Market weights, coin weights, and silver coinage:

A look on linked standards

Workshop "Weight Standards in the Eastern Mediterranean in Archaic and Classical Times" (Berlin, April 1–2, 2019)

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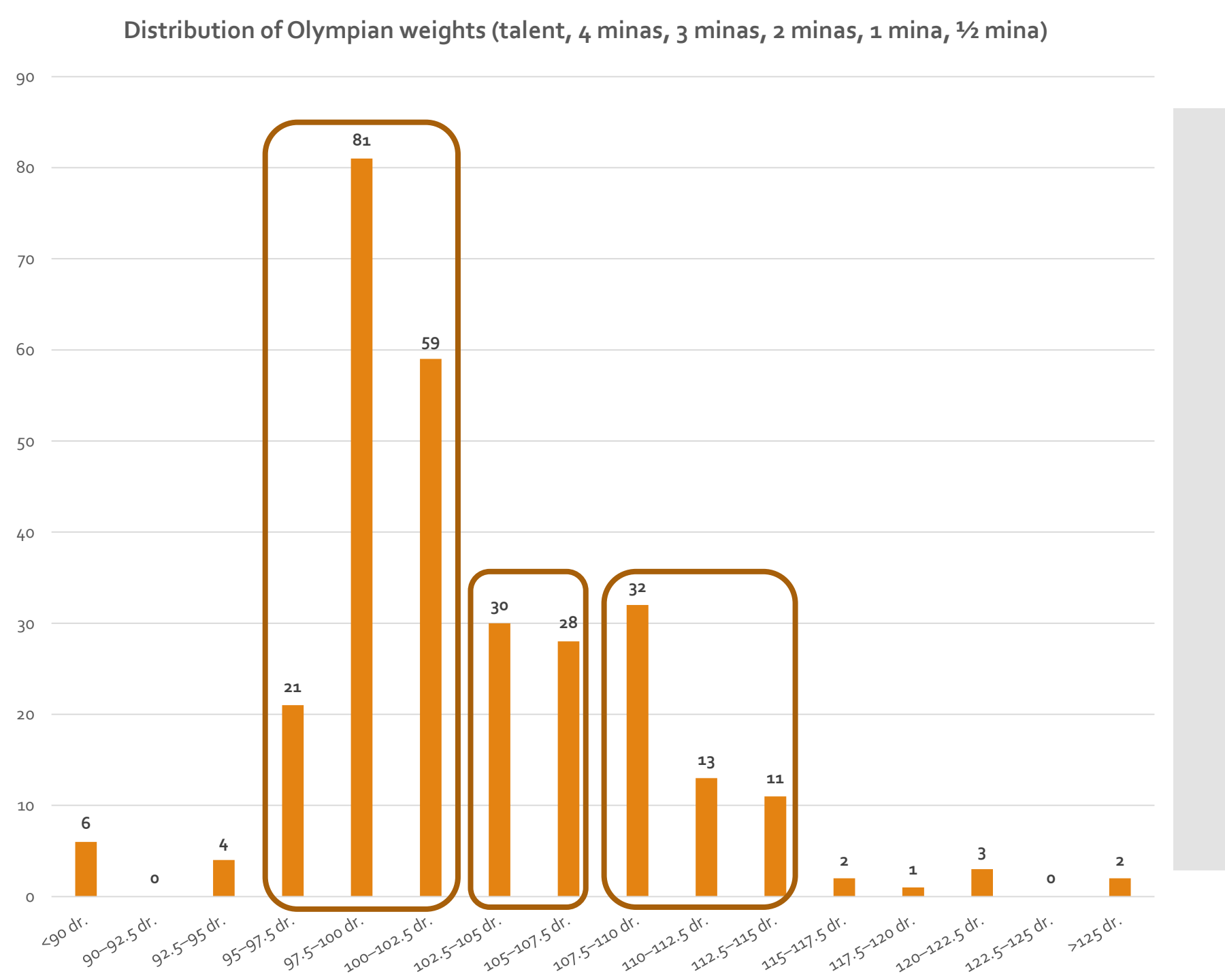
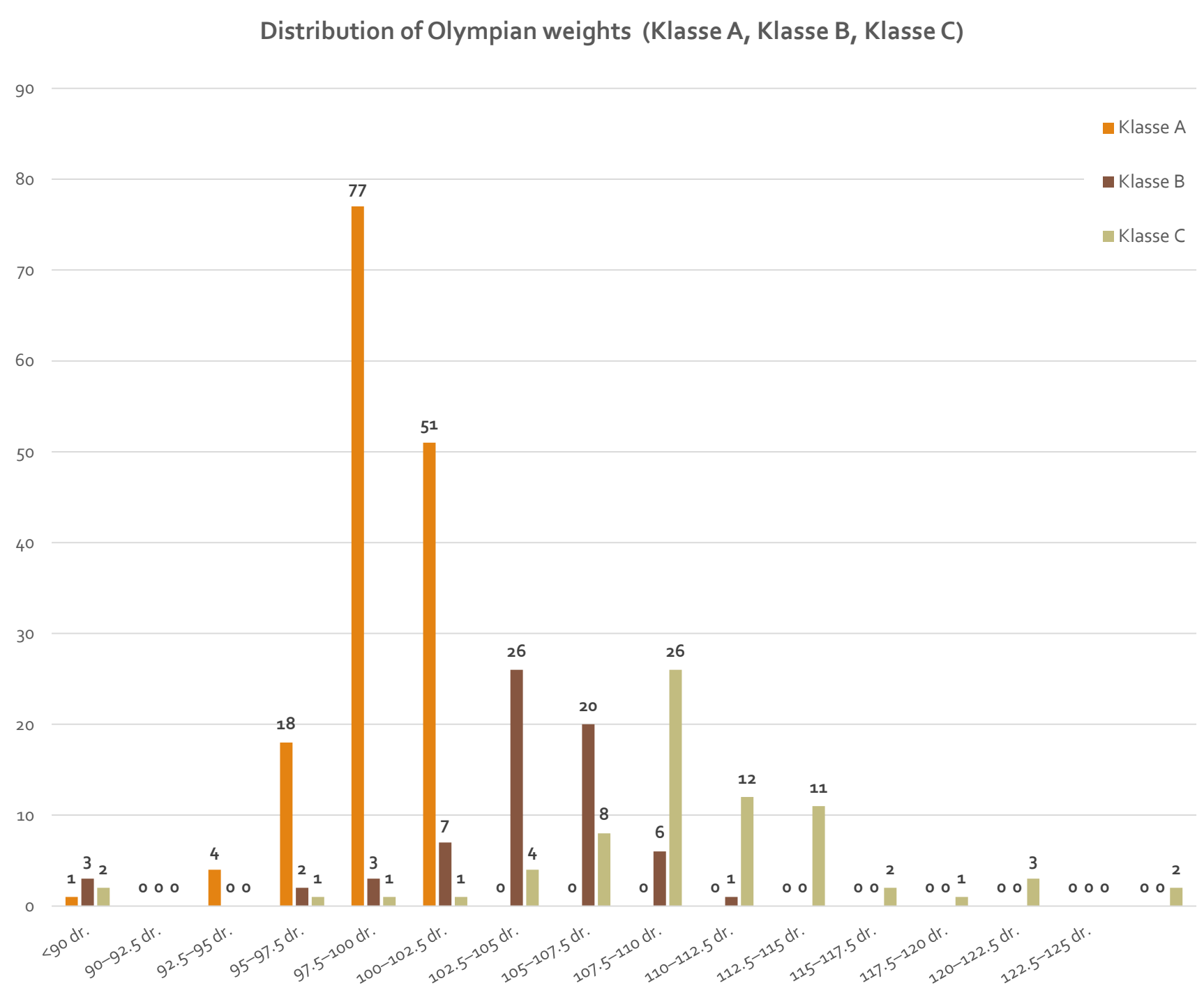
Olympian weights



