000; Brysbaert 2008; Phillips 2008; Barrett 2009; Højen Sørensen 2009; Cherry 2010; Sherratt 2010: 95–96; MacGillivray 2013; Broodbank 2013: 345–446).

Unfortunately, there are no detailed studies on MBA Aegean weights, and the course of developments is therefore difficult to detect. The only systematically studied and published assemblage comes from Malia (*Quartier Mu*, MM IIB; Alberti 2000). Analysis of that material suggests that in Crete a local weighing system was in use, characterised by local types (stone discs and lead discs, among others) and metrological standards that have possible correspondences with the later 'Minoan' units and with contemporary Near Eastern units. At the moment, however, it is impossible to say if these units and types are really new and local, because the documentation from EB III and MBA is so poorly known and understood.<sup>1</sup>

### **Late MBA – Early LBA: Minoanisation, the 'northern route' and Minoan/Aegean weights**

In general terms, the last phases of the MBA and the early phases of the LBA in the southern Aegean (MM III – LM IB, MH III – LH IIA) are characterised by the continuation and intensification of previous dynamics of interaction, including a closer and fuller linkage of Mainland societies with those in the southern Aegean. The trade system starts to expand and to incorporate bordering areas that were previously not closely linked, such as the central Mediterranean, northern Greece and, more indirectly, the Black Sea area. Interconnections with the eastern Mediterranean increased, resulting in a strong economic stimulus for the Aegean as a whole (Muhly 2003; Broodbank 2004; Laffineur and Greco 2005: 175–226, 323–335, 429–472; 571–599; Brodie *et al.* 2008: 339–408; Sherratt 2010; Papadimitriou and Krige 2012; Broodbank 2013: 368–372; Knappett and Nikolakopoulou 2014).

In the internal southern Aegean sphere, major trends notable in the mature MBA develop further in this phase, giving way to a more integrated and less regionalised system, with Neopalatial Crete and Minoanisation as the leading economic and cultural elements. The pattern of trade-circuits is substantially the same as in the previous phase (Figure 11.1), with an increasing weight of Crete at one extremity (reinforcing the dendritic aspects of the network) and the growing influence of the Helladic pole(s) on the other side (a precursor to the future gravitational reversal). Minoan cultural influence or Minoanisation (see above) which increased in the Aegean throughout the MBA, reaches its apogee in this period. What is becoming increasingly clear is that the spread of these Minoan and Minoanising traits is due not only to first-hand contacts, but, especially for the eastern Aegean and Helladic mainland, also to second-hand transmissions of cultural elements and to the creation of a Minoanising or hybrid *milieux* in each region (Laffineur and Greco 2005: 175–226; Felten *et al.* 2007: 257–360; Taylour and Janko 2008: 551–610; Macdonald *et al.* 2009; Philippa-Touchais *et al.* 2010: 847–884). In this phase, the presence of Minoan and Minoanising material culture in some strategic key-sites of the southern Aegean increases, especially at Kythera, Trianda (Rhodes) and Miletus (Caria) (see above).

Transcultural phenomena seem to play an important role, now as before, in shaping regional and local material culture: Cycladic, Helladic and Anatolian – Aegean ‘Interface’ worlds, were, each one in its own way and with many internal variations, the result of various intermingling traditions and influences (see above; Broodbank 2004; Laffineur and Greco 2005: 175–226; Whitelaw 2005; Berg 2007; Felten *et al.* 2007: 257–360; Brodie *et al.* 2008: 338–408; Macdonald *et al.* 2009: 59–96, 121–166; Philippa-Touchais *et al.* 2010: 603–633, 683–699). To give a most famous example, the offerings from the Mycenae Shaft Graves are a splendid case of a ‘glocal’ assemblage: imports from various areas accompany hybrids and typical local products, and Minoanising features seem to be filtered through the Cyclades or Aegina (Maran 2011). Interestingly, Early Mycenaean material culture shows a special multi-rooted character from its very beginnings, though the final combination(s) and the underlying substantial tradition are definitely (and variously) Helladic (Wright 2006; 2008; Schon 2010; Voutsaki 2010; Maran 2011; Rutter 2012; Broodbank 2013: 432).

By LB I, when complex Helladic societies begin to emerge, Early Mycenaean materials are increasingly attested in other Aegean areas. This is especially true for the Cyclades in the years (LM IB/LH IIA) following the Santorini eruption, when direct contacts with Crete appear reduced and relationships have to be conducted through the route linking the western Cyclades with the southern Peloponnese and Kythera or with the ‘Eastern String’ (Figure 11.1 box). In particular, Kythera and Melos seem to replace Thera within the system of trade-routes (compare figs 35a, 35b and 35c in Berg 2007; *ibidem*, 104; Davis and Cherry 1990; Davis and Gorogianni 2008; Knappett and Nikolakopoulou 2014; for routes, Agouridis 1997 and Mountjoy 2004). It is precisely in this framework that we can place some ‘delocalisation’ phenomena: the good quality LM IB style pottery produced in the Greek mainland and Aeginetan workshops apparently outnumbers the LM IB wares manufactured in Crete at sites

such as Melos and Keos in the Cyclades (Mountjoy and Ponting 2000; Mountjoy 2008; Rutter 2012). Early Mycenaean pottery is also imported and imitated in the 'Lower Interface' (Mountjoy 1998; Marketou *et al.* 2006). It has to be stressed that from this advanced phase (LB I), the distinction between Cretan and Helladic/Cycladic fine ware starts to diminish, giving place to a more integrated stylistic and technological horizon. This is distinctly different from the EBA and MBA situation, and eventually will result in the homogeneous (though nonetheless regionalised) production of Mycenaean decorated pottery during the following centuries.

Aegean relationships with the eastern Mediterranean develop further in this phase (import/export evidence, Minoanising fashion and frescoes in the Levant and Egypt, representations of people from 'Keftiu' in tombs from Thebes, Egypt, 15th century: Gale 1991; Cline and Harris Cline 1998: 39–97; Laffineur and Greco 2005: 323–334, 429–472; Brysbaert 2008; Bennet 2011; Duistermaat and Regulski 2011: 183–380). Crete still seems to be acting as a filter between internal and external routes, though mainland Greece is probably in contact with western Anatolia through the north Aegean circuits (Schon 2010; Pavúk 2012). The distribution of imports in Cyprus, the Dodecanese, Crete, southern Italy and Sicily during LB I underlines the popularity of a northern sea-route: a continual series of overlapping networks can be traced from the north coast of Cyprus (Ayia Irini Paleokastro and Toumba tou Skourou), to Trianda on Rhodes, then on to the 'Eastern String' and the east and north coasts of Crete (Kato Zakros, Mochlos, Knossos, Poros – Katsambas, and Chania)<sup>2</sup>. From there the route continued on to the Ionian Sea, eastern Sicily and the Tyrrhenian Sea. Visits to the southern coasts, from Levant to southern Cyprus and Crete and then to southern Sicily, are not so numerous in this phase (see *e.g.* the low numbers of imports from Eastern Mediterranean and Aegean at Kommos for this phase, Shaw *et al.* 2006) and apparently mostly linked to Levantine initiatives (Cline 1994: 92; Graziadio 2005; Marazzi and Tusa 2005; Militello 2005; Soles 2005; Sauvage 2012: 265–294; Broodbank 2013: 346–347, fig. 8.1: 444).

As for weighing systems, this is the phase that has yielded the greatest evidence for the use of Minoan/Aegean balance weights. These have largely been recovered from Crete (Knossos, Mochlos, Zakros, and Haghia Triada) but also other locations in the Aegean: Ayia Irini (Keos), Akrotiri (Thera), Mikro Vouni (Samothrace), Heraion (Samos), Miletus (Caria), Vapheio (Laconia). The islands of the 'Western String' have yielded the largest assemblages, mostly sets of weights found in good archaeological contexts, thus pointing to the relevance of their economic (trading and production) activities. Most of these weights are made in lead which comes from Laurion (Stos-Gale and Gale 2006). The diffusion of these weights is considered one of the most important marks of Minoanisation and of the leading role of Minoan power in the Aegean (Parise 1986; Petruso 1992; Alberti 2003; 2011a; Akrotiri: Michailidou 1990; 2006; 2007; 2008a: 41–100; Ayia Irini: Petruso 1992: 21–36; Alberti 1995; Knossos: Evans 1906; Mochlos: Brogan 2006).

The most common weight type is the disc, both in lead and in stone, and it is typical of the Aegean. The basic Minoan/Aegean unit of measurement is **x** or 60–65 g. The talent (**L**), double mina (**M**), mina, wool unit (**I**), main unit (**x**), main sub-multiple (**k**) and other smaller units are used within a single series of fractions, even if each can function

as a unit independently ('parallel units'). As far as the inferior units are concerned, the situation has still to be fully understood, since very few small weights are known for this period (Alberti and Parise 2005; Alberti 2011a: 22, table 5). The progressive division (Table 11.1) has a duodecimal or sexagesimal base (Parise 1986; Petruso 1992; Michailidou 2008; Alberti 2011a). Along with local Aegean weights (lead and stone discs, with relative values related to the main Minoan series), typical Near Eastern weights (especially haematite sphendonoid and domed ones, with relative values related to shekels, 'western mina' or even *deben*) have been recovered from sites in the Aegean (e.g. Akrotiri and Mochlos; see respectively Michailidou 2006 and Brogan 2006). In the most important groups of balance weights (MB III-LB I; Table 11.2), the best represented units and types are the Aegean ones, and only a minority of Near Eastern elements have been recognised (Michailidou 2006; Brogan 2006; Alberti 2009; 2011a).<sup>3</sup> Unfortunately, most of the main assemblages of balance weights from Neopalatial Crete come from early excavations, and are thus without a secure context (e.g. Knossos, Tylissos, Mochlos, Zakros; Petruso 1992). Recently, however, a group of weights has been published from Mochlos Building B.2 (LB I advanced – LM IB): they are four lead discs, with weights based on the main unit *x*:  $1/2 x$ ;  $3/2 x$ ;  $2 x$ ;  $2 x$  (Brogan 2006).

As mentioned, the datasets of weights recovered from the large-scale excavations at Ayia Irini on Keos and from Akrotiri on Thera (LB I – LC I) are very large and informative. In particular, the finds from Ayia Irini have been one of the main sources for the identification of the Aegean weighing system. At that site, the weights from House A ground floor are all lead discs and they are calibrated to the main unit *x*:  $1/4 x$ ,  $1/2 x$ ,  $1/2 x$ ,  $1 x$ ,  $1 x$ ,  $3/2 x$ ,  $3/2 x$ ,  $2 x$  (Petruso 1992: 21–36; Alberti 1995). Akrotiri yielded the largest and most impressive range of finds, which includes also heavier weights and the use of a standard related to the measurement of wool: see e.g. the case of the West House, where there were lead discs weighing up to 1, 3, 4 and 6 double minas, and submultiples of the wool unit (Michailidou 1990; 2006; 2007; 2008a: 41–100).

Table 11.1: Simplified structure of the weighing system used during the Neopalatial period in the Aegean, reconstructed on the basis of the attested groups of weights. The wool (l) and textile (f) units and the smaller hypothetical fractions are not considered. For a detailed view, see Alberti 2011a. Abbreviations: par – parallelepiped; d – disc; cb – cube; sf – sfendonoid; st – stone; ld – lead; br – bronze.

‘Minoan’ (Neopalatial) System MMIII-LMI			
1	L	30,000 g	480
1/30	M		
	<i>double mina</i>	1,000 g	16
1/60	Mina	500 g ca	8
1/480	x	60–65 g	1
1/1440 (1/1500)	k	20 g	1/3

duodecimal and sexagesimal progressive fractions

Table 11.2: Aegean weighing units and weight types during MBIII – LB I-II.

