Ancient balance scales

Jordan Bell

jordan.bell@gmail.com

Department of Mathematics, University of Toronto

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Agade period, No. 42, Plate VI [1, p. 46]:


Shamash, seated before an altar, holds the saw; from his shoulders issue the usual sunrays. Before him stands a person holding in his raised left hand a pair of scales. This person is followed by another, who carries a goat as an offering. A smaller person behind the others holds a knife(?) over an altar(?), perhaps waiting to perform a sacrifice. At the end of the scene are two badly worn cuneiform signs.

To the best of the author’s knowledge, this is the only representation of the balance with scalepans in Mesopotamian glyptic.

R. M. Boehmer 1965, Die Entwicklung der Glyptik während der Akkad-Zeit, de Gruyter, n. 1105


A History of Trust in Ancient Greece, Johnstone, p. 55

Isaiah 40:12–15.

shaduf=kelon, keloneion=telo, tolleno.

shaduf, mosaic floor in House of the Laberii at Oudna in Tunisia, Gauckler 1896

Markets And Marketing in Roman Palestine, pp. 76–77
Roman steelyard circa 79 CE, found in Pompeii (Naples, National Archaeological Museum. Inv. No. 5569).


Next prepare round pills weighing one drachma, precisely limiting their weight with a scale (plastinx) Nicander, Theriaca 954–955

Weighing devices have turned up at several surgical sites, including a scale and a steelyard in a grave at Rheims (Kunzl [1983a] 63.3264.33; Fig. 93), a scale—probably in a grave—at Colophon (Caton [1914] 118; Fig. 92) and several scales (bilancie) in Pompeian houses: the Casa del Medico Nuovo (I), the Casa del Medico Nuovo (ii), and the Casa del Centauro (where there were two); see Bliquez, Jackson (1994) 83, 84, 91.

Ernst Kunzl, Thomas Weber, Das späantike Grab eines Zahnarztes zu Gadara in der Dekapolis, Damaszener Mitteilungen, 5: 81118, plus 7 plates.

Richard Caton, Notes on a Group of Medical and Surgical Instruments found near Kolophon, Journal of Hellenic Studies, 34: 114118.


Epiphanias, James Elmer Dean, Epiphanias’ Treatise on Weights and Measures. The Syrian Version. Chicago 1935


Illahun, Kahun and Gurob. Medum, Petrie, p. 30, steelyard


Daremberg Saglio, sv libra and machina

Ventris and Chadwick, 55

Barker GMW II

[EGYPT 29589] ’Libra and Virgo on astronomical ceiling at Dendera.’ Scales and a woman holding an ear of corn portray the zodiac signs Libra and Virgo
on the astronomical ceiling in the outer hypostyle hall of the Hathor Temple at Dendera.

Balance and stone weights from Naqada, Science Museum, South Kensington, London
Theognis 157–8
Bach. 4.13,17.24–9, Aes. Pers. 345,
Aeschylus, Suppliants, ll. 402 ff., “holding the balance nicely poised, as ready to incline this way as that”, Tucker, 1889
Homeric Hymn 4 to Hermes ll. 320–324, Evelyn-White:

Soon they came, these lovely children of Zeus, to the top of fragrant Olympus, to their father, the Son of Cronos; for there were the scales of judgement set for them both.

Libra, Akkadian zibanitu, zi-ba-an-na, Sumerian RIN, “scales”.
LG/23, No. 4 Straight St. outside SE wall of Room 5, Larnax A, p. 196, two copper scale-pan and weights.
LG/45, No. 1 B Baker’s Square, Chapel, Larnax A.
LG/170 On town wall, Corbel-vaulted tomb
U.16307, U.16769
A Companion to the Archaeology of the Ancient Near East, Volume 1
Nineveh palace walls shaduf
Beazley, ABV, 174,1
Machabey, Armand J, Memoire sur l’histoire de la balance et de la balancerie, Paris, 1949
Petire, Ancient Weights and Measures, London 1926; Measures and Weights, London 1934
Viedebantt, Oscar. Zur Metrologie des Altertums, Leipzig 1917; Antike Gewichtsnormen und Munzfusse, Berlin 1923
shaduf, Tomb of Ipy, Thebes, ca. 1250 BC, N. de G. Davies, Two Ramesside Tombs at Thebes, Plate XXIX, 1927. Tomb of Neferhotep, ca. 1340 BC, Plate XLVI.
EGYPTIAN TOMB PAINTING. Shadoof used for irrigation. Tomb painting, 19th Dynasty. From Tomb of Ipy at Der-el-Medineh, c. 1275 B.C.

