

Increases in Greek Weight Standards at the End of the Hellenistic Period*

Louise Willocx

This article provides an overview of the phenomenon of increases in the commercial weight standard that affected several Greek cities in the Late Hellenistic period. It starts by examining the Athenian metrological reform of the late second century BC. Then, it compares the Athenian metrological reforms with the corpus of commercial weights from Cyzic and Istros, as well as the Seleucid weights from Antioch and the weights from Byblos in the Southern Levant. All of these cities appear to have increased their weight standards simultaneously. However, further research is required to confirm these increases and to determine whether they can be attributed to a common cause or not.

Keywords: weight standards – metrological reforms – Greek weights – Late Hellenistic period – commercial mina

The increase in weight standards at the end of the Hellenistic period is a phenomenon that affects the weights of Athens, but not only. The same phenomenon also affected other Greek cities such as Cyzicus, Istros (or Histria) and several cities in the Levant.

Athenian weights

The corpus of Athenian weights from the Classical and Hellenistic periods is the largest corpus of ancient Greek commercial weights, comprising over 850 objects.¹ Like other Greek weights, most Athenian weights feature a symbol on the main face. Over a dozen symbols are attested, including the wheel, the astragalus, the dolphin, the shield, the amphora (whole, half and quarter), the tortoise (whole, half and quarter), the crescent (whole and half) and the cornucopia. However, unlike the weights of other Greek cities, which mostly display the *parasemon*, the emblem of the city, the symbols represented on Athenian weights refer to a specific denomination.

Moreover, several sources and the weights themselves attest to the existence of metrological reforms that modified the Athenian weight system during the Classical and Hellenistic periods. For five centuries, Athenian weights maintained a consistent appearance with the same formal characteristics, such as shape, symbols, and legends. However, the mass of objects representing the same denomination varied greatly, reflecting several successive increases in the mass of the commercial mina.

* Dr Louise Willocx, UCLouvain, INCAL/CEMA, Pondera Online [Place Cardinal Mercier 31/L3.03.13 – 1348 Louvain-la-Neuve, Belgium]. louise.willocx@uclouvain.be; 0000-0001-9962-5198.

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¹ For an overview of Athenian commercial weights, refer to Lang and Crosby 1964; Willocx 2020, 23-46; Willocx 2022.

Some literary or epigraphic sources attest to these metrological reforms.² One of the most significant sources is an Athenian decree from the end of the second century BC. This unique document provides insight into how weight standards were defined in Athens during the Hellenistic period.

Over course of a few centuries, no less than seven significant changes are attested (see table 1). The commercial mina initially weighed 100 drachmas (435 g). The mass of the drachma remained stable. However, the mass of the mina was increased first to 105 drachmas (456.75 g) and 112 drachmas (487.2 g) in Classical times, and then to 126 drachmas (548.1 g), 138 drachmas (600.3 g), and 150 drachmas (652.5 g) in Hellenistic times. Furthermore, more than 30 weights likely belong to standards exceeding 150 drachmas.

	Mass	Standard	Chronology
1 commercial mina	435 g	100 drachmas	Sixth c. BC
	456.75 g	105 dr.	From ca. 470s BC
	487.2 g	112 dr.	From ca. 370s BC
	548.1 g	126 dr.	Early third c. BC
	600.3 g	138 dr.	Late third – Early second c. BC
	652.5 g	150 dr.	From ca. 110 BC
	704.7 g	162 dr. ?	First c. BC
	765.6 g	176 dr. ?	First c. BC
	...	...	...

TABLE 1. Chronology of the Athenian metrological reforms.

The decree from the end of the second century BC provides clear evidence of a metrological reform that established a new standard of 150 drachmas. The text mentions a 12-drachma increase in the weight of the commercial mina, which previously weighed 138 drachmas and was now equivalent to 150 drachmas:

ἀγέτω δὲ καὶ ἡ μινᾶ ἢ ἐκμυπορικὴ στεφανηφόρου δραχμᾶς ἑκατὸν τριάκοντα καὶ ὀκτὼ (...)[ρόπ]κῆν ἐχέτω στεφανηφόρου δραχμᾶς δεκαδύο (...)ιστάντες τὸν πῆχυν τοῦ ζυγ[οῦ] ἰσόρροπον ἄγοντα τὰς ἐκατὸν πενήκοντα δραχμᾶς τοῦ στεφανηφόρου· (l. 29-33)

“And the market mina shall weigh one hundred thirty-eight drachms of the stephanephoros [silver], (...) and shall have a makeweight of twelve drachms of the stephanephoros [silver], (...) balancing the beam of the scales at the weight of one hundred fifty drachms of the stephanephoros [silver].”³

This decree is significant for comprehending the Athenian metrological reforms and the political and economic context of Athens in the Late Hellenistic period. It has garnered considerable scholarly attention and sparked controversy. The standard of 150 drachmas has been interpreted by many scholars as a measure intended to simplify conversions between the Athenian and Roman weight systems. Indeed, an Athenian commercial mina of 150 drachmas

² Solon is attributed with the first metrological reform and the adoption of the 105 drachmas standard, according to the *Athenaion Politeia* by the Pseudo-Aristotle (10.1–2) and a passage by Androtion (*FGrH* III 324, fr. 34) quoted in the *Life of Solon* by Plutarch (15, 3-4).