	Aegean Units						???	Eastern Units		Minas		Types			
	f 36 g	W 50 g	k 20 g	w 5 g	x 58-66 g	M/N		Wool (z, l)	s = qdt 9.4 g	mp= 8.7 g	Western 470-480 g	Heavy 500-579 g	dist	ld	others
Haghia Triada	x	x	x	x	x	x	x	x				x	x		
Tylissos		x			x		x	x		x		x	x	x	
Malia					x								x		
Mochlos			x		x	x	x						x	x	x
Palaikastro					x							x	x		
Ayia Irini			x		x		x	x			x	x	x	x	
Akrotiri	x	x	x		x		x		x		x	x	x		x
Vapheio					x	x							x		

The same picture holds true for the restricted evidence available from mainland Greece. In the Vapheio tholos tomb (LB I advanced–LH IIA), among other gravegoods that exhibited a complex pattern of cultural influences (particularly a strong Minoanising flavour), an impressive assemblage of nine balance weights (lead discs) and ten bronze scale pans has been found. The set of weights is typically Minoan, both in shape and standards, with weights clearly arranged in a series based on  $x$  and  $M$ :  $1 x$ ;  $2 x$ ;  $2 x$ ;  $3 x$ ;  $4 x = N$ ;  $8 x = N 2$ ;  $16 x = M$ ;  $16 x = M$ ;  $16 x = M$ . Every multiple from  $x$  to  $4 M$  ( $64 x$ ) can be composed (Alberti 2006; Michailidou 2008a: 156–178). Apparently, no echo of the previous EH weighing systems is discernible, although its absence does not prove the system was no longer in use. The absence is quite striking nonetheless, and can probably be seen as another example of shared Minoanising practices adopted by the Early Mycenaean leading groups.

The metrological evidence thus confirms the general historical picture for this period: the Aegean economy was quite interconnected, with a strong leading role being played by Crete. Connections with the Near East, though relevant, were of secondary importance in the structure of the internal economic system.

### **Advanced and mature LBA: Mycenaeanisation, ‘globalisation’, the southern route, the northern shift and ‘glocal’ weights**

A different scenario can be reconstructed for the following Mycenaean palatial phase: first, the ‘core’ of the southern Aegean system moves from Crete to the Mainland; second, Aegean trade circuits are structurally connected to external *foci* of economic growth, such as the central Mediterranean and Cyprus (LB IIIA-B; general overview in Sherratt 2010: 96–98; Broodbank 2013: 402–414, 446–447, 464–465, fig. 8.1, 8.67, 9.1).

During LB IIIA-B early, internal Aegean trade routes are substantially similar to those in the preceding period (Figure 11.2). During the LB IIIA surviving Eastern Mediterranean imports are concentrated in Crete, especially Kommos (Cline 1994; 2007; Shaw *et al.* 2006; Day *et al.* 2011; van Wijngaarden 2012), suggesting that the island is still playing its role of interface or filter between the Aegean and Mediterranean routes. In the following LB IIIB Early period, the pattern of distribution of eastern imports start to change: their presence in Kommos is considerably reduced, while some clusters are attested at LH IIIB1 Mycenae and Thebes (Cline 1994; Tournavitou 1995; Shaw *et al.* 2006). A more internal entrance route for Eastern imports through our ‘Interface’ is probable, especially via Rhodes and across through the Cyclades (Mountjoy 1998; Hope Simpson 2003; Schon 2010). The first Western elements appear during the early part of LB IIIB (bronzes at Ulu Burun, Knossos; mould at Mycenae; Handmade Burnish Ware at Chania and Sardinian Handmade Burnished Ware at Kommos; Jung 2009; Lis 2009; Shaw *et al.* 2006). Many scholars consider that Mediterranean trade involvement formed a major economic basis for Mycenaean palatial societies (though see Molloy, this volume), but trading and diplomatic frameworks are both notoriously difficult to understand (Cline and Harris Cline 1998: 137–148, 291–299; Cline 2007; Alberti 2011b; Beckman *et al.* 2011; van Wijngaarden 2012).



Based on the long-term cultural osmosis of previous periods, and especially on the diffused Minoanising matrix, during LB IIIA and IIIB Early Mycenaean influence and fashions (*e.g.* fine and coarse pottery, prestige goods, funerary habits, ritual paraphernalia and, with respect to Crete only, administrative tools) spread out into the whole Aegean and beyond, in various combinations with preceding local traditions. The dynamics of Mycenaeanisation are as complex and variegated as the Minoanisation phenomena. What has to be stressed is that Mycenaeanisation is a dynamic process, both within mainland and island societies, resulting in strongly regionalised (and continuously transforming) identities in the framework of what has been termed a Mycenaean *koine* (Georgiadis 2003; D'Agata and Moody 2005; Mountjoy 2008; Langohr 2009; Knappett and Nikolakopoulou 2014; for decorated pottery, Mountjoy 1999). Pottery from various regions (especially the Argolid and western and southern Crete) circulates and there are local imitations and hybridisation phenomena at work (see *e.g.* for the 'Lower Interface', Mountjoy 1998; Laffineur and Greco 2005: 129–152, 199–286; Marketou *et al.* 2006; Benzi 2009). The presence of groups of Cretan transport stirrup

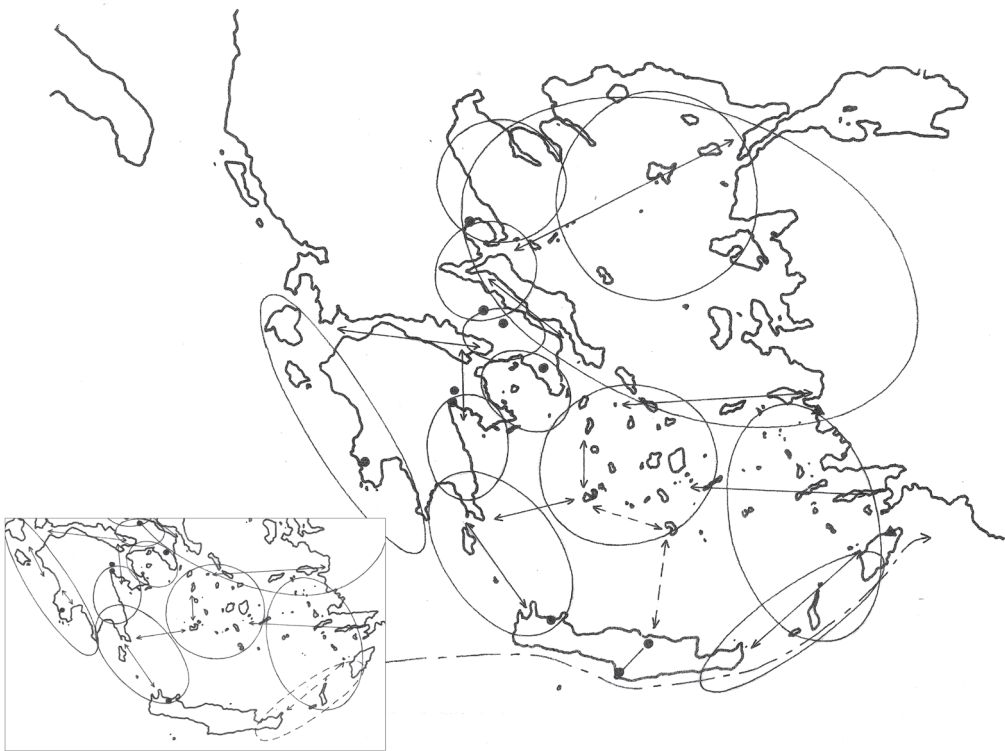


Figure 11.2: Aegean trade routes and circuits during the LBII-III B Early (main figure). During LB III B Advanced, the trade involvement of Southern and North-Central Crete diminishes, Chania being then the major trading centre of the island (box) (M. E. Alberti, F. Merlatti).

jars (probably containing olive oil) at Mycenae and Thebes in the first part of LB IIIB (Haskell *et al.* 2011) raises questions about the economic relationships and balance among the Aegean regions in this phase.

On the external Mediterranean side, the southern variant of the ‘long route’ between Syria and the central Mediterranean, also called the ‘route of the isles’, acquires renewed importance during the LB IIIA – IIIB Early (Broodbank 2013: 464–465, fig. 8.1, 8.67 and 9.1; Cline 1994: 92; Marazzi and Tusa 2005; Militello 2005), incorporating the south and east coasts of Cyprus (Enkomi, Kition, Kalavassos-Ayios Dimitrios, Alassa, Hala Sultan Tekke), the south coasts of Crete (Kommos), southern Sicily (Thapsos, Cannatello) and southern Sardinia (Antigori). In the anticlockwise pattern of Mediterranean circuits (see above), the return route from the Aegean towards Syria may have followed a series of already well-established ports on the Libyan (Marsa Matruh and Zawiyet Umm el-Rakham) and Syro-Palestinian coasts (Gaza, Ashkelon, Ashdod, Tel Nami, Tell Abu Hawam, Tel Akko, Tyre, Sarepta, Byblos), until it reached the important centre of Ugarit (Cline and Harris Cline 1998: 105–111, 137–148, 291–299; Stampolidis and Karageorghis 2003: 15–83; Laffineur and Greco 2005: 355–392). The strengthening of this more direct connection between the Levant and the central Mediterranean allows a further exchange of people, products and ideas in both directions, especially during the LB IIIA2 – B, with an intensity that gives a sense of ‘globalisation’, perfectly embodied by the variegated cargo of the Ulu Burun shipwreck (Sherratt 2003; Stampolidis and Karageorghis 2003: 15–83; Laffineur and Greco 2005: 355–392; Duistermaat and Regulski 2011: 183–380). On this southern route we may recognise above all materials from Cyprus, the Levant and, to a lesser extent, Crete and Sardinia (Hallager and Hallager 2003; Stampolidis and Karageorghis 2003: 15–35, 141–151; Militello 2005; Bell 2006; Shaw *et al.* 2006; Haskell *et al.* 2011; Maran and Stockhammer 2012: 32–120; Sauvage 2012). Though Mycenaean and Mycenaeanising wares become the ‘fashion’ of the period in the eastern Mediterranean, along with fine Cypriot tableware, it is now widely accepted that the greater part of the Aegean materials found in the Levant travelled more often via Cypriot or Levantine intermediaries rather than with Mycenaean ones (Yon *et al.* 2000; van Wijngaarden 2002; Sherratt 2003; Balensi *et al.* 2004; Laffineur and Greco 2005: 355–370). On the other hand, Levantine and Cypriot materials, though present, are less common on the northern paths of the route, especially in the Ionian and Adriatic Sea and eastern Sicily, where Aegean materials have the major share of imports / influence (Laffineur and Greco 2005: 473–652; Shaw *et al.* 2006; Blake 2008; Radina and Recchia 2010). A crucial element in fostering the growth is the full linkage of Cyprus and its export-oriented economy from the 13th century (Sherratt 2000; 2003; 2010; Gale 2011; Cadogan *et al.* 2012; Kassianidou and Papasavvas 2012). The metallurgical aspect of Cypriot production and trading initiatives has been seen as contributing to the spread of metallurgical innovations and the progressive intermingling and blending with technical traditions from the central Mediterranean and central Europe, which will take place more consistently in the following phases (Sherratt 2000; 2010; Jung 2009; Borgna 2009).

Some important changes in the internal structure of Aegean trade can be identified by the very end of the palatial period (LB IIIB2), possibly caused by definitive establishment of the core in the Mainland, and these hold true at least for the LB IIIC Early (Figure 11.2 box): judging from the distributions of imports in the Aegean for the late 13th century, the major internal sea routes seem to shift towards the north (Sherratt 2001; 2003), with the minor involvement of southern Crete (Rutter 2006), and a major role for western Crete (Chania; Hallager and Hallager 2000; 2003), the Argolid, which is as usual the hub of connection between north and south (Mycenae, Tiryns; Cline 1994; Vettters 2011; Maran 2012), and also Boeotia (Thebes; Alberti *et al.* 2012 with references) and Achaea (Giannopoulos 2008; Moschos 2009). Though Mycenae has its own share of imports in this late palatial phase, the most important

Table 11.3: Simplified structure of the weighing system used during the Mycenaean period in the Aegean, reconstructed on the basis of the attested groups of weights. The wool unit (l) and the hypothetical smaller fractions are not illustrated.

