

Lead 'slingshot' (*glandes*)

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Glandes or *μολυβδαίδες/μολυβδαίνια* (fig. 1a) were ordinarily made of a lead alloy and cast, in sequences of 3 or more, or in trees of 6¹ or more, into a shape and size that resembles an acorn, olive, or almond nut in its shell — hence the Latin name. Ordinarily they weigh c.30-40 gm and are c.30-40 mm long. Sometimes they are marked with an inscription or design (in relief). From the large unpublished collection in the British Museum (available on-line since December 2008), and the catalogues of other collections, I have constructed a database of over 1400 objects in an effort to analyse these objects systematically.

The sample

Glandes with given weight, which form the backbone of the study, come from many different collections, the chief being:

— 159 in the British Museum (Greco-Roman Department; mostly unpublished);

— 153 in Rome (Gorga collection; Cerchiai 1982-83);

— 109 excavated in and around Olynthus in the 1930s (Robinson 1941);

— 85 in Basel (Vischer 1866 to 1878);²

— 79 in the Nicosia Museum (Nicolaou 1977, 1979, 1980);

— 74 from Iberia (Dias Ariño 2005);³

— 58 found in and around Miletos (Weiß 1997); and

— 48 in the Bibliothèque Nationale Paris (Froehner collection; Hellmann 1982).

The remainder come mostly from smaller public and private collections, such as 25 in the Ashmolean Museum (Foss 1974-75) and a similar number in the Canellopoulos collection (Empereur 1981), along with a few unpublished finds and small groups in other departments of the British Museum (Prehistoric and Roman Britain; Middle Eastern; Egyptian⁴).

Added too were 176 of Zangemeister's *Glandes plumbeae litinae inscriptae* with weights that were not already in the database. They have a significantly higher mean, median and modal weight⁵ and a much smaller range than the sample as a whole: they form a relatively consistent subset, distinguished not only by bearing inscriptions in Latin, but also by having a c.25% heavier mean weight and a nearly 100% heavier modal weight.

Glandes published without measurements were not included because no useful analysis can be done on them. This typically affects plain *glandes*,⁶ but is true also of some inscribed specimens.⁷ Since the objects are missiles, weight is crucial.

A steady stream of *glandes* is offered for sale on eBay (mostly from its American, British, Dutch and German branches) and those noted while I was compiling the database were included. Most seem to be new finds by metal detectorists in countries that were once part of the empire. Although unstratified and with unverified information, they should not be ignored. *Glandes* are likely to have been deposited on battlefields (the kind of

1 See, e.g., the mould illustrated at Empereur 1981, 555.

2 I am grateful to J. Ma for information on the location of this material. Maiuri (1925) and Segre and Pugliese-Carratelli (1949-51) republished Vischer's specimens from Kamiros.

3 This is the number with length or weight or both amongs; the 95 that are discussed by Dias Ariño 2005.

4 A large collection of 517 specimens has recently been recovered at Velsen. Discussion of types found and distribution map of findspots around the fort is given in Bosman 1995; also Bosman 1999.

5 The mean is the average value; the median is the middle value, with the same number of other values occurring either side of it; the mode is the most common value in a given set.

6 E.g., Munda: Pina Polo and Zanier 2006, 29. Only 109 of the c.500 *glandes* from Olynthus are in my data-base because only that number was published with sufficient details. Even the total number found is an estimate rather than a count.

7 Most entries in *IG* and *CIL* are not included in the database; e.g., *IG* XIV 2407 comprises 26 specimens for which only the inscription is recorded. This practice continues into recent times; e.g., Rouillard 1997, 68-73, is apparently a representative selection of the 90 or so specimens from Osuna now in the Louvre. Collectively they are stated to be 3.5 to 5.5 cm long and weigh 80 to 100 gm; the (maximum) length and width of each is given, but not the weight. Likewise, averages are given for the specimens found at Carnunna: Vicente et al. 1997, 195.