Olympian weights



Olympian weights:

Klasse A

1 talent = 60 minas (6000 Att. dr. = 4200 Aeg. dr.)

Olympian weights:

Klasse A

4 minas (400 Att. dr. = 280 Aeg. dr.)

2 minas (200 Att. dr. = 140 Aeg. dr.)

1 mina
(100 Att. dr. = 70 Aeg. dr.)

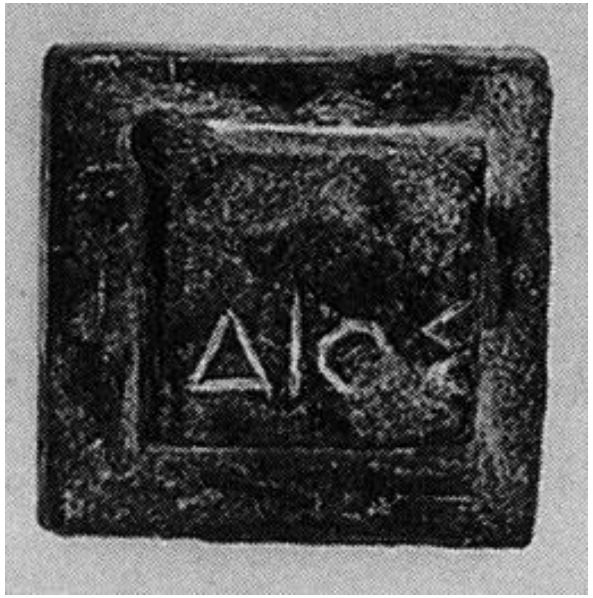
½ mina
(50 Att. dr. = 35 Aeg. dr.)

¼ mina
(25 Att. dr. = 17.5 Aeg. dr.)

Olympian weights:

Klasse B

4 minas (420 Att. dr. = 294 Aeg. dr.)



2 minas (210 Att. dr. = 147 Aeg. dr.)

1 mina
(105 Att. dr. = 73.5 Aeg. dr.)

½ mina
(52.5 Att. dr. = 36.75 Aeg. dr.)

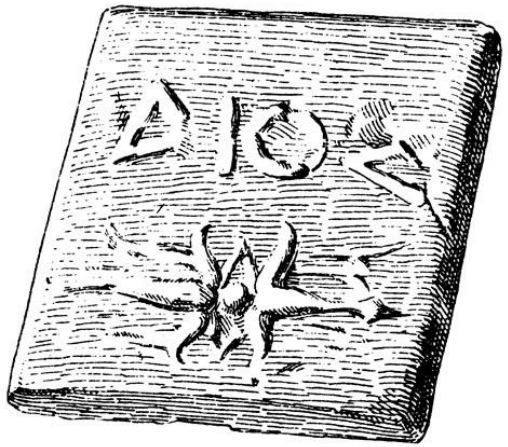
¼ mina
(26.25 Att. dr. = 18.375 Aeg. dr.)

