Anatolian Weights and Measures

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SUNA & İNAN KIRALC
RESEARCH INSTITUTE ON
MEDITERRANEAN CIVILIZATIONS

ZARO KIRKMAN
When we founded the Sura and İhsan Karaoğlu, Mediterranean Civilizations Research Institute, one of our primary aims was to produce publications of universal significance that would make multidimensional contributions to knowledge and understanding of our rich historical, cultural and urban heritage. Accordingly, since 1996 our periodical Adalya and other publications have made an increasing contribution to international literature and become reference sources for researchers. As the founders of the Institute, we have been delighted and encouraged by this development as we strive more to advance scholarship.

This book explores the fascinating but little known subject of Anatolian weights and measures, and their development over the millennia, from the depths of Anatolian history up to the present day. This is a subject that has been paid insufficient attention by researchers, perhaps because it is so much a part of ordinary life.

About a year ago, when we decided to prepare such a book, the first name which came to mind was Galip Kürkçü, who in 1991 had prepared an exhibition and catalogue on Ottoman Weights and Measures for the Museum of Turkish and Islamic Arts. After discussion of the project with Mr. Kürkçü, he undertook this demanding task, completing it in the projected time.

We wish to thank Mr. Kürkçü and all those others who have contributed to the work in one way or another, soecifically a newly forgotten page of Anatolian cultural history, and hope that this invaluable study will be of benefit to scholars and of interest to general readers.

Sura and İhsan Karaoğlu
This book was prepared with the object of publishing the scales and weights in the collection of the Samsa and İsmet Kavşak Mediterranean Civilizations Research Institute, and investigating the utilisation and values of units of measurement and measuring devices used in Anatolia. The lack of a system of imperial standards for the weights and measures used over the ages from ancient Greece to the Ottoman period, which meant that units of measurement varied in value from place to place, time to time, and according to what was being measured, and more importantly the inadequacy of comparative studies of weights and measures are serious impediments to accurate evaluation of measuring devices. Therefore, I hope that readers will excuse any errors in this text arising from such inconsistencies. Conflicting information and values cited in the books and articles that I examined in the course of my research convinced me that a more systematic study of the subject is still required. Therefore, in some parts of the book I have suffixed with the tables given by researchers in their publications.

I am indebted to Samsa and İsmet Kavşak for enabling this study to be published, and to Kerim Dondurak, director of the Mediterranean Civilisations Research Institute, Çetin Atalay, director of Sadberk Hanım Museum, and Tanju Atalay for their constant support.

I wish to thank Dr. Önder Bilge, Lecturer in archaeology at Istanbul University, for his article on weights and measures used in ancient Anatolia; Dr. Meryem Ayar Eser, Lecturer in art history at Hacettepe University, for her article on Byzantine period weights and measures and catalogue of related Byzantine objects; Dr. Michael Barnes, curator in ANS, Zeynep Çetin and Gönülcan Nalçığlı, curators in the Topkapı Palace Museum, Gönülcan Kayabaşı, Can Mahnud, Dr. Yakup Dığın, Dr. Bilgın Akgül, Dr. Cemal Pulak, Seyfullah Dömen, Osman Dinc, Mehmet Türeşoğlu, Seyit Ali Kalerem, Professors Dr. Zekeriya Karapınar, RâbiÜ Yerdu Asadi, Bishop Aram Kevork, P. Volodya Kevorkian, Tunan Gökaydın, İsa Abaci, Professor Dr. Cemal Işık, Hüskü Pirik, Nancy S. Pyle Nichols, Ioannis-Christoph Hornbein, Yeşilköy Seğhir, and Selma Tutal for their invaluable assistance during my research into the Ottoman period; Bahadur Tutal for his meticulous photography; and Murat Tutal for his technical assistance.

I am also grateful to Selman Kağan for her patient and generous assistance at every stage in the preparation of this book, to my dear friend Ertuğrul Yıldız for completing its design in such a short time, to Mary Iyet for her translations, and to Levent Yıldız and his team at Mav Print and House for their dedicated work preparing the book for printing.

I am confident that this book, which is at the same time a catalogue of the Anatólian weights, scales and other artefacts relating to measurement in the Samsa and İsmet Kavşak Mediterranean Civilizations Research Institute collection, will throw light on the subject for researchers in many fields.

Garo Kırktanım

İstanbul, November 2002
INTRODUCTION

The use of measuring systems for agricultural products and land for the purpose of standardizing commercial transactions began in Egypt and Babylon. The ancient Egyptians are known to have used scales around 3000 BC, and the ancient Greeks and Romans made wide use of scales, weights and rules, many examples of which have survived to the present day.

In Anatolia from antiquity until the middle ages merchants who did not wish to use unfamiliar units of measurement in trade carried their own weights and rules with them when they travelled by land or sea, as demonstrated by the evidence of wicks and archaeological excavations. Finds of this kind on land may have been buried by merchants passing through Anatolia or left there temporarily to prevent them being stolen, or alternatively merchants may have had them in Anatolia, leaving their scales and weights there. Some researchers have been misled by such discoveries into the assumption that these weights were of local provenance.

Similarly misleading is the fact that local merchants kept weights of different countries for use in trade with foreign merchants. The discovery in Egypt of deben weights of the kind used by the Anatolian Seljuk, or in Anatolia of barley weights of the kind used in Egypt illustrate this phenomenon. Another fact that has led to conclusions of this type with regard to Anatolian weights and measures is discrepancies between units of measurement of the same name in different regions.

The Jewish, Christian, and Islamic religions, which developed systems of rules for the ethical guidance of societies, give many instructions and advice concerning weights and measures.

Weights and measures in the Bible

Leviticus 19:35-37: 'Ye shall do no unrighteousness in judgment, in measure, in weight, or in rent.' Just balances, just weights, just measures, shall ye have; I am the Lord your God, which brought you out of the land of Egypt. Therefore shall ye observe all my statutes, and all my judgments, and do them: I am the Lord.'

Leviticus 27:16: 'And if a man shall sanctify unto the Lord some part of a field of his possession, then his estimation shall be according to the seed thereof: a homer of barley seed shall be valued at 50 shekels of silver.'

Exodus 38:24-26: 'All the gold that was occupied for the work in all the work of the holy place, even the gold of the offering, was 29 talents, and 750 shekels, after the shekel of the sanctuary. And the silver of them that were numbered of the congregation was 100 talents, and 1775 shekels, after the shekel of the sanctuary. And the silver of them that were numbered was 29 talents, and 1775 shekels, and 603 quarts of fine flour, after the shekel of the sanctuary.'

Deuteronomy 25:13-16: 'Then shalt thou have in thy barns and thy threshing floors, and in thy vintage, two tithe of every grain of corn, and of thy grapes, and of thy oil, and of the wool of thy sheep, and the increase of thy cattle, and of thy Atari, shall be holiness unto the Lord thy God.'

Proverbs 16:11: 'A just weight and balance are the Lord's: all the weights of the land are his work.'

Luke 21:4: 'And hearken, two men went up into a village to a village called Emmaus, which was from Jerusalem about 60 furlongs.'

Ornous. Σημαντικές διαφορές εν εκείνη Ερμου ο εκείνην εξ ουτών εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκείνης εκεί

Leviticus 19:35-37: 'Ye shall do no unrighteousness in judgment, in measure, in weight, or in rent.' Just balances, just weights, just ephah, and just minah, shall ye have: I am the Lord your God, which brought you out of the land of Egypt. Therefore shall ye observe all my statutes, and all my judgments, and do them: I am the Lord.'
### Units of Measurement Mentioned in the Old Testament and Bible

<table>
<thead>
<tr>
<th>Units of Weight</th>
<th>Grain Measures</th>
</tr>
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<tbody>
<tr>
<td>1 unit</td>
<td>375.4 grams</td>
</tr>
<tr>
<td>1 quintal</td>
<td>22.95 grams</td>
</tr>
<tr>
<td>1 kehila</td>
<td>11.97 grams</td>
</tr>
<tr>
<td>1 shekel</td>
<td>5.99 grams</td>
</tr>
<tr>
<td>1 talent</td>
<td>2.99 grams</td>
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<table>
<thead>
<tr>
<th>Units of Length</th>
<th>Liquid Measures</th>
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</thead>
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<td>1 qomeq</td>
<td>0.07 liter</td>
</tr>
<tr>
<td>1 resheq</td>
<td>0.02 liter</td>
</tr>
<tr>
<td>1 eleyeh</td>
<td>0.05 liter</td>
</tr>
<tr>
<td>1 enor</td>
<td>1.78 meters</td>
</tr>
<tr>
<td>1 aram</td>
<td>1.68 meters</td>
</tr>
<tr>
<td>1 elon</td>
<td>1830 meters</td>
</tr>
</tbody>
</table>

### Weights and Measures in the Koran

And unto Midyan (We sent) their brother, Shu'ayb. He said, "O my people, serve God! You have no god other than Him. Lay not your hands to corruption on the earth after the fair ordaining thereof. That will be better for you, if you are believers." Koran VII.55.

And unto Midyan (We sent) their brother, Shu'ayb. He said: O my people! Serve God, Ye have no other god save Him. And give not short measure and short weight. Let I see you well-to-do, and let I fear for you the doom of a beauteous day. O my people! Give full measure and full weight in justice, and wrong not people in respect of their goods. And do not evil in the earth, causing corruption. Koran XLI.84-85.

### Arabic Text

And unto Midyan (We sent) their brother, Shu'ayb. He said: O my people! Serve God, Ye have no other god save Him. And give not short measure and short weight. Let I see you well-to-do, and let I fear for you the doom of a beauteous day. O my people! Give full measure and full weight in justice, and wrong not people in respect of their goods. And do not evil in the earth, causing corruption. Koran XLI.84-85.

Woe unto the defrauders: Those who when they take the measure from mankind demand it full. But if they measure unto them or weigh for them, they cause them loss. Do such (men) not consider that they will be raised again? Koran LXXIII.2-3.

And Midyan (We sent) their brother, Shu'ayb. He said, "O my people, serve God! You have no god other than Him. Let not your hands to corruption on the earth after the fair ordaining thereof. That will be better for you, if you are believers." Koran VII.55.

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### Arabic Text
ANATOLIAN WEIGHTS AND MEASURES IN THE PRE-CLASSICAL AGE

ONDER BİLGİ

C"ensos on the Atlantic coast of Europe in particular have revealed tools used by human beings during the Ice ages, such as flint axes, blades and scrapers made of pebbles and flints. Tools with stone forms and made of new materials in terms of temperature now in the post-glacial period are found in southern Turkey and in the region extending in an arc from Eastern Mediterranean coast to the Zagros Mountains in the south.

The use of obsidian, which gave sharper cutting edges, as well as flint, is one of the distinctive characteristics of this period. Tools were also made of metals such as lead and copper. Simple ornaments were created from the same metals, along with polished stones and particularly shells. Such findings show that inter-regional trade was underway during this period. Tools and weapons made of obsidian, of which there were extensive deposits in central and western Anatolia, have been found in the Eastern Mediterranean coastal regions, while Mediterranean shells have been found in central Anatolia, demonstrating the existence of a broader trade in raw materials to the Near East.

During the Chalcolithic, Bronze and Iron ages that followed the Neolithic, there was little fundamental change in socioeconomic life. Metals began to be used extensively towards the end of the Chalcolithic, reflecting the development of trade. At the beginning of the Middle Bronze Age, tin began to replace arsenic as an alloying material for mixing with copper to improve its functional properties. The insufficiency of tin deposits led to an increasing volume of trade in this commodity in the Near East, and the fact that tin was transported into Anatolia was one result of this trade, which is also documented by written sources. From these sources we learn that units of weight originating in Mesopotamia were now used in Anatolia. Although there is no firm evidence regarding the use of weights and measures in Anatolia prior to the Assyrian Trade Colonies period, findings made of valuable metals, bearing graduated markings, are thought to have been used for measuring or for exchange (i.e. trade). For example, at Troy small gold bars, in particular graduated only (see Fig. 1), seem beyond doubt to show the existence of trade based on measurement.

FIG. 1

GRADUATED RODS

Troy, 3rd millennium BC
1. Gold, 1145-1130
1 MM, 663 AM
2. Gold, 1145-1130
1 MM, 630 HN
3. Gold, 1150
1 MM, 647 BNC

Archaeological excavations in central Australia in particular have uncovered written documents and weights dating from the first quarter of the 2nd millennium BC that reveal extensive organisational trade based on a system of weights and measures in Anamuria during the period of the Assyrian Trade Colony. Moreover, there is some pictorial documentation showing that these weights were used for sales. The finest examples of weights used in this period have been discovered at Kition, the ancient Kinyvya-Kinyva, which was a colony founded by Assyrian merchants near Kinyvya. Large numbers and types of lead and stone weights that would have been used in the marketplace known as the Kinyvya here have been found.

These finds include lead weights in the form of discs or oval shapes tapering to points at either end. These in the form of discs either have a hole in the centre, or holes or notches at the edges. Those with holes in the centre have their edges bent upwards in one direction, while the other face is slightly concave. The oval lead weights similar in shape to olive stones are smaller in size and lighter than the discs.

Numerous stone weights of different sizes have been uncovered by archaeologists. These are either geometric in shape or in the form of ducks, and for the most part are made of hematite, a stone which was probably preferred because of its resistance to wear. The color of these weights is generally dark grey or black, and all are brightly polished. Those with geometric forms are in varying dimensions, and usually oval or cylindrical, with either truncated or rounded ends (see Fig. 3). Another type in spherical flattened at top and bottom (see Fig. 3). Rarely, this type of weight was a small bead that was used for attaching metal rings, as proved by some examples discovered. Examples of such weights made of rock crystal have also been found.

Another group of weights are carved in the form of ducks (see Fig. 4). These are various sizes, with their heads turned back over their bodies. As well as examples made of white or cream coloured hematite, some made of rock crystal have been found (see Fig. 5). These weights dating from 1000 BC have inscribed signs and marks on the base that are thought to identify the owner.

Very similar weights have been found in the Near East, where they are known to belong to the system of weights used in the Early Babylonian period in Mesopotamia, and therefore must have been introduced into Anamuria by Assyrian merchants. Similar weights have also been found at other sites in Australia, and were probably produced in the equivalents of units of weights such as the mna and dood, that were used in the countries of the Near East at this period. That these lead and some weights were used in scales is verified both from the discovery.

