1 Introduction

1.1. Setting the stage

Together with bronze metallurgy, weighing technology is one of the great original innovations of the Bronze Age. Both played pivotal roles in shaping the era. The only reason why weighing technology seldom takes centre stage in the grand narratives of the Bronze Age is that, unlike bronze metallurgy, it has been historically overlooked as a research subject. It is hard to overstate the significance of weighing technology in modelling Bronze Age economies, yet articulating its role in historical processes, particularly in Bronze Age Europe, is a challenging task. This is mostly because the large-scale phenomena that either required or were facilitated by weighing technology have been evident for a very long time before weighing technology – at least, beyond Mesopotamia – even became a focus of research. Suffice it to say, the concept of a Bronze Age 'global' trade network has been a central theme in archaeological grand narratives since at least Gordon Childe's time, whereas research on weighing technology in Europe started to become systematic only on the verge of the 21st century (Pare 1999; Cardarelli *et al.* 2001; Vilaça 2003). Among the influential figures of European prehistory who never directly engaged in the technicalities of weight metrology, C. Renfrew (2012) was one of the first to fully realise the untapped potential of this research field, and the oddity of overlooking it for such a long time. Bringing weighing technology under the spotlight does not make these phenomena more visible, nor does it reveal new ones. Instead, it introduces a new crucial variable, the long absence of which may have led to overlooking or misinterpreting some of the causes behind these phenomena. In other words, understanding weighing technology and weight systems can help explain why certain known processes occurred and how they unfolded.

The substantial number of research papers and edited books published in the last few years demonstrates a renewed interest in Bronze Age weighing technology and weight-related economic phenomena (*e.g.,* Rahmstorf/Stratford (eds.) 2019; Hermann *et al.* 2020; Ialongo *et al.* 2021; Kuijpers/Popa 2021; Poigt *et al.* 2021; Rahmstorf *et al.* (eds.) 2021; , Chambon/Otto 2023; Lago *et al.* 2023; Ialongo/Lago 2024). Perhaps even more telling is the fact that this book is only the fourth monograph on Bronze Age weights and balances published in less than two years, each covering different periods and regions of Western Eurasia, and pursuing different objectives (Ascalone 2022; Poigt 2022; Rahmstorf 2022). What all such monographs – including this one – have in common is a high emphasis on data. The field of Bronze Age weight metrology is in dire need of data, especially in pre-literate Europe, as research in this area lags significantly behind that of other regions in Western Eurasia, where studies began much earlier. Large amounts of data are needed to define the typological variability of weighing tools, assess their chronological and geographical spread, recognize the contexts in which they were used, and reconstruct the weight systems with which they complied.

This book compiles the largest database of weighing tools from pre-literate Bronze Age Europe available to date, encompassing 696 weights and 18 balance beams, distributed unevenly but widely across Continental Europe and the British Isles. In spite of its size, it is safe to remind the reader that such a dataset merely scratches the surface of a research field poised to advance more rapidly in the near future than it has thus far. While this collection marks an improvement over previous research, it still pales in comparison to better-known prehistoric artifacts. To put things into perspective, imagine how much we would know about Bronze Age metalwork if all we had was roughly 700 objects. Probably not bad for a study published in the 19th century, but definitely a long way to go to catch up with today's knowledge. These limitations define the objectives of this book. Bronze Age Europe as a whole – at least, the portion of Europe that is delimited by the study area – is the subject of research. For now, the only feasible approach to working with sufficiently large datasets that maintain statistical validity is to keep the data together. All the observations on typology, diachronic diffusion, contexts, and metrological structure are drawn with the aim of uncovering overarching trends. This, of course, comes at the expense of local peculiarities, which most likely existed, but which the available data do not consent to address in any meaningful way.

The results presented in this work are the outcome of previous and ongoing research on weighing technology, weight systems, and weight-based trade in Bronze Age Western Eurasia. Although this book focuses exclusively on data from Europe (west of Greece), it is based on theoretical and methodological principles that can be consistently applied to any region where weighing technology was used extensively. The evidence suggests that while the general framework of each macro-region resulted from original developments, these developments were constrained by a set of fundamental principles that influenced the spread of weighing technology and the formation of weight systems across the Bronze Age world. These principles can be summarized as follows:

- the main purpose of weighing technology is the quantification of economic value;
- balance weights have no formal requirements;
- the spread of weighing technology is the outcome of a diffusion process;

- weighing technology is used by both public and private subjects;
- weight units are indeterminate in nature;
- weight systems emerge from, and are regulated by the market.