Olympian weights:

Klasse C

⅛ mina
(14 Att. dr. = 9.84 Aeg. dr.)

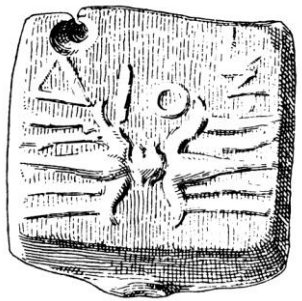
4 minas (448 Att. dr. = 315 Aeg. dr.)



1 mina
(112 Att. dr. = 78.75 Aeg. dr.)

½ mina
(56 Att. dr. = 39.375 Aeg. dr.)

2 minas (224 Att. dr. = 157.5 Aeg. dr.)

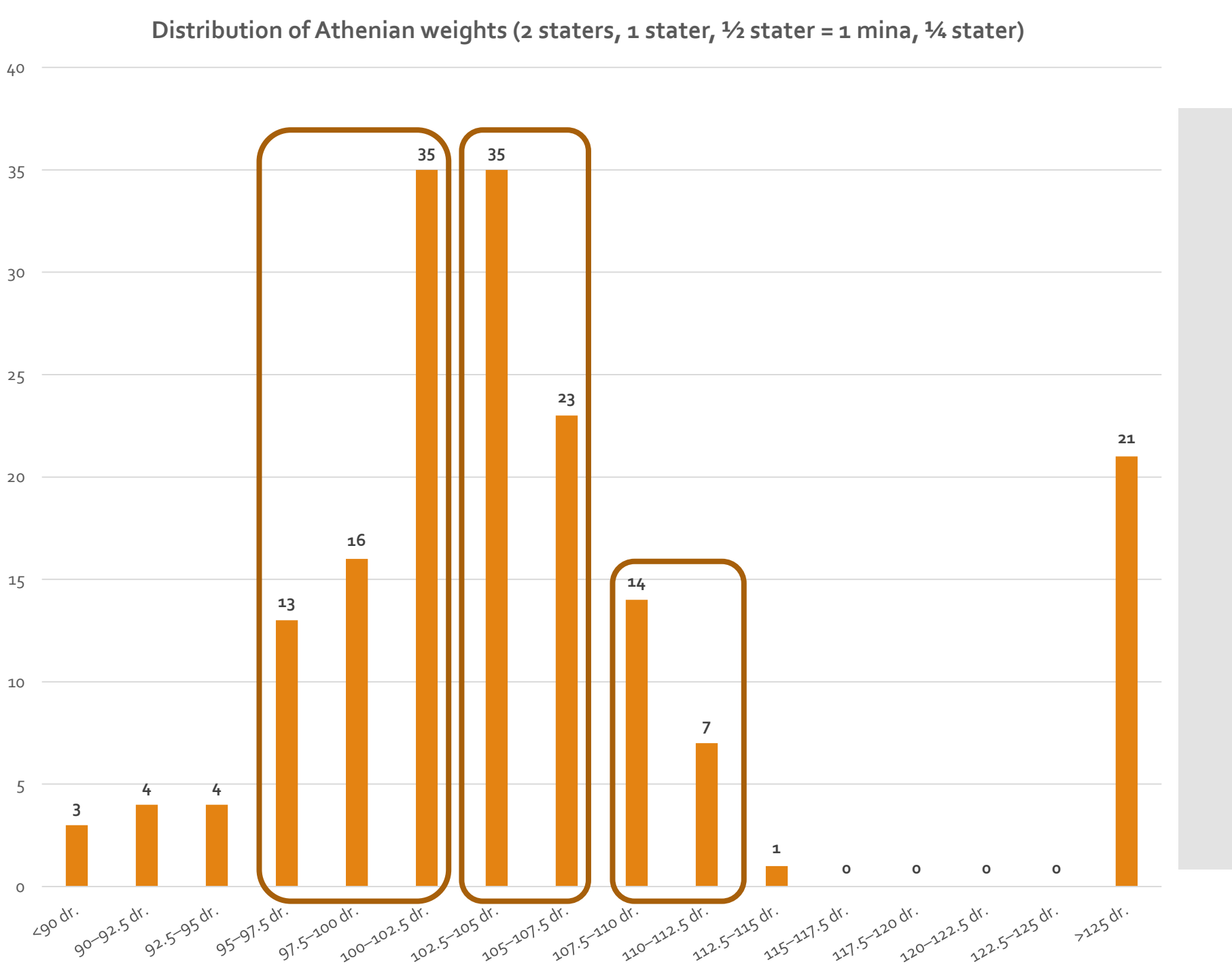


¼ mina
(28 Att. dr. = 19.69 Aeg. dr.)