“Mycenaean” System (LBIIIA-B)			
	<i>most used</i>		<i>less used</i>
1	L	30,000 g	1,500
1/30	M		
	<b>double mina</b>	1,000 g	50
1/60			Mina 500 g ca) (= 8 x = 24 k)
1/70	20 k	400–440 g	20
1/140	10 k	200–220 g	10
			x 60–65 g (= 3k)
1/1440 (1/1500)	k	20–22 g	1

mixed counting system  
sexagesimal and decimal  
(duodecimal only residual)

Table 11.4: Measures of weight in Linear B. Some units known from the balance weights of the Neopalatial period (x c. 60 g, and mina c. 500 g) are not attested in the Mycenaean documents, though some examples of both are present among the LB IIIA-B weights. The absolute value of Q is still uncertain (see Alberti forthcoming for discussion). On ‘light’ and ‘heavy’ values, see Alberti 2005.

Linear B	Lin.B Trascr.	Talent ratio	P ratio	“light” absolute value (g)	“heavy” absolute value (g)
AB *118 (talent)	L	1		29,088	31,329.6
*145 (wool unit)	LANA	1/10		2899	3132.96
*117 (double mina)	M	1/30		969.6	1044.32
*116 (half mina)	N = RO (02)	1/120	12	241	261.08
*115	P	1/1440	1	20.2	21.75
*114	Q	1/8640	1/12	3.36	3.62

concentrations of Eastern and Western items are found at the harbour-towns of Chania and Tiryns, both in pivotal positions within the trade routes (also Sherratt 2003; Jung 2009; Lis 2009; Iacono 2012). The intensification of the internal route to the central Mediterranean and Adriatic is paralleled by the increasing emergence of wealthy and warrior burials in western Achaea, which start to include imports from the Argolid, Crete and some 'Westernising' bronzes during LB IIIB2-C Early (Sherratt 2001; Rutter 2006; Borgna 2009; Moschos 2009; an alternative position is argued by Molloy, this volume). The circulation of decorated pottery from the Argolid decreases considerably, with the parallel growth of regional production (Mountjoy 1999; 2008; Georgiadis 2003; Knappett and Nikolakopoulou 2014), while the presence of Cretan transport stirrup jars on the mainland is still strong (especially at Tiryns and Mycenae, some at Thebes: Haskell *et al.* 2011). However, regional networks are affected by settlement shifts taking place in the Cyclades (Mountjoy 2008; Knappett and Nikolakopoulou 2014), the 'Interface' (Georgiadis 2003) and Crete (Wallace 2010; Borgna 2013).

During LB IIIB2/C Early, the shipwrecks of Cape Iria (Argolic Gulf) and Modi (Saronic Gulf) illustrate the importance of small- to medium- scale transport within regional circuits and, at the same time, the role of long-term connections (Phelps *et al.* 1999; Agouridis 2011). The similar case of Cape Gelidonya, off the south Anatolian coast, has been considered the best example of the widespread Mediterranean circulation and recycling of bronze in this phase (Bass 1967; Sherratt 2000; 2003).

Following the general economic trend, weighing standards become more 'international' or 'globalised' during the Mycenaean palatial period. In the Aegean, most balance weight groups of this period have both traditional Minoan/Aegean characteristics and innovative features and also include various weights representing Near Eastern units. The Mycenaean weighing system presents some innovations in relation to the Neopalatial tradition (Parise 1994; 1996; 2009; Petruso 2003; Alberti 2006; 2009; 2011a; Rahmstorf 2008a). A decimal accounting system for multiples is documented, along with the more traditional duodecimal and sexagesimal multiples and fractions of the main talent/ $x$  series. It is worth recalling that the decimal system of multiples was already in use during the EBA (see above). Major units used include the talent, the double mina, mina (only a few cases) and the wool unit, and are familiar from the previous phase. The unit  $x$  (60–65 gr) is found less frequently, while the series based on  $k$  (20 gr) becomes increasingly popular; especially as 10  $k$  and 20  $k$  and as fractions of  $k$ . This series based on  $k$ , integrated within the mina series, can be seen to be the main series of the period (Table 11.3). This is a transformation *within* the Minoan system, more adapted to both the Helladic tradition and its Near Eastern counterpart (which was at the base of the Early Helladic weighing system, as we saw above). These new elements of the weighing system, as reconstructed from the balance weights, match from many points of view the measuring system attested in Linear B, where the unit  $x$  and the mina are not attested, and the unit used for measuring small quantities is  $P$  of c. 20 g (Table 11.4). The most important evidence for weights comes from Mycenae, Athens, Thebes, Tiryns and the area of Knossos. In

most find groups from these sites, disc shaped weights have Aegean units, while the elongated/sphendonoid ones use Near Eastern units: see, for example, the evidence from LB IIIB Tiryns (Figure 11.3; Rahmstorf 2008a: 158–163). At Mycenae, however, beside typical Aegean weights, and a few typical Near Eastern ones, some groups of weights of Aegean type seem to be based on Near Eastern units (Alberti 2011a: 24–25, tables 10–11; Table 11.5).

One of the best examples of what may have been considered a (then) ‘modern’ set comes from Thebes: there, both traditional and innovative weighing assemblages are documented. The two lead discs from the ‘Armoury’ are not surprisingly based on the double mina *M*, according to the Minoan/Aegean tradition. On the other hand, the group of stone weights from the ‘Ivory Workshop’ includes one disc, two cubes and five sphendonoids: their metrological values can be ascribed respectively to the widely attested Mycenaean/Aegean *k* unit, to the main Minoan/Aegean unit *x* and to the Syrian shekel *s* (or Egyptian *qdt*). However, if the group is to be seen as a working set, the mark incised on one sphendonoid seems to suggest a common unit of c. 20 g, i.e. again the unit *k* (Table 11.6). In this case, weights of different traditions would have been re-organised according to the local measuring system (Alberti and Aravantinos 2006).

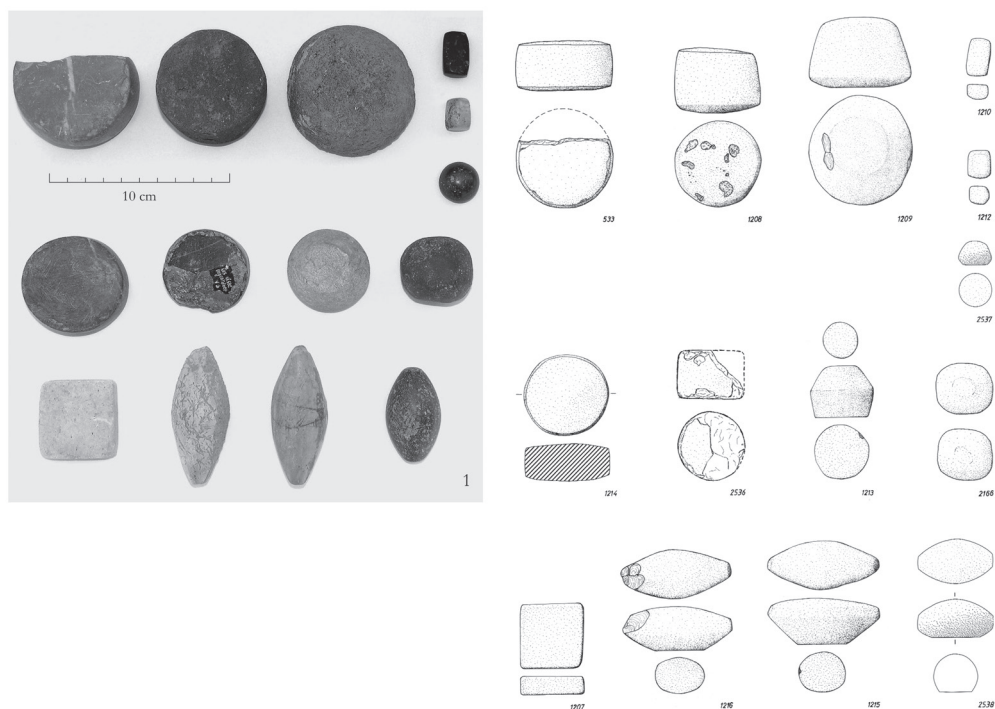


Figure 11.3: LH IIIB stone balance weights from Tiryns: disc-shaped, dome-shaped, cube, sphendonoids (elongated) (from Rahmstorf 2008 a, Taf. 57 and 93.1; courtesy of L. Rahmstorf).

Table 11.5: Aegean weighing units and weight types during LB IIIA-B.

	Aegean units						Aegean weights				Sets of Near Eastern weights							
	f 36 g	w 50 g	k 20 g	w 5 g	x 58-66 g	M/N Wool (z, l)	???	Eastern units		Minas		Typology						
							ae 6.6 g/ dbn 13.2 g	s = qdt 9.4 g	h = 11.4 g	mp = 8,7 g	Western 470-480 g	Heavy 500-579 g	d	st	ld	cb	st	
Mycenae			x	x	x	x		x	?	?			x	x				x
Thebes			x		x	x							x	x	x			x
Tyrins						x									x			x
Athens			x		x	x	?			x					x			x
Knossos						x							x					

Table 11.6: Thebes, the 'Ivory Workshop' weights as a whole set (modified from Alberti &amp; Aravantinos 2006, Tab. V).

<i>Weight</i>	<i>Type</i>	<i>Marks</i>	<i>Mass (g)</i>	<i>s</i>	<i>k</i>	<i>x</i>
TH.01	sf st		4.9	½	¼	1/12
TH.02	sf st	One incised circle	19.5	2	1	1/3
TH.03	sf st		39.5	4	2	2/3
TH.04	sf st		39.7	4	2	2/3
TH.05	sf st		39.8	4	2	2/3
TH.06	cb st		57 (-)	6	3	1
TH.07	cb st		59.2 (-)	6	3	1
TH.10	d st		431.7	40	20	7

The complexity of the trading and weighing relationships of the period is reflected in the balance weights found in the two shipwrecks of Ulu Burun (end of the 14th c.) and Cape Gelidonya (end of the 13th c.). The weights from the former (Pulak 2000) include various sets based on the Syrian/Egyptian *s/qdt* (9.4 g), one set based on the Syrian *kar* (7.8 g) and another set based on the Mesopotamian *mp* (8.7 g). Two (or perhaps even four) examples can be probably considered as of Aegean type and standard, but they do not form a series (their possible values would be *k* and 3 *x*)<sup>4</sup>. Also interesting is the presence among the Syrian weights from Cape Gelidonya of various examples weighing 7 *s* (9.4 × 6 = 65.8 g). This is quite an unusual multiple, not commonly attested in Near Eastern sets: since the weight corresponds to the Minoan unit *x* (60–65 g), it can be suggested that these weights were expressly included because they were suitable for conversion between the Syrian and the Aegean system (Bass 1967; Parise 1971; Alberti and Parise 2005: table 11–12; Alberti 2011a).

### LB IIIC–EIA: 'Western' fashions, Aegean networks and Near Eastern weights

The crisis of the Mainland palatial organisations at the transition from LB IIIB2 to LB IIIC Early, though affecting in many ways the settlement pattern and the political and socio-economic structures of Mainland polities (e.g. Deger-Jalkotzy and Zavadil 2003; 2007; Deger-Jalkotzy and Lemos 2006; Deger-Jalkotzy and Bächle 2009), does not seem to have had immediate repercussions on the main routes of the internal trade system, which apparently continued to be effective, with some internal modifications (Sherratt 2000; 2003; see below). In terms of cultural trends, the most characteristic trait of the period is the wide diffusion and imitation in the Aegean (and Levant) of Westernising elements (bronzes, Handmade Burnished Ware), leading to the progressive but definitive insertion of new fashions (especially for weapons and

jewellery, but also pottery) into the regional codes of material culture (Harding 1984; Bouzek 1985; Sherratt 2003; Jung 2006 and 2009; Lis 2009; Rahmstorf 2011c; Iacono 2012; Molloy, this volume). The distribution of these ‘Westernising’ elements seems to follow a rather more diffuse and polycentric pattern than before, suggesting the existence of important settlement networks along the major trading routes: from Attica (Laurion ores still being a key-resource) the route heads west, through the Corinthian Gulf to Achaëa with neighbouring regions and the Adriatic corridor (*e.g.* Aigeira, Nikoleika, Patras, Monodendri and Teichos Dymaion). The second segment of maritime activity is the sea-route from eastern Attica (*e.g.* Thorikos and Perati, very close to the Laurion/Thorikos silver sources) to the Euboean Gulf (*e.g.* from Perati to Mitrou and Kynos on the mainland side and Amarynthos and Lefkandi on the Euboean side) and the Pagasitic Gulf (Volos), all areas that were intensively settled and shared various elements of material culture (Deger-Jalkotzy and Zavadil 2003; 2007; Deger-Jalkotzy and Lemos 2006: 257–360, 465–664; Thomatos 2007; Giannopoulos 2008; Vlachopoulos 2008; Bachhuber and Roberts 2009: 22–60; Borgna and Càssola Guida 2009: 29–158; Deger-Jalkotzy and Bächle 2009; Iacono 2012; Broodbank 2013: 445–502). In many Aegean regions, settlement patterns changed throughout the period, especially in the Cyclades (Mountjoy 2008), the SE Aegean (Georgiadis 2003) and Crete (Wallace 2010; Borgna 2013): trade activities in these areas would probably vary accordingly, as has been suggested for Crete (Borgna 2013).