• Mastaba of Mereruka, Necropolis of Saqqara. Sixth Dynasty. Chamber A 3, East Wall, Scene 2, Plate 32, detail of Plate 29, A. “Metal-workers
weighing and smelting ore, pouring molten metal, beating out gold foil, and making collars and pectorals.” [4, Plate 29]

- Mohenjodaro, Harappa. “Mizan”.

Temple of Kom Ombo, outer corridor, depiction of scales on relief to the right of Marcus Aurelius. Inner aspect of the northern part of the outer enclosure wall of the Temple of Kom Ombo, Gift of Ritual and/or Surgical Instruments from the Roman Emperor Trajan.

Museo archeologico nazionale di Napoli. Sommer, Giorgio. n. 11144.
Pompeii, House of the Centenarian; Chemist’s scales
udj Egyptian, judge, judgment
Minoan, Evans IV.2 656, balance sign on libation bowl from Knossos
Mohenjo-Daro, 2500 B.C., DK-80/2604 and DK I-355/2605
Yale 1938.2976
Yale 1938.2979
Yale 1938.2980
Cyrene, Egyptian scales on plate
Cyrene, Arcesilas cup, ca. 550 BC, Cabinet de Médailles, Paris, bibl nationale

K11.14 HERMES PSYKHOSTASIA MEMNON Museum Collection: British Museum, London, United Kingdom Catalogue Number: London B639 Beazley Archive Number: 456 Ware: Attic Black Figure, White Ground Shape: Lekythos Painter: Attributed to the Sappho Painter or Little-Lion Class Date: – Period: Archaic
Scene in a cloth shop, weighing rolls of cloth. Black-figured jug (oenochoe), terracotta (mid 6th BCE), Attic Height: 22.5 cm Inv. IV 1105 Kunsthistorisches Museum, Antikensammlung, Vienna, Austria

Ancient scenes of weighing are virtually nonexistent in Mesopotamia but are much more common in Egypt. This depiction is part of a larger harbor scene from the tomb of Kenamun, an 18th Dynasty official from Thebes. Drawing adapted from N. de Garis Davies and R. O. Faulkner “A Syrian Trading Venture to Egypt.” Journal of Egyptian Archaeology 33 (1947):40-46.
Met, 30.4.103, Dynasty 18, Tomb of Nebamun and Ipuky
Met, 30.3.31, Dynasty 21, The Singer of Amun Nany’s Funerary Papyrus
Met, 33.8.21, Dynasty 19, Anubis Weighing the Heart, Tomb of Nakhtamun
Met, 2008.355ad, Byzantine
Met, 31.11.10, Amasis Painter
Met, 47.11.5, Taleides Painter
Met, 25.3.34, Dynasty 21, Funerary Papyrus Belonging to the Singer Tiye
Berlin, Inv. Nr.: Fr. 892, Waagen und Gewichte

Berlin, Inv. Nr.: Misc. 10030, Waagen und Gewichte
Merchant carrying a pair of scales for weighing metals. Funeral stele from
Marash, Northern Syria. Neo-Hittite, 8th BCE Basalt, 49 x 31,5 cm AO 19221
Louvre, Departement des Antiquites Orientales, Paris, France

Louvre, Departement des Antiquites Egyptiennes, Paris, France
Wooden box for “Ushebtis”, on the side God Anubis weighing souls. Box dec-
ørated with small funerary figurines and servants for the Hereafter. Wood/stucco/paint,
Middle Kingdom (2060-1785 BCE) N 4124

Louvre, Departement des Antiquites Egyptiennes, Paris, France
The Voyage to Punt: Cattle weighed against gold. Coloured limestone relief
from the temple of Queen Hatshepsut (Maat Ka-Re) (1495-1475 BCE), south
side of the west terrace, Deir el-Bahri. 18th Dynasty (1554 BC–1305 BC), New
Kingdom
Deir el-Bahri, Luxor-Thebes, Egypt