When introducing a book on Bronze Age weighing, it is somehow inevitable to reserve at least a small space to the Ancient Near East. When it comes to the origins of weighing technology in the Bronze Age world, there is little doubt that the Mesopotamian documentation provides by far the best benchmark to understand these principles. The prominent role of the Ancient Near East is not only dependent on its chronological primacy – weighing technology was invented between Mesopotamia and Egypt around 3000 BCE (*e. g.*, Rahmstorf 2022) – but also on the unparalleled abundance of high-quality data. Mesopotamia is the only region of the Bronze Age world for which extremely detailed textual evidence is sided by abundant archaeological data. This, in turn, makes it inevitable to take this region of the Bronze Age world as a sort of methodological benchmark to test assumptions and interpret the development of weighing technology elsewhere in Western Eurasia. For these reasons, several of the concepts illustrated throughout this book are sometimes introduced by, or evaluated against a discussion of the Mesopotamian setting.

Including this introduction – which also fulfils the role of conclusions – this book is composed of five chapters. Chapter 2 illustrates the general typological assessment, and the diachronic and geographical distribution of weighing devices in the study region, based on materials coming mainly from Italy, Switzerland, Germany, France, England, Portugal and Spain, with sporadic data from eastern Europe. In Chapter 3, I present an analysis of the find-contexts of weighing tools – settlements, burials, and hoards – in order to identify clues about their users and the circumstances in which they were used. The statistical analyses presented in Chapter 4 focus on reconstructing the metrological structure of weight systems and exploring their implications for understanding the economic system of Bronze Age Europe. Finally, Chapter 5 includes a typological catalogue, and a detailed description of the typology, chronology, distribution, and construction materials of each formal type.

Each chapter is conceived as a self-contained treatment of a specific problem or question, and can be approached in any order. All contain data-intensive quantifications and/or statistical analyses, explained in detail in the text and illustrated in graphs and tables. The typological catalogue provides all the raw data and information necessary to replicate each of these analyses. The full dataset is available for download on Zenodo: https://doi.org/10.5281/zenodo.13903718.

Although the chapters are conceptually separated, they address different aspects of the same broader problem. The second part of this introduction, then, is devoted to the formulation of a unifying narrative, briefly illustrating each chapter's main results and connecting them together in order to paint a general picture of the significance of weighing technology and weight systems for the study of prehistoric economies in Europe.