On the other hand, the pattern of Mediterranean interconnections that had emerged in the previous phase is substantially still valid in most aspects, even with some transformations. Cypriot, Levantine and Levantinising objects, Western and Westernising products, Mycenaean and Mycenaeanising, Late Minoan and Minoanising exports circulate along these segmented routes, engaging with the continuous transformation and hybridisation of local material cultures, in a complex mixing of strong regional identities and international blending, which paves the way to the Early Iron Age world (Sherratt 2003; Stampolidis and Karageorghis 2003: 83–101, 173–186; Borgna and Càssola Guida 2009; Karageorghis and Kouka 2011). Iron technology, though already practised on Cyprus, has only a minor role within the Aegean economy of this phase (Sherratt 2000; 2003).

In particular, during the LB IIIC Early southern Aegean internal trade circuits continue as before (Figure 11.4 box), but the involvement of Messenia diminishes in favour of the Argolid, Corinthian Gulf and Achaëa (Sherratt 2001; 2003). The main trading centres are still Chania and Tiryns, which collect a number of Western and Westernising items and some Eastern imports (Hallager and Hallager 2000; Jung 2009; Rahmstorf 2011c; Vettors 2011). Westernising objects reach their widest Aegean diffusion in this phase, spreading in coastal and inland sites of the Peloponnese, Central Greece and Crete (Jung 2009; Lis 2009; Rahmstorf 2011c; Iacono 2012). The evidence from Chania is paralleled by other indicators of Cretan economic activity, such as the presence of a few Cretan transport stirrup jars at Tiryns (Maran 2005) and of a strong Cretan flavour in the pottery production of southern Italy (Borgna 2009; 2013).



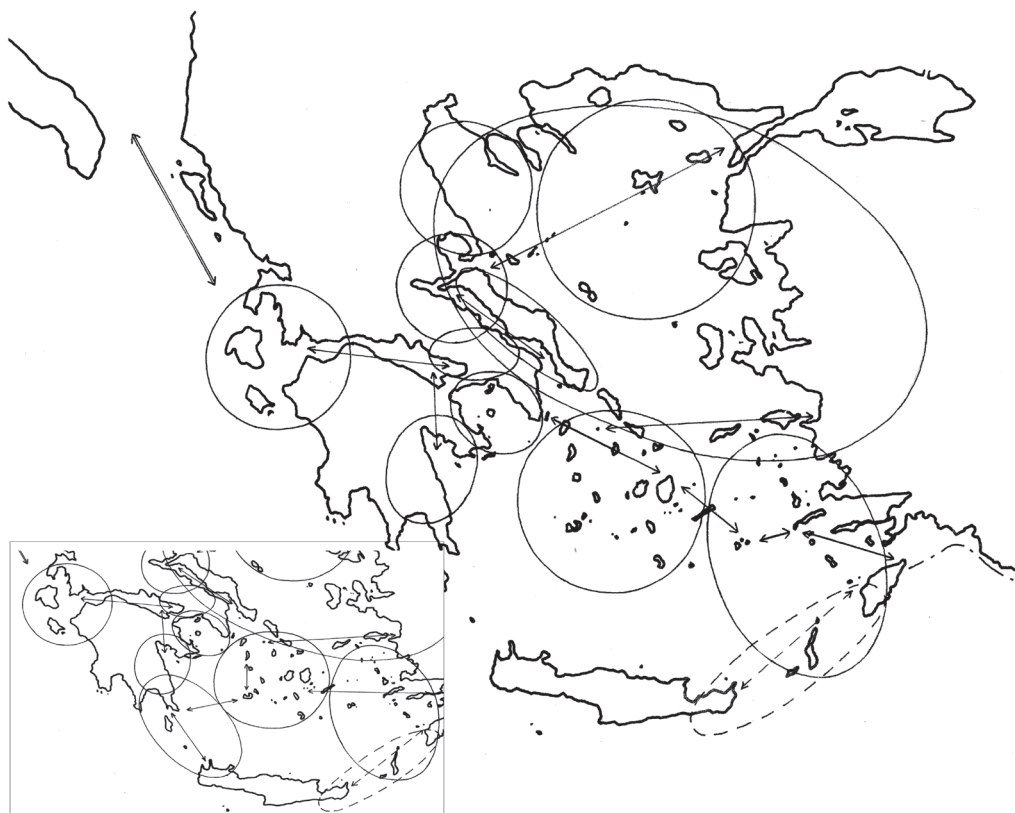


Figure 11.4: Aegean trade routes and circuits during the LB III B Late and the LB III C Early, when the involvement of Messenia diminishes in favour of the Corinthian Gulf and Achaean (box). Aegean trade routes and circuits during the LB III C Middle (main figure) (M. E. Alberti, F. Merlatti).

Following this period, major transformations take place during the transition to LB III C Middle, and are fully visible in its latest part (Advanced): the role of Crete in trading activity seems to diminish (Borgna 2009; 2013) and Cypriot connections are more evident, both in the Argolid and the south-east Aegean. The LB III C Middle evidence from Tiryns is a good example of this trend, with the continuing presence of Cypriot and other Eastern imports but the reduction of Cretan transport stirrup jars (Maran 2005; Vettors 2011). Southern Aegean circuits seem to acquire a new configuration (most probably following already existing routes), a network connecting Cyprus to Attica via Rhodes, Kos and Naxos, with various possible deviations (Figure 11.4). Along this route, major centres thrive and material culture is highly interconnected, especially pottery and funerary assemblages, while island products, Cypriot imports or Cypriote-related objects circulate, along with some Westernising bronzes (Cline 1994; Mountjoy 1998; 1999; Georgiadis 2003; 2009; Thomatos 2007; Vlachopoulos 2008; Benzi 2009; Knappett and Nikolakopoulou 2014). A Levantinising



taste is particularly common along this route, and, assuming funerary repertoires are representative of broader trends in movement of material culture, it is quite well represented in the funerary assemblages, especially at Perati (Cypriot and Levantine pottery, jewellery, balance weights and seals and iron knives are attested), which has to be seen as one of the most important terminals or pivot-points of the Aegean trade in the period (Iakovidis 2003; Sherratt 2003). In Achaea, this is the main flourishing phase, with important long-range connections towards the central Mediterranean and the SE Aegean and a local production of Westernising bronzes (Moschos 2009).

After the end of LB IIIC Middle, evidence for trade becomes progressively rare, even though some areas are clearly still involved in regional and overseas interconnections (Sherratt 2003; Deger-Jalkotzy and Bächle 2009; Bachhuber and Roberts 2009: 22–60). When the data become sufficient again for us to begin to draw a more holistic picture, by the advanced EIA (end of the 9th and 8th c.), we again find Aegeans ('Greeks') and Cypriot-Levantines ('Phoenicians') acting on the same routes, using often the same ports (*e.g.* Kommos, Tharros, Sant' Imbenia, Carthage, and later on also Pithekoussai, Sulcis/S. Antioco, Toscano, Cadiz). By the 7th c., when proper colonisation in the central Mediterranean began according to widely accepted opinion, the previous division Aegeans/northern route and Levantines/southern route finds new archaeological visibility and territorial substance (Sherratt and Sherratt 1993).

Quite interestingly, almost no evidence for the survival of the Mycenaean weighing system is known for this (quite long) period, but Near Eastern weights do occur, even if in very low numbers, at the major Aegean trading centres. It seems then that local Aegean systems were essentially administrative tools, linked to the palatial administration, and/or that the process of evolution that had already started during Mycenaean palatial times ended with a complete 'Orientalisation' of the system. Types and units that are known are almost always of Near Eastern type, while traditional Aegean weights are not attested after LB IIIC. This may also be taken to support the suggestion that the economic leadership of the Mediterranean belonged to Cyprus, the Levant and then to Phoenicia (Table 11.7; Kroll 2008; Alberti 2011a).

It is in this framework that Greek weighing systems and then coinages were shaped in the first centuries of the 1st millennium BC. And so, it is highly possible that the origins of many Greek weighing measures, which are at the base of the subsequent coinages, are based on Near Eastern standards. We can see this, for example, in the balance weight from Pithekoussai, the first Greek settlement in the Central Mediterranean (from levels of the early 7th cent.). This is considered to be an 'Euboic stater', but, to our eyes, it is a Mesopotamian shekel (8.7 g) (Ridgway 1984: 108–109; Parise 2006). To some extent, then, a parallel can be traced with the history of the writing systems in the Aegean.

## Explanatory note and acknowledgements

The present text is a short overview (with reduced references) of the most recent developments in the field of southern Aegean trade and metrology, ideally to be read

alongside the contribution of L. Rahmstorf, this volume. For a wider discussion and full bibliography, see Alberti *et al.* 2006; Michailidou 2008; 2010; Alberti 2009; 2011a; 2011b; 2012. On measure and ancient societies, see recently Morley and Renfrew 2010. Relative chronological phases are mainly designed as EBA, MBA, LBA, to cover all the Aegean areas: however, in some cases regional chronologies are adopted as well (i.e. EC, EM, EH, *etc.*). All dates are Before the Common Era. The temporal and geographical scope of the paper has required the use of many iterations of ‘-isation’ which are accepted as a debated concept, though it is impractical to place all posited terms in inverted commas.

I especially wish to thank Barry Molloy for his help with this text, both for the language and the contents, which considerably improved the final outcome. My thanks also go to John Bennet, Lorenz Rahmstorf and Susan Sherratt for their comments and suggestions on a first draft of this paper. I am also grateful to Elisabetta Borgna, Carl Knappett and Irene Nikolakopoulou for permission to read and quote from their unpublished works, to Lorenz Rahmstorf for the images of the Tiryns weights, and to Luca Girella and Peter Pavúk for valuable information on the Mikro Vouni excavation. I am obviously the only one responsible for any remaining errors.

## Notes

1. I wish to thank Lorenz Rahmstorf for bringing to my attention the existence of lead discs at Old Assyrian (i.e. roughly contemporary with the Proto-palatial period) Karum Kanesh (Özgülç 1986: 77–78, figs. 62–63, pl. 130, 1–6; comments in Michailidou 2004). More study and reflection on this evidence is needed before any conclusion can be reached. On the Aegean side, the presence of at least one weight of 65 g from EB Tiryns, which from the context has to be interpreted as 7 s, may perhaps suggest that this mass was not unknown in the previous EB Aegean (Rahmstorf 2006a: 27, fig. 4). EB Cycladic documentation also needs re-examination.
2. See *e.g.* the import and local manufacture of Cypriot pottery in Trianda on Rhodes (Marketou *et al.* 2006), the metal ingots and other *exotica* from Kato Zakros (Platon 1971), Mochlos (Soles 2005) and Poros – Katsambas (Dimopoulou–Rethemiotaki 2004) on Crete.
3. In some cases, Aegean weights can be used also according to Near Eastern units: *e.g.* lead discs of 48 g are to be considered from the context as  $\frac{3}{4}$  x, but they can mathematically also be 5 s (for such correspondences, see Alberti 2011a: 21, tab. 4).
4. Respectively lead discs W 60 and W 111 in Pulak 2000, where they are considered as Near Eastern multiples; other reported lead discs W 108 and W 109 are damaged. It would be quite significant to have a sample standard of the “Mycenaean” k among the ship weights, especially considering the few actual hints of the use of a double shekel (2 s or 2 h) in Ugarit at the same time (Bordreuil 2006: 222).

