

WEIGHING UP THE ECONOMY OF ROMAN LONDON

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INTRODUCTION

The following two appendices have been published online and contain supplementary information in support of an article in *LAMAS Transactions* Volume 68 (2017), 41–58.

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APPENDIX 1: TYPOLOGY OF WEIGHING EQUIPMENT FROM BRITANNIA

The different types of Roman weighing equipment were described earlier (Figs, 1, 2 & 3). Each different type of balance is identified by a four-point code. The first part is a number, either 0, 1, 2 or 2a, which relates to the number of scales marked on the arm. Equal arm balances always begin with type ‘0’ as they have no scale marks. In rare cases

steelyards are classed as type ‘1’, but this classification is more common for dual arm balances. Type ‘2’ examples of steelyards and dual balances have their scales marked on opposite planes of their scale arm. Type ‘2a’ examples are dual balances where the scales are marked on the same planes, but on opposite sides of the central fulcrum. The second part of the four-point code is defined by the type of the fulcrum (or pivot point) loops (Fig 16).

The fulcrum loop types I, II and IIA were forged as an integral part of the arm. Types I and II are found on steelyards as they are the fulcrum loops for different scales. Type II loops can also be found on dual balances, but the latter loops are positioned much further apart. Type IIA is found on equal and some dual balances as a single central fulcrum.

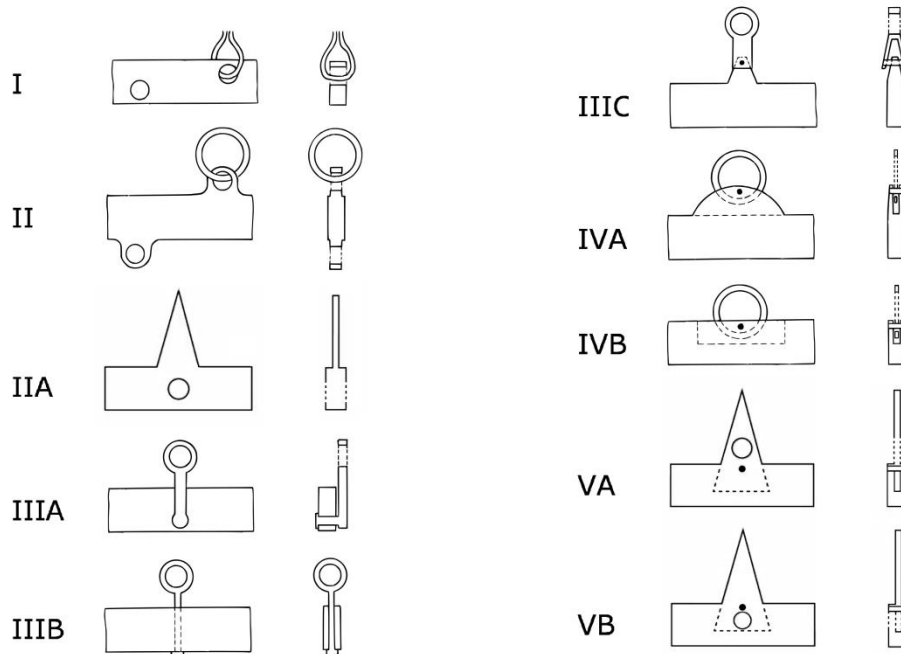


Fig 16. Typology for the suspension loop attachments of Roman balances (based on Grönke & Weinlich 1992, 205)