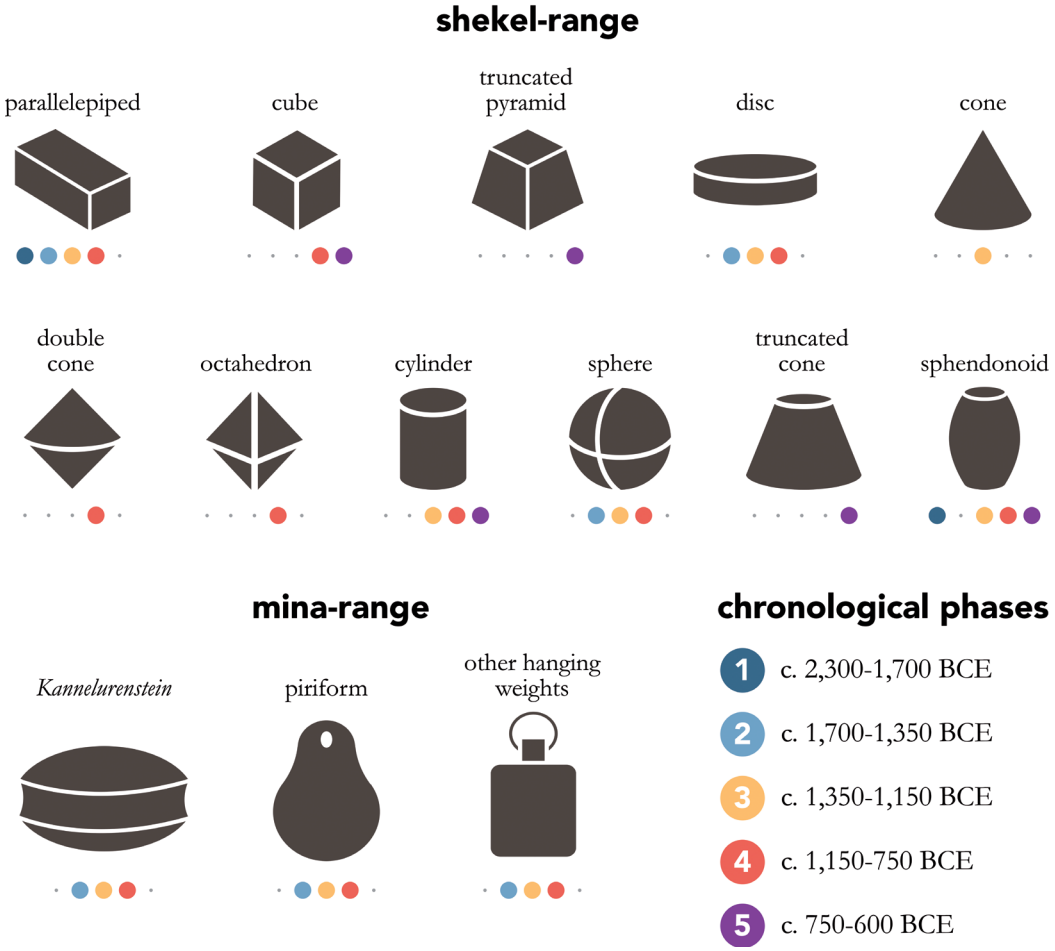
1.2. Typology: unremarkable objects

The balance weights of pre-literate Bronze Age Europe belong to 14 different formal archetypes, almost all of which can be traced back to simple solid geometric shapes (Fig. 1.1.). These observations largely confirm the overall typological variability already identified by previous studies focussing on limited regional and chronological contexts (Pare 1999; Cardarelli *et al.* 2001; 2004; Vilaça 2011; 2013; Feth 2014), while significantly expanding the catalogue of identified objects (see Chapter 2).

The typological assessment combined with metrological analyses shows that the formal archetypes are sharply divided into two separate orders of magnitude: a class of 'light weights' – corresponding to multiples and fractions of a *shekel* (*i. e.*, a small unit) of *c.* 10 g – and a class of 'heavy weights' – corresponding to multiples and fractions of the *mina* (*i. e.*, a large unit) of *c.* 440 g. Overall, while there seem to be regional and chronological differences in the distribution of different formal types, the sample is still too unevenly distributed to exclude that these differences may be simply due to chance.

With some exceptions, the evidence seems to speak against the possibility that the manufacture of balance weights usually required specialised skillsets. The most apparent characteristic of most balance weights is being "*aesthetically* [...] *unremarkable, if not downright unappealing*" (Petruso 1992, vii), which means that they frequently lack any skill-intensive decorative or functional feature. Moreover, aesthetic canons appear to have been rather lax, allowing for a high variability within archetypes. For example, many of the stone parallelepipeds (cat. no. 19-58) – the most frequently attested archetype in the *shekel*-range – have variable proportions and roughly-sketched outlines. Not to mention the unknown amount of unshaped natural pebbles and casual objects that could have been occasionally used as weights (see Chapter 2). Interestingly, more complex shapes seem to be mostly represented in heavy weights in the *mina*-range. On the other hand, some types of balance weights, especially those made of bronze, sometime show more elaborate features, such as the parallelepipeds with wavy mouldings (cat. no. 116-127) which are occasionally attested in elite burials.

Overall, the typological appraisal does not seem to suggest that balance weights were exceptional objects with particular aesthetic or symbolic value. Such an unremarkable character appears to be consistent with the evidence related to archaeological contexts and metrological structure.