³ For the edition, translation, and commentary of the inscription, see most recently Doyen 2016b.

(652.5 g) was almost exactly equivalent to two Roman pounds ($2 \times 326.5 \text{ g} = 653 \text{ g}$).⁴ However, the political or economic reasons and intentions behind the decree remain a controversial subject within the scientific community. The Roman influence on the process is a subject of debate and should be minimized, despite their good relations with the city of Athens at that time.

First of all, the 150-drachma standard is consistent with the increases in the Athenian weight standard and does not primarily reflect a search for equivalence with Roman weight standards. Additionally, the Athenian weights calibrated to this new standard are typically Athenian, with the same symbols, denominations and legends as earlier weights, and lack Roman symbols or any indication of intentional correspondence with Roman weight standards.⁵

Doyen demonstrated that the commercial mina is a local and regional measure that fits perfectly into the structure of the Athenian metrological system and was far less important in international trade than other measures, such as the talent or the *medimnos*.⁶ The commercial mina has indeed a simple equivalence with the Roman pound. However, this similarity can be explained more by the long-standing links between the two metrological systems⁷ than by any deliberate desire on the part of the Romans or the Athenians to align Athenian weights and measures with Roman ones.

Another argument for limited, or even non-existent, Roman influence on the Athenian metrological reform at the end of the second century is the existence of weight standards higher than 150 drachmas per mina. Thus, the equivalence between the Attic mina and two Roman pounds would not have lasted very long and did not directly precede the adoption of Roman weight standards in Athens, which took place a few decades later.

Around thirty weights bear witness to the existence of other increases in the commercial mina during the first century BC (see graph 1).⁸ These weights are again typically Athenian and consistent with examples from previous centuries. They share the same characteristics as the 150-drachma standard weights. These characteristics include being made of lead, having a reduced number of symbols and denominations, which are fractions of the mina, and featuring legends that refer to the denomination or the magistrate in charge.

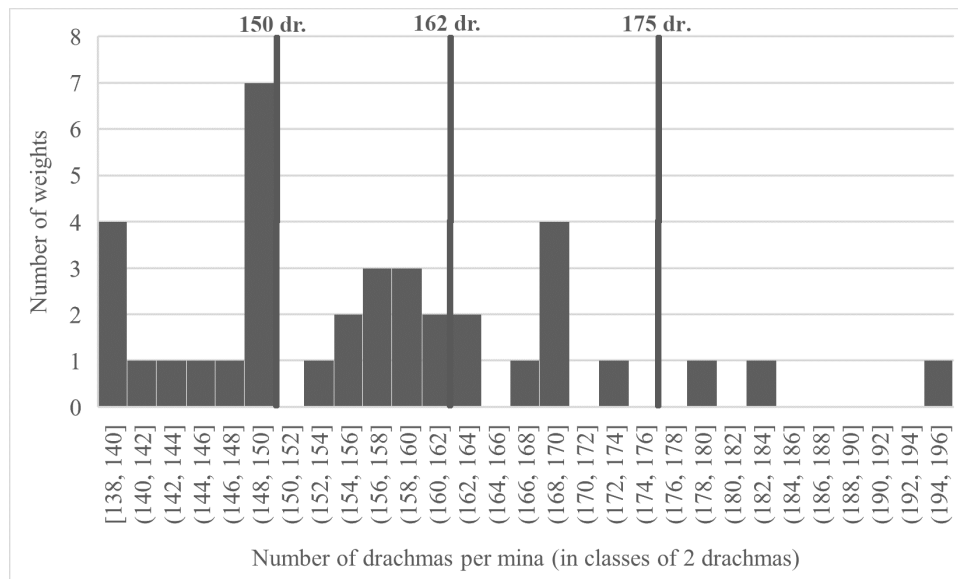
⁴ The connection was first observed by Schillbach (1865, 172), and later supported by Viedebant (1916, 132-133). The historiography of the question is summarised in Willocx 2022; forthcoming. For recent discussions, see Chankowski and Hasenohr 2014, 34-36; Rizzi 2013, 163-164; 2015, 284-287; Doyen 2017b.

⁵ *Pondera Online*, #205, 207, 421, 610, 685, 1231, 1239, 3002.

⁶ Doyen 2017b.

⁷ Hultsch 1882, 112-126; Van Driessche 2009, 39-43; Doyen 2016a.

⁸ *Pondera Online*, #ID 414, 603, 608-609, 630-633, 683-684, 1506, 1509, 2871, 2882, 2912, 2918-2919, 3100, 3114, 11134-11136, 11139-11140, 11144, 12004, 14553, 14759-14760, 14823.