**Fig. 2** HEMATITE WEIGHTS

1. 37.2 g, 75 mm, 1.60 mm. Kibbutz Permos collection, 543.
2. 40 g, 73 mm, 1.58 mm. Kibbutz Permos collection, 39.
3. 44.2 g, 77 mm, 1.45 mm. Kibbutz Permos collection, 29.
4. 28.2 g, 69 mm, 1.10 mm. Kibbutz Permos collection, 47.
5. 17 g, 1.05 mm, 1.15 mm. Kibbutz Permos collection, 15.
6. 17 g, 1.35 mm, 1.37 mm. Kibbutz Permos collection, 29.
7. 8 g, 1.15 mm, 1.15 mm. Kibbutz Permos collection, 29.
8. 8 g, 1.35 mm, 1.25 mm. Kibbutz Permos collection, 29.
9. 1.5 g, 1 mm, 1.19 mm. Kibbutz Permos collection, 20.

**Fig. 3** HEMATITE WEIGHTS

1. 173.4 g, 74.4 mm, 1.79 cm, SMBH 0498.
2. 285.7 g, 64.5 cm, 3.3 cm, SMBH 0495.
3. 102.1 g, 65.4 cm, 3.09 cm, SMBH 0497.
4. 106.9 g, 5.10 cm, 1.64 cm, SMBH 0496.
5. 70.6 g, 5.14 cm, 1.70 cm, SMBH 0503.

**Fig. 4** DUCK-SHAPED HEMATITE WEIGHTS

1. 22.1 g, 1.25 cm, 3.80 cm, SMBH 0476.
2. 33.9 g, 1.54 cm, 2.70 cm, 3.50 cm, SMBH 0473.
3. 21.4 g, 2.75 cm, 2.95 mm, 1.46 cm, SMBH 0479.

**Fig. 5** DUCK-SHAPED WEIGHTS IN MARBLE, AGATE, AND HEMATITE

1. 4.7 g, 1.5 cm, 3.1 cm, SMBH 0504.
2. 5.7 g, 2.24 mm, 1.22 cm, 3.7 mm, SMBH 0497.
3. 3.7 g, 2.13 cm, 1.63 cm, 2.59 cm, SMBH 0496.
4. 6.7 g, 1.3 cm, 1.00 cm, 2.15 cm, SMBH 0492.
5. 8.2 g, 2.03 cm, 1.10 cm, 1.38 cm, SMBH 0495.
of bronze scale pans, and the impression of an ancient Babylonian style cylinder seal depicting scales was being used, dating from circa 1900 BC (see Fig 6). During the period of the Assyrian Trade Colonies silver ingots and graduated rods are also known to have served as a medium of exchange in place of money.

As city states became wealthy on the well-organised trade of the Assyrian colonies, they began to covet one another’s wealth. The resulting wars and political upheaval led to the development of centralised theocratic systems of government, and resulted in the rise of the Hittite state based in central Anatolia. Written Hittite documents of this period show that the economy in Anatolia of this period was based not so much on trade as on the use of force to seize resources. Political contention and wars destroyed trade between Anatolia and Mesopotamia, cutting off supplies of essential commodities in Anatolia. In order to obtain these, the Hittites resorted to invade Mesopotamia, and the Hittite kings advanced as far as the cities of Aleppo and Babylon, plundering both cities before retreating to Anatolia. In their ambition to transform their state into an empire, the Hittite rulers sought to seize control of Syria and Eastern Mediterranean trade, so gaining possession of the raw materials and goods that they required. To this end they fought with the Egyptians, the greatest political power of the period.

In the first century BC, the Hittites, like the other countries of the Near East, used silver as a medium of exchange. For the Hittites, too, the silver coins had a value. In the earlier times, hemi-obol weight continued to be used to measure shekels and minas, units of weight that originated in Babylonian.

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14. See Özgüç, Kültepe, Kayaşlı Kayası 1949, pl. LXXI, fig. 608, p. 56.
16. See Özgüç, Kültepe, Kayaşlı Kayası 1949, pl. 107, p. 4.
17. These inscriptions are in contemporary written documents. The Hittites also used weights in the form of weights. See R. Ono, ‘Recent Discoveries in Hittite History’ (1999), p. 126.
18. The Hittite values of the deben and mina varied over time and space. In Hatti, the deben was used to weigh silver, while in the 14th century BC it was used to weigh silver, according to written sources. The Babylonian deben was 8 g, so the Babylonian deben was approximately 500 g. For details see A. M. Dupont, Anabasis Ephesien Alexander, pp. 78-79.
Fig. 8
URIKATAN STORAGE JARS
Upper Alula, Fortresses, Vila
Late 9th century BC. Scabreton to II.
Olgyay Bell’s archive.

Fig. 9
URIKATAN POTTERY JAR (PERIODS)
Greek Latin writing suggests the owner of the jar.
Upper Alula, Fortresses, Vila.
Late 9th century BC.
Olgyay Bell’s archive.

Fig. 10
SYMBOL EXPLAINING THE VOLUME
AND CONTENTS OF AN URIKATAN JAR
Olgyay Bell’s archive.
The laws of Solon were implemented not only around Athens in the Greek period but also in Attica. Solon noted that the weight solon should be 5 minae heavier than the monetary solon, distributing the difference between the constituent parts of the weight solon. The stater is the unit of weight regarded as equivalent to the old currency unit, the obolus. Therefore, the currency also decreased in the currency does not mean what the entire unit of weight was to the entire unit of weight. That the state was a unit of weight is proved by the existence of fractional weights of the state, and records of payments for goods by weight. For example, one such record reveals that one solon was equivalent to 50 staters, and that these states could not have been equivalent to the silver unit of weight, the obolus. It appears that raw materials like minerals (red earth used for extractions) gran and silver were sold by the miner, and finished goods by the mine. Solon's ruling that the silver of weights should be 5% higher than the weight of the monetary solon means that the weight value of a talion of 6000 drachmai was equal to a monetary value of 6000 drachmai.

1. REDUCTION WEIGHT
   (above left)
   130.1 g. 145.5 x 61.5 mm
   Private collection.

2. REDUCTION WEIGHT
   (above right)
   145.1 g. 62.4 x 62.7 mm
   Private collection.

3. DRACHMA WEIGHT
   (above center)
   0.23 g. 12.0 x 12.0 mm
   Private collection.

4. DRACHMA WEIGHT
   (above right)
   0.55 g. 13.6 x 6.5 mm
   KAMA 5983 (cat. 008)

5. DRACHMA WEIGHT
   (above right)
   0.51 g. 13.3 x 6.5 mm
   KAMA 5984 (cat. 009)

6. Darius II Weight
   (above) 1st century BC
   62.5 g. 13.1 x 3.0 mm
   KAMA 5982 (cat. 010)

7. Darius I Weight
   (above) 1st century BC
   67.5 g. 13.6 x 3.7 mm
   KAMA 5981 (cat. 011)
STEELYARD VESICHT
Late archaic or pre-classical Greek period
220 g, ø 93.5 mm
KMA 1286 (cat. 001)

Similarly 100 desyllones by weight was equivalent to 1 minos of weight (100 monetary desyllones), and 100 minas by weight was equivalent to 1 stor (or 100 monetary minas). Further proof of the existence of this period is found in a device dating from the middle 2nd century BC, according to which the new mina was to be equivalent to 70 monetary desyllones. This derives from a mina equivalent to 180 drachms.

Friedrich Kohler's table of Greek units of weight from his book "Griechische und römische Mengen- und Gewichtsmaßgebäude" published in Berlin in 1862 is reproduced below:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Abbreviation</th>
<th>Conversion</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 drachma</td>
<td>δραχμή</td>
<td>0.0536</td>
<td>1 drachma = 0.0536 kg</td>
</tr>
<tr>
<td>1 mina</td>
<td>μίνα</td>
<td>0.48</td>
<td>1 mina = 0.48 kg</td>
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<tr>
<td>1 polydrachma</td>
<td>πολυδραχμή</td>
<td>0.0536</td>
<td>1 polydrachma = 0.0536 kg</td>
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<tr>
<td>1 stor</td>
<td>στορ</td>
<td>0.48</td>
<td>1 stor = 0.48 kg</td>
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</table>

**Bronze Weights in the Form of Ducks**

Mesopotamia

3rd century BC

Height: 3.1 cm

Length: 7.1 cm

Width: 3.9 cm

KMA 5822 (cat. 096)

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<table>
<thead>
<tr>
<th>Weight</th>
<th>Equivalent</th>
<th>Measurement</th>
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<tbody>
<tr>
<td>Alpha</td>
<td>1 Drachma</td>
<td>87.2 grams</td>
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<tr>
<td>Beta</td>
<td>2 Drachma</td>
<td>174.4 grams</td>
</tr>
<tr>
<td>Gamma</td>
<td>5 Drachma</td>
<td>348.8 grams</td>
</tr>
<tr>
<td>Delta</td>
<td>10 Drachma</td>
<td>697.6 grams</td>
</tr>
<tr>
<td>Epsilon</td>
<td>20 Drachma</td>
<td>1395.2 grams</td>
</tr>
</tbody>
</table>

The Romans introduced their own system of weights based on the abacus to Anatolia. According to this system one abacus was originally equivalent to 12 drachmai, although over time the system was transformed into the Graeco-Roman system that was used throughout the Mediterranean region. It was this system that became the basis of that used by the Byzantines.

<table>
<thead>
<tr>
<th>Liquid Measuring Stone</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dinara 12 Drachmai</td>
</tr>
<tr>
<td>1/2 Dinara 6 Drachmai</td>
</tr>
<tr>
<td>1/4 Dinara 3 Drachmai</td>
</tr>
<tr>
<td>1/8 Dinara 1 Drachmai</td>
</tr>
</tbody>
</table>

This stone followed out of limestone and was used to measure liquids by volume. It was discovered in Rome in 1986. On the side are engraved the words librae duodecim and minuta.

141 x 54.5 x 67 cm

(Photograph: Kayhan Dostzad)
Roman weights as given by Karl Pink in his article entitled 'Römische und byzantinische Gewichte in österreichischen Sammlungen,' published in Studienrhein des öster. arch. Instituts (Vienna, 1938):

<table>
<thead>
<tr>
<th>Name</th>
<th>Mt</th>
<th>Ounce</th>
<th>Symbol</th>
<th>Grain</th>
</tr>
</thead>
<tbody>
<tr>
<td>As quadrans</td>
<td>1/2</td>
<td>1</td>
<td>i</td>
<td>327.48</td>
</tr>
<tr>
<td>Denarius</td>
<td>1</td>
<td>1</td>
<td>s</td>
<td>509.58</td>
</tr>
<tr>
<td>Decies</td>
<td>5</td>
<td>9.165</td>
<td>d</td>
<td>272.88</td>
</tr>
<tr>
<td>As quadrans</td>
<td>1</td>
<td>1</td>
<td>i</td>
<td>327.48</td>
</tr>
<tr>
<td>Septemuncia</td>
<td>7</td>
<td>5.57</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>191.02</td>
</tr>
<tr>
<td>Scia</td>
<td>2</td>
<td>5.57</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>191.02</td>
</tr>
<tr>
<td>Quinaria</td>
<td>5</td>
<td>2.78</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>95.53</td>
</tr>
<tr>
<td>Tremissis</td>
<td>1</td>
<td>2</td>
<td>s&lt;sup&gt;11&lt;/sup&gt;</td>
<td>39.86</td>
</tr>
<tr>
<td>Quinarius</td>
<td>5</td>
<td>2.78</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>95.53</td>
</tr>
<tr>
<td>Semis</td>
<td>2</td>
<td>1.39</td>
<td>s&lt;sup&gt;2&lt;/sup&gt;</td>
<td>48.42</td>
</tr>
<tr>
<td>Semuncia</td>
<td>3</td>
<td>1.1</td>
<td>s&lt;sup&gt;3&lt;/sup&gt;</td>
<td>31.81</td>
</tr>
<tr>
<td>Denarius</td>
<td>1</td>
<td>1</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>509.58</td>
</tr>
<tr>
<td>Quinarius</td>
<td>5</td>
<td>2.78</td>
<td>s&lt;sup&gt;5&lt;/sup&gt;</td>
<td>95.53</td>
</tr>
<tr>
<td>Semis</td>
<td>2</td>
<td>1.39</td>
<td>s&lt;sup&gt;2&lt;/sup&gt;</td>
<td>48.42</td>
</tr>
</tbody>
</table>

**Units of measurement used by Herodotus:**

- **Length:**
  - stadion: 606 Greek feet. The Attic stadion was equivalent to 177.6 meters.
  - foot: 29.6 cm (the modern foot is 30.48 cm)
  - value: 1.5 feet, 9.444 meters
  - fathom: 6 feet, 4.408 meters
  - furlong: 100 feet

- **Weight:**
  - ounce: one-twelfth of a pound, 0.06855 ounces
  - pound: one ounce of a pound, 0.00265 pounds
  - stone: one pound of a stone, 14 pounds, 0.774 kg

- **Volume:**
  - Egyptian and equivalent to 0.03595 cubic yards
  - amphora: one-seventeenth of a stone, 0.01355 cubic yards
  - stater: 0.09 cubic yards

- **Liquid Measures:**
  - minas: 2.01 liters
  - amphora: 1.84 liters

- **Dry Measures:**
  - minas: 1.08 liters
  - macedon: 2.14 liters

B. Kisch, in his *Scales and Weights: A Historical Outline* (New Haven, London 1964) gives the following table of values for the Roman unit of weight, the *as*, used in the first century BC:

<table>
<thead>
<tr>
<th>Name</th>
<th>Symbol</th>
<th>Name</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>As quadrans</td>
<td>i</td>
<td>Semuncia</td>
<td>i</td>
</tr>
<tr>
<td>Denarius</td>
<td>s</td>
<td>Decia</td>
<td>s&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Tremissis</td>
<td>2</td>
<td>Semuncia</td>
<td>2</td>
</tr>
<tr>
<td>Quinaria</td>
<td>5</td>
<td>Semuncia</td>
<td>5</td>
</tr>
<tr>
<td>Semis</td>
<td>2</td>
<td>Semuncia</td>
<td>2</td>
</tr>
</tbody>
</table>

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considerable information is to be gleaned from written texts, coins, weights and other artifacts about the Byzantine period system of measures. However, the use of the same term for different units, or conversely the use of different terms for the same unit causes confusion. The Byzantine system developed entirely under state control, and was based on earlier measures, so that many ancient terms continued to be used into the middle ages.\(^1\)

Under this system the Byzantine pound was based on the late Roman pound (libra). The original libra (327.45 g) as recognised by Constantine I, was equivalent to 12 ounces or 72 soldius. The arbelon of the Romans was known as the semisses by the Byzantines, and its weight defined by Constantine I as 1/72 of a libra, that is 4.55 g, for the purpose of setting the coinage standard.\(^2\)

The marios continued in use over later centuries, but although its official value was supposed to be 1.55 g, making the pound equivalent to 327.40 g, surviving examples of actual weights show that the values of both units varied. A pound was equivalent to 324 g between the 4th and 6th centuries, 332 g between the 6th and 7th centuries, 320 g between the 7th and 8th centuries, and 319 g between the 9th and early 10th centuries, afterwards falling to below 319 g.\(^3\)

1. One of the most important sources on this subject is cited by Saint Ephraim (131-402) who was bishop of Constantinople (subject in Cyprus between 307 and 302) (Ephraim’s Paradise on Weights and Measures. The Syrian Version, trans. James Ernest stark, Chicago, 1935, pp. 11-12). Other Byzantine texts (texts of measurement are defined, for example, for the marios as 1/72 libra, the semisses as 1/144 libra, the libra as 12 semisses or 2 marios, and the ascriptia in 4 parts.


