

## Roman astragalus-shaped weights

The astragalus (Greek ἀστράγαλος) or talus (Latin *talus*) is a bone from the tarsus (ankle), which is the articulation between the rear leg and the foot. In ancient times, animal astragali (especially from sheep and goats) were collected for many uses. Since the astragalus has four different sides, each of which having a specific name and a numerical value, astragali have served as dice for a long time. According to Homer's *Iliad* (23.84–90), Patroclus had to leave his father's house and to join the house of Peleus, the father of Achilles, because he accidentally killed the son of Amphidamas while playing dice (astragali). Many other examples from Greek and Roman literature depict children playing astragali.

However, the astragalus was a powerful symbol that is not limited to the area of childhood. As dice, astragali were used in gaming and divination contexts. Astragali also served as offerings in shrines or tombs: more than 23.000 astragali were found in the Corycian Cave near to Delphi, and almost 9.000 astragali were discovered in the necropoleis of Locri, in Calabria. Bigger-than-life astragalus-shaped bronze ingots were also dedicated in major sanctuaries, such as Didyma (Ionia) or Olympia (Elis). Several Greek cities produced astragalus-shaped weights (e.g. Gela, Himera, or Tyre), or used the astragalus as a weight and/or monetary symbol (e.g. Athens).

For Roman times, about 15 big astragalus-shaped bronze weights are known so far, in Greece, Italy, Gaul and Spain. In most cases, they are very heavy: two 30-libra weights (9.79 kg), two 50-libra weights (16.31 kg), one 75-libra weight (24.47 kg), maybe one 80-libra weight (26.10 kg) and one 90-libra weight (29.36 kg), as well as two 100-libra weights (32.62 kg). These objects are either bronze solid castings, or hollow castings filled with lead.

In Greece, four astragalus-shaped bronze weights are recorded in an inscription from Tegea (*IG V, 2, 125*) dating from early 2<sup>nd</sup> century CE:

Πό(πλιος) Μέμμιος Ἀγαθοκλῆς ἀγορανομήσας ἀνέθηκεν ἐ[κ τῶν ιδί?]-  
ων τὸν οἶκον καὶ τὰ ἐν αὐτῷ σταθμὰ χαλκᾶ < σ[ῶν]  
καὶ ἔλαφον < λι(τρῶν) < ν' < Ἀταλάντην < λι(τρῶν) κε' < ἀστράγαλον [λί(τρας) α']  
ἄλλον < λί(τρας) < α' < οὐν(κιῶν) < θ' < ἄλλον < λι(τρῶν) < β' < ἄλλον < λι(τρῶν) [ς] δ' [ς] Ἐρωτα [ς – –].

“The former agoranomos Pu(blius) Memmius Agathocles dedicated [on his own expenses?] the premises and the bronze weights that are inside: a boar and a deer, 50 libras; an Atalanta, 25 libras; an astragalus, [1 libra?]; another astragalus, 1 libra 9 uncias; another astragalus, 2 libras; another astragalus, 4 libras; an Eros, [– – –].”

Astragalus-shaped bronze weights always lie on the superior surface of the anatomical bone, and have a handle on the inferior surface. According to the inscription and to the shape of the handle, the material can be organised in two categories. The first category includes four left astragali; the second category, nine right astragali. This interesting distribution between left and right astragali could be significant; at least, weights from the same set always show the same laterality.

1. Some weights are anepigraphic or only show a discrete dotted or incised inscription; these weights are fitted with a simply welded handle. Two astragalus-shaped weights from Pompeii (to be dated before 79 CE) belong to this category: the first one, damaged, still weighs 28.60 kg (maybe a 90-libra weight?); the second one weighs 25.85 kg (80 libras, i.e. an Attic talent?). A weight excavated in Baron (France, Gard), 25 km north of Nîmes, has the dotted inscription (*Exactum ad*) *Cast(oris) XXX*; it is a 30-libra weight (current mass: 9.675 kg). At Arucchi/Turobriga, in Baetica, a 10-libras weight (3.27 kg) with the inscription *X* (“ten”) was also brought to light during archaeological excavations.

2. Other weights have an inlaid silver inscription mentioning their denomination and, sometimes, the issuing authority; these weights have a much more elaborate handle, which is attached with two rings welded on a leaf-shaped support. A big 100-libra astragalus-shaped weight (29.8 × 17.8 × 15.0 cm) excavated near Varese (Italy, Lombardy) shows the inlaid inscription *C* (“one hundred”), i.e. 100 libras (32.62 kg); since the lead filling has disappeared, this object only weighs 17.25 kg. Three other weights form a set: they all bear the inscription *CF*, that can be interpreted as *C(oloniae) F(alerensis)*, i.e. Falerio (Italy, Picenum), where the two heaviest weights were discovered. Each of these weights has other inscription mentioning its denomination: *L* (“fifty”) for the 50-libra weight, *XXX* (“thirty”) for the 30-libra weight, and *I* for the 1-libra weight. Another weight, conserved in Bologna, has the Greek

inscription  $\Lambda$  | H : it could be a 8-libra weight,  $\lambda(\acute{\iota}\tau\rho\alpha\iota) \eta'$ . A last similar weight was discovered in Almuñécar (Spain, Grenada), and it could correspond to a 3-libra weight.

The beautiful set of three astragalus-shaped weights conserved in the Pera Museum also belong to this second category. On each weight, the Greek inscription ΓΕ – NE probably refers to the issuing authority of these weights. Another inscription indicates the denomination, by combining Greek and Latin abbreviations: the heaviest weight bears the legends *C* (in Latin) and *P* (in Greek), i.e. 100 (libras); the second shows *NXXV*, that is 50 (in Greek) + 25 (in Latin), i.e. 75 (libras); the smallest has the legend *N* (in Greek), i.e. 50 (libras). These weights stand out with their detailed workmanship: their handles are particularly elaborate, with a vegetal motive, and extremities shaped as a thumb and a swan head. This typical ornament can also be found on bronze handles of stone weights (e.g. Madrid, Real Academia de la Historia, inv.no. 46 ; Brussels, Musées royaux d'art et d'histoire, inv.no. Ap 146), and the thumb motive appears on bronze weights, for instance in Pompei (Naples, Museo archeologico nazionale, inv.no. 74393).

This interesting corpus of Roman bronze weights shows that the astragalus is still used as a weight symbol during Imperial times, just as in the Archaic and the Classical periods. Originally, astragalus-shaped ingots were probably produced in connection with the trade of tin in the Mediterranean (see Diodorus Siculus, 5.22.2 = Timaeus, FGrH IIIB, 566 F, fr. 164). Somehow, this particular shape evokes pastoral economies. Standardised tin and bronze ingots could have been used as a store of value and, later on, a standard of value. Finally, the astragalus became a well-spread weight symbol throughout the Mediterranean area. Many centuries later, Roman astragalus-shaped bronze weights carry on the tradition.