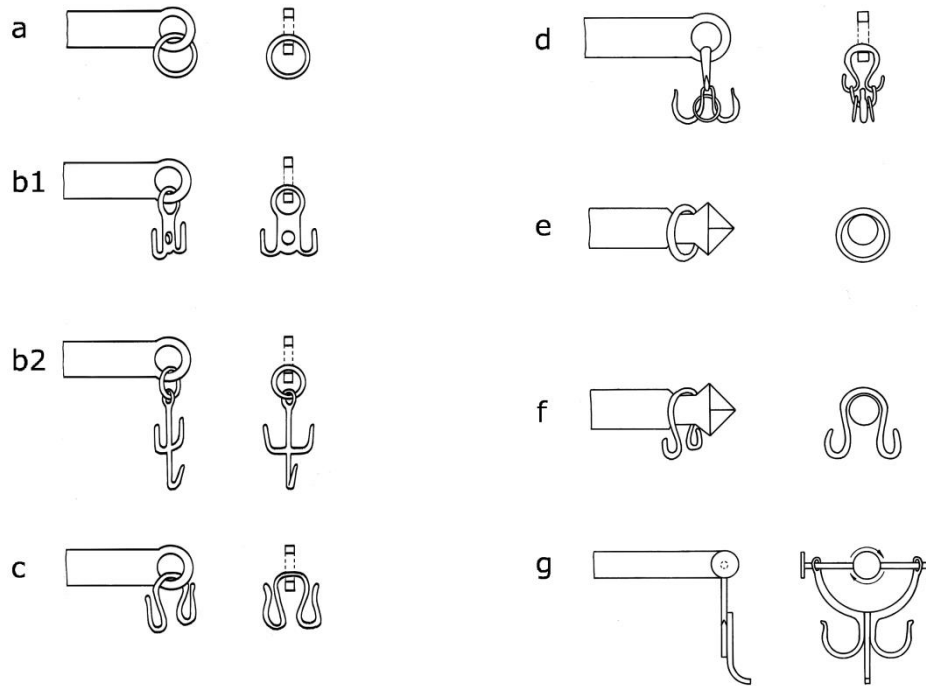


Fig 17. Typology for the load suspension loop attachments of Roman balances (based on Grönke & Weinlich 1992, 208–9)

The fulcrum loops for all other types are attached by a rivet, either through the arm or through a protrusion. Types IIIA–IVB are found on steelyards, whereas types VA and VB are found on equal and dual balances. The third element of the code indicates the type of the load suspension loop at the end (or ends) of the arm (Fig 17). Each type of load suspension loop can be found on any design of balance. Types a–d are hooks, which are forged

or twisted through the load loop. Types e–g, use a hook, which is attached to a divot in the end of the arm.

Finally, the fourth part of the code indicates the type of the load instruments combined with the type of the fulcrum hooks present on Roman balances. These are split into eight types; α , β , Γ , δ , ζ , η , θ , λ . (Table 4).

Table 4. Types of fulcrum hook on Roman balances combined with types of load instruments and load suspension

Fulcrum hook	Load instruments	Load suspension
α single wire hook. Wire either wrapped around the shaft on the lower end or bent over against the shaft. Wider, flat hook on the upper end. With or without counterweight between chains	wire, figure 8 chain links or small loop links. Ends forged to or helically wound around the shaft. Several links connected together. With or without counterweight in between chains/rings	hooks
β hook with solid forged eyelet at the lower end. Often with a ring between the eyelet and fulcrum loop	elongated counterweight with rings at either end	hooks
Γ as ' β ', but with additional rings/chains between hook and fulcrum loop	foxtail chains, often with a ring around the chains	pans or hooks
δ as ' α '	as ' Γ ' or ' $\alpha\Gamma$ '	pans or hooks
ζ as ' β '	as ' α '	hooks
η as ' Γ '	as ' Γ ' or ' $\alpha\Gamma$ '	pans or hooks
θ as ' β '	as ' Γ ' or ' $\alpha\Gamma$ '	pans or hooks
λ stirrup hanger. Two eyelets at the ends of the prongs are connected by a bar which feeds through a hole on the balance arm	as ' Γ ' or ' $\alpha\Gamma$ '	pan or hooks



Fig 18. An example of the most common steelyard type from Britannia (MoL Inv.19068.3) (Table 6. BUC97*) (Photo courtesy of the Museum of London and Owen Humphreys) (scale 1:2)

For example, one steelyard above from the MoL collection is given the typological code '2IIaa' (Fig 18). The arm has two (2) scales on opposite planes, the fulcrum loops are forged to the arm and project outward (II), the load loop is a forged loop with a single wire looped through (a) and the load instruments are figure eight wires wrapped around the shank and might have had a counterweight attached (α). This type is the most common steelyard found in Britannia and the north-western provinces.

The steelyard weight typology used is based upon Franken's (1994) classification of figured steelyard weights. New categories identified in Britannia have also been added to it. In addition, a typology has been developed for plain steelyard weights.

APPENDIX 2: THE SITES AND OBJECTS FROM LONDON

In total, there are 326 objects from 53 sites (Table 5). Of these, 133 are from the core corpus in this study, which consists of finds of weighing instruments. In addition there 193 pan weights (including some unidentified pan or steelyard weights, which have been recorded separately).