GRAPH 1. Histogram of Athenian weights from the Late Hellenistic period, with the mass reduced to that of one mina and expressed in drachmas.⁹

Actually, the 150-drachma standard established a purely binary scale in Athens, and the mina became the sole reference unit for the weight system, replacing the stater. Previously, the stater was the main reference unit of the system, as shown by the various denominations of the system, which were mostly multiples and fractions of the stater, on both a binary and ternary scale. Although the mina already existed, it was somewhat "isolated". With the introduction of the 150-drachma standard, the number of different denominations (as well as the number of symbols) was greatly reduced, and now almost all weights are based on the mina. The attested symbols and denominations include the stater with the astragalus, the mina with the dolphin, the half mina with the amphora, the quarter mina with the half amphora, and the eighth mina with the cornucopia. All weights, except for a few whose state of preservation makes it difficult to judge, bear a legend indicating their denomination, which removes any doubt about its denomination. However, the abbreviation ΔΕΜΟ is no longer attested. Some weights feature the legends ΜΕΤΡΟ and ΑΓΟΡ, which refer to the magistrates responsible for weights and measures. A dozen weights calibrated to a higher standard have a known archaeological context and were found mostly in layers dating to the first century BC.¹⁰

The Athenian typology of these weights, the legends confirming their denominations, their discovery in an archaeological context, and the mass of the objects, all suggest the existence of standards higher than 150 drachmas, probably in the first century BC.

Identifying these standards can be challenging because, unlike the 150-drachma standard, there are no written sources that mention them.

⁹ The graph displays Athenian weights with a current weight indicating standards higher than 138 drachmas per mina. The identified theoretical standards are marked with a black line.

¹⁰ *Pondera Online*, #ID 603, 608-609, 630-633, 683-684, 11134-11135, 14553. The majority of these weights come from the Agora of Athens. Two were discovered in the area south of the Acropolis and one in the Agora of Limani Passa at Cape Sounion.

Accurately identifying these standards is also difficult due to the state of preservation of lead weights, which often show a loss of mass of up to 12% compared to the theoretical standard.¹¹ Therefore, it is necessary to rely on other clues. Two clues can help us in this matter: firstly, the evolutionary pattern of the commercial mina in the Classical and Hellenistic periods, which regularly shows increases of 12 or even 14 drachmas, and secondly, the division of these standards into drachmas and obols. The Athenians must have been able to handle these denominations easily and divide them up if necessary. Therefore, it is assumed that there are standards of 162 and 176 drachmas, or possibly more, as these standards allow for easy division of the stater and mina into drachmas and obols (see table 2).

Denominations		Equivalences in drachmas			
1 stater	2 minas	324	348	350	352
	1 mina	162 dr.	174 dr.	175 dr.	176 dr.
	1/2 mina	81	87	87 1/2	88
	1/4 mina	40 1/2	43 1/2	43 3/4	44
	1/8 mina	20 1/4	21 3/4	21 7/8	22

TABLE 2. Equivalences in drachmas of the different denominations for each possible weight standard.

In conclusion, it appears that the increase in the mass of the commercial mina was consistent with the internal evolution of the Athenian weight system and continued even after one Athenian mina of 150 drachmas and two Roman pounds became equivalent. Moreover, these increases seem to have accelerated within a few decades.

The rapid succession of these weight standards may be attributed to the tumultuous context of the first half of the first century BC. During this time, Athens sided with Mithridates of Pontus against Rome and was subsequently sacked by Sylla's troops in 86 BC. The city slowly recovered from the devastation but went through a period of political and economic crisis.

The transition from the Athenian weight system to the Roman weight system took place several decades after the decree from the end of the second century. While developing a close relationship with Rome, the city of Athens, which remained free and allied to the Roman people, appears to have retained its full autonomy with regard to weights, measures, and coins until the end of the first century BC.¹² At this point, Attic weights were no longer attested and were replaced by weights clearly calibrated to the Roman pound. The shift from Athenian to Roman weight standards probably coincides with the transition from Attic to Roman coinage in the

¹¹ The relatively high mass loss of objects can be explained by several factors. These factors include wear and tear from ancient use (Hemmy 1935, 83), chemical reactions such as corrosion resulting from prolonged burial in the ground (Seyrig 1946-1948, 76; Naster 1975, 72), and the cleaning and chemical treatments carried out in modern times for their conservation in museums. In a recent article, Kroll (2020) evaluated the mass loss of a dozen Athenian bronze commercial weights dated to the fifth century BC. The weights exhibited mass deviations ranging from 5.3% to 12% from their theoretical norm. The mass losses in modern times, i.e. between the first weighing when the objects were discovered and the last weighing, range from 2.7% to 6.1%.

¹² Picard (2010, 189-190) demonstrated that during the Late Hellenistic period, Rome rarely interfered with the monetary policies of its allies and generally granted them significant autonomy in this field. Therefore, it is reasonable to assume that the Roman state adopted a similar non-interventionist approach towards weights and measures. Moreover, it is possible that the transition from the Athenian mina to the Roman pound was a pragmatic decision based on experimentation. The formalisation of a phenomenon typically begins informally, with customary practices that are subsequently formalised and approved by the state (North 1990, 89; 1991; Rizzi 2015, 286-287).

second half of the first century BC.¹³ Indeed, weights are closely linked to monetary standards. Furthermore, the persistence of Athenian coinage until the middle of the first century BC and the lack of equivalence between the Attic drachma and the Roman denarius further supports that Rome was not behind the decree on weights and measures.¹⁴

Cyzicus weights

This phenomenon of increasing weight standards was not exclusive to Athens. Other cities seem to have followed the same pattern.

Leblanc has already conducted a preliminary study of weights from Cyzicus and has compiled a corpus of over 200 weights.¹⁵ The majority of Cyzicene weights are square lead weights, with a few bronze examples. The symbols depicted on the weights are the *parasema* of the city. The torch is the most commonly used symbol, although others such as the tuna fish, caduceus, and dolphin are also used. The symbol is usually flanked by two legends: one above and one below, the ethnic which identify the city and the weight denomination, respectively. The denomination is therefore clearly indicated by the legend.