## References

- Agouridis, Ch. S.  
1997 Sea-routes and Navigation in the Third Millennium Aegean. *Oxford Journal of Archaeology* 16(1): 1–24.  
2011 The Late Bronze Age Shipwreck off the islet of Modi (Poros). *Skyllis* 11(2): 25–34.

Alberti, M. E.

1995 Ayia Irini : Les poids de balance dans leur contexte. *Quaderni Ticinesi di Numismatica e Antichità Classiche* 25: 9–37.

2003 Weighing and dyeing between East and West: weighing materials from funerary contexts in the Late Bronze Age Aegean. In Polinger Foster and Laffineur 2003: 277–284.

2005 I sistemi ponderali dell’Egeo nell’età del Bronzo. Studi, storia, pratica e contatti. *Annuario della Scuola di Atene LXXXI*, serie III, 3, 2003/II (2005): 597–640.

2006 Changing in time: some aspects of the Aegean and Cypriot balance weights. In Alberti *et al.* 2006: 315–340.

2009 Pesi e traffici: influenze orientali nei sistemi ponderali egei nel corso dell’età del bronzo. In F. Camia and S. Privitera (eds.), *Obeloi. Contatti, scambi e valori nel Mediterraneo antico. Studi offerti a Nicola Parise* (Tekmeria 11): 13–41. Paestum – Athens: Pandemos.

2011a La levantinizzazione dei sistemi ponderali nell’Egeo dell’età del Bronzo. In Ascalone and Peyronel 2011: 1–42.

2011b Redistribuzione e commercio? Il sistema di traffici miceneo, in N. Parise, M. E. Alberti, C. Martinelli, Reciprocità e ridistribuzione: modelli meccanici e modelli statistici. In V. Nizzo (ed.), *Dalla nascita alla morte: antropologia e archeologia a confronto, Atti dell’Incontro Internazionale di Studi in onore di Claude Lévi – Strauss, Roma 21 maggio 2010*: 346–359. Rome: Editoriale Service System s.r.l.

2012 Aegean Trade Systems. Overview and Observations on the Middle Bronze Age. In Alberti and Sabatini 2012: 22–43.

forthcoming *I sistemi di misura micenei*. In M. Del Freo and M. Perna (eds.), *Introduzione allo studio dei testi in lineare B*, Napoli, in press.

Alberti, M. E. and V. Aravantinos

2006 The balance weights from the Kadmeia, Thebes. In Alberti *et al.* 2006: 293–314.

Alberti, M.E., V. Aravantinos, M. Del Freo, Y. Fappas, A. Papadaki and F. Rougemont

2012 Textile Production in Mycenaean Thebes. A First Overview. In Nosch and Laffineur 2012: 87–105.

Alberti, M. E., E. Ascalone and L. Peyronel (eds.)

2006 *Weights in Contexts. Bronze Age Weighing Systems of Eastern Mediterranean. Chronology, Typology, Material and Archaeological Contexts. Proceedings of the International Colloquium Rome 22nd – 24th November 2004* (Studi e Materiali 13). Rome: Istituto Italiano di Numismatica.

Alberti, M. E. and N. Parise

2005 Towards a unification of mass-units between the Aegean and the Levant. In Laffineur and Greco 2005: 383–390.

Alberti, M. E. and S. Sabatini (eds.)

2012 *Exchange Networks and Local Transformations. Interaction and Local Change in Europe and the Mediterranean from the Bronze Age to the Iron Age*. Oxford: Oxbow.

Aram Stern, E.

2011 Kreta und die Kykladen. Zu den Außenbeziehungen Kretas während Frühminoische IB und II. In F. Blakolmer, C. Reinholdt, J. Weilhartner, and G. Nightingale (eds.), *Österreichische Forschungen zur Ägaischen Bronzezeit 2009. Akten der Tagung vom 6. Bis 7. März 2009 am Fachbereich Altertumswissenschaften der Universität Salzburg*: 31–40. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Ascalone, E., and L. Peyronel

2007 *I pesi da bilancia del bronzo antico e del bronzo medio* (Materiali e studi archeologici di Ebla VII). Rome: Università degli Studi di Roma La Sapienza.

2011 *Studi italiani di metrologia ed economia del Vicino Oriente Antico dedicati a Nicola Parise in occasione del suo settantesimo compleanno* (Studia Asiana 7). Roma: Herder.

Bachhuber, Ch. and R. G. Roberts (eds.)

2009 *Forces of Transformation. The End of the Bronze Age in the Mediterranean. Proceedings of an international symposium held at St. John's College, University of Oxford, 25–26th March 2006* (Themes from the Ancient Near East BANEA Publication Series, vol. 1). Oxford: Oxbow.

Balensi, J., J.-Y. Monchambert and S. Müller-Celka (eds.)

2004 *La céramique mycénienne de l'Égée au Levant. Hommage à Vronwy Hankey* (Travaux de la Maison de l'Orient et de la Méditerranée 41). Lyon: Maison de l'Orient et de la Méditerranée.

Barrett, C. E.

2009 The perceived value of Minoan and minoanizing pottery in Egypt. *Journal of Mediterranean Archaeology* 22(2): 211–234.

Bass, G. F.

1967 Cape Gelidonya: A Bronze Age Shipwreck. *Transactions of the American Philosophical Society* 57(8). Philadelphia: American Philosophical Society.

Beckman, G., T. Bryce and E.H. Cline

2011 *The Ahhiyawa texts. Writings from the Ancient World*. Atlanta, GA: Society of Biblical Literature.

Bell, C.

2006 *The Evolution of Long Distance Trading Relationships across the LBA/Iron Age Transition on the Northern Levantine Coast. Crisis, Continuity and Change. A Study Based on Imported Ceramics, Bronze and Its Constituent Metals* (BAR IS 1574). Oxford: British Archaeological Reports.

Bennet, J.

2011 The Geography of the Mycenaean Kingdoms. In Y. Duhoux and A. Morpurgo Davies (eds.), *A Companion to Linear B: Mycenaean Greek Texts and their World*, Vol. 2: 137–168. Leuven: Peeters.

Benzi, M.

2009 LB III Trade in the Dodecanese: An Overview. In Borgna and Càssola Guida 2009: 47–62.

Berg, I.

1999 The Southern Aegean System. *Journal of World – Systems Research*, vol. V.3: 475–484.

2007 *Negotiating island identities. The active use of pottery in the Middle and Late Bronze Age Cyclades* (Gorgias Dissertation 31 Classics 5). Piscataway NJ: Gorgias Press.

Bevan, A.

2002 The Rural Landscape of Neopalatial Kythera: A GIS Perspective. *Journal of Mediterranean Archaeology* 15(2): 217–255.

Blake, E.

2008 The Mycenaeans in Italy: a minimalist position. *Papers of the British School at Rome* 76: 1–34.

- Bordreuil, E.  
 2006 Preliminary consideration for a typology of the weights of the Late Bronze Age discovered at Ras Shamra – Ugarit. Archaeological and textual data. In Alberti *et al.* 2006: 203–232.
- Borgna, E.  
 2009 Patterns of bronze circulation and deposition in the Northern Adriatic at the close of the Late Bronze Age. In Borgna and Càssola Guida 2009: 289–309.  
 2013 Di periferia in periferia. Italia, Egeo e Mediterraneo orientale ai tempi della koinè metallurgica: una proposta di lettura diacronica. *Rivista di Scienze Preistoriche* 63: 123–151.
- Borgna, E. and P. Càssola Guida (eds.)  
 2009 *Dall'Egeo all'Adriatico: organizzazioni sociali, modi di scambio e interazione in età postpalaziale (XII-XI secolo a.C.)*, *Atti del Seminario internazionale (Udine, 1-2 dicembre 2006)* (Studi e ricerche di protostoria mediterranea 8). Rome: Quasar.
- Bouzek, J.  
 1985 *The Aegean, Anatolia and Europe: Cultural Interrelations in the Second Millennium B.C.* (Studies in Mediterranean Archeology 29). Göteborg – Prague: Åström.
- Brodie, N., J. Doole, G. Gavalas and C. Renfrew (eds.)  
 2008 *Horizon 'Οπίζων. A colloquium on the prehistory of the Cyclades* (McDonald Institute Monographs). Cambridge: McDonald Institute for Archaeological Research.
- Brogan, T. M.  
 2006 Tipping the scales: evidence for weight measurement from the wider neopalatial community at Mochlos. In Alberti *et al.* 2006: 233–264.
- Broodbank, C.  
 2000 *An Island Archaeology of the Early Cyclades*, Cambridge: Cambridge University Press.  
 2004 Minoanisation. *Proceedings of the Cambridge Philological Society* 50: 46–91.  
 2013 *The Making of the Middle Sea. A History of the Mediterranean from the Beginning to the Emergence of the Classical World*. London: Thames and Hudson.
- Broodbank, C. and E. Kiriati  
 2007 The first Minoan of Kythera revisited: technology, demography, and landscape in the prepalatial Aegean. *American Journal of Archaeology* 111(2): 241–274.
- Broodbank, C., E. Kiriati and J. Rutter  
 2005 From Pharaoh's feet to the slave-woman of Pylos? The history and cultural dynamics of Kythera in the Third Palace Period. In Dakouri–Hild and Sherratt 2005: 71–96.
- Brumfiel, E.M. and T.K. Earle  
 1987 Specialization, exchange and complex societies: an introduction. In E.M. Brumfiel and T.K. Earle (eds.), *Specialization, exchange and complex societies*: 1–9. Cambridge: University Press.
- Brysaert, A.  
 2008 *The power of technology in the Bronze Age eastern Mediterranean: the case of the painted plaster* (Monographs in Mediterranean Archaeology 12). London – Oakville, CT: Equinox Publishing Ltd.

Cadogan, G., E. Hatzaki and A. Vasilakis (eds.)

2004 *Knossos: Palace, City, State. Proceedings of the Conference in Herakleion organised by the British School at Athens and the 23rd Ephoreia of Prehistoric and Classical Antiquities of Herakleion, in November 2000, for the Centenary of sir Arthur Evans's Excavations at Knossos* (BSA Studies 12): 311–321. London: British School at Athens.

Cadogan, G., M. Iacovou, K. Kopaka and J. Whitley (eds.)

2012 *Parallel lives. Ancient island societies in Crete and Cyprus. Papers arising from the Conference in Nicosia organised by the British School at Athens, the University of Crete and the University of Cyprus, in November-December 2006* (BSA Studies 20). London: British School at Athens.

Cherry, J.F.

2010 Sorting Out Crete's Prepalatial Off-Island Interaction. In Parkinson and Galaty 2010: 107–140.

Clancier, Ph., F. Joannès, P. Rouillard and A. Tenu (eds.)

2005 *Autour de Polanyi. Vocabulaires, théories et modalités des échanges*. Paris: de Boccard.

Cline, E. H.

1994 *Sailing the Wine-Dark Sea. International Trade and the Late Bronze Age Aegean* (BAR IS 591). Oxford: British Archaeological Reports.

2007 Rethinking Mycenaean international trade with Egypt and the Near East. In Galaty and Parkinson 2007: 190–200.

Cline, E. H. and D. Harris-Cline (eds.)

1998 *The Aegean and the Orient in the Second Millennium, Proceedings of the 50th Anniversary Symposium, Cincinnati 18–20 April 1997* (Aegaeum 18). Liège: Université de Liège.

Cutler, J.

2012 Ariadne's thread: the adoption of Cretan weaving technology in the wider southern Aegean in the mid-second millennium BC. In Nosch and Laffineur 2012: 145–154.

D'Agata, A. L. and J. Moody (eds.)

2005 *Ariadne's Threads. Connections between Crete and the Greek Mainland in Late Minoan III (LMIIIA2 to LMIIIC). Proceedings of the International Workshop held at Athens, Scuola Archeologica Italiana, 5–6 April 2003* (Tripodes 3). Athens: Scuola Archeologica Italiana di Atene.

Dakouri-Hild, A. and S. Sherratt (eds.)

2005 *Autochthon. Papers presented to O.T.P.K. Dickinson on the occasion of his retirement* (BAR IS 1432). Oxford: British Archaeological Reports.

Davis, J. L.

1979 Minos and Dexithea. Crete and the Cyclades in the Later Bronze Age. In J. L. Davis and J. F. Cherry (eds.), *Papers in Cycladic Prehistory*: 143–157. Los Angeles: University of California Press.  
2008 Minoan Crete and the Aegean Islands. In Shelmerdine 2008: 186–208.