The Rassam obelisk from Nimrud, Mesopotamia, northern Iraq. Neo-Assyrian,
883-859 BCE. This fragment of a stone relief formed part of an obelisk discov-
ered by archaeologist Hormuzd Rassam. The obelisk decorated one of the cen-
tral squares in Nimrud, the site where King Ashurbanipal II chose to build his
new administrative centre of the Assyrian Empire. This panel shows the king
watching treasure being weighed on a pair of scales. BM ANE, 118800, 136897,
136898
British Museum, London, Great Britain

One of the oldest surviving images of an equal-arm balance. Egyptian tomb,
VI Dynasty, after ca. 2300 BC. (OIP 31, plate 30, Copyright The Oriental
Institute of The University of Chicago).

To the modern observer, this is no longer something to marvel at. The
operation of the unequal-arm balance can be described by the law of the lever.
Equilibrium is obtained when the arms of the lever are in inverse proportion
to the weights that are applied to them. Should it therefore be assumed that
insight into the law of the lever was what made it possible for such balances
to be built? Research by Department I has shown that the opposite is more
likely to be the case. The first mention of an unequal-arm balance is found in
a comedy from the year 421 BCE by the Athenian playwright Aristophanes.
The first known formulation of the law of the lever, however, dates to the next
century. There is in fact much to suggest that it was the existence of unequal-arm balances which so clearly embody the law of the lever that first stimulated the formulation of the law.

Book of the Dead with 125 chapters, judgement in the Otherworld. The defunct, the Lady Nefer-is, is led into the courtroom: her heart is weighed against the truth; she sacrifices to the Gods Osiris, Isis, and Nephtys. Papyrus (350 BCE), Late Period, Egypt - Inv. 10477

Staatl. Museen, Agyptisches Museum, Berlin, Germany
Stone weights from Megiddo. Israelite, Iron Age II
Israel Museum, Jerusalem, Iron Age II, 7th–6th century BC, bronze weight pans, 71.090.0305, 71.090.0306

Bronze balance with one pan and a weight shaped like a bust.
Musée des Antiquités Nationales, St-Germain-en-Laye, France
Roman scales. From the Forêt de Compiegne, France.
Musée des Antiquités Nationales, St-Germain-en-Laye, France
A set of Hematite weights from Ur, southern Iraq, 1900-1600 BCE. Hematite was consistently used in Mesopotamia for weights from the late 3rd millennium BC; it is a hard stone which wears well and it would be obvious if it had been tampered with. A system of weights and measures was adopted, so that payments to workers could be reckoned, and also in order to calculate the value of precious objects. ANE 117891, ANE 117.
British Museum, London, Great Britain
British Museum, London, Great Britain

Moorey [2, p. 4]:

Evolving irrigation networks are likely to have been a powerful stimulus to innovation in related technology. As the necessary technical devices were made of organic materials and very rarely appear in art, their development is largely a matter of conjecture. Apart from the screw, which is a development of the Neo-Assyrian (?) period, it is known that the four basic technical devices for the redirection of muscular effort-the lever, the wedge, the windlass, and the pulley-were inherited by the Greek world from the East. In all likelihood the lever and the wedge had emerged there in remote prehistory; but it is possible that a particular application in irrigation popularized the lever. It is vital to the shadoof, an extremely versatile water-lifting device easily constructed from locally available timber. Although this machine is not illustrated until it appears on a cylinder seal in
the third quarter of the third millennium BC, it is a device so neces-
sary to irrigation in southern Mesopotamia that its invention has
been assumed to be much older. The shadoof was generally made
of a long wooden pole secured at a fulcrum to a horizontal beam of
wood, supported at each end by a timber pole or by a mudbrick col-
umn. The short end of the lever was counterweighted with a stone
or a lump of clay, with the bucket attached by a rope to the other
end. The best surviving illustrations are on a relief of the reign of
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(BM 124820).