Leblanc conducted a comprehensive metrological analysis, and his hypothesis is as follows (see table 3). The city of Cyzicus adopted the Attic weight standard during the early Hellenistic period, at the time of Alexander's conquest. Cyzicus adopted the 112-drachma standard used by Athens at that time. The corpus mostly comprises weights calibrated to the 112-drachma and 126-drachma standards. Additionally, there are a dozen weights calibrated to the 150-drachma standard¹⁶ and about twenty weights calibrated to higher standards are also attested (see graph 2).¹⁷

	Mass	Standard	Chronology
1 commercial mina	487.2 g	112 dr.	From <i>ca.</i> 334 BC
	548.1 g	126 dr.	Early third c. BC
	600.3 g	138 dr.	Late third – Early second c. BC
	652.5 g	150 dr.	From <i>ca.</i> 110 BC
	704.7 g	162 dr. ?	<i>First c. BC</i>
	765.6 g	176 dr. ?	<i>First c. BC</i>

TABLE 3. Chronology of the Cyzicene weight standards.

¹³ Kroll 1993, 15-16, 86-87; Burnett et al. 1998, 265. For more information on the end of Stephanephoros coinage, refer to Thompson 1961; Lewis 1962; Mørkholm 1984; Picard 2010. Based on archaeological evidence, it seems that Roman coins were not widely used in the Greek world until the significant presence of Sylla's troops during the First Mithridatic War (89-85 BC). It appears that Roman coins did not enter circulation until the latter half of the first century BC, when the Roman presence in Greece expanded. See Giovannini 1978, 28-29; Crawford 1985, 195-198; Fournier 2009, 56-57; Callataÿ 2011; Doyen 2017a, 437. The civil wars of the 50s and 40s, particularly the stay of Marcus Antonius and his army in Athens after the Battle of Philippi in 42, resulted in the widespread circulation of Roman coins in Greece. As a result, Athenian minting ceased. For more information, see Price 1985, 99; Burnett et al. 1998, 245; Picard 2010, 192.

¹⁴ Doyen 2016a. Doyen (2017a, 443) has further demonstrated that the Denarial standard (δενάριον) succeeded the Attic standard (ἀργύριον ἄττικόν), rather than coexisting with it.

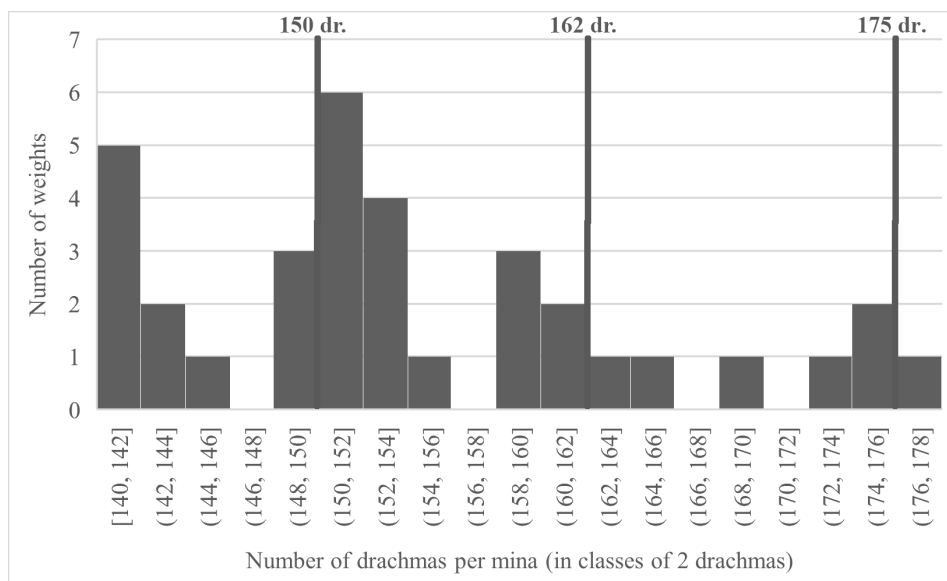
¹⁵ Leblanc 2020; 2021a; 2021b. His research is still ongoing. See also Tekin 2013a; 2013b; 2016.

¹⁶ *Pondera Online*, #ID 1804, 1814, 3222, 3363, 12002, 12031, 12040, 12051, 12063-12064, 15571, 15577, 17195. As for the Athenian weights, only those with a legend specifying their denomination have been selected to eliminate any doubt about the denomination in question.

¹⁷ *Pondera Online*, #ID 3371, 3374, 12008, 12039, 12048-12049, 12062, 12812, 13009-13010, 13200-13201, 14068, 15572, 15576, 15578, 16537, 16889, 16977, 16980, 17183.

It should be noted that all Cyzicene weights calibrated on standards above 150 drachmas are either multiples or fractions of the stater. This is consistent with the majority of the corpus, which mainly consists of multiples and fractions of the stater. About 75% of the weights in the corpus are multiples or fractions of the stater, while only 25% are multiples or fractions of the mina.