4. Christopher Edmunds, “Byzantine Weights”, Byzantine, Traces of the Byzantine Art and Culture from Britain, Collectors, Int. 21st Biennial, London 1996, pp. 30-31. Simon Bouloub, Byzantine Weights, Int. Introduction, London 1996, pp. 6-7. Byzantines have customs differences in the production of this object. According to H. Monmonier a pound was equal to 327.4 g, and according to N. Stavros, the author of the catalog in the Collection of the Byzantine Museum, 320 g. Examples in the collection of Byzantine weights purchased by Monmonier weigh 340 g. The first detailed study of Byzantine weights was carried out by Slobodchik, who says that at the 5th and 6th centuries a Byzantine pound weighed 325.527 g, and that the proportion of this value dropped to around 315 g. According to the same research, Byzantine coins struck in the 5th, 6th centuries were lighter than those struck in the 7th century by around 15 percent. In other words, the weight of a given coinage was not greater than 4.5 g. The weights discovered in a shipwreck of Vaeur Ada in the Marmara Sea, were even lighter, G. K. Donetsk, who has studied these coins, says that this should not be regarded as significant, however, once the weights have been examined macroscopically. In one of the pounds, found here weighs 306 g, at
In the Greek and earlier periods of antiquity balances (scales) and the steelyard (aureus) together for weighing. The steelyard consists of a square arm, a sliding weight, and a hook for hanging the object to be weighed. Two or three faces of the arm are graduated with notches at equal intervals. A steelyard (aureus) with a maximum capacity of 400 Roman pounds among the finds at Yassı Ada has an arm 140 cm long and is marked as follows:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
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<tbody>
<tr>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
<td>200</td>
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The steelyard was used to weigh foodstuffs like meat, fish and vegetables, and also amphorae, as the finds at the Sergy Linezhe site indicate. Unlike balances, the two parts of a steelyard are not equal. For the most part the arms of medieval steelyards are 35-45 cm in length, with a maximum capacity of 20-60 grams (11-19 kg). A balance or scales consists of a horizontal beam pivoted on a vertical support, with pans attached by silk strings of equal length to the two ends of the beam. Scales of this kind were used to measure precious metals, coins, valuable substances. Scales used by tax collectors had to be held by two fingers, leaving three fingers free and not pressing down on the weights. In some cases names as well as letters and scale markings are inscribed on weights and steelyards. Sometimes these names appear to belong to the people who used them, and others to be the names of mages. On the steelyard found at the Yassı Ada wreck is the name of the ship's captain Docimes. A weight in the form of a base of the goddess Athena dating from the 4th-5th century found near Çanakkale in Turkey and today in the New York Metropolitan Museum bears the inscription, God protect the owner of this weight. Weights sometimes bore the name of mages because it was against standard weights kept at these and other official institutions that weights used by merchants and retailers were checked for accuracy.

In Greek and Roman antiquity, balances (scales) and steelyards (aurei) were used for weighing. The steelyard consists of a square arm, a sliding weight, and a hook for hanging the object to be weighed. Two or three faces of the arm are graduated with notches at equal intervals. A steelyard (aureus) with a maximum capacity of 400 Roman pounds among the finds at Yassı Ada has an arm 140 cm long and is marked as follows:

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The others being far lighter. For example, two ivory weights that should be equivalent to 23.2 g actually weigh 39.2 and 39.5 g respectively. Figure 6 shows that most of the data given by Schefold in this respect, and proposed that a second weight system existed, probably with some 10 other then 12 items in a pound, and further than 5 ounces were archaic. The Roman pound weights at the Museum of Science and Art of the Greek and Roman weights vary in weight from 233.5 to 258.6 g. Of the 63 weights in the Greek and Roman weights, one weight 307 g, 30 percent weight between 220 g and 285 g, 25 percent weight between 230 g and 255 g, and 20 percent are less than 195 g. For the Roman steelyard found weights at the Arsinoe podium, the weight 302 g, 30 percent weight between 250 g and 275 g, 20 percent weight between 310 g and 325 g. The scales and weights from London, LINDSAY (British Museum of National Archaeology [London], 20.8.1991), p. 46. In the 4th century the Byzantine Bureaus varied between 102 g and 150 g.

1. Bensusan-Brandt, Early Byzantine, p. 221.
Most of the weights in the form of beasts and statuettes have been discovered in the eastern Mediterranean region, and although it has been assumed that this was also where they were made, the weights in many instances outside Turkey actually appear to have been produced in Constantinople and its environs. Some researchers believe that Constantinople was the production center for statuettes and weights. Ross in particular asserts that these beasts and statuettes have a connection with the art of sculpture in the Byzantine capital, and that examples exposed from here were used as molds by provincial workshops.

Coincounter was a common offense in the Byzantine era, and the state was constantly battling against bribery, cheating, and counterfeiting, for which the penalties were severe. Special officials were given responsibility for matters relating to weights and measures in the effort to prevent forgery. In the CXXVIII Nova of the year 545 by the Emperor Justinian, publican prefects were held responsible for weights, and the comites rectores longissimums were coinage standards. The weight standards used for assaying commercial weights were at first kept at coin stations, but later in the most holy church of each city. Later on, according to Tammiaos Bessar's book, "Vestian merchants used to keep their own weights and measuring instruments in the church where Rizan Pasha Mosque now stands (Bundmann says that this was the church of St. Akimion). In addition, the Emperor Julianus decided that an official known as a coryphour was appointed in every city to settle disputes between sellers and purchasers.

Standard weights were manufactured in the imperial mints at the command of certain high ranking officials, and elegant examples were used only by important personages. They were made with their values and the titles of those with authority over their manufacture, the emperor, consort, or prefect, preserved and never counterfeited, except by a few stations, so that those standing to counterfeiting might not have access to them. Examples "Byzantine Weights," by John M. Neumann, "Treasures of Byzantine Art and Culture from British Collections," pp. 14-17.

One of the officials with authority over the production and assaying of weights was the governor (archon) of the prefect of Constantinople, who was also responsible for law enforcement and the control of economic life, including trade and manufacture, in the city. According to the Book of the Prefect, in the 6th century this official's responsibility was confirmed by the assay of...
1. BELYARD
Early Byzantine, 6th-7th century
1:20 ton.
KMA 105 (cat. 105)

2. BELL STRAP WEIGHT
Early Byzantine, 6th-7th century
31.09 g, 28.8 x 25.8 cm
KMA 125 (cat. 107)

3. OUNCE WEIGHT
Early Byzantine, 6th-7th century
21.67 g, 22.6 x 8.4 cm
KMA 150 (cat. 92)

4. OUNCE WEIGHT
Byzantine, 7th-8th century
81.11 g, 29.1 mm
KMA 151 (cat. 97)
glass weights, whereas in the middle Byzantine period his jurisdiction expanded significantly. This expansion also likely led to the development of a more centralized administration.

During the Byzantine period, concept figures were awarded by the court of various titles, and sometimes higher titles were conferred when existing titles declined in prestige. Such titles were granted not only to those responsible for the manufacture of weights, but also to those responsible for assaying them. One such title, that of "ichnionarchus", which refers to the act of testing weights in the mid-6th century, was granted to students, governors, magistri militum, and officials responsible for other high-ranking officials. Another title given to officials responsible for weights and measures was "spyratiarchou", which referred to the second ranking senatorial title later used in the year 365, and last mentioned in a document dated 710. The title "spyratiarchou" was granted to all senators between 365 and 530, after which it gradually fell into decline.20

Sets of flat weights and scales were kept in large rectangular wooden boxes approximately 20 cm in length. Several examples of these dating from the 5th to 7th centuries have been found in Egypt, and another dating from the early 7th century was discovered in the Yassu Ada, which included sliding lid and decoration consisting of floral, geometric, or figurative compositions. The weights, balance beam, and pans of the scales fitted into sockets of matching sizes. The lid was generally adorned in low relief靠形象 an arch of a column and a capital. The inscriptions were inscribed with the words "Grace of God", taken from the First Epistle of Paul the Apostle to the Corinthians I: 5-10: "By the grace of God I am what I am." So the inscription is saying in effect that true weight and the prosperity that brings them is the gift of God. Inscriptions in Latin, also of varying sizes, were written in the form of a capital letter, such as "Sly Theodore, holy" or "Sly Theodore, holy" the name of the city of the period of the time, such as "Sly the time of the most distinguished Eparch of the City, Constantine" (circa 600) are encountered.21

Weights were of two types, depending on whether they were made for stability or balance; those for the former to the form of a box or a container, and those for the latter flat for conveniently piling in the balance pan. The earliest of many surviving weights dating from the 5th-7th centuries mainly pertain to the emperor, empress, and the goddess Athena (Minerva), and weigh approximately 4 Roman pounds.22

34. Vikan, "Weights", p. 2704.
Some scholars believe the place of manufacture to be Egypt on account of the large number of examples found there, while others opt for Constantinople. Byzantine glass weights are generally in the form of disks pressed from glass while it was hot and molten. Glass weights had several advantages. They were cheap to produce, revealed any attempts at adulteration, and were not subject to oxidation or corrosion. They are generally stamped with a monogram or an inscription concerning the provider of the capital. According to a study of over two hundred glass weights by the numismatist G. Miles, the scutelum (4.55 g), semis (2.27 g) and munita (1.52 g) were used as standards for gold coins. The production of semis and munita weights ended in the 9th century. More than twenty types of monograms and monoi occur on glass weights, but these can be classified into seven main categories: 1. Dot monograms. 2. Cruciform monograms. 3. Box or cruciform monograms and inscriptions. 4. Figures of emperors. 5. Busts of an emperor and inscription. 6. Signs or monograms indicating a name. 7. Plain bases. Stamped box or cruciform monograms are the most common. In the first half of the 7th century, box monograms were widespread, continuing until the reign of Justin II (565-578), when cruciform monograms also began to appear on weights. The use of box monograms on coins and weights ended in 578. Glass weights were produced in diverse colours, including blue, brown, red, green, and yellow. In the case of figurative designs, generally stamped, a bust of the city provider is most common, while a few examples feature a bust of the emperor. Non-figurative designs on glass weights are restricted to monograms.

Portraits of emperors and empresses are of importance for dating Byzantine weights of the 6th-7th centuries. The weights manufactured between 563 and 491, and particularly those dating from the second half of the 5th century, are classified as examples found by the emperors. Weights of the reigns of Julian (361-363) bear the emperor's portrait, those of the time of Honorius (395-423) bear his name, and those of the reigns of Marcia (450-457) and Leo I (457-474) bear their monograms, which also appear on coins of the period.

When dating weights, excavations whose stratigraphy and data provide specific dates must also be taken into account. Weights dating from after the 7th century are extremely few in number, whether in museums and collections or finds from excavations. The Yassi Ada wreck provides important data for dating weights, its finds including fifty-four copper and sixteen gold coins, and eight bronze and one glass weight, and these studies that can be dated approximately. The gold coins belong to the reign of Phocas (602-610) and Heraclius I (610-641). Since the latest copper coin was struck in the sixteenth year of Heraclius' reign, the semis post quem for the wreck and its finds is 625 or 626.

Of the relatively few number of coin weights dating from the middle and late Byzantine periods, a unique example is a silver weight weighing 1 statere inscribed with the name of the Emperor Theodosius (550-556). Five small bronze weights dating from the 10th-11th centuries and weights dating from the 9th-12th centuries discovered at Constantinople are among the examples from this period. The latest examples pertain to Arcadius II (1272-1282) and Michael IX (1289-1291).

2 OUNCE WEIGHT
Byzantine 8.36 g 18.2 x 22 mm KNA 627 (cat. 980)

2 SOLIDUS WEIGHT
Byzantine 8.27 g 18.2 x 22 mm KNA 628 (cat. 981)

34. Rodd and Demack, Jr., Tissue Ada, p. 211.
35. Vilas and Noble, Society in Byzantium, pp. 36-37.
36. Glihor Tokay, Byzantine Lead Reliefs at Kizilcukur, in Byzantine Coins: The Hope-Kraemer Collection, Sotheby's, London 1987, p. 27.
38. Buxbom, Byzantine Weights, p. 41.
39. Vilas and Noble, Society in Byzantium, p. 73, figs. 86-87.
40. Vilas and Noble, Society in Byzantium, p. 73, figs. 86-87.
41. Rodd and Demack, Jr., Tissue Ada, p. 9.
42. Rodd and Demack, Jr., Tissue Ada, p. 211.

The table of Byzantine weights given by Simon Henderson in his book Byzantine Weights, printed in London in 1996, and the units of weight given by Nicolas Perier in his Catalogue de la Collection Enrico Norelli on Cabinet des Monnaies et Antiques de Genève (Geneva, XII, 1984, pp. 65-106) are the main sources for the information given in the table below, which also includes information compiled from other sources in the course of research.