Davis J. L. and J. F. Cherry

1990 Spatial and temporal uniformitarianism in Late Cycladic I: perspectives from Kea and Milos on the prehistory of Akrotiri. In Hardy *et al.* 1990: 185–200.



- Davis, J. L. and E. Gorogianni  
 2008 Potsherds from the Edge: The Construction of Identities and the Limits of Minoanized Areas of the Aegean. In Brodie *et al.* 2008: 339–348.
- Day, P. M., P. S. Quinn, J. B. Rutter and V. Kilikoglou  
 2011 A world of goods: transport jars and commodity exchange at the Late Bronze Age harbor of Kommos, Crete. *Hesperia* 80(4): 511–558.
- Deger-Jalkotzy, S. and A. E. Bächle (eds.)  
 2009 *LHIIIC Chronology and Synchronisms III. LHIIIC Late and the Transition to the Early Iron Age. Proceedings of the International Workshop held at the Austrian Academy of Sciences at Vienna, February 23rd and 24th, 2007*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Deger-Jalkotzy, S. and I. S. Lemos (eds.)  
 2006 *Ancient Greece: from the Mycenaean Palaces to the Age of Homer* (Edinburgh Leventis Studies 3). Edinburgh: Edinburgh University Press.
- Deger-Jalkotzy, S. and M. Zavadil (eds.)  
 2003 *LHIIIC Chronology and Synchronisms. Proceedings of the International Workshop held at the Austrian Academy of Sciences at Vienna, May 7th and 8th, 2001*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.  
 2007 *LHIIIC Chronology and Synchronisms II. LHIIIC Middle. Proceedings of the International Workshop held at the Austrian Academy of Sciences at Vienna, October 29th and 30th, 2004*. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Dimopoulou-Rethemiotaki, N.  
 2004 Το επίγειο της Κνωσού στον Πόρο – Κατσαμπά. In Cadogan *et al.* 2004: 363–380.
- Duistermaat, K. and I. Reguluski (eds.)  
 2011 *Intercultural Contacts in the Ancient Mediterranean. Proceedings of the International Conference at the Netherlands-Flemish Institute in Cairo, 25th to 29th October 2008* (Orientalia Lovaniensia Analecta 202). Leuven – Paris – Walpole MA: Peeters Publishers and Department of Oriental Studies.
- Evans, A. J.  
 1906 Minoan Weights and Minoan Currency from Crete, Mycenae and Cyprus. In *Corolla Numismatica: Numismatic Essays in Honour of Barclay V. Head*: 336–367. Oxford.
- Faust, A. and E. Weiss,  
 2011 Between Assyria and the Mediterranean world: the prosperity of Judah and Philistia in the seventh century BCE in context. In Wilkinson *et al.* 2011: 189–204.
- Felten, F., W. Gauß and R. Smetana (eds.)  
 2007 *Middle Helladic Pottery and Synchronisms. Proceedings of the International Workshop held at Salzburg October 31st – November 2nd, 2004* (Ágina-Kolonna Forschungen und Ergebnisse I, Contributions to the Chronology of the Eastern Mediterranean XIV, ÖAW Denkschriften der Gesamtkademie XLII). Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Galaty, M. L. and W. A. Parkinson (eds.)  
 2007 *Rethinking Mycenaean Palaces II* (The Cotsen Institute of Archaeology University of California, Los Angeles Monograph 60). Los Angeles: University of California.

Gale, N. H.

2011 Copper oxhide ingots and lead isotope provenancing. In Ph. P. Betancourt and S. C. Ferrence (eds.), *Metallurgy: Understanding How, Learning Why. Studies in Honor of James D. Muhly* (Prehistory Monographs 29): 213–220. Philadelphia PA: INSTAP Academic Press.

Gale, N.H. (ed.)

1991 *Bronze Age Trade in the Mediterranean. Papers presented at the Conference held at Rewley House, Oxford, in December 1989* (Studies in Mediterranean Archeology 90). Jonsered: Äström.

Georgiadis, M.

2003 *The South-Eastern Aegean in the Mycenaean period. Islands, landscape, death and ancestors* (BAR IS 1196). Oxford: British Archaeological Reports.

2009 The South-Eastern Aegean in the LHIIC Period: What do the tombs tell us? In Bachhuber and Roberts 2009: 92–99.

Gestoso Singer, G.

2010 Forms of payment in the Amarna Age and in the Ulu Burun and Cape Gelidonya shipwrecks. *Ugarit Forschungen* 42: 261–277.

Giannopoulos, Th. G.

2008 *Die letzte Elite der mykenischen Welt. Achaia in mykenischer Zeit und das Phänomen der Kriegerbestattungen im 12.-11. Jahrhundert v.Chr.* (Universität Forschungen zur prähistorischen Archäologie Heidelberg 152). Bonn: R. Habelt.

Girella, L. and P. Pavúk

2015 Minoanisation, Acculturation, Hybridisation: the evidence of the Minoan presence in the NE Aegean between Middle and Late Bronze Age. In N. Chr. Stampolidis (ed.), *Migration and Integration in the Aegean Islands and Western Anatolia during the Late Bronze and Early Iron Age. Istanbul 31 March – 3 April 2011*: 387–340. Istanbul: Koç University Press.

Gleba, M. and J. Cutler

2012 Textile production in Bronze Age Miletus. First observations. In Nosch and Laffineur 2012: 113–119.

Graziadio, G.

2005 The Relations between the Aegean and Cyprus at the beginning of Late Bronze Age: an overview of the archaeological evidence. In Laffineur and Greco 2005: I, 323–334.

Hägg, R. and N. Marinatos (eds.)

1984 *The Minoan Thalassocracy. Myth and Reality, Proceedings of the Third International Symposium at the Swedish Institute in Athens, 31 May-15 June 1982* (Skrifter utgivna av Svenska Institutet i Athen 40 32). Stockholm: Svenska Institutet i Aten.

Hallager, E. and B. P. Hallager (eds.),

2000 *The Greek-Swedish Excavations at the Agia Aikaterini Square, Kastelli, Khania, 1970-1987, Vol. II, The Late Minoan III C Settlement* (Skrifter utgivna av Svenska Institutet i Athen 4° 47/2). Stockholm: Svenska Institutet i Aten; Sävedalen: P. Åström.

2003 *The Greek-Swedish Excavations at the Agia Aikaterini Square, Kastelli, Khania, 1970-1987 and 2001. Vol. III, The Late Minoan IIIB:2 Settlement* (Skrifter utgivna av Svenska Institutet i Athen 4° 47/3 i-ii). Stockholm: Svenska Institutet i Aten; Sävedalen: P. Åström.

Harding, A. F.

1984 *The Mycenaeans and Europe*. London: Academic Press.

Hardy, D. A., C. G. Dumas, J. A. Sakellarakis, and P. M. Warren (eds.)

1990 *Thera and the Aegean World III. Proceedings of the Third International Congress, Santorini, Greece, 3-9 September 1989*: vol. I Archaeology. London: The Thera Foundation.

Haskell, H. W., R. E. Jones, P. M. Day and J. T. Killen (eds.)

2011 *Transport Stirrup Jars of the Bronze Age Aegean and East Mediterranean*. Philadelphia: INSTAP Academic Press.

Højten Sørensen, A.

2009 Approaching Levantine shores. Aspects of Cretan contacts with western Asia during the MM – LM I period. *Proceedings of the Danish Institute at Athens* 6: 9–56.

Hope Simpson, R.

2003 The Dodecanese and the Ahhiyawa question. *Annual of the British School at Athens* 98: 203–298.

Iacono, F.

2012 Westernizing Aegean of LH IIIC. In Alberti and Sabatini 2012: 60–79.

Iakovidis, Sp.

2003 Late Mycenaean Perati and the Levant. In M. Bietak (ed.), *The Synchronisation of Civilisations in the Eastern Mediterranean in the Second Millennium BC II, Proceedings of the SCIEM 2000 – Euroconference, Haindorf, 2nd of May – 7th of May 2001* (Contributions to the Chronology of the Eastern Mediterranean IV): 501–513. Wien: Verlag der Österreichischen Akademie der Wissenschaften.

Jung, R.

2006 *XPONOΛΟΓΙΑ COMPARATA. Vergleichende Chronologie von Südgriechenland und Süditalien von ca. 1700/1600 bis 1000 v.u.Z.*, Wien.

2009 I ‘bronzi internazionali’ e il loro contesto sociale fra Adriatico, penisola balcanica e coste levantine. In Borgna and Càssola Guida 2009: 129–157.

Karageorghis, V. and Ou. Kouka (eds.)

2011 *On Cooking Pots, Drinking Cups, Loomweights and Ethnicity in Bronze Age Cyprus and Neighbouring Regions: An International Archaeological Symposium held in Nicosia, November 6th-7th 2010*. Nicosia: A.G. Leventis Foundation.

Kardulias, N.

2010 World-Systems applications for understanding the Bronze Age in the Eastern Mediterranean. In Parkinson and Galaty 2010: 53–80.

Karetsou, A. (ed.)

2000 *Κρήτη-Αίγυπτος. Πολιτισμικοί δεσμοί τριών χιλιετιών*. Herakleion: Υπουργείο Πολιτισμού.

Kassianidou, V. and G. Papasavvas (eds.)

2012 *Eastern Mediterranean metallurgy and metalwork in the second millennium BC. A conference in honour of James D. Muhly, Nicosia, 10th-11th October 2009*. Oxford: Oxbow Books.

Kiriatzis, E.

2010 “Minoanising” Pottery Traditions in southwest Aegean during the Middle Bronze Age: Understanding the Social Context of Technological and consumption Practice. In Philippa – Touchais *et al.* 2010, 683–699.

Knapp, A. B.

1998 Mediterranean Bronze Age trade: distance, power and place. In Cline and Harris Cline 1998: 193–205.

Knappett, C.

2011 *An Archaeology of Interaction. Network Perspectives on Material Culture and Society*. Oxford: Oxford University Press.

Knappett, C., T. Evans, and R. Rivers

2008 Modelling maritime interaction in the Aegean Bronze Age. *Antiquity* 82: 1009–1024.

Knappett, C. and I. Nikolakopoulou

2008 Colonialism without colonies? A Bronze Age case study from Akrotiri, Thera. *Hesperia* 77(1): 1–42.

2014 Inside Out? Materiality and Connectivity in the Aegean Archipelago. In A. B. Knapp and P. van Dommelen (eds.), *Cambridge Handbook of the Mediterranean World in the Bronze-Iron Ages*: 25–39. Cambridge: Cambridge University Press.

Kohl, Ph. L.

2011 Worlds-systems and modelling macro-historical process in later prehistory: an examination of old and a search for new perspectives. In Wilkinson *et al.* 2011: 77–86.

Kroll, J. H.

2008 Early Iron Age balance weights at Lefkandi, Euboea. *Oxford Journal of Archaeology* 27 (1): 37–48.

Kula, W.

1986 *Measures and men*. Princeton; Guildford: Princeton University Press.

Laffineur, R. and E. Greco (eds.)

2005 *Emporia. Aegeans in the Central and Eastern Mediterranean, Proceedings of the 10th International Aegean Conference, Athens, Italian School of Archaeology, 14–18 April 2004* (Aegaeum 25). Liège and Austin: Université de Liège and University of Texas at Austin.

Langohr, Ch.

2009 ΠΕΡΙΦΕΡΕΙΑ. *Étude régionale de la Crète aux Minoen Récent II-III B (1450 – 1200 av. J.-C.) 1. La Crète centrale et occidentale* (Aegis 3). Louvain-la Neuve: Presses universitaires de Louvain.

Legarra Herrero, B.

2011 New kid on the block: the nature of the first systemic contacts between Crete and the Eastern Mediterranean around 2000 B.C. In Wilkinson *et al.* 2011: 266–281.

Lis, B.

2009 Handmade and Burnished pottery in the eastern Mediterranean at the end of the Bronze Age: towards an explanation for its diversity and geographical distribution. In Bachhuber and Roberts 2009: 152–163.

Liverani, M.

1998 *Uruk la prima città*. Rome-Bari: Laterza.

Lolos, Y. G.