In the Cyzicene weight system, the stater is a singular metrological unit that is equivalent to one 25th of a mina. These weights are therefore relatively light, ranging from 12 g (for half staters) to 82 g (for three staters). Due to the usual wear and loss of mass,¹⁸ which can be as much as 12%, identifying a precise weight standard for ancient lead weights remains difficult and hypothetical. However, some weights, such as 1-stater and 3-stater weights, have masses significantly higher than the expected mass for a 1 stater of the 150-drachma standard, and weigh about 4 g more, which is equivalent to a difference of about 15%.¹⁹



GRAPH 2. Histogram of weights from Cyzicus from the Late Hellenistic period, with the mass reduced to that of one mina and expressed in drachmas.

As with the Athenian weights, the Cyzicus weights calibrated to standards above 150 drachmas are consistent with the weights of the earlier standards and do not exhibit significant typological changes. Like the majority of other Cyzic weights, most of them feature a torch, the abbreviated ethnic of the city (KYZ or KYZI), and the abbreviated denomination (HMI, CTA, ΔICTA or TPIC).

Based on these few weights, it seems that Cyzicus followed the rise of Athenian weight standards until the first century BC. However, since these weights are all small denominations and low weights, the evidence for Cyzicus is less conclusive and requires further investigation.

Istros weights

Weights from Istros, a city on the shores of the Black Sea, also provide evidence of an increase in the commercial mina.

¹⁸ See 5, n. 11.

¹⁹ In particular, *Pondera Online*, #ID 12048-12049, 13009, 16980.

Istros' weights come in various shapes, including triangular, square, and leaf or heart-shaped. However, the iconography has remained consistent for several centuries, with the majority of weights depicting an eagle surmounting a dolphin. About half of the weights also show the bust of the god Hermes wearing the petasos, often accompanied by the caduceus, on the opposite side of the weight. The majority of the weights have a legend indicating their denomination, with only a small portion bearing the name of an *agoranomos*. Additionally, about half of the weights display the ethnic legend ΙΣΤΡΗ. Most weights are eighths of a mina, but there are also a number of quarter minas, and some half minas and one mina weights.

Researchers studying Istros' weights have identified weight standards similar to those of Athens.²⁰ During the third century, the 112-drachma standard was in use until it was replaced by a mina of 126 drachmas, as was the case in Athens, during the second half of the second century. In the first century AD, the Attic system was abandoned in favour of the Roman pound.

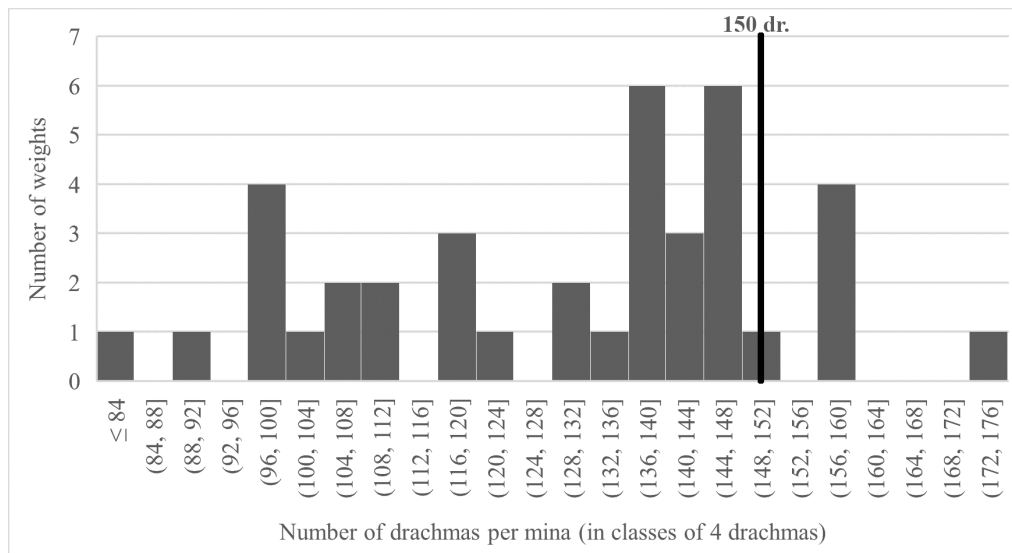
Identifying Istros' weight standards with certainty is challenging due to the limited corpus of about fifty weights and the poor condition of many Istros weights. However, it is possible that Istros adjusted the mass of his commercial mina to align with the regular increases in the Attic commercial mina.²¹ Furthermore, there is evidence of weight standards that exceed 150 drachmas (see graph 3). Two weights of a quarter of a mina and three weights of an eighth of a mina are certainly calibrated to higher standards.²² Once again, this is consistent with the other Istros weights. The legends unambiguously identify the denominations of these few weights, which are also the most attested in the corpus. The iconography of the weights features a traditional motif of an eagle surmounting a dolphin, sometimes accompanied by Hermes and his attributes, the caduceus and petasos. The weights are square, triangular or leaf-shaped (or heart-shaped). With the exception of one, all bear the ethnic legend and the name of an *agoranomos*.²³

²⁰ In particular, Preda 1958; Meyer 2001-03; Gramaticu 2015. It is quite possible that the Athenian weight system was also used in Istros and other neighbouring cities on the north-western coast of the Black Sea, due to the many trade contacts between these regions and Athens. However, the current state of documentation does not allow us to confirm this.