Olympian weights

Denominations	Klasse A	Klasse B	Klasse C
1 talent	6000 Att. dr. 4200 Aeg. dr.	—	—
4 minas	400 Att. dr. 280 Aeg. dr.	420 Att. dr. 294 Aeg. dr.	448 Att. dr. 315 Aeg. dr.
2 minas	200 Att. dr. 140 Aeg. dr.	210 Att. dr. 147 Aeg. dr.	224 Att. dr. 157.5 Aeg. dr.
1 mina	100 Att. dr. 70 Aeg. dr.	105 Att. dr. 73.5 Aeg. dr.	112 Att. dr. 78.75 Aeg. dr.
½ mina	50 Att. dr. 35 Aeg. dr.	52.5 Att. dr. 36.75 Aeg. dr.	56 Att. dr. 39.375 Aeg. dr.
¼ mina	25 Att. dr. 17.5 Aeg. dr.	26.25 Att. dr. 18.375 Aeg. dr.	28 Att. dr. 19.69 Aeg. dr.
⅛ mina	—	—	14 Att. dr. 9.84 Aeg. dr.
Hitzl 1996	**“Äginetischer Standard”**	**“Attischer Standard”**	**“Attisch-aginetischer Standard”**

Athenian weights



Athenian weights:

100dr.-mina

2 staters (400 Att. dr.)

Athenian weights:

100dr.-mina

1 stater (200 Att. dr.)

⅓ stater
(66.67 Att. dr.)

⅙ stater
(33.33 Att. dr.)

1/12 stater
(16.67 Att. dr.)

½ stater = 1 mina
(100 Att. dr.)

¼ stater
(50 Att. dr.)

⅛ stater
(25 Att. dr.)

Athenian weights:

105dr.-mina

2 staters (420 Att. dr.)

1 stater (210 Att. dr.)

½ stater = 1 mina (105 Att. dr.)

Athenian weights:

105dr.-mina

⅓ stater
(70 Att. dr.)

⅙ stater
(35 Att. dr.)

1⁄12 stater
(17.25 Att. dr.)

¼ stater
(52.5 Att. dr.)

⅛ stater
(26.25 Att. dr.)

1⁄16 stater
(13.125 Att. dr.)

Athenian weights:

112dr.-mina

1 stater (224 Att. dr.)

⅓ stater
(74.67 Att. dr.)

⅙ stater
(37.33 Att. dr.)

1/12 stater
(18.67 Att. dr.)

1 mina
(112 Att. dr.)

¼ stater
(56 Att. dr.)

⅛ stater
(28 Att. dr.)

1/16 stater
(14 Att. dr.)

Athenian weights:

Stater/Mina

Denominations	Ratio 100	Ratio 105	Ratio 112
2 staters (4 minas)	400 Att. dr.	420 Att. dr.	448 Att. dr.
1 stater (2 minas)	200 Att. dr.	210 Att. dr.	224 Att. dr.
½ stater 1 mina	100 Att. dr.	105 Att. dr.	112 Att. dr.
⅓ stater (⅔ mina)	66.67 Att. dr.	70 Att. dr.	74.67 Att. dr.
¼ stater (½ mina)	50 Att. dr.	52.5 Att. dr.	56 Att. dr.
⅙ stater (⅓ mina)	33.33 Att. dr.	35 Att. dr.	37.33 Att. dr.
⅛ stater (¼ mina)	25 Att. dr.	26.25 Att. dr.	28 Att. dr.
1/12 stater (⅙ mina)	16.67 Att. dr.	17.25 Att. dr.	18.67 Att. dr.
1/16 stater (⅛ mina)	12.5 Att. dr.	13.125 Att. dr.	14 Att. dr.

Athenian weights:

Drachma

33.33 drachmas

25 drachmas

20 drachmas

16 drachmas

12 drachmas

8 drachmas

4 drachmas

1 drachma

Athenian weights:

Drachma

Denominations		(Total)
33.33 drachmas	×	1
25 drachmas	××	2
20 drachmas	××××	4
16 drachmas	×××	3
12 drachmas	××××××	6
10 drachmas	××××××	6
8 drachmas	×××××××××××××××××××××××××××	27
6 drachmas	××××××××××××	13
5 drachmas	××××××××××××××××	18
4 drachmas	××××××××××××××××××××××××××××××××××	38
3 drachmas	××××××××××××	12
2 drachmas	××××××××××××××××××	20
1.5 drachma	×××	3
1 drachma	××××××××××	10
4 obols	××	2
3 obols	××××	4
2 obols	×	1

Agoranomic decree (late 2nd cent. BCE)

***IG* II-III² 1013, l. 29–37**

Ἀγέτω δὲ καὶ ἡ μνᾶ ἡ ἐ‹μ›πορ‹ικ›ὴ **στε[φανηφό|ρου** δραχ]μὰς ἑκατὸν τριάκοντα κ‹αὶ› ὀκτὼ **πρὸ‹ς› τὰ στάθμια τὰ ἐν τῶι ἀργυροκοπί‹ωι›** [κ]αὶ | [ῥοπ]‹ὴ›ν ἐ[χέτω **στε]φανηφόρου** δραχμὰς δεκαδύο, καὶ πωλε[ίτ]ωσαν πάντες τἆλλα ‹π›άντα ταύ|[τηι] τῆι μνᾶι **‹πλ›ὴ‹ν› ὅσα πρὸς ἀργύριον διαρρήδην εἴρηται πωλεῖν**, ἱστάντες τὸν πῆχυν τοῦ ζυ‹γ›[οῦ | ἰσόρ]ροπον ἄγοντα τὰς ‹ἑ›κατὸν πεντήκοντα δρ̣αχ[μὰ]ς **τοῦ σ[τεφανηφ]όρου**· (…) [εἶναι δὲ | σύ]νφ[ω]να πάντα **τοῖς ἐν τῶι ἐμπορίωι ζ[υ]‹γ›ο[ῖς κ]αὶ σ‹τ›[α]θ̣[μ]ο[ῖς]**. (…)

"And the market mina shall weigh one hundred thirty-eight drachmas **of the *stephanephoros* [silver], in accordance with the weights (στάθμια) which are at the mint,** and shall have a makeweight of twelve drachmas **of the *stephanephoros* [silver],** and everyone shall sell everything else with this mina**, except for what should expressly be sold in accordance with the silver [standard],** balancing the beam of the scales at the weight of one hundred fifty drachmas **of the *stephanephoros* [silver]**. (…) All [the weighing instruments] shall be harmonized to **the scales and weights which are in the marketplace**. (…)

Metrological reform (late 2nd cent. BCE)

1 commercial mina
(ἐμπορικὴ μνᾶ)
(138 Att. dr.)