2009 Salamis ca 1200 B.C.: connections with Cyprus and the East. In Borgna and Càssola Guida 2009: 29–46.

Macdonald, C. F., E. Hallager and W.-D. Niemeier (eds.)

2009 *The Minoans in the central, eastern and northern Aegean – new evidence. Acts of a Minoan Seminar 22–23 January 2005 in collaboration with the Danish Institute at Athens and the German Archaeological Institute at Athens* (Monographs of the Danish Institute at Athens 8). Athens: The Danish Institute at Athens.

MacGillivray, J. A.

2013 Absolute Middle Minoan III — the bigger picture: early Neopalatial Crete's relations with the ancient Orient in the mid-second millennium B.C. In C. F. Macdonald and C. Knappett (eds.), *Intermezzo. Intermediacy and Regeneration in Middle Minoan III Palatial Crete* (BSA Studies 21): 221–224. London: British School at Athens.

Maran, J.

2005 Late Minoan coarse ware stirrup jars on the Greek Mainland. A postpalatial perspective from the 12th century B.C. Argolid. In D'Agata and Moody 2005: 415–431.

2006 Coming to terms with the past: ideology and power in Late Helladic IIIC. In Deger-Jalkotzy and Lemos 2006: 123–150.

2011 Lost in translation: the emergence of the Mycenaean culture as a phenomenon of globalization. In Wilkinson *et al.* 2011: 282–294.

2012 Ceremonial feasting equipment, social space and interculturality in Post-Palatial Tiryns. In Maran and Stockhammer 2012: 121–136.

Maran, J. and Ph. W. Stockhammer (eds.)

2012 *Materiality and Social Practice: Transformative Capacities of Intercultural Encounters*. Oxford and Oakville: Oxbow Books.

Marazzi, M. and S. Tusa

2005 Egei in Occidente. Le più antiche vie marittime alla luce dei nuovi scavi sull'isola di Pantelleria. In Laffineur and Greco 2005: II, 599–610.

Marketou, T.

2009 Ialysos and its neighbouring areas in the MBA and LBI period: a chance for peace. In Macdonald *et al.* 2009: 73–96.

Marketou, T., E. Karantzali, H. Mommsen, N. Zacharias, V. Kilikoglou, and A. Schwedt

2006 Pottery Wares from the prehistoric settlement at Ialysos (Trianda) in Rhodes. *Annual of the British School at Athens* 101: 1–55.

Mathioudaki, I.

2010 “Mainland Polychrome” Pottery: Definition, Chronology, Typological Correlations. In Philippa-Touchais *et al.* 2010, 621–633.

Matsas, D.

1991 Samothrace and the north-eastern Aegean: the Minoan connection. *Studia Troica* I: 159–180.

2009 The Minoan in Samothrace. Abstract and bibliography. In Macdonald *et al.*: 251.

Melas, M.

2009 The Afiartis Project: excavations at the Minoan settlement at Fournoi, Karpathos (2001–2004) – a preliminary report. In Macdonald *et al.* 2009: 59–72.

Michailidou, A.

1990 The Lead weights from Akrotiri: The archaeological record. In Hardy *et al.* 1990: 407–419.

2004 On the Minoan economy: a tribute to “Minoan weights and mediums of currency” by Arthur Evans. In Cadogan *et al.* 2004: 311–321.

2006 Stone balance weights? The evidence from Akrotiri on Thera. In Alberti *et al.* 2006: 233–263.

2007 Σταθμά. In Chr. G. Doumas (ed.), *Ακρωτήρι Θήρας. Δυτική Οικία. Τράπεζες - Λίθινα - Μετάλλινα - Ποικίλα*: 200–230. Athens: Η εν Αθήναις Αρχαιολογική Εταιρεία.

2008 *Weight and Value in Pre-Coinage Societies II. Sidelights on Measurement from the Aegean and the Orient* (ΜΕΛΕΤΗΜΑΤΑ 61). Athens: Athens: National Hellenic Research Foundation and Research Centre for Greek and Roman Antiquity.

2010 Measuring by weight in the Late Bronze Age Aegean: the people behind the measuring tools. In Morley and Renfrew 2010: 71–87.

Milano, L. and N. Parise (eds.)

2003 *Il regolamento degli scambi nell'antichità (III-I millennio a.C.)*. Rome – Bari: Laterza.

Militello, P.

2005 Mycenaean palaces and western trade: a problematic relationship. In Laffineur and Greco 2005: II, 585–595.

Momigliano, N.

2012 Bronze Age Carian Iasos. Structures and Finds from the Area of the Roman Agora (c. 3000–1500 BC). Roma: Giorgio Bretschneider.

Morley, I. and C. Renfrew (eds.)

2010 *The Archaeology of Measurement: Comprehending Heaven, Earth and Time in Ancient Societies*. Cambridge: Cambridge University Press.

Moschos, I.

2009 Evidence of social re-organization and reconstruction in Late Helladic IIIC Achaea and modes of contacts and exchange via Ionian and Adriatic sea. In Borgna and Càssola Guida 2009: 345–414.

Mountjoy, P. A.

1998 The East Aegean – West Anatolia Interface in the Late Bronze Age: Mycenaean and the Kingdom of Ahhiyawa. *Anatolian Studies* 48: 33–69.

1999 *Regional Mycenaean Decorated Pottery*. Rahden/Westf: Leidorf.

2004 Knossos and the Cyclades in Late Minoan IB. In Cadogan *et al.* 2004: 399–404.

2008 The Cyclades during the Mycenaean period. In Brodie *et al.* 2008: 467–478.

Mountjoy, P. A. and M. J. Ponting

2000 The Minoan thalassocracy reconsidered: provenance studies of LH II A/LM I B pottery from Phylakopi, Ayia Irini and Athens. *Annual of the British School at Athens* 95: 141–184.

Mühlenbruch T.

2009 Tiryns – the settlement and its history in LHIIIC. In Deger-Jalkotzy and Bächle 2009: 313–326.

Muhly, J.

2003 Trade in Metals in the Late Bronze Age and Iron Age. In Stampolidis and Karagerorghis 2003: 141–150.

Niemeier, W. -D.

1984 The end of the Minoan Thalassocracy. In Hägg and Marinatos 1984: 205–214.

Nosch, M.-L. and R. Laffineur (eds.)

2012 *Kosmos. Jewellery, Adornment and Textiles in the Aegean Bronze Age. Proceedings of the 13th Aegean International Conference, University of Copenhagen, Danish National Research Foundation's Centre for Textile Research, 21–26 April 2010* (Aegaeum 33). Leuven: Peeters.

Overbeck, J. C. and D. M. Crego

2008 The commercial foundation and development of Ayia Irini IV (Kea). In Brodie *et al.* 2008: 305–310.

Özgülç, T.

1986 *Kültepe-Kaniş II. Eski yakınođu'nun ticaret merkezinde yeni arařtırmalar/ New researches at the trading center of the Ancient Near East* (Turk Tarih Kurumu Yayınları V. Dizi – Sa. 41). Ankara: Türk Tarih Kurumu Basimevi.

Pakkanen, J.

2011 Aegean Bronze Age Weights, Châines Opératoires and the Detecting of Patterns through Statoistical Analyses. In A. Brysbaert (ed.), *Tracing Prehistoric Social Networks through Technology: A Diachronic Perspective on the Aegean* (Routledge Studies in Archaeology 3): 143–166. London and New York: Routledge.

Papadimitriou, A.

2006 The Early Iron Age in the Argolid: Some new aspects. In Deger-Jalkotzy and Lemos 2006: 531–548.

Papadimitriou, N. and D. Kriga

2012 “Periphery versus core”. The integration of secondary states into the World System of the Eastern Mediterranean and the Near East in the Late Bronze Age (1600–1200 BC). In Alberti and Sabatini 2012: 9–21.

Papageorgiou, D.

2008 Sea Routes in the Prehistoric Cyclades. In Brodie *et al.* 2008: 9–12.

Pare, C. F. (ed.)

2000 *Metals Make the World Go Round. The Supply and Circulation of Metals in Bronze Age Europe, Proceedings of a Conference held at the University of Birmingham in June 1997*. Oxford: Oxbow Books.

Parise, N. F.

1971 Un'unità ponderale egea a Capo Gelidonya. *Studi Micenei ed Egeo-Anatolici* 14: 165–170.

1986 Unità ponderali egee. In M. Marazzi, S. Tusa and L. Vagnetti (eds.), *Traffici micenei nel Mediterraneo. Problemi storici e documentazione archeologica, Atti del Convegno di Palermo (11-12 maggio e 3-6 dicembre 1984)*: 303–314. Taranto: Istituto per la storia e l'archeologia della Magna Grecia.

1994 Il sistema ponderale “miceneo”. In M. Marazzi (ed.), *La società micenea*: 300–303. Rome: Bagatto.

1996 Fondamenti “minoici” delle misure “micenee”. In E. De Miro, L. Godart and A. Sacconi (eds.), *Atti e Memorie del Secondo Congresso Internazionale di Micenologia, Roma-Napoli, 14-20 ottobre 1991*: III, 1269–1271. Rome: Ateneo.

2005 Metallo e moneta fra Oriente e Occidente. Intorno al dibattito su imprestiti orientali e innovazioni greche. In Clancier *et al.* 2005: 229–237.

2006 Equivalencias entre las antiguas unidades ponderales en Oriente y las primeras especies monetarias de Occidente. In A. Beltrán Martínez (ed.), *Actas del XII Congreso Nacional de Numismática, Madrid-Segovia 25-27 de octubre de 2004*: 15–22. Madrid.

2009 *Pesi e misure nel Mediterraneo orientale prima della moneta*. Roma: Edizioni Nuova Cultura.

Parkinson, W. and M. Galaty (eds.)

2010 *Archaic State Interaction: The Eastern Mediterranean in the Bronze Age*. Santa Fe: School for Advanced Research Press.

Pavúk, P.

2012 Of spools and discoid loom-weights. Aegean-type weaving at Troy revisited. In Nosch, and Laffineur 2012: 121–130.

Peyronel, L.

2008 *Storia e archeologia del commercio nell'Oriente antico*. Rome: Carocci.

Petruso, K. M.

1992 *Keos VIII. Ayia Irini: the balance weights*. Mainz on Rhine: Philipp von Zabern.

2003 Quantal Analysis of Some Mycenaean Balance Weights. In Polinger Foster and Laffineur 2003: 285–291.

Phelps, W., Y. Lolos and Y. Vichos (eds.)

1999 *The Point Iria Wreck: Interconnections in the Mediterranean ca. 1200 B.C. Proceedings of the International Conference, Island of Spetses, 19 September 1998*: 59–76. Athens: Hellenic Institute of Marine Archaeology.

Philippa-Touchais, A., G. Touchais, S. Voutsaki and J. Wright (eds.)

2010 *Mesohelladika. Μεσοελλαδικά: La Grèce continentale au Bronze Moyen. Η ηπειρωτική Ελλάδα στη Μέση εποχή του Χαλκού. The Greek Mainland in the Middle Bronze Age. Actes du colloque international organisé par l'École française d'Athènes, en collaboration avec l'American School of Classical Studies at Athens et le Netherlands Institute in Athens, Athènes, 8-12 mars 2006* (BCH Suppl. 52). Athens: École française d'Athènes.

Phillips, J.

2008 *Aegyptiaca on the Island of Crete in Their Chronological Context: A Critical Review*. (Contribution to the Chronology of the Eastern Mediterranean XVIII, OAW XLIX), vols. I-II. Wien: Verlag der Österreichischen Akademie der Wissenschaften.



Platon, N.

1971 *Zakros. The Discovery of a Lost Palace of Ancient Crete*. New York: Charles Scribner's Sons.

Polinger Foster, K. and R. Laffineur (eds.)

2003 *METRON. Measuring the Aegean Bronze Age. Proceedings of the 9th International Aegean Conference, New Haven, Yale University, 18-21 April 2002* (Aegaeum 24). Liège and Austin.

Popham, M., L.H. Sackett and Ph. Themelis

1980 *Lefkandi I. The Iron Age* (BSA Suppl. Vol. 11). Oxford: The British School of Archaeology at Athens, Thames and Hudson.

Pulak, C. M.