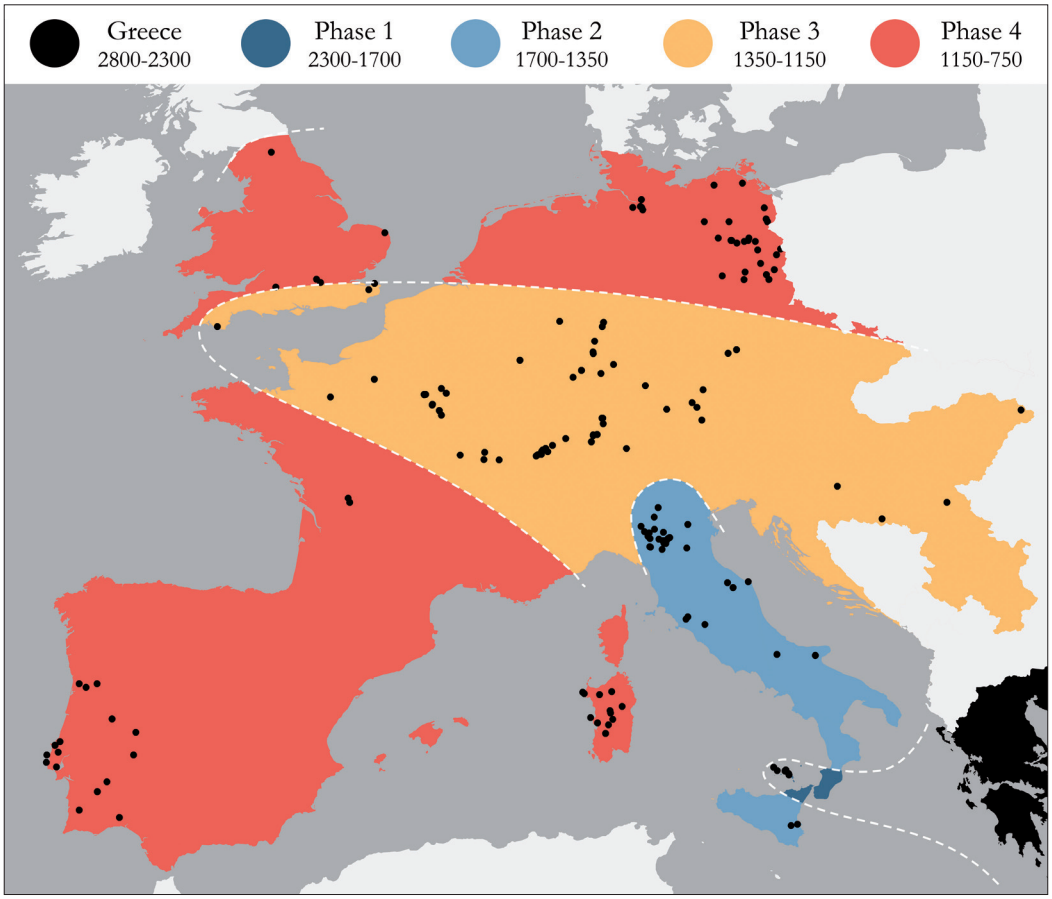
◀ *Fig. 1.1. Typology of the balance weights of Bronze Age Europe. The icons are a simplification of the ideal archetype, and they are not to scale. The archetypes are grouped according to their respective order of magnitude. The colours identify the chronological phase in which they are attested.*

1.3. Geographical distribution: a gradual spread

The data analysed in this book confirm previous observations (Ialongo/Rahmstorf 2019), and suggest that weighing technology spread across pre-literate Bronze Age Europe gradually, in a time-span of roughly 1,000 years (Fig. 1.2.). Balance weights appear in southern Italy around 2000 BCE, and are first attested in northern Italy by *c.* 1600 BCE; they then spread north of the Alps around 1350 BCE – apparently reaching the southern coast of England – and they are eventually documented in the Iberian Peninsula and in the rest of England only in the final centuries of the 2nd millennium BCE. The evidence appears consistent with the relatively slow process of technological diffusion that characterises the spread of weighing technology virtually everywhere in Western Eurasia, starting from its origin point between Egypt and Mesopotamia around 3000 BCE (Rahmstorf 2011; Ialongo *et al.* 2021).

In Chapter 2 I highlight the current limitations of the available evidence in pinpointing the precise timing of the spread of weighing technology, which are largely dependent on the still uneven distribution of the data – some European regions, such as Austria, have not been sampled at all – and partly on the difficulty of correlating the many local chronological sequences of different regions of Bronze Age Europe. While in some regions balance weights might have existed even before the available evidence allows us to assess at the moment, it is nonetheless safe to assume that their appearance in the visible archaeological record reflects an increment in their actual use.

These observations raise a question: Why was the spread of weighing technology so gradual and seemingly slow? There is little doubt that, everywhere in Western Eurasia, the adoption of weighing technology is the consequence of the generalised adoption of the abstract concept of weight – or better, mass – as a universal measure of economic value. For the first time in history, the invention of weights and balances allowed economic agents to convert the values of a virtually limitless array of goods into one another, based on an objective frame of reference (Powell 1979; Renfrew 2012; Rahmstorf 2016a). On a long-duration, cross-continental perspective the gradual spread can easily reflect a model of technological transmission: simply put, trading agents from a non-weighing region get in contact with their peers from a weighing-region, see the advantages of the new technology, and eventually adopt it as their own. Such a transmission model is supported by statistical models simulating the gradual emergence of slightly different weight systems in Western Eurasia throughout the 3rd and 2nd millennia BCE (Ialongo *et al.* 2021; see also Chapter 4). What statistical models cannot



▶ *Fig. 1.2. The gradual diffusion of weighing technology in Bronze Age Europe. The isochrones represent a simplification of the distribution maps illustrated in Chapter 2.*

pinpoint, however, are the historical circumstances in which such a transmission happened, especially for Bronze Age Europe. In particular, it remains to be explained why the adoption of weighing technology in different regions of Europe seems to be often separated by several centuries.