<table>
<thead>
<tr>
<th>Units of weight</th>
<th>Late Roman and early Byzantine commerical weights</th>
<th>Monograms inscribed on Byzantine commerical weights</th>
<th>Monograms inscribed on Byzantine coin weights</th>
<th>Minas inscribed on coin weights or pounds</th>
<th>Equivalent in pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attika 24 1/12</td>
<td>36.85 g 7.95 mm B.A.</td>
<td>N.B. 327.00 9/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Attika 20 1/12</td>
<td>33.20 g 6.40 mm N.A.</td>
<td>N.E. 200.00 8/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Attika 16 1/12</td>
<td>29.55 g 5.10 mm B.S.</td>
<td>N.M. 350.00 6/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Attika 12 1/12</td>
<td>25.90 g 4.25 mm N.P.</td>
<td>N.N. 400.00 4/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Attika 8 1/12</td>
<td>22.25 g 3.40 mm N.P.</td>
<td>N.N. 500.00 2/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Attika 4 1/12</td>
<td>18.60 g 2.55 mm N.P.</td>
<td>N.N. 600.00 0/12</td>
<td>12.00</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

The table compiled by Maryam Aziza Elor and Garry Kokkinos.
5 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 4th–6th century
25.9 g, 23.6 x 23.6 x 0.9 mm
KMA 550 (cat. 495)

3/4 POUND COPPER WEIGHT
Early Byzantine, 4th–6th century
53.5 g, 39 x 26 x 1.4 mm
KMA 525 (cat. 575)

2 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 5th–6th century
58.07 g, 53.5 mm, h 7.5 mm
KMA 115 (cat. 495)

5/8 POZITAS COPPER WEIGHT
Byzantine, 17.69 g, ø 25 mm, h 5 mm
KMA 547 (cat. 495)

3 1/2 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 6th–7th century
78.47 g, ø 25.8 mm, h 8.8 mm
KMA 545 (cat. 495)

1/4 POZITAS COPPER WEIGHT
Early Byzantine, 6th–7th century
12.57 g, 19.9 x 10.4 x 3 mm
KMA 564 (cat. 495)

STEEL YARD WEIGHT
Most of the Byzantine
Athena Foundas
Byzantine, 7th century
0.000 lb, 0.29 mm
KMA 695 (cat. 725)

Secondary weights in the form of beads date from between the 3rd and 7th centuries AD. In the early part of this period the majority of these weights portrayed emperors or the goddess Athena, but towards the end of the 6th century began to portray emperors. Weights in the form of beads in the collection of Istanbul Archaeological Museums are given in the table below from Istanbul Arkeoloji Müzeleri Rütubet ve Kullanım Arşivi, "Secondary Weights in the Forms of Beads," by Yalın Mersinbey and Nümayet Adıgüzel.
Authenticus (ODB) (Gk.) G. c. Proconsul: A governor of one of several provinices. The term also probably designated the head of the administration of the city of Constantinople until 512.

Clarissimus (Lati.) When Consociation created the Senate in Constantinople, he granted the new senators the title Clariss. On weights the title appears as CLV (c.2 Clarissimus).

Cotis numerus (num. 1st) (ODB) High-ranking financial official.

Dyonisos (AN S.15) Known in the form of a nervous head.

Endowment (see Glorification)

Eponymous (Sb.) The Proconsul of Constantinople. He was responsible for the maintenance of law and order and he combined trade and industry and, indeed, the city's whole economic life.

Eugenes (ODB) A unit of weight equal to 1/172 of the Heavy Roman Siliqua or Byzantine Hyperpyros (c.4.4 g). Eugenes can also refer to weights used at standards for gold coin.

Glorification (ODB and Sb.) The highest title bestowed on Senators and high officials such as Prefects, Magistrates, Militias, Magistrate Officer and Commodors from the middle of the 5th century.

Stimulus (AG CIC) A loose marble vase in ancient Greece.

Skeina (Sb.) From the last quarter of the 6th century until the middle of the 6th century this was the highest senatorial rank bestowed upon such officials as the Proconsul Perfect, the City Perfect, Magistrates, Militias, and Consuls. On weights the title appears as VI (c.2 Skeina).

Christogram (ODB) Christ's monogram. The combination of Chi (X) and Kappa (K), which are the first two letters of the Greek name "Christos".

Largomentum (see Clarissimus)

Liber (ODB) (c. Libra, Libra). The most important Byzantine measure of weight, equivalent to 3/4 lb or 310 g. Established by Constantine I in 313 or 314 as the basis of the monetary system. 1 unit equals to 0.717418 or 0.717418 (c.2 Libra) 0.915 (c. 1 Siliqua) 0.310 (c. 1 Hyperpyros) 0.242 (c. 1 Tissia) 0.192 (c. 1 Tomma) 0.135 (c. 1 Kastinga)

Lomentum (AG CIC) A long staff withlle with precious stones worn by Byzantine emperors and empresses, originally derived in an "X" over the upper body with one end hanging down in front and the other over the left arm.

Magnostitis Militias (ODB) Commander in chief of the armies in the late Roman Empire.

Magister Officiorum (ODB) Master of the office, the head of the central civil administration in the late Roman Empire.

Numimata (ODB) (pl. nummata) a word meaning 'coins' generally, but specifically of the standard gold coin of 24 carat which formed the basis of the late Roman and Byzantine monetary system. It was thus identified with the coin called in Latin a solido. Circa 145 g.

Skeina (Sb.) A sort of added to the coins which had cuticles printed on the same emperors.

Osmaga (ODB) (c.1) Unit of weight derived from Latin. Is used to 1/172 ounce. Accordingly, the ounce was 1/172 of the Hyperpyros of 320 g, weighing 206.5 g.

Pericles (see Socrateis)

Potentia (ODB) A weight used for commercial goods.

Prætorianus (Sb.) A Roman unit of weight used for commercial goods. A Roman prætorianus were equal to 1 libra. In 1 libra was equivalent to 1.72 pounds or 788 grams. Approximately 300-354 g.

Prætorianum princeps (ODB) Commander of the emperor's bodyguard under the principle but from the 4th century an important regional civil functionary responsible for a praetorian prefecture. Their responsibilities included taxation, justice, grain provision, trade, peace, and higher seditions.

Prosopon (see Authentikos)

Quadriga (ODB) A high-ranking official of the late Roman Empire, an office created by Constantine I.

Quadriga (ODB) In late Roman and Byzantine times a small gold coin weighing 2.7 g and worth half a solido.

Sodalis (ODB) (pl. sodalis) Initially the name of a gold coin struck by Eusebius. It was introduced under Constantine I at the rate of 1 solidus to 10 denarii. It was a small silver coin equivalent to 24 carat gold. It was used to stamp the coins down to the 10th century. Also see Numimata.

Spectabilis (ODB and Sb) The title of second-ranking senators in the Late Roman Empire between Excellent and Clarissimus. Removed primarily upon Praetorian, Vicarius and Deacon. The same title appears in documents in 535 and for the last time in 703.

Tremissis (ODB) A small gold coin weighing 1.62 g, nearly a third of a solido, introduced in the 300s during the reign of Theodosius I.

Tyche (AG CIC) A concept of fate and fortune in antiquity, often taking the form of a female personification. It has several names, one of the most familiar, being Tyche (AG CIC), a concept of fate and fortune in antiquity, often taking the form of a female personification. It has several names, one of the most familiar, being Tyche (AG CIC), a concept of fate and fortune in antiquity, often taking the form of a female personification.

Zygodontus (ODB) Publicly weighed a monarchical official who, according to a law of Justinian (Cod. Justin. X/21), was to check the quality of orichalc.
The word "sanja" means a weight used not for weighing goods, but for checking the weight of silver coins. In an Arabic word whose first letter could either besaid (س) or (س), deriving from the Persian "samak", meaning fish. We have already seen that coin weights were used by the Romans and Byzantines. In the past, some scholars have claimed that sanjas were used as money, but it is unanimously agreed today that they were used as standards for coins struck from precious metals. Research has shown that Byzantine coin weights were the same as the Byzantine dinar or solidus, being equivalent to 68 grams (4.484 grams). The Arabic dinar was equivalent to 66 grams or 4.270 grams.

Among the Arabic coins, weights were first produced between the years 747-77 by Abd al-Malik b. Marwan as a means of standardising coinage weights, and were also produced in Egypt during the Byzantine period for the same purpose. The latter coins weights sometimes bear the names of governors of Egypt. Excavations at Fustat and Flynan have revealed coins weights made in Damascas and other ports of Syria. On Abbasid coins weights we find the name of the caliph, name of the mint, governor or official known as pura who was responsible for assaying weights and measuring. Some researchers have interpreted these names as belonging to the craftsmen who made them but the validity of this claim is questionable.

In time, Islamic coin weights attained their classical forms. Some bear Arabic inscriptions such as Aahila Allah, Maimuna Allah or Ennus Allah Leila, or quotations from the Koran. Two coin weights that we encountered in the course of our research bear both decoration and inscriptions of the Roman period and Islamic legends.

The word (مكية) 'to manufacture' which appears on Islamic coin weights has been extensively debated, and interpreted by some scholars as (مكية) 'to stamp'. In our opinion, however, the former reading is correct, and so we have similarly read (مكية) as 'manufactured'.

Sanjas were made of bronze or iron, and generally stamped on one side only until the Abbasid period, when they began to be stamped on both sides. As well as the words mokhi or mokhi, sanjas bear words referring to the coin or its fraction for which they were intended to provide a standard, "dinar", "kharub", "half dinar", "varis" (thin), "rili" (thick), "dirham", "dinar". Some sanjas also bear the words "cost of" (في فات). It is like the word sah stamped on assayed silver objects assessed their compliance with legal standards.

Even with the best of intentions, however, complete accuracy was impossible, and coin weights produced by the same person or by state institutions display variations in weight resulting from the casting process. The same was true for commercial weights. One example of a glass weight demonstrates that flaws of form and spelling mistakes could be made by the craftsmen producing them by carving the mouth and inscriptions in mirror image on the glass. There are coin weights with Coptic inscriptions written entirely in reverse. Some coin weights are marked with astrological symbols, stars or crescents, either for purely decorative purposes, or to separate the lines of writing.

Sanjas of different colours were obtained by the addition of different chemical elements: copper and iron oxide for blue, copper and carbon for black, and manganese for dark blue.

GLASS WEIGHT
Unknow, dated 122
stamp: ø 79 mm
ANN 7049.892
The inscription on this seal weight tells us that it was made when Al Qa'im b. ‘Umaysedhah was serving as minister of finance (1186/1247–1254/1252 AD).
Since it is broken we do not know what substance it was made of.

GLASS WEIGHT
Unknow, 6th century
ø 95.7 mm
ANN 1933.34.2
Since the stamped inscription is worn, it is only partially legible, but tells us that it dates from the time when ‘Umaysedhah was minister of finance (1171–1175/1176–1181 AD). The words ‘al fath al ‘afal’ mean ‘full weight for most weighing a rav’. Since it is broken its original weight is unknown.

GLASS SEAL
Unknow, early 8th century
ø 34 mm
ANN 1017.225.4668
The seal bears the words ‘Umaysedhah Zaid’ and ‘al fath al ‘afal’ (full weight for most weighing a rav). It is made of silver, and it is likely that it dates from the time when ‘Umaysedhah was minister of finance (1166–1168/1172–1175 AD). This seal was used for stamping silver coins.

GLASS WEIGHT
Albani, 6th century
ø 75 mm, ø 50 x 64.25 mm
ANN 1963.168.57
This weight is thought to be a double unit, and bears two inscriptions, from which we learn that it dates from the time of the Albani dynasty (6th–7th century AD).
The pre-Ottoman Turkish system of measurements appears to have originated in Central Asia as a result of trade relations with Iran and China. The 11th century dictionary of Turkish dialects, Örmeç-Eğil'i Tābīk, is an important source of information about units of weight and measurement, defining the asık as half a jin of silver, the Ardash as a pile, the nāqi as a measure of ewed, the kawāl as equivalent to 10 asık, the batin as a measurement of weight, and the yūz as a measurement of length along with diverse local units used for the measurement of land area.

The most important source of information about Seljuk period weights and measures are the ships' documents. From these we learn that the obbya, irshād, mid̤b and bānnā were the basis of the measuring system of this period.1

The expansion of trade relations between the western Anatolian Turkish emirates of Menteşe and Aydıngün with the Byzantines, Venice and Genoa, led to the introduction of Byzantine and Italian units of measurement, which began to be used in Anatolia in the 14th century. Ibn Battuta’s account of his travels, the account of Anadolu by the 14th century Mongol historian and geographer Ibn Faḍlallāh al-Dawrani on the basis of information obtained in Cairo from a Genoese slave named Domenichino Doria included in Mehrāb al-Šarāi‘ī’s Kitāb al-Ta‘rīkh wa-l-Fatḥ wa-l-Mu‘awādah wa-l-‘Uṣūl wa-l-Mawā‘id,2 and La Pratica della Mercatura,3 written by the Italian Baldacci Paganoni, who travelled to the Levant in the first half of the 14th century for the purpose of identifying Anadolu’s trade goods and providing a guide for merchants are all sources that provide important information about the weight and measures of this period. Paganoni even gives a table comparing the units of measurement used in Alanya and Alexandria with those of Italy.4

Sources dating from the 14th century reveal that the pre-Ottoman Anatolian system of measurement was based on the koda, an Iranian Ilkhānid unit of weight, the kontar, obbya and bānānā, and that the main units of grain measurement were the šūh and mādī. With some modifications, the Ottomans continued to use the systems of weights and measures used by both western and eastern cultures in the territories conquered by the empire.

Mamals, written in the 16th century for the guidance of Ottoman fiscal authorities are valuable as the first comprehensive sources of information about Ottoman weight and measurement. Among these is a arithmetic book written in Greek in Salonaics around 1500 showing that by this time the Byzantine system of weights had been abandoned. Mecma’s F. K. Rıza, which was the first example for subsequent books about accounting, was written by Mehmed Mehmed Haci Aqra in H 1491 (1491 AD) under the influence of Arabic and Persian accounting handbooks, and gives contemporary Ottoman units of measurement.5

Another of these accounting books entitled Rıza’s Kermeyi’i Cihânet-i Maşuq, published by Seyfi Ali Paşa Kayalarlı, “No 1979” thought to date from the 16th century and written by Yusuf ibn Mehmed gives one of the most detailed accounts of the Ottoman system of weights and measures, which the author divides into four categories: small units of weight, karat, mikān and dilbëken; large units of weight, kontar, iloda, bornan and dayen; units of volume, aslal, dayene, pthik, tarq and midillā’ey, and units of length and area, zira and mirdaş respectively.6

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DINAHM WEIGHTS WITH HIRD'S EYE MOTIFS
6 Hird, cat. 108
10 Hird, cat. 108
16 Hird, cat. 107
20 Hird, cat. 108
25 Hird, cat. 105
30 Hird, cat. 104

10 DRINKER WEIGHTS
Ardoush Jokha, 13th-14th century
25.50 g
18.76 x 7.1 x 1.1 mm
26.38 g
19/18 x 15 mm
Private collection, Iran
It is thought to have been used for weighing silk, since it is stamped with the word 'helped silk'.
For: 75.47 g
18.4 x 7.2 mm
Private collection, Iran
The inscription reads '...el dina'.