12 drachmas

1 commercial mina
(ἐμπορικὴ μνᾶ)
(150 Att. dr.)

***IG* II-III² 1013, l. 54–55**

Θέτω ‹δ›[ἐ Διόδωρος εἰς Ἀ]‹κ›ρόπολιν σηκώματα τοῦ τε ἐμπορι‹κ›οῦ [ταλάν|το]υ καὶ δεκάμνου καὶ δί‹μν›ου [καὶ μνᾶς καὶ] ἡμιμναίου καὶ ταρτη‹μ›όρου καὶ χοὸς [καὶ χοίνικος].

Diodoros shall deposit in the Acropolis metrological instruments (σηκώματα) of the commercial talent, a decamnoun, a dimnoun, a mina, a half-mina, a quarter mina, a chous, and a choinix."

Athenian weights:

Stater / Mina

Denominations	Ratio 138	Ratio 150	Ratio 162?	Ratio 175?
1 stater (2 minas)	276 Att. dr.	300 Att. dr.	324 Att. dr.?	350 Att. dr.?
½ stater 1 mina	**138 Att. dr.**	**150 Att. dr.**	162 Att. dr.?	175 Att. dr.?
⅓ stater (⅔ mina)	92 Att. dr.	—	—	—
¼ stater ½ mina	69 Att. dr.	75 Att. dr.	81 Att. dr.?	87.5 Att. dr.?
⅙ stater (⅓ mina)	46 Att. dr.	—	—	—
⅛ stater ¼ mina	34.5 Att. dr.	37.5 Att. dr.	40.5 Att. dr.?	43.75 Att. dr.?
1/12 stater (⅙ mina)	23 Att. dr.	—	—	—
1/16 stater ⅛ mina	17.25 Att. dr.	18.75 Att. dr.	20.25 Att. dr.?	21.87 Att. dr.?

Metrological reform (late 2nd cent. BCE)

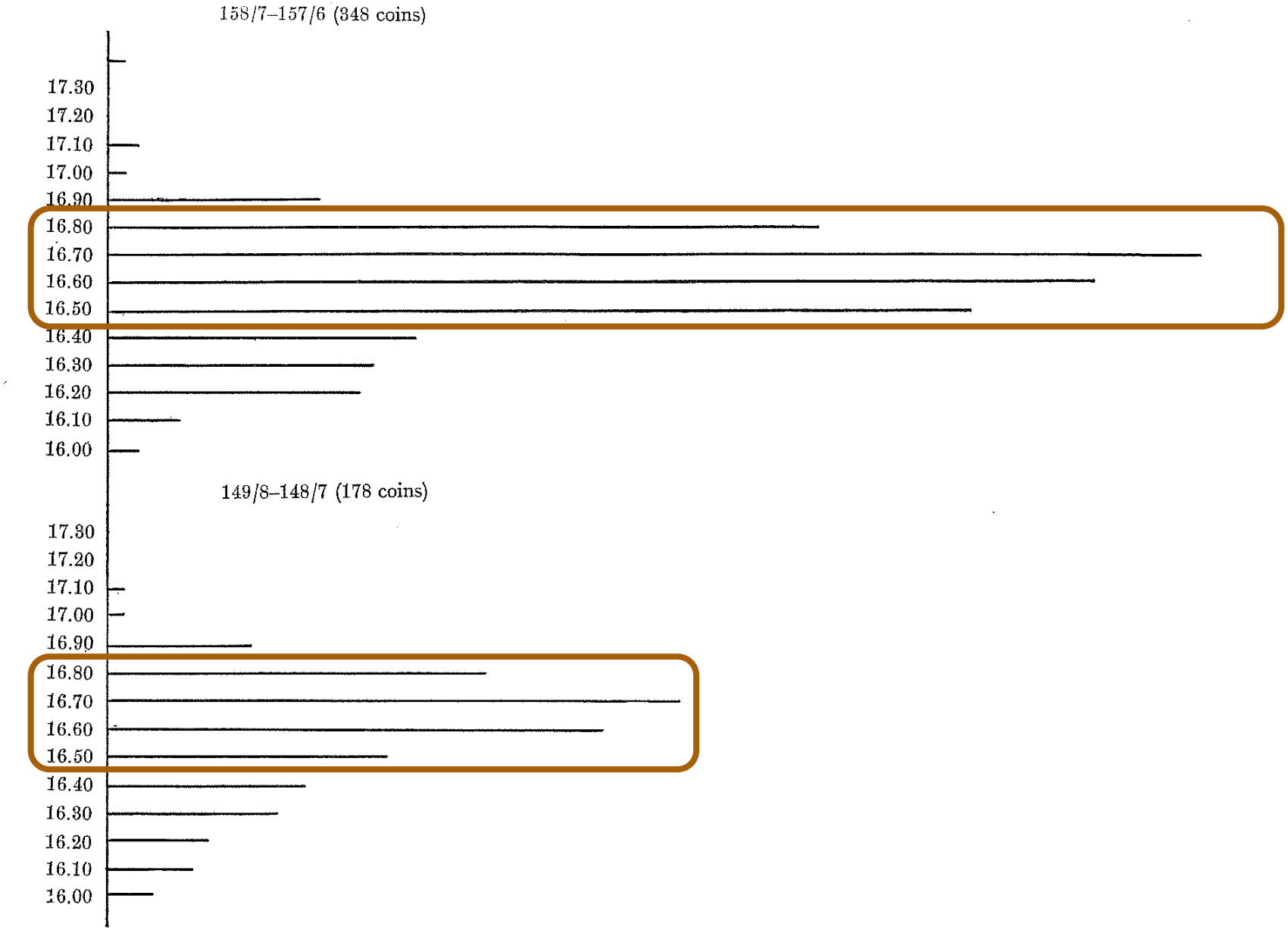
1 commercial mina
(ἐμπορικὴ μνᾶ)
(138 Att. dr.)