As already observed, the regional shift might have been actually smoother than the available evidence might seem to suggest. This, however, still does not explain the objectively long time-span it took before weighing technology was adopted everywhere. The diffusion of weighing technology, then, might be seen as a proxy of the intensity of trade relationships between two regions: If weighing technology is transmitted through trade, does it mean that the transmission takes longer when trade relations are relatively weaker or more occasional, and proceeds faster when they are more intense?

The available evidence does not seem to offer a clear-cut answer. One can try and address the question from the perspective of mainstream models. It is commonly accepted that, between the 3rd and the beginning of the 2nd millennium BCE, the diffusion of tin-bronze technology on a cross-continental scale triggered the formation of a global trade network aimed at the procurement of essential raw materials – tin and copper – that were universally on demand, but whose sources were relatively rare and unevenly distributed (Vandkilde 2016; Kristiansen 2018a). There is evidence that, in Mesopotamia, the invention and initial spread of weighing technology at the onset of the Bronze Age is correlated to a surge in metal trade. A large number of cuneiform tablets throughout the 3rd millennium reports transactions in which metals were traded by weight (Powell 1977; 1987; Englund 2012), their occurrence being so frequent and systematic to suggest that the origin of weighing technology was connected to the need to assess the economic value of a material – metal – whose 'amorphous' nature was incompatible with traditional quantification methods, such as volume and simple counting (Rahmstorf 2016a).

Such a strict relationship between the origin of tin-bronze metallurgy and weighing, however, does not appear to be supported for Bronze Age Europe. Weighing technology appears in southern Italy around 2000 BCE – possibly following contacts with Greece – and gradually spreads northwards until reaching the southern coast of England. Tin bronze metallurgy, however, seems to follow the opposite route (Pare 2000; Nessel *et al.* 2018). While the chronology of both phenomena still has relatively wide error margins, a direct correlation between these two processes does not seem consistent with the evidence. If future research confirms these observations, the available evidence would seem to indicate a clear chronological mismatch between the appearance of weighing technology and the adoption of tin-bronze metallurgy. It follows that, if we assume that tin bronze is the engine of the Western Eurasian trade in the Bronze Age – and there

is no reason to think otherwise – then the spread of weighing technology in Europe, for now, cannot be directly connected to the spread of tin-bronze metallurgy. In principle, this neither contradicts the importance of trade at the onset of tin metallurgy, nor the economic function of weights and balances: While it may be true that trade is the main purpose of weighing technology, not all trade is necessarily always carried out by weight. The evidence might simply indicate that the formation of an international trade network was not in itself enough to prompt the diffusion of weighing technology in pre-literate Bronze Age Europe, at least not at its onset. Further observations suggest a different explanation.