²¹ Gramaticu (2015) suggests a reverse chronological development for the Istros standard, proposing that the mass of the mina decreased, rather than increased, between the Archaic and Late Hellenistic periods. However, her study may be based on a number of potentially flawed assumptions. She attributes a particular denomination to weights that have no legend specifying their denomination. The interpretation of the oldest Istros stone weight, which she claims to be a 1-mina weight, is problematic due to its typological differences from all the others and the lack of indication of its denomination. Furthermore, several weights do not fit into the presented scheme and are labelled as “deviations from the mina standard”. The dating of the weights remains highly hypothetical.

²² *Pondera Online*, #ID 11470, 13490-13492, 13553. It may be possible to include *Pondera Online*, #ID 13480, as well as 11500, 11504-11506, 13495, 13479, 13565.

²³ Due to the poor state of preservation of the objects, it is uncertain, but several weights seem to bear the name of the same *agoranomos* and should therefore be compared. *Pondera Online*, #ID 11506, 13490 and 13504 bear the name of a certain Aristo(...). The name of Artemidoros can be read on *Pondera Online*, #ID 11500 and 11505, that of Monimos on *Pondera Online*, #ID 11504 and 13542, or that of Apatourios on *Pondera Online*, #ID 11508 and 13500. The differences in mass among these various weights highlight the challenge of accurately determining a weight standard.



GRAPH 3. Histogram of weights from Istros (4th c. – 1st c. BC), with the mass reduced to that of one mina and expressed in drachmas.

Regarding objects, the commercial weight standard increases are also noticeable at Istros. However, as with Cyzicus, further investigation is required to confirm the existence of standards exceeding 150 drachmas at Istros.

Antioch weights

Levantine weights are distinguished by their precise dating through a legend indicating the year of the Seleucid era or another era. Therefore, we can date the objects to the exact year, provided that the era in question can be identified, which is not always easy. Unlike Hellenistic Greek weights, Levantine weights do not depict the *parasemon* of the city and may not always bear an ethnic. Attributing weights to a specific city can be complex and controversial.

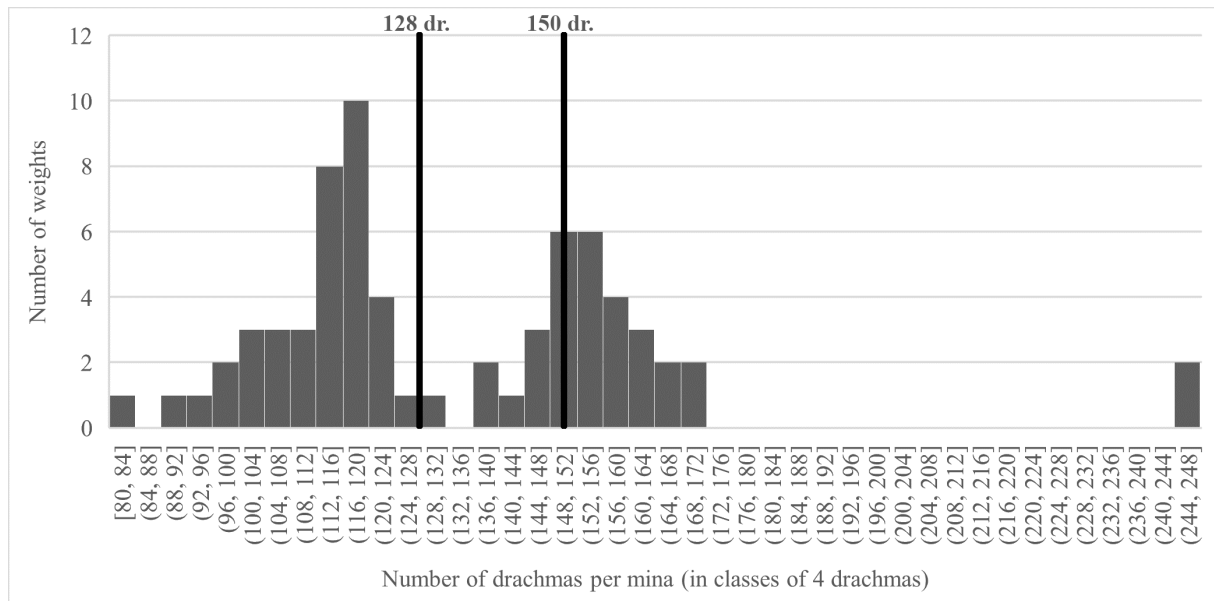
The Pondera database lists nearly 80 weights that were issued by the city of Antioch between the third and first centuries BC. The majority of these weights were square lead weights, with the most common denomination being 1 mina. Additionally, there were some quarter minas and half minas, as well as a few eighths and double minas, with a binary scale similar to Athens and other cities. The weights feature several Seleucid symbols, including the anchor, cornucopia, caduceus, trident, elephant, star, and others. Most of the weights have a lattice pattern on the reverse side.

Denominations are usually inscribed on the object, and some also feature the name of the city (Ἀντιοχεία) or its adjective (Ἀντιόχειον), while others bear the adjective δημοσία or δημόσιον. Most of the weights feature a legend indicating the name of an authority, typically the *agoranomos*, although the name of the Seleucid king is also frequently mentioned. Most objects can be dated accurately either by the date inscribed on the weight (year according to the Seleucid era) or by the name of the sovereign inscribed on the weight, providing the period of their reign.