12 drachmas

1 commercial mina
(ἐμπορικὴ μνᾶ)
(150 Att. dr.)

‹ἐ›κατὸν πεντήκοντα δρ̣αχ[μὰ]ς **τοῦ σ[τεφανηφ]όρου πρὸ‹ς› τὰ στάθμια τὰ ἐν τῶι ἀργυροκοπί‹ωι›**

Attic standard (2nd cent. BCE)



Attic standard (2nd cent. BCE)

Treaty of Apamea (188 BCE)

Polybius 21.43.18-19:

Ἀργυρίου δὲ δότω Ἀντίοχος **ἀττικοῦ** Ῥωμαίοις **ἀρίστου** τάλαντα μύρια δισχίλια ἐν ἔτεσι δώδεκα, διδοὺς καθ' ἕκαστον ἔτος χίλια· **μὴ ἔλαττον δ' ἑλκέτω τὸ τάλαντον λιτρῶν ῥωμαϊκῶν ὀγδοήκοντα.**

"Antiochus shall pay to the Romans twelve thousand talents of the best Attic standard during twelve years, and he shall pay one thousand talents a year, the talent not to weigh less than eighty Roman pounds."

Livius 38.38.13:

Argenti probi duodecim millia attica talenta dato; ***talentum ne minus pondo octoginta Romanis ponderibus pendat.***

"(Antiochus) shall pay twelve thousand Attic talents of excellent silver, the talent not to weigh less than eighty Roman pounds."

1 Attic talent (60 minas) = 80 Roman libras
1 Attic mina (435g) = 1.33 Roman libra (326g)
1 Roman libra (326g) = ¾ Attic mina (435g)

Minting the New Amphictyonic Coinage

Sorting and counting old coins: **100%** (122.44T)

Global *Apousia*

–13.71%

New Amphictyonic coins: **86.29%** (105.65T)

Weighing old coins and calculating deficit *(apousia)*: **–10.36%** (12.68T)

Minter: **~2.1%** (2.25T) [9 obols / mina]

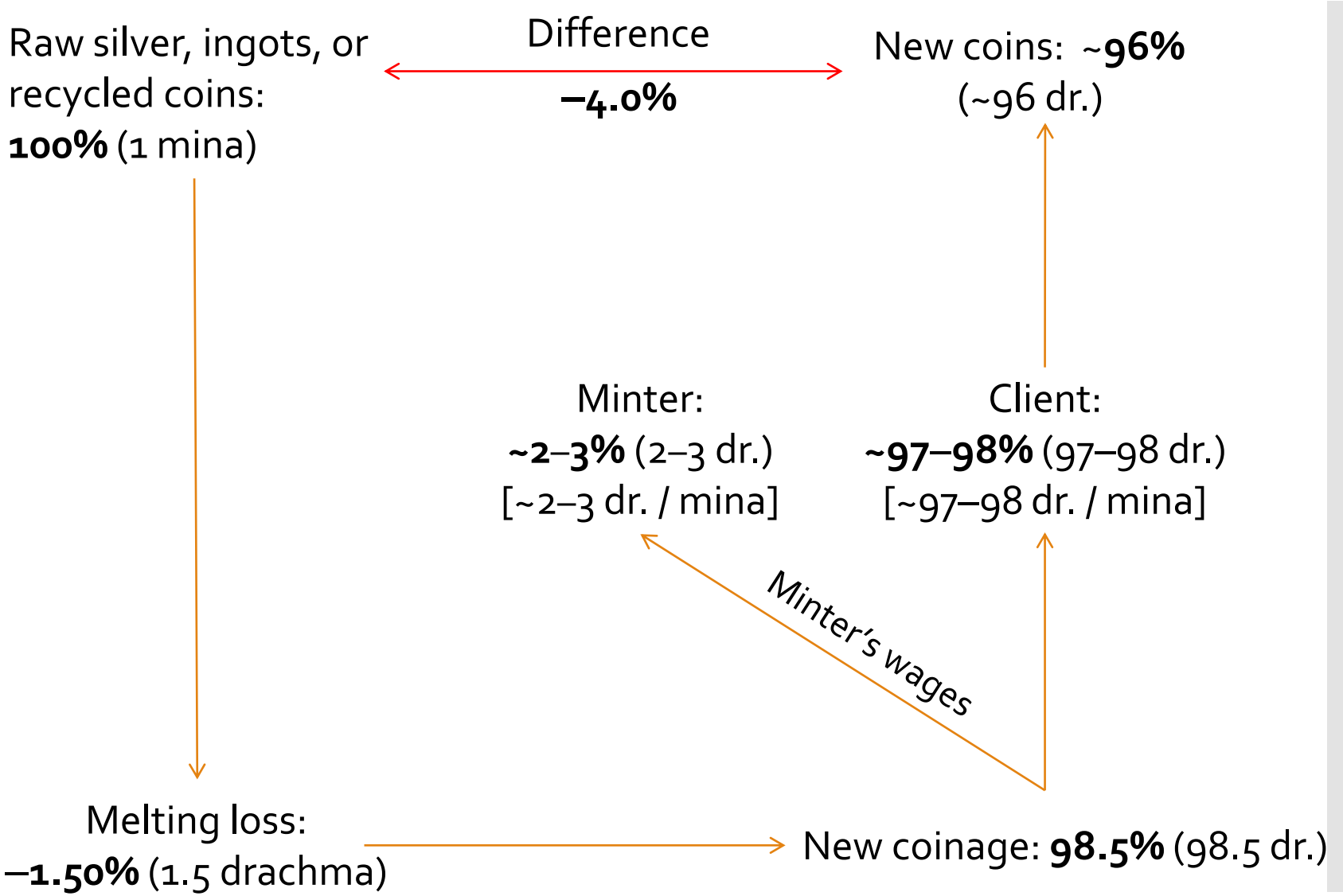
Amphictyony: **~97.9%** (105.65T) [6,339 minas]