1.4. Weights in context: a technology for everyone

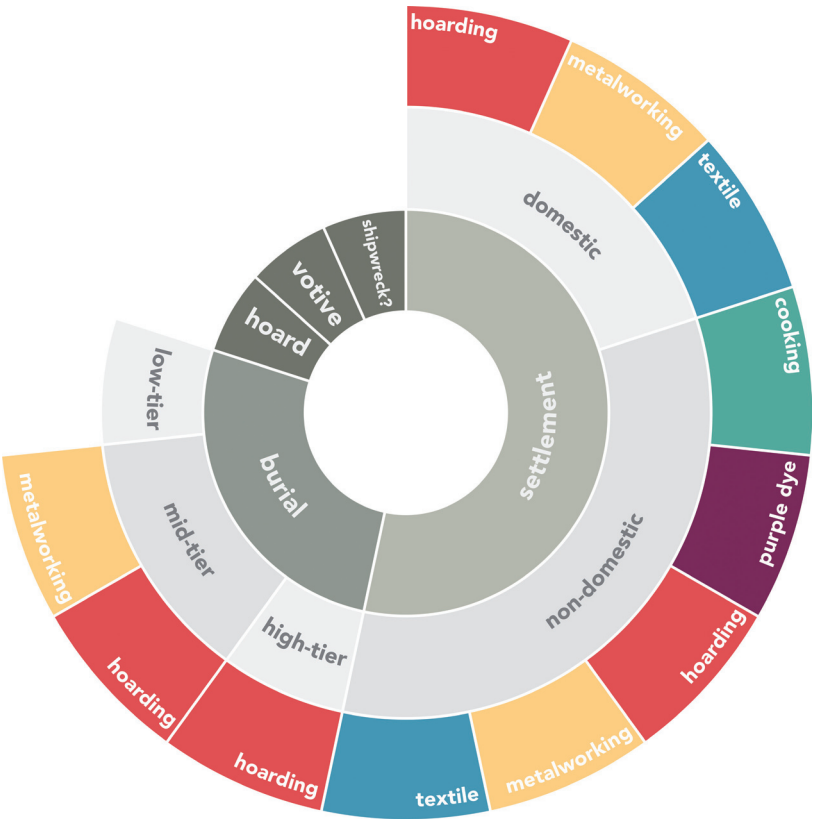
In Chapter 3 I analyse the archaeological contexts of weighing technology, in order to collect clues about its users and the circumstances in which it was used. The data, collected on a continental scale, seem to contradict the results of previous research based on regional contexts, that sought to establish a direct connection between weight-based trade and elite groups (Pare 1999; Mordant *et al.* 2021; Poigt *et al.* 2021). The data rather show that there is no clear association pattern between weighing technology and any particular social category. In burials, weights and balances occur in association with the complete spectrum of social categories that are commonly recognised by European archaeologists based on the accompanying grave goods, from 'elite warriors' – actually, a minority of all analysed graves – to undifferentiated individuals.

Data from settlements further show contextual associations of weighing technology with a wide variety of economic activities: associations with metalworking are frequently attested, but also with textile production, hoarding, purple-dye production, and cooking (Fig. 1.3.). Furthermore, all these activities seem to be indistinctly distributed between houses, open areas – both inside and outside settlements – and burials. All in all, the data suggest that weighing was not only a technology that everyone could potentially use, but one that everyone could potentially have a use for.

As already observed in connection with the chronological pacing of the diffusion process, the evidence from the archaeological contexts appears to be partly at odds with standard models of trade in Bronze Age Europe, in which high emphasis is generally put on elite individuals and groups, exchanging high volumes of goods with peers across long distances. While there is indeed evidence of the occasional association of weighing equipment and elite contexts, such associations are decidedly minoritarian.

If we look at the data, weighing tools appear associated with diverse activities, all of which can be directly or indirectly classified as 'economic' in many ways. In particular, one should not view the economic function of weighing tools only narrowly in connection with the productive activity to which they are associated. For example, the 'economic' connection between, say, weighing and textile production – widely attested in Early and Middle Bronze Age texts in Mesopotamia (*e. g.*, Powell 1996; Peyronel 2014; Dercksen 2021) – was not limited to assessing the value of the good being sold, *e. g.*, wool, but also included assessing the value of the good being received in payment, such as metal. This reasoning can be extended to any other economic activity that we find associated with balance weights: weighing technology is never exclusively associated with this or that good or activity, simply because weight-based value – as Renfrew (2012) put it – lies at the nexus of potentially any good whose worth can be assessed by weight. In this perspective, which activity weights are associated with is not really important, because weights, by their very nature, can be used to measure an extremely wide variety of goods.

If one were to approach the question with a statistical mindset, one would have to concede that there is no proof of any statistically significant correlation with this or that social category or economic activity, and derive that we cannot exclude that the distribution of weighing equipment is simply random. A minimalist explanation for the apparent ubiquity of weighing tools, then, would be to think that they were just so common, that they happen to be randomly scattered and associated with the most diverse activities – even though they were not necessarily directly connected to them, at least not



▲ *Fig. 1.3. Sunburst diagram illustrating the graphic summary of all the activities documented in association with weighing devices in archaeological contexts.*

always. In other words, weights and balances can have been a common element of many individuals' personal equipment, stored in houses or even carried around in pouches (Pare 1999; Roscio *et al.* 2011; Uhlig *et al.* 2019), and hence randomly lost by their owners – and just as randomly found by archaeologists. The fact that our current quantitative appraisal of weighing tools in archaeological contexts is certainly greatly underestimated (see Chapter 2) further reinforces this impression.

1.5. Metrological structure: a market for everyone

The metrological analysis in Chapter 4 confirms previous results (Ialongo 2019; Ialongo/Rahmstorf 2019; Ialongo *et al.* 2021), showing that all balance weights across Bronze Age Europe tend to comply with the same weight system, based on a light unit of *c.* 10 g and a heavy unit of *c.* 440 g (Fig. 1.4.). In a purely conventional fashion, I labelled these units, respectively, *shekel* and *mina*, in order to reflect the standard terminology in common use in Mesopotamian metrology. Both units belong to the same orders of magnitude of their counterparts in different regions of Western Eurasia, but they are different enough to stand as independent systems (Fig. 1.4.).