The MoL objects make up the largest part of this corpus (Table 6), however, due to the nature and antiquity of this collection there is less specific locational data than for the MOLA and the LAA objects, which are derived from 28 sites with

precise locational data. Where a site code has been assigned to material this is cited. For the other sites, an alpha-numeric code has been assigned beginning 'LON', as this wording has not been used as a London site code. In total, 25 sites were identified from collections other than the MOLA or LAA. Finds from unlocated sites within the collections have also been given an alpha-numeric code.

From this data, 27 MoLA/LAA sites can be accurately plotted on a distribution map in and around the main city walls (apart from NYP73, which is situated in Westminster, SW1) along with a further 13 MoL sites. In Table 6, those sites plotted are marked with an asterisk (*). The 193 pan weights, although not a key part of this study, have been included to complement the core material and demonstrate how widespread weighing activity was within Roman London. For further details concerning all sites in Table 6, see the London Archaeological Archive and Research Centre online catalogue.

Table 5. Number and percentage of London weighing objects from various collections

Stored Location	No. of Objects	%
MoL	74 ¹	56
LAA	22	17
MoLA	15	11
British Museum	15	11
Salisbury Museum	3	2
Unknown	4	4

¹Excludes the two uncertain items

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Table 6. Number and location of weights from the core London corpus and other (pan) weights not included in the main study

Site Code	Collection	Site	Core objects	Other weights
106BHS73*	LAA	106–114 Borough High Street	1	
120BHS89*	LAA	120–124 Borough High Street	1	3
BGH95*	LAA	Main Ticket Hall, Borough High Street,		5
BUC97*	LAA	Bucklersbury, 3 Queen Victoria Street		1
BZY10*	MOLA	Bloomburg Place, Bucklersbury	11	64
CID90*	LAA	72–80 Cheapside	1	28
CW83*	LAA	Cotton's Wharf, Tooley Street	1	
ETA89*	LAA	7–11 Bishopsgate		6
ETE97*	LAA	Equitable House		1
FER97*	LAA	Plantation House		1
GHT00*	LAA	Blossom's Inn, 20–30 Gresham St		2
GPO75*	LAA	General Post Office	2	
GSM97*	MoLA	10 Gresham Street	2	
GYE92*	LAA	Guildhall Art Gallery		5
KWS94*	LAA	Regis House		6
LCT84*	LAA	Leadenhall Court	2	
MOQ10*	MOLA	8–10 Moorgate	2	10
NGT00*	LAA	Laud House Forecourt, Newgate Street		1
NPY73	LAA	New Palace Yard, Parliament Square	1	
ONE94*	LAA	1 Poultry	8	52
PNS01*	LAA	Charterhouse Bank Building		1
STU92*	LAA	Southwark Street (Jubilee Line)		1
SYV04*	LAA	Syon Park, London Road		3
TEA98*	LAA	41–53 Threadneedle Street		1
TEX88*	LAA	Thames Exchange Buildings	2	
TGM99*	LAA	8–10 Throgmorton Avenue		2
TR74*	LAA	Billingsgate Buildings	1	
VHA89*	LAA	Vintry	2	
LON01*	MoL	1 Queen Victoria Street	2	
LON02	MoL	Aldersgate Street	1	
LON03*	MoL	Austin Friars, EC2	1	
LON04*	MoL	Bank Tube Station	1	
LON05*	MoL	Bank of England	5	
LON06*	MoL	Barge Yard, Bucklersbury	1	
LON07*	MoL	Bell Alley	1	
LON08*	MoL	Billingsgate Lorry Park	1	
LON09*	MoL	Bucklersbury House	4	
LON10	MoL	Bethnal Green (City Site)	1	
LON11	MoL	Craven Street, Strand	1	
LON12	MoL	Fenchurch Street	1	
LON13*	MoL	Finsbury Circus, Moorfields	1	
LON14	MoL	London Bridge, Southwark	1	
LON15	MoL	London Wall (EC2)	6	
LON16	MoL	Moorgate Street	2	
LON17*	MoL	Phoenix House (EC4)	1	
LON18	MoL	Queen Victoria Street, Walbrook	1	

LON19	BM/MoL	River (Walbrook Stream)	3
LON20*	MoL	Sir John Cass School	1
LON21	MoL	Southwark (Foreshore)	1
LON22*	MoL	St. Mildred's, Poultry	1
LON23*	MoL	Stock Exchange	1
LON24	MoL	Tabernacle Street	2
LON25	MoL	Upper Thames Street	1
LON26	MoL/Others	unknown	54