Minter's wages

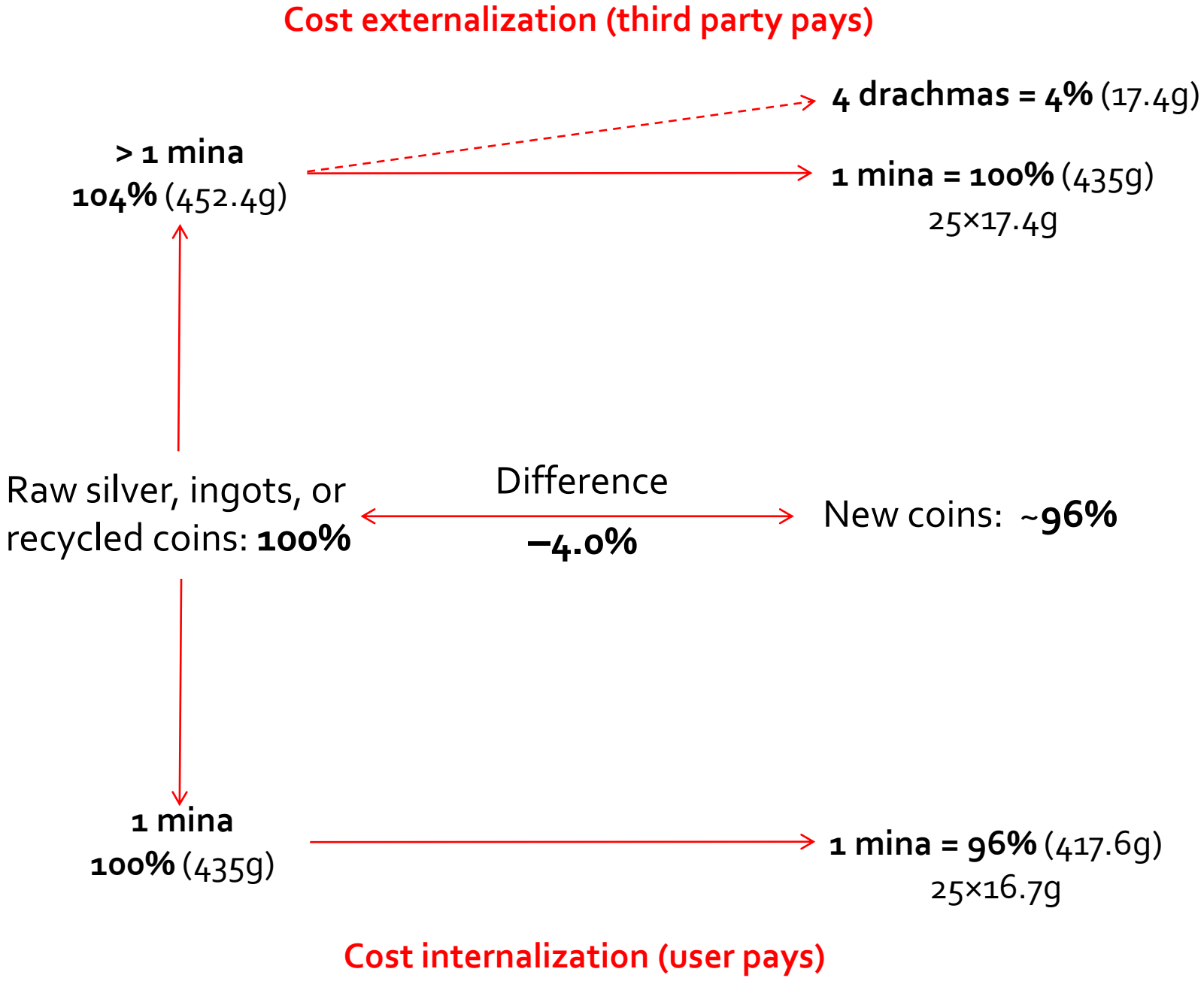
Melting loss: **–1.50%** (1.83T)

New Amphictyonic coinage: 88.13% (107.90T)

Coin production



Coin production



Producing 100 dr.-phiale

Raw silver, ingots, or recycled coins:
~110–114 dr.