The methodological and interpretive approaches adopted in this book are substantially different from those adopted in traditional metrological research of the Bronze Age world, and are discussed in detail in Chapter 4. The main results can be summarised as follows:

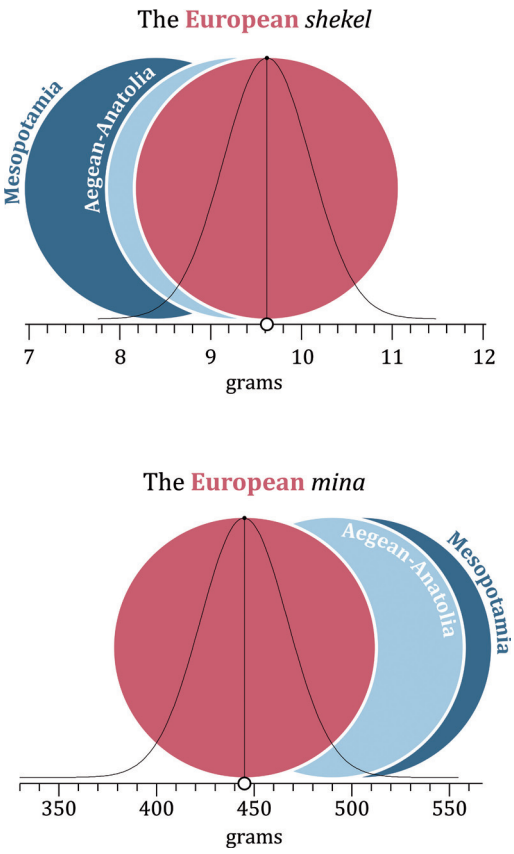


Fig. 1.4. Weight units of Bronze Age Europe. The images show the theoretical values of the European shekel (above) and mina (below) compared to the theoretical values of similar units in the Aegean-Anatolian area and in Mesopotamia. The bell-shaped curves represent the normal-distribution model for the European units, and the vertical lines indicate the mean. The width of the circles represents the statistical interval of each theoretical unit, with a Coefficient of Variation of 5 %, at three Standard Deviations. Each value falling within this interval corresponds to the unit, regardless of the distance from the distribution mean.

Units are not exact numbers, but normally-distributed intervals with a conventional Coefficient of Variation of *c.* 5 %;

Available methodologies cannot identify prehistoric units, but only shared multiples and fractions;

The concept of 'unit', as understood through modern common sense, did not exist in prehistoric economies. In prehistoric Europe, there were no official norms that regulated the value of weight units, let alone official authorities that could enforce them. This also implies that weight units could not be 'imported' as-is from other regions;

The identified units are purely conventional values: We will never know if these values were actually perceived as '1' by their users. What the data indicate is that, regardless of the theoretical unit value, all weight systems in Europe were organised according to multiples and fractions of *c.* 10 g (*shekel*) and *c.* 440 g (*mina*);

This implies that, theoretically speaking, a multitude of different units may have coexisted, but all seamlessly connected through a common system of fraction and multiples, which – from both a practical and analytical perspective – is tantamount to having just one unit;

Weight systems were created and regulated from the bottom-up as a result of economic interaction between agents, *i. e.*, they were created and regulated by the market.

If weight systems are regulated by the market, then their structure provides information on the market by which they are regulated (Ialongo *et al.* 2021). In particular, weight systems are quantitative proxies of the kind of person-to-person interactions that form the backbone of every market: economic transactions.

In Chapter 4, I describe a model that can explain how weight systems were kept relatively stable without top-down control, through one-to-one, interpersonal economic relationships. In short, the satisfactory outcome of a transaction between two trading agents will largely depend on the reciprocal trust that both agents are using fair weights. If one of the weights is not deemed fair it will be removed, otherwise reciprocal trust will be broken. When framed within a network with a multitude of agents, this one-to-one relationship becomes many-to-many, and deviant weights can be excluded as a result of indirect control. It follows that the statistical error of a weight unit can be kept under check from the bottom-up without the need for top-down regulation.