2000 The balance weights from the Late Bronze Age Shipwreck at Uluburun. In *Pare 2000*: 247–266.

Radina, F. and G. Recchia

2010 *Ambra per Agamennone. Indigeni e Micenei tra Egeo, Ionio e Adriatico nel II millennio a.C.*, Exhibition catalogue. Bari: M. Adda.

Rahmstorf, L.

2003 The identification of Early Helladic balance weights from Tiryns and their implications. In Polinger Foster and Laffineur 2003: 293–300.

2006a In search of the earliest balance weights, scales and weighing systems from the East Mediterranean, the Near and Middle East. In Alberti *et al.* 2006: 9–45.

2006b Zur Ausbreitung vorderasiatischer Innovationen in die frühbronzezeitliche Ägais. *Prähistorische Zeitschrift* 81: 49–96.

2008a *Tiryns XVI. Kleinfunde aus Tiryns. Terrakotta, Stein, Bein und Glas/Fayence vornehmlich aus der Spätbronzezeit*. Wiesbaden: Reichert Verlag.

2008b Early Bronze Age balance weights from Tarsus, Alişar Höyük and other sites, *Araştırma Sonuçları Toplantısı* 26: 201–210.

2010 The concept of weighing during the Bronze Age in the Aegean, the Near East and Europe. In Morley and Renfrew 2010: 88–105.

2011a Re-integrating 'diffusion': the spread of innovations among the Neolithic and Bronze Age societies of Europe and the Near East. In Wilkinson *et al.* 2010: 100–119.

2011b Maß für Maß. Indikatoren für Kulturkontakte im 3. Jahrtausend. In *Kykladen. Lebenswelten einer frühgriechischen Kultur*: 144–153. Karlsruhe and Darmstadt: Badisches Landesmuseum and Primus Verlag.

2011c Handmade pots and crumbling loomweights: 'Barbarian' elements in the eastern Mediterranean in the last quarter of the 2nd millennium BC. In Karageorghis and Kouka 2011: 315–330.

Renfrew, C.

1972 *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium BC*. London: Methuen.

Ridgway, D.

1984 *L'alba della Magna Grecia*. Milano: Longanesi.

Routledge, B. and K. McGeough

2009 Just what collapsed? A network perspective on 'palatial' and 'private' trade at Ugarit. In Bachhuber and Roberts 2009: 22–29.

Rutter, J. B.

2006 Ceramic evidence for external contact: Neopalatial and Post-palatial. In Shaw *et al.* 2006: 859–863.

2012 Migrant drinking assemblages in Aegean Bronze Age settings. In Maran and Stockhammer 2012: 73–88.

Sauvage, C.

2012 *Routes maritimes et systèmes d'échanges internationaux au Bronze Récent en Méditerranée orientale* (Travaux de la Maison de l'Orient et de la Méditerranée 61). Lyon: Maison de l'Orient et de la Méditerranée.

Scarre, Ch. and F. Healy (eds.)

1993 *Trade and Exchange in Prehistoric Europe. Proceedings of a Conference held at the University of Bristol, April 1992*. Oxford: Oxbow Books, in association with the Prehistoric Society and the Société préhistorique françaises.

Schon, R.

2010 Think Locally Act Globally: Mycenaean Elites and the Late Bronze Age World-System. In Parkinson and Galaty 2010: 213–236.

Shaw, J. W, A. Van de Moortel and J. B. Rutter

2006 The harbor town and its international connections. In J. W. Shaw and M. C. Shaw (eds.), *Kommos V. The Monumental Minoan Buildings at Kommos: 854–863*. Princeton and Oxford, Princeton University Press.

Sherratt, S.

1998 'Sea Peoples' and the economic structure of the late second millennium in the Eastern Mediterranean. In S. Gitin, A. Mazar and E. Stern (eds.), *Mediterranean People in Transition. Thirteenth to Early Tenth Centuries BCE in Honour of Professor T. Dothan: 292–313*. Jerusalem: The Israel Exploration Society.

1999 *E pur si muove*. Pots, markets and values in the second millennium Mediterranean. In J.-P. Crielaard, V. Stissi, G. J. van Wijngaarden (eds.), *The Complex Past of Pottery. Production, Circulation and Consumption of Mycenaean and Greek Pottery (Sixteenth to Early Fifth Centuries B.C.)*. *Proceeding of the ARCHON International Conference, held in Amsterdam, 8–9 November 1996: 163–211*. Amsterdam: Gieben.

2000 Circulation of metals and the end of the bronze age in the Eastern Mediterranean. In Pare 2000: 82–98.

2001 Potemkin palaces and route-based economies. In S. Voutsaki and J. Killen (eds.), *Economy and Politics in the Mycenaean Palace States. Proceedings of a Conference held on 1–3 July 1999 in the Faculty of Classics, Cambridge* (Cambridge Philological Society Suppl. 27): 214–238. Cambridge: The Cambridge Philological Society.

2003 The Mediterranean economy: 'globalization' at the end of the Second Millennium BCE. In W. G. Dever and S. Gitin (eds.), *Symbiosis, symbolism, and the power of the past: Canaan, ancient Israel, and their neighbors from the Late Bronze Age through Roman Palaestina. Proceedings of the Centennial Symposium, WF Albright Institute of Archaeological Research and American Schools of Oriental Research, Jerusalem, May 29–31, 2000: 37–62*. Winona Lake Indiana: Eisenbrauns.

2010 The Aegean and the wider world: some thoughts on a world-systems perspective. In Parkinson and Galaty 2010: 81–106.

Sherratt, A. and S. Sherratt

1991 From Luxuries to Commodities: The Nature of Mediterranean Bronze Age Trading Systems. In Gale 1991: 351–386.

1993 The growth of the Mediterranean economy in the early first millennium BC. *World Archaeology* 24/3 1993: 361–378.

1998 Small worlds. Interaction and identity in the ancient mediterranean. In Cline and Harris Cline 1998: 329–342.

Soles, J.

2005 From Ugarit to Mochlos – Remnants of an Ancient Voyage. In Laffineur and Greco 2005: I, 429–448.

Sorda, S. and L. Camilli (eds.)

2003 *Per una storia del denaro nel Vicino Oriente Antico. Atti dell'incontro di studio, Roma 13 giugno 2001* (Studi e Materiali 10). Roma: Istituto Italiano di Numismatica.

Stampolidis, N. Chr. and V. Karageorghis (eds.)

2003 Πλώες. *Sea Routes... Interconnections in the Mediterranean 16th–6th c. BC. Proceedings of the International Symposium held at Rethymnon, Crete, in September 29th–October 2nd 2002*. Athens: Museum of Cycladic Art.

Stockhammer, P.W. (ed.)

2012a *Conceptualizing cultural hybridization. A Transdisciplinary approach. Papers of the Conference, Heidelberg, 21st–22nd September 2009* (Transcultural Research. Heidelberg Studies on Asia and Europe in a Global context). Berlin and Heidelberg: Springer.

2012b Entangled pottery: phenomena of appropriation in the Late Bronze Age Eastern Mediterranean. In Maran and Stockhammer 2012: 89–103.

Stos-Gale, Z. and N. Gale

2006 The origin of metal used for the lead weights in Minoan Crete. In Alberti *et al.* 2006: 290–292.

Taylour, W. D. and R. Janko,

2008 *Ayios Stephanos. Excavations at a Bronze Age and Medieval settlement in southern Laconia* (BSA Suppl. Vol. 44). London: British School at Athens.

Thomatos, M.

2007 Koine and subsidiary Koines: coastal and island sites of the central and southern Aegean during the LHIIC middle. In Deger-Jalkotzy and Zavadil 2007: 315–326.

Tournavitou, I.

1995 *The 'Ivory Houses' at Mycenae* (BSA Suppl. Vol. 24). London: The British School at Athens.

van Wijngaarden, G.J.

2002 *Use and appreciation of Mycenaean pottery in the Levant, Cyprus and Italy (1600–1200 BC)*. Amsterdam: Amsterdam University Press.

2012 Trade goods reproducing merchants? The materiality of Mediterranean Late Bronze Age exchange. In Maran and Stockhammer 2012: 61–72.

Vetters, M.

2011 A Clay Ball with a Cypro – Minoan Inscription from Tiryns. *Archäologischer Anzeiger* 2011/2: 1–49.

Vitale, S. and T. A. Hancock Vitale

2012 The Minoans in the south-eastern Aegean? The evidence from the “Serraglio” on Kos and its main historical implications. In Alberti and Sabatini 2012: 44–59.

Vlachopoulos, A.

2008 A Late Mycenaean journey from Thera to Naxos: the Cyclades in the twelfth century B.C. In Brodie *et al.* 2008: 479–492.

Voskos, I., and A. B. Knapp

2008 Cyprus at the end of the Late Bronze Age. *American Journal of Archaeology* 112(4): 659–684.

Voutsaki, S.

2010 From the kinship economy to the palatial economy: The Argolid in the second millennium B.C. In D. Pullen (ed.), *Political Economies of the Aegean Bronze Age. Papers from the Langford Conference, Florida State University, Tallahassee, 22–24 February 2007*: 86–111. Oxford and Oakville: Oxbow Books.

Wallace, S.

2010 *Ancient Crete. From Successful Collapse to Democracy’s Alternatives, Twelfth to Fifth Centuries BC*. Cambridge: Cambridge University Press.

Warren, P. M.

2009 Final summing up. In Macdonald *et al.* 2009: 263–265.

Wilkinson, T. C., S. Sherratt and J. Bennet (eds.)

2011 *Interweaving Worlds. Systemic Interactions in Eurasia, 7th to 1st Millennia BC. Papers from a conference in memory of Professor Andrew Sherratt “What Would a Bronze Age World System Look Like? World systems approaches to Europe and western Asia 4th to 1st millennia BC”*. Oxford and Oakville: Oxbow Books.

Whitelaw, T.

2004a Alternative pathways to complexity in the southern Aegean. In J. C. Barrett and P. Halstead (eds.), *The Emergence of Civilisation Revisited* (Sheffield Studies in Aegean Archaeology 6): 232–256. Oxford: Oxbow Books.

2004b The development of an island centre: urbanization at Phylakopi on Melos. In J. Cherry, Ch. Scarre and S. Shennan (eds.), *Explaining social change: studies in honour of Colin Renfrew* (McDonald Institute Monographs): 149–166. Cambridge: McDonald Institute for Archaeological Research.

2005 A tale of three cities: chronology and minoanisation at Phylakopi in Melos. In Dakouri–Hild and Sherratt 2005: 37–62.

Wright, J. C.

2006 The formation of the Mycenaean palace. In Deger-Jalkotzy and Lemos 2006: 7–52.

2008 Early Mycenaean Greece. In C. W. Shelmerdine (ed.), *The Cambridge Companion to the Aegean Bronze Age*: 230–257. Cambridge: Cambridge University Press.

Yon, M., V. Karageorghis, and N. Hirschfeld

2000 *Céramiques mycéniennes d’Ougarit* (Ras Shamra – Ougarit 13). Paris – Nicosia: Éditions Recherche sur les civilisations.

Zaccagnini, C.

1986 Aspects of copper trade in the eastern Mediterranean during the late bronze age. In M. Marazzi, S. Tusa, L. Vagnetti (eds.), *Traffici micenei nel Mediterraneo. Problemi storici e documentazione archeologica, Atti del Convegno di Palermo (11-12 maggio e 3-6 dicembre 1984)*: 413-424. Taranto: Istituto per la storia e l'archeologia della Magna Grecia.

1994 Les échanges dans l'antiquité: paradigmes théoriques et analyse des sources. In J. Andreau, P. Briant and R. Descat (eds.), *Les échanges dans l'antiquité: le rôle de l'Etat. Entretiens d'archéologie et d'histoire* : 213-225. Saint Bertrand de Comminges.

2003 *Mercanti e politica nel mondo antico*. Roma: Erma di Bretschneider.

Zurbach, J.

2012 Mobilités, réseaux, ethnicité. Bilan et perspectives. In L. Capdetray and J. Zurbach (eds.), *Mobilités grecques. Mouvements, réseaux, contacts en Méditerranée, de l'époque archaïque à l'époque hellénistique (Actes du colloque de Nanterre, juin 2012)* (Scripta Antiqua 46): 261-273. Bordeaux: Ausonius; Paris: de Boccard.