Silversmith's wages

Silversmith:
~6–8 dr.

Melting loss:
4–6 dr.

Silver phiale:
100 dr. (1 mina)

Producing 150 dr.-wreath

Silver coins: **150 dr.**

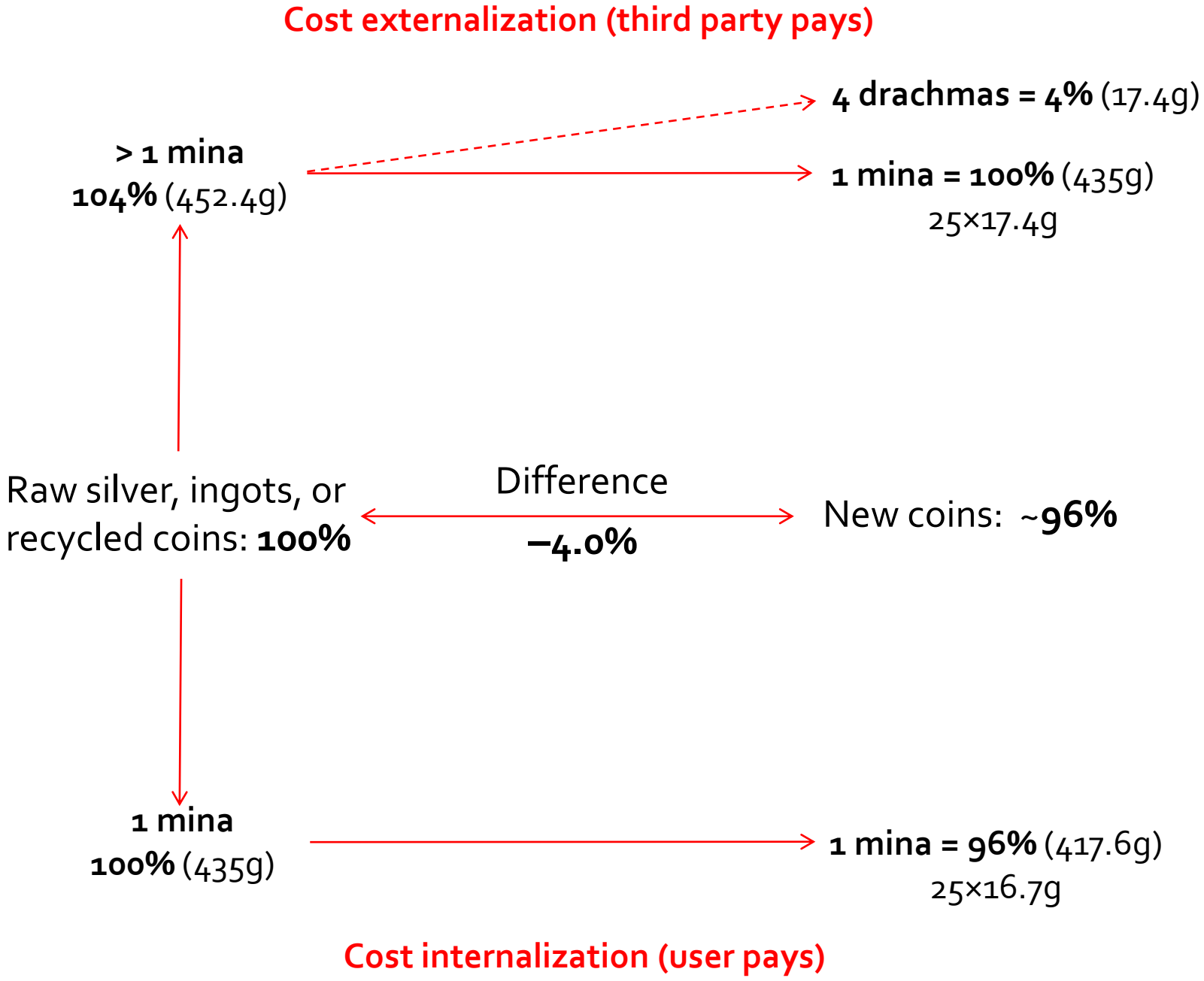
Purchase of gold
= **146.25 dr.**
[26 dr. / stater]

Goldsmith's wages

Goldsmith:
3.75 dr.
[4 ob. / stater]

5.625 staters → Melting loss: **~10%?** → Golden wreath: **~ 5 staters** = 130 drachmas

Coin production



Increased commercial minas and reduced silver drachmas

Ratio	Commercial mina	Monetary mina
100	100 Att. dr. (435g)	100 Att. dr. (435g)
105	105 Att. dr. (457g)	
112	112 Att. dr. (487g)	
125?	125 Att. dr. (544g)	
138	138 Att. dr. (600g)	
150	150 Att. dr. (652g)	
162?	162 Att. dr. (705g)	
175?	175 Att. dr. (761g)	

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