STEELYARD
Chinese, 9th-10th century
L: 191 mm
12MA 68 (cat. 148)

50 DRINKER WEIGHT
Sultani, 13th-14th century
145.54 g, ø 22.3 mm
KMA 118 (cat. 130)
The dinar was introduced into Arabia with the spread of Islam, but for a long time the Byzantine solidus continued to be used alongside this new unit of weight. The dinar served both as a unit of weight and currency, since coins were valued according to their weight. The word is derived from the Greek drachma, which was borrowed first into Persian and later into Arabic as a result of trade relations.

The Seljuk s adopted the dinar system as used by the Umayyads, Abbasids and Persians, but the unit was not fully standardized, and its value varied from region to region and period to period. These discrepancies in the values of the dinar and miskal, the units of weight used in Islamic societies, are evident from information in local sources.Both the dinar and miskal were based on multiples of the kurush (cra). According to Sahib Bahrg, 1 dinar is equivalent to 14 kurush, and 1 miskal to 20 kurush, a ratio of 7:10. Walther Binsn explained that the Islamic weight measurement system was based on the dinar, deriving from the Greek drachma, and on the miskal, deriving from the Roman and Byzantine solidus. According to canonical law the ratio between the miskal and the dinar was 7:10 in theory, and 2:5 in practice. The values of all other units depended on the accurate determination of these two units.

Since the earliest periods of Islam, the rub had been the foremost unit of weight. An Umayyad period solid weight used in Syria in the year 744 weighs 33.53 grams. A romen rub may have been equivalent to 72 Roman solidi or miskal. Since one dinar was regarded as equivalent to 1.5 miskals, the weight of dinar is equivalent to 31.25 grams. When we look at the glass kurush (also known as the harran), weights used by the Abbasids in Syria, we find that these weigh 0.193 grams. Therefore a dinar of 16 kurush makes 3.125 grams.

A Fifteenth-period solid weight equivalent to 140 dinars in the Louvre Museum weighs 437.2067 grams. From this, we can conclude that one dinar was equivalent to 3.123 grams.

Meanwhile V. Quispn calculates the value of a dinar at approximately 3.125 grams.

Hafiz Sahib Bahrg calculates the weight of the dinar on the basis of the Mongol dinar coin and the Turkish dinar coin used around the 13th century as follows: 1 Mongol dinar coin was equivalent to 6 Seljuk dinar coins, and during the reign of the Buhara Mongol ruler Gauzem Muhmnd (H. 694-708/1295-1304) 1 dinar coin was equivalent to 3 miskals, and a Tahafeur miskal was equivalent to a Persian (tabarz) miskal of 400 grams. Gauzem Hoxay decided to make the Tahafeur miskal the standard unit of weight and miskal that it should be equivalent to 2 dinars. The Ottomans, on the other hand, regarded the Tahafeur miskal as equivalent to 1.5 dinars.

In the early Ottoman period, however, the dinar was not fully standardized. Various sources tell us that until the year H. 1000 (1600-89) the dinar was equivalent to 3.672 grams, and after that date equivalent to 3.207 grams. During the reign of Sultan Mehmed II, who struck the first Ottoman gold coin in H. 885, 129 gold coins were struck from 100 miskals of gold. If
we assume 1 mithid to be 4.606 grams, then 100 mithids is equivalent to 460.6 grams, which, when divided by 129 means that one gold coin weighed 3.573 grams. Since 1 mithid equaled 1.5 dirhems, then 1 dirhem was equivalent to 3.072 grams. Hult-Hallack refers to the table of weights and measures given by Muhaydin Mahmud in his book Mawam al-Tawaruf in 1493, where he defines 1 mithid as 1.5 dirhems. 3

As an Egyptian commission set up by the Khedive of Egypt Muhammad Ali Pasha in 1845 reported that the dirhem weight was equivalent to 3.0098 grams. 4 H. Sauri, who has made the most detailed study of Islamic units of measurement so far, takes this value as the basis for his own calculations. However, J. A. Decour had claimed that the value given by the Egyptian commission was erroneous, 5 and should have been 3.148 grams. 6 In 1924 the Egyptian government officially announced that the dirhem would be regarded as equivalent to 3.12 grams. 7

11. Revue Archéologique, 6, 1916, p. 222: “Il faut noter que pour la fourmi complètement transformée la commissio egyptienne a fixé un pour 3 dirhems de 1810; au moyen du dirhem legal”.
Setting aside all the controversial discussion outlined above, we weighed all the 3 dinar weights found in the Ottoman period that we came across, and drew up the following table of our findings. The average weight of the 32 dinar weights we examined was found to be 3.1487 g.

<table>
<thead>
<tr>
<th>Region/Period</th>
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<th>Weight</th>
<th>Material</th>
<th>Collection</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>3.14 g</td>
<td>Copper</td>
<td>KMA 12</td>
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<tr>
<td>2</td>
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<td>Bronze</td>
<td>SAM 9.2.83</td>
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**Examples of Dinar Weights Used Between the Reigns of Bayezid II and Mehmed IV**

- **Dinar Weight**: Ottoman, 15th century
  - Triqa of Bayezid II
  - KMA 96/8 (cat. 132)
- **Dinar Weight**: Ottoman, 14th century
  - Triqa of Mehmed IV
  - 3.14 g, ø 15 mm
  - KMA 96/8 (cat. 137)
In order to calculate the equivalent of the dinhims in grams, a table was drawn up of dinhims or weights in multiples other than one in the AKMEO collection. The findings for weights, denominated as multiples of 400, 200, 100, 50, 25, 20, 15, 12 1/2, 10, 5, and 2 dinhims are given chronologically below.

It emerges from this table that 1 dinhim was equivalent to just over 3.163 grams.

If discrepancies according to region are ignored, this may be taken as the average value.

<table>
<thead>
<tr>
<th>Dinhim weight</th>
<th>Region/Period</th>
<th>Date (AD)</th>
<th>Date (AD)</th>
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<th>Weight equivalent (gr)</th>
<th>Material</th>
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<tbody>
<tr>
<td>100</td>
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6 DINHEM WEIGHT

Ottoman, dated H 1253 (1839-1840)

<table>
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<th>Dinhim weight</th>
<th>Region/Period</th>
<th>Date (AD)</th>
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<td>1779</td>
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KMA 11 (cat. 220)
Inadequate studies of material dating from the Seljuk and early Ottoman periods in general, and weights in particular, means that it is difficult to date surviving weights with any certainty. Moreover, for the Seljuk period no assy marks have been found on any weights, measuring rods or measuring cups.

The dövern weights that will be examined here consist partly of cubic or rectangular prism weights, used in Iran and the Arab countries, and partly of cast bronze weights, either ring-shaped or polyhedral, mainly dating from the Seljuk period. The latter group of weights are decorated with various motifs, such as the so-called bird's-eye motif, and vary in weight between half a dövern and 200 döverns. With one exception it has proved impossible to date the dövern weights which we have examined by reference to their motifs. The weights are generally decorated with animal motifs, geometric patterns or kufic inscriptions. Only one, 2.5 dövern weight (cat. 104), is in the collection of the Mediterranean Civilizations Research Institute with a figure of a double-headed eagle carved on the edge, which seems to date from the Seljuk period by its motif.
Decorated ring weights with denominations of 125, 250, 50, 100, 200, and 400 dirhems were manufactured. Most researchers have assumed that these weights were found in Iran during the Sasanian period. However, recent finds have suggested that they may have been manufactured in Iran during the Sasanian period. The weights were typically found in the region of Rayyan, near the city of Rayyan, and were used to weigh precious metals and other goods. They were typically made of bronze and featured ornate designs. The weights were typically found in the region of Rayyan, near the city of Rayyan, and were used to weigh precious metals and other goods. They were typically made of bronze and featured ornate designs. The weights were typically found in the region of Rayyan, near the city of Rayyan, and were used to weigh precious metals and other goods. They were typically made of bronze and featured ornate designs. 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Fruit Seller's Stall at the Line Celebrations
Detail of an Ottoman Illuminated Book, Safvet-ı Hasebi, 1344, Saf, 1684.

200 Dirhem Weight (detail)
Ottoman, dated 1191/92
Temple of Sultan I and Mehmed IV
130 g, ø 134 mm
KMA 963 (cat. 130)

200 Dirhem Weight (detail)
Stamps reading '4 Ayrap 1112' and '240' on the weight in the Nancy R. Pyle collection.

Nancy S. Pyle has made some errors in her reading of the stamps on these weights. The weight stamp on one of these (illustrated above), which she has read as 'Tyget 1184', should in fact be read as 'Ayrap 1112'. This stamp dates from the reign of the Ottoman Sultan Mehmed IV, and was struck after the year H. 1184 (see cat. 135 and 130).

The Ottomans continued to stamp dishome weights that had been used at earlier periods. For example, a weight dating from the reign of Selim III (H. 1192-1194) bears the assay stamp 'Ayrap 1112', and another weight dating from the reign of Mahmoud II (H. 1226-1228) bears the assay stamps 'Ayrap 1112' and 'Mehmed 1112' (cat. 177). Another weight dating from the reign of Sultan Abdulaziz (H. 1177-1192) bears the assay stamp 'Ayrap 1112' (cat. 328), and another dating from the reign of Abdulhamid II (H. 1219-1227) bears the assay stamp 'Ayrap 1112' (cat. 380). The stamp which Pyle reads as 'Qulkin 620' should in our view be read as 'Temih 1192'. 'Temih' means 'inspected' (see page 93). The identical stamp found on a 200 dirhem weight in the collection of the Museum of Turkish and Islamic Arts in Istanbul (illustrated below), shows Pyle's reading to be mistaken. The same mark was also stamped on other after being inspected.

In her article the author says that the oldest marks found on an Ottoman dishome weight is that of Selim III, and that the weight was stamped on a 100 dirhem weight in her own collection is that of Selim III. In fact, however, this weight belongs to Bayezid II. On the same weight there is a second mark reading 'Sultani III b. Bayezid Has, May He Ever Be Victorious' (see p. 72) and two assay stamps reading 'Ayrap 1112' (see p. 73).
SET OF DORICHEM WEIGHTS
100 Dorian, KMA 107
50 Dorian, KMA 125
25 Dorian, KMA 320
10 Dorian, KMA 090
5 Dorian, KMA 326
2 Dorian, KMA 019
1 Dorian, KMA 327
1 Dorian, KMA 393
2 Dorian, KMA 362
1 Dorian, KMA 363

SET OF DORICHEM WEIGHTS
200 Dorian, KMA 229
50 Dorian, KMA 325
20 Dorian, KMA 490
10 Dorian, KMA 043
5 Dorian, KMA 060
2 Dorian, KMA 425
2 Dorian, KMA 493
2 Dorian, KMA 085
1 Dorian, KMA 067
22.5 DIRHEM WEIGHT
26.50 g, external ø 47 mm, internal ø 18 mm
Private collection
Tightening: Sethe's bangle... on the reverse.

22.5 DIRHEM WEIGHT
26.50 g, external ø 47 mm, internal ø 15 mm
TEBM 1806
Similar revolve on obverse and reverse.

25 DIRHEM WEIGHT
51.80 g, external ø 52 mm, internal ø 27 mm
TEBM 1969
No stamp on the reverse.

25 DIRHEM WEIGHT
51.80 g, external ø 52 mm, internal ø 27 mm
TEBM 1969
No stamp on the reverse.

25 DIRHEM WEIGHT
51.80 g, external ø 52 mm, internal ø 27 mm
TEBM 1969
No stamp on the reverse.

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection

50 DIRHEM WEIGHT
93.40 g, external ø 68 mm, internal ø 35 mm
Private collection
400 Dinar Weight

- 5,590 g, external ø 152 mm, internal ø 55 mm
  SKU 2291
- 5,560 g, external ø 151 mm, internal ø 54 mm
  SKU 2286
- 5,520 g, external ø 150 mm, internal ø 53 mm
  SKU 2282
- 5,240 g, external ø 148 mm, internal ø 48 mm
  SKU 6120

These coins are inscribed with the name of the Caliph in Arabic. The text reads: "God is the Most High, the Most Merciful. Be kind towards all, for goodness is a pledge of happiness."
TUĞRAS
OTTOMAN ABBAY MARKS

محمد بن مراد خان المظفر دانی

Mehmed II, Murad II, May He Ever Be Victorious

The earliest tuğra stamp of the Ottomans belongs to Sultan Mehmed II.

As a means of preventing fraudulence of weights and measures in trade, the Ottoman government made it compulsory that weights and other measuring instruments be inspected and stamped. Officials known as muhəfiz appointed for this purpose inspected weighting and measuring equipment, and if found to be accurate stamped them with the tuğra of the reigning sultan. We think that this procedure began during the reign of Sultan Mehmed II (1451-1481) and continued until the reign of Sultan Mehmed V (1909-1918). Examples of the tuğra stamps used by Ottoman sultans over the centuries are given in chronological order below.
Some weights dating from the Anatolian Seljuk period up to the 20th century have been found to bear name stamps. With the object of preventing fraudulence, weights were assayed by the authorities and stamped with the title of the reigning sultan, the names of the weight officials, or their numbers. These marks consisting of various words signify that the weights have been checked and found to be accurate, such as 'measuring', 'nominal', 'true', 'well seen', or the names of the municipal authorities that carried out the assay. In the case of stamps consisting only of a name, it is not usually possible to say for certain whether the name belongs to the mazer or to an assayee. Names of assayees identified in the course of our research are Sultan, Murad, Erzin, Mustafa, Ali, and Mehmet. The name Mustafa stamped on a 20-dinar weight (cat. 329) in the collection of the Mediterranean Civilisations Research Institute has been shown to belong to an assayee official who is mentioned in archive records as Mustafa Elfenek (ROA A.462, 1279/80). Some of the names clearly belong to the mazer as in the case of stamps bearing the names Osman, Ahmed Sabri, Ali, Osman Kılıç, Fati, and Gümüşbey. All the weights which began to be produced at Topkapi, the imperial foundry, from the year 1299 onwards, are stamped not only with the Sultan's tugra, but also the year 1299 and 'Topkapi', so there is no doubt about their place of manufacture.
During the Ottoman period, assayers sometimes stamped weights and measuring equipment with their names, numbers, or both. Of examples which we have examined so far, the names Cezâr, Ahmed, Emin, Mustafa, Arif, and Mehmed occur.
WEIGHTS AND MEASURES INSPECTOR

This illustration of a man inspecting a balance for true weight is from the collection of the German Institute of Archaeology in Istanbul.