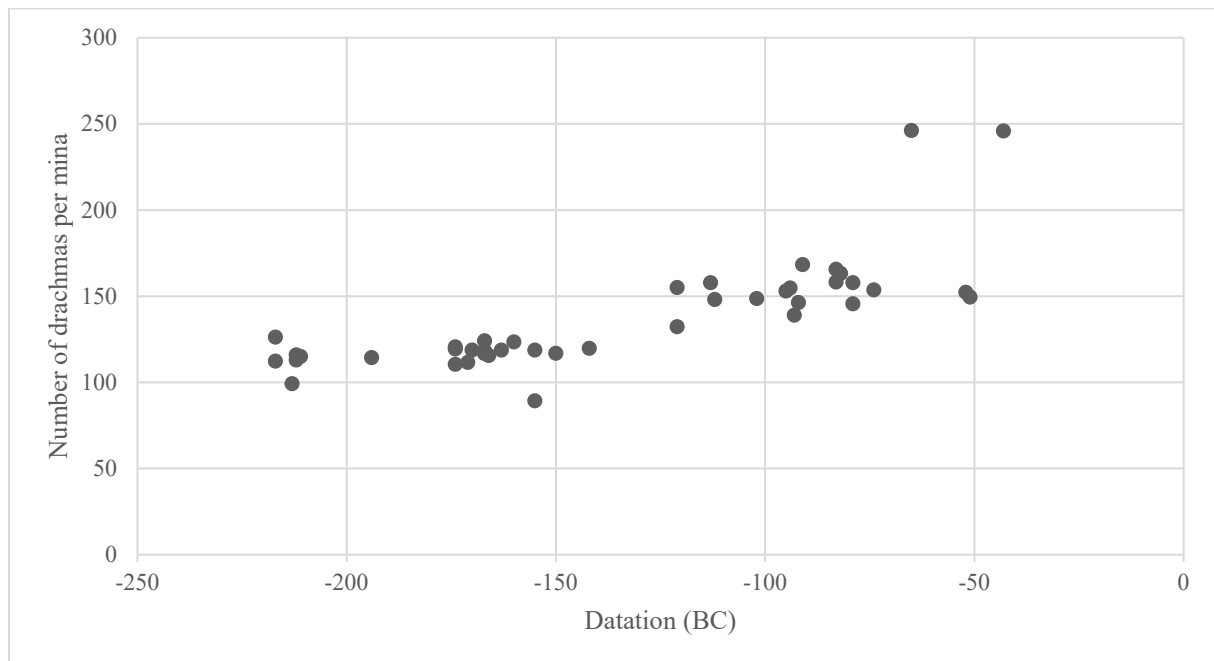
Doyen demonstrated that the Seleucid weight system of Antiochos IV was based on a mina of 128 Attic drachmas (556,8 g).²⁴ The 128-drachma mina was likely used in Seleucid Syria from

²⁴ Doyen 2014. See also Finkielsztejn 2007; 2014; Gatier 2014.

the end of the third century BC, at least since the reign of Seleucos IV (187-175 BC), and during the first half of the second century. However, several weights from the city of Antioch suggest the existence of a heavy mina in the Late Hellenistic or Early Imperial period (see graph 4).



GRAPH 4. Histogram of weights from Antioch (3rd c. – Late 1st c. BC), with the mass reduced to that of one mina and expressed in drachmas.



GRAPH 5. Weights from Antioch (3rd c. – Late 1st c. BC) places on a chronological scale, with the mass reduced to that of one mina and expressed in drachmas.

Graph 5 displays the weights on a chronological scale and their mass in terms of the number of drachmas for the mina. The weights dated to the nearest year indicate that after the standard of 128 drachmas, one or more standards equal to or greater than 150 drachmas were adopted at

the end of the second century or the first century BC.²⁵ Additionally, one or two isolated examples also testify to a probably much higher standard at the end of the first century BC.²⁶ The Antioch weights, dated to the nearest year,²⁷ confirm an increase in the mass of the commercial mina at the end of the Hellenistic period, and the possible existence of standards higher than 150 drachmas.

Southern Levant - Byblos

Studying the weights of the Southern Levant is challenging due to the absence of the issuing city's name or date, unlike the Syrian Seleucid weights.

The Byblos corpus includes over 30 weights, mainly quarter and eight-mina weights, with a few rare examples of 1-mina and half-mina weights, dating from the second and first centuries BC. The weights commonly feature the double cornucopia, often accompanied by the crown of Isis and a frame on the obverse, and the lattice pattern on the reverse. A Greek legend specifies the weight denomination on most of them, and some also indicate the number of shekels using numerical notation. It is worth noting that, unlike the weights from other Levantine cities, those from Byblos do not bear a date or an ethnic.

The metrological study of weights from the Southern Levant suggests that the mina was calibrated at slightly less than 500 g in the third century BC. However, weights from the second century BC are significantly heavier, ranging between 500 g and 550 g. Therefore, the 128-drachma mina of the Syrian weight system, weighing approximately 550 g-560 g, would also have been adopted by the cities of the Southern Levant in the first half of the second century BC, likely at the instigation of Antiochos IV.²⁸

However, some weights from the Southern Levant dating from the end of the second century have a higher mass (see graph 6). The statement implies that the mina used in these regions also underwent a mass increase, similar to the Attic mina during the same period.²⁹ A comprehensive analysis of the Byblos weights would provide further evidence for these hypotheses.