Hermes - psychostasia - Paris. Musée du Louvre G 399
Peintre de Nicon, Amphore à figures rouges, Hermès pesant les mes sur
une balance (psychostasie), Vers 470 avant J.-C., Provenance : Italie, Athens.
Louvre CA 2243.
Micah 6:11, Proverbs 11:1, 16:11–12, Leviticus 19:35-36, Ezekiel 45:10-11,
Aeschylus, *Persians*, l. 346, “. Do you think that we were simply outnum-
erbered in this contest? No, it was some divine power that tipped the scale of
fortune with unequal weight and thus destroyed our host.” p. 179, Garvie
*Iliad*, viii, 69; xx, 209; xvi, 658; xix, 223
di Villa Giulia, 57684
Rijksmuseum van Oudheden, e 1897/12.1, 50–100 AD, bronze balance scales.
BM EA10554,80. Book of the Dead of Nestanebetisheru; sheet 80.
BM EA10554,63. Book of the Dead of Nestanebetisheru; sheet 63.
BM EA10479,6, Book of the Dead, Papyrus of Hor (sheet 6), 300 BC,
Akhmim.
BM 1873,0820.300, Attica, 490 BC–480 BC.
BM 1836,0224.172, 350 BC–320 BC.
BM 1914,0219.1. Bronze bust of Silenus, companion of Bacchus. Originally
an appliqu, the bust was re-used in late antiquity as a steelyard weight. The
bronze steelyard has two suspension hooks on a chain.
BM EA10558,18, 305 BC–30 BC, Book of the Dead of Ankhwahibra (sheet
18).
BM EA10008,3. Funerary papyrus of Tameni; sheet 3
Sargonid seal, Louvre A. 156, Forbes 2, p. 17
BM EA10470,3, 1250 BC, Tomb of Ani, Book of the Dead, Papyrus of Ani
(sheet 3)
Mesembria coin, Nikola Moushmov 4019, 4024
Calciati 17. Katane, Sicily. After 212 BC. AE 21mm. KATANAIIWN,
laureate head of Zeus Ammon right / Dikaiosyne (Aequitas), standing left,
holding scales and cornucopiae, monogram left, two monograms right. Calciati
17; BMC 82; SNG Cop 203.
Ref Scipio denarius, RSC Caecilia 49, Syd 1048, Cr460/3
Varbanov 1913 Nemesis-Aequitas standing with scales and cornucopiae; wheel
below.
Aristophanes
Plate XXIX, Davies, Two Ramesside tombs at Thebes.1 Apy’s House and
Garden, detail from Plate XXVII. Painted by Davies.
Petrie [3, p. 2]:
Looking at the conditions of the ancient world, of a large number of communities each developing a strongly individual civilisation, the presumption is that there would be as many standards as there were languages. The vision of our reducing all to one original standard is as hopeless as the old idea of one primitive universal language.

Metropolitan Museum of Art, Acc. No. G.R. 355. 445–446, Greek, Etruscan and Roman bronzes By G.M. Richter
The Walters Art Museum, 54.197
Roman Steelyard Balance Scale from Pompeii Bronze 1st century CE
Roman scales. From the Foret de Compiegne, France. Musee des Antiquites Nationales, St-Germain-en-Laye, France
Bronze balance with weight shaped like a Medusa’s head. from Pompeii.
Museo Archeologico Nazionale, Naples, Italy
Balance with one pan and bust of Hermes as a weight. Bronze, from Pompeii.
Museo Archeologico Nazionale, Naples, Italy

ROMAN SCALES, WEIGHTS 1ST-3RD CE Bronze balance with one pan and a weight shaped like a bust. Musee des Antiquites Nationales, St-Germain-en-Laye, France
MFA 04.1792, Hu, Egypt, steelyard
MFA 2001.546.1-4
Harvard 2007.104.3.A-C

The Insula of the Menander at Pompeii: Volume III: The Finds, a Contextual Study
BM 1980,0602.2
Roman steelyard circa 79 CE, found in Pompeii (Naples, National Archaeological Museum. Inv. No. 5569).
Musée de Frontignan (34), inv. 84-176-08.0024.00220, balance complète avec curseur et crochets

Steelyard: Gaius Firmius Severus Instrumentarium, Rheims: Musée d’Archéologie nationale, Saint-Germain-en-Laye. L. of beam 27.5 cm. Late 2nd early 3rd century ce.
References