PROCESSION OF THE BUTCHERS

A miniature from Sultan Süleyman I's Hazine, fol. 299v.
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KÜTAHYA MUNICIPAL ASSAY STAMPS
KMA 253 (cat. 451)
The miskal was a unit of weight used by the Ottomans for the precise measurement of small quantities. Money changers used the miskal to weigh pearls and precious metals such as gold, and apothecaries to weigh the ingredients of their pharmaceutical preparations, as we learn from works concerning the Ottoman accounting system, and Evliya Celebi’s Seyahatnere. A 16th-century manual entitled Rıslu-i Kurnucve explains that gold and pearls were measured in miskals and troyes (carats), and even when gold was measured in akçes, the result was always calculated in a miskals.

It is difficult to determine the weight of the miskal and akçe as used in Iran. Until the end of the middle ages the miskal is known to have been based on the Sassanian silver weight of 4.3 grams.15 The evidence for this is not only the actual weight of coins used in the early 14th century.16 In his calculations, A. Z. V. Tregon uses a slightly smaller value of 4.26 grams,17 and this is confirmed by F. B. Pigolotti of Florence, who flourished in the 1330s.18

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**BOX FOR A BALANCE AND WEIGHTS**

Lacquered decoration. Around the border are the symbols of the alchemist and their alchemical prototypes.

Private collection.
### SET OF BALANCE AND WEIGHTS

Istanbul, 18th century.

- Large box: 30x18.3x5.5 cm
- Small box: 18.3x18.3x5.5 cm
- Small box 2: 10.7 cm
- Iron prisms (consisting of two sections): 15.2 cm

Private collection.

While the ratio between the Ottoman drachm and arz suit was 1.5, in Iran the ratio was 1.32. The denominations and weights in grams of the weights in the set are given in the following table. Only one of the seven original weights in the small box has survived, and this weighs 1.65 grams.

<table>
<thead>
<tr>
<th>Weight</th>
<th>Weight in Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dram</td>
<td>5.90 grams</td>
</tr>
<tr>
<td>1 Maked</td>
<td>6.62 grams</td>
</tr>
<tr>
<td>1 Minas</td>
<td>9.71 grams</td>
</tr>
<tr>
<td>3 Minas</td>
<td>11.82 grams</td>
</tr>
<tr>
<td>4 Minas</td>
<td>16.86 grams</td>
</tr>
<tr>
<td>5 Minas</td>
<td>22.91 grams</td>
</tr>
<tr>
<td>10 Minas</td>
<td>45.93 grams</td>
</tr>
<tr>
<td>25 Minas</td>
<td>90.93 grams</td>
</tr>
<tr>
<td>50 Minas</td>
<td>135.78 grams</td>
</tr>
<tr>
<td>100 Minas</td>
<td>231.30 grams</td>
</tr>
</tbody>
</table>
From the medieval period onwards, Anatolian Christians and Muslims used a unit of weight called the sugi, which was equivalent to 200 diones. Walter Husz says that the sugi as used in the southeast Anatolian city of Mardin in 1518 was equivalent to 200 diones, in other words to 1,414 grams, or to 78 diones, or 250.1 grams. During the same period he says that the sugi of Cennik was again equivalent to 200 diones or 441.4 grams. This shows how the same name can refer to different units of weight in different places.9

From the provisions in some provincial law codes, we learn that the sugi was used in various parts of the Ottoman Empire during the reign of Sultan Selim I, particularly in the eastern provinces. Legal practice in this eastern region can often be traced back to earlier civilizations. For example, the law code for the district of Bayburt dating from 1097/1590 is significant in showing that units of weight used by the alike-named Turkish state (1308–1591) continued to be used by the Ottomans without any modification.

And in the aforementioned district, the boutara (a unit of weight) in general use is
equivalent to 12 dars, and the magn in 200 dars, so that one balaur is equivalent to 2400 dars, and from ancient times to the present day the local people have made these weights accordingly, so let them be made as described, not one dars nor more or less."

The law code for the province of Georgia also states that the magn used in the region was equivalent to 200 dars, and that one balaur was equivalent to 12 dars. In the law code for the subprovince of Eastern Kakhour dated 1599, it states that the Yekert magn in used in the region, and that this unit of weight is identical to the Georgian magn. With respect to the magn, this code explains: "And pouring these are 2 akars per household, or a Tokhs magn, which is 200 dars, and one magn of butter has always been accepted, and let this limit not be exceeded."

A code for the province of Zirakazhuy says, "And if anyone's magn should weigh below standard, let one akar be fined for each dars less of that sold and let the punishment required by canonical law also be imposed."

**Pocket Balances Used by Moneychangers**

Small balances for weighing coins were made for moneychangers to carry in their pockets. These had notches on one side according to the different denominations of coins, and when the coins were placed in these notches, if the beam slowly descended so that the coin dropped out, it was full weight, but if the beam gradually rose, and the coin remained in the notch, then it was defaced or fraudulent. All the examples that we have been able to examine are designed for weighing half coins on one side and full coins on the other. The half values are marked as 'H', 'half French', '50', 'half Ottoman', and '55', 'half English', and the full values as '80', 'full French', '500', 'full Ottoman', and '110', 'full English'. Balances of this type vary slightly according to the period when they were made.

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Units of weight used in and around Istanbul in the 18th-20th centuries

<table>
<thead>
<tr>
<th>Unit</th>
<th>Equivalent in Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Çelî</td>
<td>250 kg</td>
</tr>
<tr>
<td>Kiśme</td>
<td>40 Odus or Keyse</td>
</tr>
<tr>
<td>Odus</td>
<td>4 Odus</td>
</tr>
<tr>
<td>Odası</td>
<td>1 Odasi</td>
</tr>
<tr>
<td>Seviir</td>
<td>10 Odasi</td>
</tr>
<tr>
<td>Bebek</td>
<td>4 Bebek</td>
</tr>
<tr>
<td>Deng</td>
<td>4 Deng</td>
</tr>
<tr>
<td>Kent</td>
<td>5 Kent</td>
</tr>
<tr>
<td>Mukadd</td>
<td>24 Kent</td>
</tr>
<tr>
<td>Mukaddal</td>
<td>1 Mukaddal</td>
</tr>
<tr>
<td>Reul</td>
<td>14 Mukaddal</td>
</tr>
</tbody>
</table>

Set of Grain Weights

Dated in 1290 (1873)
KMA 396 (cat. 395)

The metric system was announced in 1861 and passed in 1870 (1863), and the set of weights was produced in Istanbul at the imperial brewery of Tabibacha. This set is incomplete, missing the 20 grain weight.
ARTY MARKET AT AN ENCAMPMENT DURING A MILITARY CAMPAIGN
Miniature from the Nastirnameh, 1544
TMM II 1985, ill. 96

STEEL SCALES
Chinese, 18th-19th century
8 3/16 in. long
INAA 681 (cat. 279)
The word arşın comes from the Persian arq, meaning cubit, the length from the elbow to the tip of the middle finger. Three types of arşın were used by the Ottomans, the minor arşın (architect’s arşın), the jırgalı arşın (market arşın) and the enzâler. Although the arşın was used throughout the Ottoman Empire, the units of weight is varied from region to region. Even the Istanbul arşín, which was recognised as the standard, has been found to vary over time. The Istanbul arşín originally measured 67.3 cm, but in the 19th century has been found to measure 68.579 cm. The term arşın measuring rods were made of boxwood, ebony, ivory, iron, or steel. These were used for measuring land or buildings under construction were known as the builder’s arşín or the architect’s arşín. In connection with the measurement of buildings, gardens or fields, the term arşín always referred to the architect’s arşín. Around the 16th century the architect’s arşín is thought to have been 75.8 cm, which exceeds both the market arşín and the enzâler. However, on the basis of documents concerning the construction of the Selimiye Mosque, Omer Lütü Barakan calculates the 16th century architect’s arşín at 73.333 cm.

 Attempts were made to standardise units of measurement for both weight and length and Sultan Selim III (1789-1807) had an architect’s arşín measuring rod made from ebony to serve as the standard. This measuring rod was kept at the Hagia Sophia Museum. It was marked in one side in 24 parts, each divided into 12 pits, and on the other divided into twenty equal parts, each subdivided into 10 pits, which in turn were divided into 10 molas.

DETAILS OF THE MARKS:
Left: Tags of Sultan Murad III
KMA 796 (cat. 294)

Right: Maker’s mark reading Hâşinski Anışa
KMA 791 (cat. 462)

In other words:
1 architect’s arşín = 24 parts = 288 hat = 3486 molas.

Metric equivalents:
1 architect’s arşín = 75.8 cm
1 jırgalı arşín = 73.3 cm
1 hat = 0.263 cm
1 mola = 0.00219 cm

An architect’s arşín rule made of iron during the reign of Sultan Selim III is today in the collections of Topkapi Palace Museum (TSM 2706). This rule is dated B 1213 (1800) and is stamped with two names, "Master Selimcan," whom we assume to have owned it, and "Hanan Bey," who is thought to be the maker. The rule has 16 knaps and is 62.3 cm long. The same museum also has a shorter half-arşín made of ebony with 12 knaps (TSM 20333), and a 73.5 cm long architect’s arşín rule made of ebony with 24 knaps (TSM 2706).

For excavation purposes, another unit of length called the kadiun was used:
1 kadiun = 1/2 architect’s arşín = 12 parts

The kadiun (kadiun) was used for excavations, laying wells, and measuring the depth of water. One kadiun was equivalent to 2.5 architect’s arşın.

Other units of length were as follows:
1 nil (mile) = 100 kadiun = 2500 architect’s arşın
1 fersis (league) = 3 nil = 7500 architect’s arşín
1 kendi or mescit = 4 fersis
1 mevarsh = 2 kendi
1 metre = 1,592.061 architect’s arşín or 1 architect’s arşín = 7 parts + 7 hat + 11 mola.

GEZ
A measuring rope with two scales stamped with a sign or other mark used for measuring land.
KMA 625 (cat. 122)
In the 19th century, we learn from various archive documents that examples of standard units of length were sent to provincial towns and cities for the purpose of checking those in use locally, as was the case for weights. A letter dated 26 Safer 1327 addressed to the Kayseri emir by the head district official of Tokat reports that two stamped arz ari measures required for checking those used locally had been manufactured at the Imperial Mint in a cost of 40 kuruş and sent to Tokat.

Mustafa Nasif Efendi Calendar of Hayri Nasif Efendi Calendar of Tokat Kayserikurum

Following this, we know that in 1876, the provincial official in Kayseri sent a report to the bureau of measurement in Istanbul, listing the specific units of length that were in use in the province and the standards of comparison that were available. The report included a list of the units of length, their descriptions, and the procedures for their use. The official also noted that the units were standardized and used consistently throughout the province.

From various sources we learn that measurement of land was carried out by means of measuring ropes known as " Önce", both of which were used in Surb Marz at the time of the 19th century. When local people encountered problems over the proper division of property, the board of trustees complained to the Council of State, which sent an arz ari measuring tape and a measuring rope of 75 åman (a metric unit) at each end, ordering the Lala of Bergos to measure the disputed land and resolve the dispute (DOAB, Milliye Museum, 22, p. 179).

A measuring rope of identical length was used for resolving a dispute over lands held by an infantry division in Balikesir. When it was discovered that the lands did not accord with the legal boundaries, some overstepping them and others falling short, a measuring rope of one metre åman (narrow or used for textiles) and a rope measuring 75 åman (large) sealed at both ends were sent. The lands of Balikesir, Melitian, Memetian, and the land registry clerk, Bozlu, were asked to measure the lands, and by adding these parts that were in excess to those that were less than the area prescribed in the deeds, to resolve the question so that the infantry had no cause for further complaint (DOAB, Milliye Museum, 34, p. 180, H. 386).
The garus argon or market argon was, as the name implies, used in shops and markets for retail goods, such as fabrics and spices. This unit of measurement was based on an average garus's length from the shoulder to the tip of the middle finger, and must have derived from use of the arm as a practical way of measuring items like cloth. Market argon measuring rods were made, like archictectural argon rods, of boxwood, iron or steel. One market argon was divided into eight equal parts, each referred to as a rod or argon, and these in turn were divided into two parts known as points. These fractional units arose from the need for more precise measuremenet.

- 1 market argon = 8 rods = 16 points
- 1 market argon = 68 cm
- 1 point = 1.476556 market argon, that is 1 market argon = 3 points + 1.5 points.

As a precaution against fraudulence, the Ottoman authorities inspected the argon measuring rods used by tradesmen and struck them with assay stamps if they were found to comply with the official standard. Sixteenth century documents recording complaints made to the Council of State reveal that some tradesmen cheated their customers by keeping a second measure to use instead of the stamped one that had been checked by the authorities. A written order dated 9 Cemalıyıliften 9 H. 353 (25 July 1577) concerns a fraud perpetrated by the sarpal (infantry captain) of Salonica, when purchasing bread from Jewish traders in the city for the annual needs of the janissaries. By measuring the bread with a measure that was longer than the legal standard, he defrauded the traders of their rightful due. An order was sent to the kadi of Salonica commanding him to measure the bread with a stamped argon rod (Midhat Mehmed, no. 31, p. 193, 494).

Cemal Mehmed

The stamped argon rods manufactured in Philippopolis conformed with the measurements of ancient custom, and that the measuring rods used were inspected and stamped.

A document written to the kadi of Philippopolis concerning that the length of these measuring rods produced in Philippopolis, conform with the measurements of ancient custom, and that the measuring rods used were inspected and stamped.

Cemal Mehmed

Concerning the use of stamped weights and graders in Sarosia

1924

Concerning the stamping of measuring rods in Philippopolis

The stamped argon rods manufactured in Philippopolis conformed with the measurements of ancient custom, and that the measuring rods used were inspected and stamped.
Endez rods were made of boxwood, iron or steel, like other measuring rods and rules. They were used by tradesmen for measuring cloth and similar articles. There are some endez rods in Topkapı Palace Museum, one made of ebony, with Krupp, and measuring 64.8 cm (TSM 27100), one of every measuring 64.4 cm (TSM 27116), and another of informal every measuring 64.5 cm (TSM 777).

Like the market yard, the endez was divided into eight equal parts known as modules, which were divided in turn into two parts known as grades. While the market yard was equivalent to 68 cm, the endez measured 68 cm. The similarity between the two units of length led to constant confusion.

1 endez = 8 modules = 16 grades
1 module = 8.125 cm
1 grade = 4.06 cm
1 meter = 1.538462 endez, or 1 endez = 0.65 grade.
One of the units of volume used as a grain measure by the Ottomans was the kile. Other grain measures were the qasil and kams. As in the case of other measures, the kile varied according to place and time, and even according to the type of grain. The standard kile, which was equal to 4 qasil, and 1 qasil to 2 kams, was the most commonly used unit of volume for grains. Measuring containers for the kile and its fractions were cylindrical, and their diameters were equal to their height.