What needs to be explained next is how the abstract formulation of this model fits the evidence of a relatively stable weight system stretched across a continent: In other words, how can one explain that, say, Italy and Portugal had the same weight system? Given the premises, the answer must reconcile what may sound as the two opposite propositions of a paradox: Agents must be, at the same time, close enough to have frequent transactions,

and far enough to regulate the system on a continental scale. The long-distance, elite-centred model alone cannot explain the archaeological evidence, as it only accounts for the second requirement. The model, then, must include a second variable that is often overlooked: small-scale exchange between 'commoners' in local markets.

Local markets are sometimes evoked to explain the archaeological evidence connected to Mediterranean trade that the long-distance model cannot explain (Harding 2013a; Knapp *et al.* 2022; Powell *et al.* 2022; Ialongo/Lago 2024). But what is, practically, a 'local market'? The term simply represents an analytical tool, a convenient simplification to convey a concept, but its meaning must be understood in a relative dimension. Local markets are not physical places and do not have definite geographical boundaries. The term rather denotes a social network of economic relationships between agents that operate approximately in the same area. This is to say that a local market does not begin where its neighbour ends: Local markets are not discrete entities, but a seamless continuum only defined by who knows whom, and can overlap to large extents (see, *e. g.*, Knapp *et al.* 2022, fig. 3). By the same token, the same individual can be part of different 'local markets' that exist approximately in the same region, but slightly shifted. It follows that a continuous 'chain' of local markets can indirectly bind together an extremely wide region. This is to say that a local market located, for example, in Sicily was seamlessly connected to another local market located across the Strait of Messina, which was in turn partly encompassed by a Tyrrhenian market to the north and a Ionian market to the east, and so on until reaching the opposite ends of Western Eurasia. In a similar system, goods could theoretically travel from point A to point B without traders from A ever setting foot in B, and vice versa, regardless of the distance: Things were, in other words, more mobile than people.

The interconnectedness of local markets, moreover, introduces the possibility that price shocks at one extremity of the continental network, in time, may produce an effect on the opposite end, according to the law of supply and demand. This can explain why weight systems remained relatively stable across Europe throughout roughly a millennium. This can also explain why it took a long time for weighing technology to spread, in two ways: 1) If exchange was not mostly directional but rather distributed, and there was no top-down regulation, the slow pace of the diffusion roughly corresponds to the slow pace of the gradual formation, generation after generation, of new relationships in local markets located progressively further away from the diffusion centre of the new technology; 2) Each time weighing tools reach a new region, one can assume that a more or less long acclimation period was necessary for new users to change their habits and embrace the new technology.

In the last part of Chapter 4, I introduce the emergence of metallic money as a further variable in the general model of weight-based trade in Bronze Age Europe. The problem of pre-coinage money in Europe is vast and complex, and only tangential to the aims of this book. Here, the discussion is largely based on analytical research on a vast sample of metal objects spanning northern Europe and southern Italy (Ialongo/Lago 2021; 2024), on the background of recent theoretical studies re-evaluating the purely commercial instances of supposedly 'primitive' economies (Baron/Millhauser 2021; *e. g.*, Blanton/Feinman 2024). In short, the data show that metal fragments in European hoards start to comply with weight systems as soon as weighing technology reaches a new region, suggesting that metal circulated as weight-regulated currency. This also suggests that the spread of metallic money could have been the main material vector of the formation of the Pan-European weight system.

1.6. Concluding remarks

In Bronze Age Europe, the diffusion of weighing technology seems to be mostly correlated to three factors: the development of local markets, the engagement of progressively larger swathes of the population in market exchange, and the spread of metallic money.

While the standard model of high-volume, long-distance elite exchange is not entirely inconsistent with the evidence related to weighing technology and weight systems, it can only explain a relatively small part of it. In order to fill the gap, one must admit the existence of a widespread sector of the Bronze Age economy that has been so far largely underestimated: low-volume exchange in local markets, involving elite individuals and 'commoners' alike.

There is nothing in the available data excluding that money and weighing technology can have been involved in high-volume, long-distance trade between elites, but there is more substantial evidence supporting small-scale exchange between different strata of the population in local markets.

The unremarkable aspect of balance weights, the slow spread of weighing technology, the transversal ownership of weighing equipment, and the bottom-up regulation of weight units – cast on the background of the remarkable stability of weight systems across time and space – all point to a continental-scale economic system that was sustained by the collective participation of the European population, operating both on a local and international basis. At the same time, in order to explain the wide diffusion of weighing technology and the emergence of metallic money, our definition of 'trade' must be extended to include a wide range of petty economic transactions that took place in local markets on a frequent basis, many of which were carried out by average, non-elite individuals.