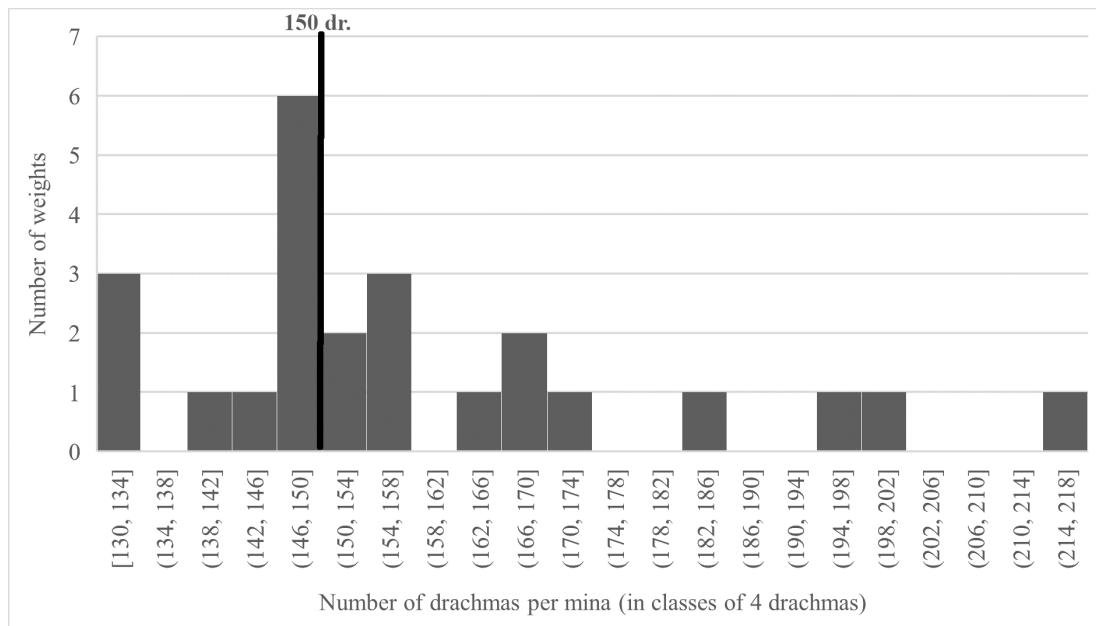
²⁵ *Pondera Online*, #ID 1617, 3056, 3521, 3527-3528, 3557-3560, 3562, 3564-3566, 3569, 3581, 3750, 12012, 12807, 12819, 12844, 12867, 14061, 14410, 14412-14413, 14482, 14824, 14846-14847.

²⁶ *Pondera Online*, #ID 3496, 3589.

²⁷ Some weights, shown in graph 5, are not precisely dated, but rather dated within an interval of several decades due to the mention of a reign.

²⁸ Finkielsztejn 2007; 2014; Doyen 2014.

²⁹ *Pondera Online*, #ID 11094, 11096-11098, 11100, 11103, 11105, 11982, 12822, 13353, 14406, 14414, 14853, 15217, 16715, 17320, 17493. There are also a few weights attesting to the existence of much higher standards: *Pondera Online*, #ID 1877, 11104, 12068, 13356, 14854.



GRAPH 6. Histogram of weights from Byblos (2nd c. – 1st c. BC), with the mass reduced to that of one mina and expressed in drachmas.

Conclusion

In conclusion, the increase in the mass of the commercial mina, or more generally in the reference measure of a weight system, is a phenomenon attested in several regions and cities of the Greek world, at least during the Hellenistic period. This phenomenon highlights the fact that ancient weight systems were not fixed but rather constantly evolving. Doyen recently demonstrated that similar mechanisms also affected imperial Roman weights from Pont-Bithynia and Thrace, which were calibrated to the Roman pound.³⁰

The reasons for these metrological reforms are manifold and cannot be reduced to a single, universal explanation. Each reason must be considered within its historical and geographical context. In any case, they all testify to a desire to adjust weight standards in order to facilitate commercial transactions and conversions within the same trading area, such as in the Levant for example, and to alleviate socio-economic difficulties, as in Athens during the first century BC.

Another significant issue is the transition from the Greek weight mina to the Roman pound, which was not introduced simultaneously across all regions. For example, in certain cities, such as Laodicea, weights calibrated to the Greek mina were still in use during the imperial period. Concerning Athens, it is certain that the Roman pound was adopted several decades after the Athenian decree of the end of the second century BC. It is possible that the adoption of a new standard was a practical decision based on experimentation and customary practices, before being formalised and approved by the authorities.

The purpose of this paper is to provide a concise overview of the issue, with a few examples that require further study. Similar phenomena have also been observed in other cities, such as Seleucia Pieria and Laodicea ad Mare. From our limited observations, it is evident that all these

³⁰ Doyen 2024.

cities underwent an increase in weight standard during the Late Hellenistic period. However, it remains to be determined whether these increases can be attributed to a common cause or not.

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