<table>
<thead>
<tr>
<th>Measure and Height</th>
<th>Volume</th>
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<tbody>
<tr>
<td>Kile</td>
<td>97.7 dm³</td>
</tr>
<tr>
<td>(½) Kile 1/4 Kile</td>
<td>48.5 dm³</td>
</tr>
<tr>
<td>1/4 Kile</td>
<td>24.2 dm³</td>
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<tr>
<td>1/8 Kile</td>
<td>12.1 dm³</td>
</tr>
<tr>
<td>Kams</td>
<td>2.1 dm³</td>
</tr>
</tbody>
</table>

5/8 KILE MEASURE
Ottoman, 18th century
D. 20 cm
L. 22 cm
KMS 1527 (cat. 315)
KUTU MEASURE
Ottoman, 19th century
h: 175 mm
KMA E25 (cat. 588)

1/2 HALE MEASURE
Ottoman, 19th century
h: 180 mm
KMA E33 (cat. 599)
1/2 KILE MEASURE

Ottoman, 19th-20th century
h 255 mm
dia 122 mm
KMA 150 (cat. 512)

1/2 MEASURE

Ottoman, late 19th century
Produced at the Topkapı imperial furniture workroom
h 290 mm
dia 120 mm
KMA 594 (cat. 391)
From the time of the Great Seljuks (1038-1194) onwards, inspectors were appointed in Turkish cities to inspect the weights and measures used by tradesmen in shops and markets, as shown by surviving documents and objects. The famous Seljuk sultan, Nizam al-Mulk, wrote in his Nusretname that rulers should appoint inspectors (mahmalshaks) to check scales and prices in every city. Inspectors must check weights and so encourage honesty and prevent dishonesty.

The royal warrant issued to Nusreddin Ebu Bekir upon his appointment as superintendent of guilds and markets in Konya during the Anatolian Seljuq period (1075-1118) provides detailed information about his duties. These included inspecting weights and measures and prices, and ensuring that the weights used in the markets were accurate. A warrant for the office of superintendent of guilds and markets issued in Tunisia by Habib Kamil is an interesting example, illustrating that the traditions of the Anatolian Seljuqs continued in later periods. In a collection of letters entitled Risālīs-Resālī (Istanbul, Üsküdar Selim Ali Library, Nuruosmaniye Valide Sultan no. 122) thought to have been written in the late 11th century, another such warrant mentions the official inspection of weights and measures, and demands that their accuracy be ensured.

But the warrant for the office of superintendent of guilds and markets published by İsmail Tekin is one of the richest Turkish-language documents (İstanbul Üsküdar Üniversitesi 1932, pp. 10-11). For Rizālīs-Resālī see Mehmet Ertuğ, "Amar", 2001, vol. II, p. 482.
STEEL YARD
Ottoman, 16th-17th century
1,400 g
KMA 877 (cat. 265)

DETAIL
KMA 877 (cat. 265)
The manufacture of vendage is described in the text. It involves the collection and preparation of vendage, which is then used to make bread and other baked goods. The process includes the soaking of vendage in water, followed by the beating and cleaning of the grains. The resulting flour is then used to make bread and other baked goods.

Summary:

Bread of superintendence, who are granted warrants, pride of the great and powerful, who sets men on the path of righteousness, support of cities, sword of the spiritual law, who eliminates innovations contrary to religion. Hence, let him be given the title of inspector of vendage and marks for the city of Isfahan. From this day onwards, let him enforce the law. Let him severely punish those who steal, those who steal, those who steal, and those who steal. Let him set the prices for food, drink, clothing, and grain.

Let him inspect the storage of vendage, and see if it is sufficient. Let him inspect the storage of vendage, and see if it is sufficient. Let him inspect the storage of vendage, and see if it is sufficient. Let him inspect the storage of vendage, and see if it is sufficient.

Let him go on praying for the continuity of the state and the right to many rewards.
ENGRAVING WAVING BELAYING
By: Olaus Magnus, 1555
The figure in the left is using a balance or
scales for weighing.

STEELYARD FOR SALT
Ottoman, 16th-17th century
9 kg (17.8 lbs)
KM 1342 (cat. 480)
And may those who read this holy edict have complete faith in him.

Charges made for assaying and measuring were an important item of revenue for the Ottoman state. Documents concerning the assaying and stamping of weights and measures provided important information relating to the revenues thus raised. An entry in the register of accounts for the province of Antalya in 1533 refers to a tax called kili. They among these revenues in the city of Hıdıra.

Farmers purchased a stamped kili measure from the superintendent, and paid a fee for it and for the produce which they measured with it. The kili and graining measuring containers produced by tradesmen in the market were checked for accuracy and stamped. The assay charges made for this service were among the revenues of the office of superintendent of golds and silvers in Izmir. 5

Assay duties were also among the revenues of the same office in Rhodes, and were payable to the public exchequer of Rhodes Island. An order written to the kadi of Rhodes says that the officers of the weights and measures department, in order to prevent fraud and swindling, used stamped weights and measures, and punished those found using them.

20 DEMIR WİGHT
Ottoman, 18th century
Shaped with the replica of Suleimans II
L 295 mm
KRM 262 (cat. 501)

CONCERNING THE KILI MEASURE TO BE USED IN DAMASCUS FOR THE COLLECTION OF TITLES FOR PROVISIONING THE ARMY 1551
Mahtum Dur好消息, p. 12, b. 885.
The lack of a standard for the kile was a frequent cause of complaint in the 17th century. The lack of Bakiya explained in a letter to the Council of States that due to variations in the kile measure used in the district, the people were not getting proper value for their money, and said that the farmers of public revenues wanted the integer kile to be used in the district. Upon this reply, a order was sent to the lord of Marnara, who had carried out the land survey for the suzerene of Baki, asking him to investigate the situation and arrange for whichever kile measure was to be the advantage of the country and the treasury to be used.

Yuxarı.

Tığrak idarəsinin Osmanlı yatağının, II. 23 Rabi‘-el-vawzet, zaman 1770

Baki suad-i nazarı cəfər olunmuş Məmməd Əli Mədəniyyət Xəritələri kubbesi ki.

SET OF METRIC WEIGHTS
250 g, 500 g, and 1 kg.
Stamped with the year 1331/2 and the reign of Sultan Abdurrahman II.
Private collection.

SWYDOLES BEING PENALIZED AT THE INSPECTOR OF MARKETS

Malpractices and exceptions in weights and measures by tradesmen and market sellers were recorded by the court, and the offenders concerned applied the appropriate penalties. Flour dealers and bakers were inspected most frequently of all. The two documents given in transcription below concern malpractices in the selling of flour and bread. In the first case, Otman of Uskudar sold 5.5 kilo of flour which turned out to be 500 dhurms short. The misdemeanour was recorded in the court register. The second case concerns a baker named Karsanc, whose loaf was found to be 110 dhurms short, and this was recorded in the register.

South Asia: Intersections

Culinary practices, as reflected in the court records, have always been at the forefront of the legal system. The records of Ayasofya, the imperial mosque, and the Grand Bazaar, which was once the largest market in the world, are rich in documentation of culinary practices.

Sixteenth-century court records generally do not mention the penalties administered. Records of penalties are found from the eighteenth century onwards. For example, a document dated 14 Recep B 1179 (1709) states that a baker named Huseyin in Fatsiye who was found guilty of producing short weight bread was imprisoned for 24 hours in Buhazisi Castle, and only released on his undertaking not to produce short weight bread in his bakery again (Records of the Court of Istanbul no 25, p. 3).

Malpractices concerning bread were sometimes punished more severely. When the grand viceroy was inspecting the tradesmen of Istanbul in 1733, he discovered insufficiently baked bread in one bakery, and had the owner of the bakery ordered to a nearby wall by the court as a warning to others. Four bakers who ran a bakery in the vicinity of Kanounkapi and Terazie and whose loaves were found to be 1.1 to 1.2 dhurms short of the declared weight, were sentenced to imprisonment in Schezhehe Castle.

It appears that sometimes the inspector of guilds and markets or his men measured the powers of key tradesmen. An order written in the name of Aleppo states that a butcher named Ahmed in the city had been harassed by the inspectors. He claimed that they had wrongly accused him of selling short meat, taken him before the kadi, who fined him. In his statement, the butcher claimed that the inspector's men would come to his shop, purchase some meat and take it away, but later return, claiming that the meat was short weight. In response to his complaint, the kadi of Aleppo was commanded to ensure that meat that had been weighed and sold by the shopkeeper should not be taken away and declared short weight in another place.

EULYVA CELEBI'S ACCOUNT OF THE LAW CODE OF \textit{MIHRAB SANI} IN IRAN* 

This account by the 13th century writer Eulyma Celebi describes the display put on by the customs officers and the inspector of guilds and markets during a guild procession to mark a royal celebration. Each guild and department demonstrated their goods, skills, and duties to the spectators as they passed by. In this case, the event was on the river banks.

The supervision of customs, the chief officers, the deputy, the inspector of markets, and all the other men on the river banks, with the inspector leading, they were holding balances with golden and silver coins, weighing the goods in the presence of many spectators. The goods were weighed in front of the guild members, who were present to inspect them. The goods included silver, gold, and other precious items. The inspectors were dressed in fine clothing and carried a variety of items, including gold and silver coins.

As the end of all the measuring was reached, and all the measuring continued, as in all the other guilds, in the presence of all, there was no god but God. Also on their weights and balances, the name of God is inscribed. Over the balance of goods there is no other weight.

When someone wants to buy bread, drink, salt, or various vegetables, he chooses the finest and places them in the scale, and the goods are weighed. He pays the amount he chooses from the goods. Since his case is good, he has the right to buy the finest goods. Meat, bread, vegetables, barley, wheat, beans, chickens, peppers, onions, kumquat, and all the other foods on the market, to choose every kind of bread and drink is sold by weight according to prices set by the guilds.

When rice and other grains are bought, sold by weight. All are bought and sold by weight. Wise to his trade knows the weights. There is no god but God. Also on their weights and balances, the name of God is inscribed. They paid the price set by the guild.

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اکنون ماده ۳۳۴ مصون اواکی وزره مصوبه مساوی می‌باشد، ولی تیم‌دان
پذیرای اعضا ایستاده‌یا باید جزئی می‌باشد. همچنین، حفظ
اولین‌چندان

اکنون ماده ۳۳۴ مصون اواکی وزره مصوبه مساوی می‌باشد، ولی تیم‌دان
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اولین‌چندان

در دکتری ماده اراضی مساهت اینک ایسوس بعده مرطوب اون
پذیرای اعضا ایستاده‌یا باید جزئی می‌باشد. همچنین، حفظ

برخی‌ماده‌ه می‌باشند جهت اجرای مصون اواکی وزره مسایل و اپارتاژ واحد قابلی‌نیا انسانی اواکی از دارا نصف
به‌دست‌رکاونک اون منجر جزئی می‌باشد. مصوبه می‌باشد برای
پذیرای اعضا ایستاده‌یا باید جزئی می‌باشد. همچنین، حفظ

ویک اکسامة واهم‌اکس در دخ‌اعشاشر یک
The process of introducing the metric system began on 20 November 1846 (1847). Under this statute, the metre was accepted as the unit of length, and named the titre (decimal unit) to encourage public acceptance by use of the nicknamed term zeri (an alternative term for metre).

The new (100 square metres) became the unit used for land area; the cubic decimetre, named the titre (decimal unit of a cubic decimetre) and the litre the units of volume; and the destot (decimal degree) or gram the unit of weight. Under articles 2 and 7 of the new law a standard titre (a gramme) and a standard kilogramme weight were to be manufactured from platinum and kept in the Imperial Treasury. It is stated that the provision of the law were to go into effect for official transactions in March 1847, but that the general public could continue to use both old and new measures together until March 1848, when use of the old measures would be prohibited.

The first statute concerning the introduction of the metric system:

The first statute concerning the introduction of the metric system was promulgated in 1846. During the reign of Sultan Abdülmecid was promulgated by the Ottoman government in 1879. Given Kılıç's archive.

The metric system was introduced by the Ottoman government in 1846. The statute was promulgated in 1846. During the reign of Sultan Abdülmecid was promulgated by the Ottoman government in 1879. Given Kılıç's archive.

**Article 1.** The metre, which is a length equivalent to one part in 10 million of one quarter of the earth, is to be taken as the fundamental unit of all weights and measures in the Ottoman lands, where it will be known as the razi a‘ld. It is divided into decimeters.

**Article 2.** To serve as a standard a metre made of platinum shall be kept in the Imperial Treasury.

**Article 3.** The metre shall be the only unit of length and distance, and its tenth part shall be called a décimètre, or decimeter, and its hundredth part a centimètre or centimeter, and the length of 10,000 zeri shall be called a kilogramme or kilogram.

**Article 4.** For the measurement of land, a square whose sides each measure 10 metres shall be taken as the unit, and known as the kana‘re, and 10,000 square metres shall be known as a square kilometre or square kilometre.

**Article 5.** For measuring liquids and grain by volume, the unit shall be the cubic titre or cubic centimetre, also known as the litre. And one tank of this shall be known as a zeri or decimeter, and a multiple of one hundred of this measure is known as yazi or centimetre.

**Article 6.** The basic unit of weight shall be the gram, which is equivalent to the weight of a cubic centimetre of distilled water at a temperature of 4 degrees. The parts of the decimetre shall be known as the décimètre or decimeter and the yazi or centimetre, and one thousand decimetres as reckoned in kilograms. The weight of the kilogramme is equivalent to that of a cubic decimetre of distilled water at a temperature of 4 degrees. A multiple of 100 kilograms shall be called the kara‘a or kara‘a, and 1000 kilograms as the ton or tonne.

**Article 7.** A standard titri or slight weight equivalent to 1 kilogramme shall be manufactured from platinum and kept in the Imperial Treasury.

**Article 8.** Standards to be used for measures of area, length and weight shall be produced in accordance with the measurements specified in articles 1 and 2, and to indicate that the weights and measures used for buying and selling are in accordance with the standard, they shall be stamped and marked with a number indicating the quantity.

**Article 9.** As of the beginning of the month of March of the year 1847, government officers and local authorities throughout the Ottoman lands shall carry out all transactions in accordance with the new weights and measures standards.

**Article 10.** Until the month of March of the year 1849, the public may continue to use the old measures. But over this period, by converting all the old measures used in every kind of contract into new measures, the inclusion of these new measures shall be compulsory, and contracts that will go into effect after March 1849 shall no longer include old weights and measures.

**Article 11.** As of March 1849, it will be obligatory for everyone in the Ottoman lands to use the new measures, and old weights and measures will be entirely prohibited.

**Article 12.** Tables for converting the old measures to newer and, the new to old, shall be drawn up and printed.

**Article 13.** These new measures and the metric system shall be taught at all schools.

**Article 14.** The provisions of this law shall not apply to the weighing and issuing of weights and coins as these are in force for legal procedures, or in the special weights used for precious goods.

**Article 15.** In accordance with this statute, all necessary regulations shall be drawn up for the practical implementation and use of the new system in Ottoman territory.

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2. The word yazi, a unit of weight traditionally equivalent to 1000 decimeters, was converted to kerest and razi in modern Turkish books and articles.
3. Eski Osmanlı, 187 i. s. 744.
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<thead>
<tr>
<th>Unit</th>
<th>Quantity</th>
<th>Explanation</th>
</tr>
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<td>ro</td>
<td>1</td>
<td>The length of a pitch or mark is one part in ten million parts of a strip one part of a strip one part of a strip</td>
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<tr>
<td>metric ton or kilogram</td>
<td>1,000</td>
<td>It is the basis for all other measurements.</td>
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<tr>
<td>nautical mile or nautical league</td>
<td>1,852</td>
<td>A length of 1,852 metres.</td>
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<tr>
<td>fractional measures</td>
<td></td>
<td>The basic unit of measurement is the unit.</td>
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<tr>
<td>dozen</td>
<td>0.01</td>
<td>One thousandth part of a metre.</td>
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<tr>
<td>acre</td>
<td>0.4047</td>
<td>An area of one acre.</td>
</tr>
<tr>
<td>inch or foot</td>
<td></td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>yard or link</td>
<td>1.094</td>
<td>It is equivalent to a square whose sides are each 0.00546 metres.</td>
</tr>
</tbody>
</table>

### Length Measurements

<table>
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<th>Quantity</th>
<th>Explanation</th>
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<tr>
<td>ro</td>
<td>1</td>
<td>The length of a pitch or mark is one part in ten million parts of a strip one part of a strip</td>
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<td>It is equivalent to a square whose sides are each 0.00546 metres.</td>
</tr>
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### Liquid and Grain Measures

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<th>Quantity</th>
<th>Explanation</th>
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<td>bushel or barrel</td>
<td>100</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>gallon or hogshead</td>
<td>8.3281</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>peck or bushel</td>
<td>0.0275</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>quart or quartine</td>
<td>0.000361</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>dram or scruple</td>
<td>0.000041</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>ounce or ounceine</td>
<td>0.000013</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>grain or cornell</td>
<td>0.000002</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
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</table>

### Weights

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<th>Explanation</th>
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</thead>
<tbody>
<tr>
<td>dekagram or dekalogram</td>
<td>1.1023</td>
<td>It is equivalent to a square whose sides are each 0.0125 metres.</td>
</tr>
<tr>
<td>kilogram or kilogram</td>
<td>1.0000</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>nautical mile or nautical league</td>
<td>1.852</td>
<td>A length of 1,852 metres.</td>
</tr>
<tr>
<td>fractional measures</td>
<td></td>
<td>The basic unit of measurement is the unit.</td>
</tr>
<tr>
<td>ton or tonne</td>
<td>1.0000</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>cwt or centner</td>
<td>1.0000</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>fractional measures</td>
<td></td>
<td>The basic unit of measurement is the unit.</td>
</tr>
<tr>
<td>pound or poundine</td>
<td>0.4536</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>half or halfine</td>
<td>0.2268</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>drachm or scruple</td>
<td>0.000115</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>ounce or ounceine</td>
<td>0.000035</td>
<td>It is the basis for all other measurements.</td>
</tr>
<tr>
<td>dram or scruple</td>
<td>0.000012</td>
<td>It is the basis for all other measurements.</td>
</tr>
</tbody>
</table>

After the statute was promulgated, a set of regulations consisting of 64 items divided into six sections was drawn up concerning the implementation and inspection of the new measures. The regulations concern all officials, the inspection of transactions using the new measures, penalties, the issue of measuring instruments and weights. According to the first two sections of the regulations, a stamped example of each new standard weight and measure was to be provided to every city for the purpose of inspection. An official responsible for implementing and inspecting the new system of measures was to be appointed in every town and district, and the public would not be allowed to use any measures, weights, balances or steel bars that had not been stamped by these officials. Manufacturers of measuring equipment would not be able to sell these before they had been inspected and stamped, and all weights and measuring equipment would be checked annually.

The third section of the regulations deals with penalties for fraudulence relating to weights and measures. Those who issued documents not in accordance with the law, and those using unstamped weights and measuring equipment, violators of the law were to be punished under Article 202 of the Criminal Code.

The fourth section again refers to legislation concerning penalties for fraudulence relating to weights and measures.

The fifth section concerns the examination of the weights and measures. The examination was to be made according to the types of weights and measuring equipment and was to be done separately.

The sixth section concerns the physical characteristics of the new weights and measures, and ways of using them.
Below is the full text of these regulations:

Section 1: Concerning Weights and Measures Inspector

Article 1: The implementation and inspection of measures used in commercial transactions shall be the responsibility of special officials. The appointment of these officials and their dismissal from office shall be carried out by means of memorandums from the local governments to the Ministry of Interior.

Article 2: Any inspector of measures shall be appointed for each province, but if necessary assistant inspectors shall be appointed to carry out their duties. The same conditions and specifications shall apply to them as for the inspectors.

Article 3: Inspectors of measures shall not at the same time be engaged in trades or professions relating to weights and measures.

Article 4: Candidates for the post of inspectors of measures shall not be appointed unless they pass an examination based on a booklet containing the information required for inspection of measures. They cannot commence work until they have been sworn in before a judge.

Article 5: Every provincial capital shall have a set of sufficient examples that have been checked against the weights and measures standards at the Ministry of Interior and stamped accordingly. At least every ten years, these examples shall be checked against the standards kept at the Ministry of Interior, and similarly those examples kept in sufficient quantities in the main cities of subprovinces shall be checked against those in the provincial capitals once every two years. As well as these examples in the provincial capitals and main cities of subprovinces, pictures of the new measures shall be kept to show those who request information.

Article 6: The stamps required by the provinces for marking assayed weights and other measuring equipment shall be manufactured by the Ministry of Interior, and the stamps used to mark new measuring equipment shall be different from those used for the annual0 assigning of such equipment. The first of these shall be referred to as the principal stamp and the second as the inspection stamp.

Article 7: The examples and stamps kept in the office of the weights and measures inspector shall be in the safe keeping and his responsibility, and under the supervision of the local authorities.

Article 8: Salaries payable to the inspectors and their assistants shall be set by the Ministry of Interior. The cost of stationary required for inspectors carried out in the office, the expenses incurred in the process of printing, and expenses for the maintenance and transportation of instruments required in the course of inspection shall be paid separately. Posting expenses may where necessary be added to the specified salaries. Sample weights and measures shall be kept in a place kept up by the local authorities, and where inspectors are exceptionally required to travel outside their own districts, the costs of this will be paid separately.

Article 9: The implementation and inspection of the new measures in important and the Three Regions, and the selection and appointment of the necessary inspectors of weights and measures shall be the responsibility of the municipality. The appointment of officials to other cities and towns subordinate to central government, and general procedures, shall be carried out by the Gendarme Command, as for the provinces.

Section 2: Implementation of New Measures and Their Inspection

Article 10: Newly manufactured weights and measuring devices shall be shown to the

office of the inspector of weights and measures for assigning and stamping before being used for commercial transactions. Those that do not comply with the specifications laid down by the government will not be accepted for stamping. The weights and measures that have not been stamped by the inspector may not be sold anywhere or used.

Article 11: The names for the various weights and measures of the decimal system that has been adopted shall be written clearly and legibly upon them. Those weights and measures which do not comply with this requirement will not be accepted for assigning, and may not be used for commercial transactions. Only in the case of weights and measures whose size is so usual as to make it impossible for the writing to fit may be exempted from this regulation on condition that a special permit is obtained from the Ministry of Interior. The weights and measures presented to the office of the inspector must comply in appearance, type of metal, and other specifications to the weights or measure in question.

Article 12: Before weighing equipment such as balances and steelyards may be used for commercial transactions, they must be presented to the office of the inspector for inspection and stamping, and inspected and stamped each year in case damage has occurred to them.

Article 13: Tradescants engaged in the manufacture and sale of measuring equipment cannot put their goods on sale before they have been checked and stamped, and the measuring equipment they use for their own trade must be inspected and stamped every three years.

Article 14: Local authorities must organize and arrange for the annual inspection of all weights, measures, balances and steelyards, according to an appropriate schedule.

Article 15: The inspector is obliged to complete his inspection of the places for which he is responsible every year, and to go to the shops of the tradesmen and merchants registered in the book reserved for this purpose. He will inspect and stamp the weights and measures presented to him so long as they meet the minimum specifications and are in excess of them. He shall record them all in a book which shall be signed and sealed by the tradesmen and merchants, and those among whom they are illegible and have no seal or hinge shall avoid signing or setting their seal, shall be recorded in the book and presented with a voucher having a stake.

Article 16: The inspectors shall go to every small town and village, and after performing their duties shall mark the place name in the aforementioned book together with the date, and this shall be endorsed and sealed by the local council of elders.

Article 17: If the local authority sees fit, the annual assay for weights and measures may take place in the nearest main town, and the tradesmen from those small towns or villages required to come to the main town for this purpose.

Article 18: Interest in tradesmen using weights and measures should take them to the office of the inspector in the subprovince where they are situated during the month of March every year for the purpose of inspection and paying the fees due, in return for which they will receive an official receipt.

Article 19: Weights and measures used by government officials shall be inspected by an inspector every year in accordance with the procedure used for tradesmen and merchants.

Article 20: In accordance with Article 14, it is forbidden that there should be any weights and measures that have not been inspected, whether belonging to tradesmen and merchants, or those used by government officials, at the end of the prescribed period, or that such be used.

Section 3: Concerning the Inspection of Purchasing and Selling Procedures Using the New Measures

Article 21: Inspection of goods and commodities to be sold by the new measures in the
responsibility of the local authority.

Article 22. Municipal officers and grademates shall inspect shops, marketplaces, fairs and other places where coins are sold in accordance with the powers and duties of their office, to see that the measuring equipment is up to standard, is being used correctly, and bears clearly struck assay stamps; and that since the previous inspection these have not been damaged or exchanged, and that the stamps are still in place. In the event of any circumstances in violation of the regulations, they shall confiscate such equipment, seal them, and report the matter to the local authority for the necessary steps to be taken.

Article 23. As well as the inspection of weights and measures in accordance with Article 14, governors must obtain permission from the Ministry of Interior for initiating any procedures and precautions regarding weights and measures not laid down in these regulations.

Article 24. Inspectors shall check and report the measures used by traders and merchants on their own initiative or in accordance with orders received from the local authority.

Article 25. Inspectors shall confiscate any weights and measures other than those specified in the table, and similarly with damaged or short weights and measures, or those which lack the correct number of assay stamps, and deliver these to the local authority.

Article 26. As well as confiscating prohibited weights and measures as stated in the previous article, the inspectors shall investigate how these were sold or obtained, for how long they have been used, and other relevant information, which they shall then present to the authorities immediately and report the situation.

Article 27. If any trader or shopkeeper is not present when the local authority arrives, the inspector shall order them to appear at their shop in 24 hours.

Article 28. Inspectors are permitted to enter shops that they find open at night for the purpose of inspection. Inspectors are also permitted to enter their premises for the purposes of inspection at any time, officers may be appointed by the authorities to enforce the right of the inspector to enter.

Article 29. Circumstances in violation of regulations discovered by the inspectors in the course of their examination shall be recorded in their own handwriting, signed, and submitted to the local authority within 24 hours.

Section 4: Penalties

Article 30. Any person who draws up advertisements, bills of exchange, or account books that violate articles 10 to 11 of the Imperial Decree on Weights promulgated on 204th (20th) of May of the year 1286 and 14 September of the year 1285 (1969), shall be fined and their respective items shall be seized and destroyed by the authorities. In addition, to the person who issued the advertisement, bill of exchange, or account book, a fine of ten thousand to twenty-five thousand dinars shall be imposed. A fine of five hundred to one thousand dinars shall be imposed on the person who received the advertisement, bill of exchange, or account book.

Article 32. Merchants, traders, and craftsmen found in the possession of unstamped metric weights and measures in their shops, factories, fairs or markets shall likewise be subject to the penalties under Article 30 of the Imperial Criminal Code.

Article 35. Forgers of assay stamps for the new measures, anyone found reselling these, or using measures that have been struck with such forged stamps shall be punished in accordance with Article 35 of the Imperial Criminal Code.

Section 5: Concerning Discs to Be Charged for Assaying and Stamping

Article 36. Discs to be charged for assaying and stamping the new weights and measures shall be as shown below.

Article 37. Weights and measures being used by government officers shall be charged at the same rate.

Article 38. Discs set and charged in each district shall be delivered to the local finance office or to the special registers, and these registers shall be stamped jointly by the inspectors of weights and collectors of duties.

Article 39. All new measures that pass through customs, whether from foreign countries or from the interior, shall be marked, and not delivered into the possession of their owners until the dues owing have been paid.

Article 40. Once the original assay stamp has been struck on new weights and measures presented by manufacturers, that year's inspection stamp shall be struck free of charge.

<table>
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<th>Item</th>
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<td>1</td>
</tr>
<tr>
<td>34</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>35</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>38</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
### Section 6: Concerning the Forms and Specifications of New Weights andMeasuring Instruments

**Article 41:** From the beginning of March of the year 1287, the old weights will not be accepted for assaying. However, those which are already stamped will be inspected until the year 1289.

**Article 42:** The use of the new weights and measures must accord with the conditions laid down in the articles below.

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>For all kinds of grain bins, for each section and multiple</td>
</tr>
<tr>
<td>20</td>
<td>For each fixed measuring container equally</td>
</tr>
<tr>
<td>8</td>
<td>For each 40 litres liquid measuring container</td>
</tr>
<tr>
<td>10</td>
<td>For each 20 litres liquid measuring container</td>
</tr>
<tr>
<td>8</td>
<td>For each additional litre of liquid measuring container</td>
</tr>
<tr>
<td>5</td>
<td>For each fixed measuring container of 30 litres (grams) or less</td>
</tr>
</tbody>
</table>

**Notes:**
- For each fixed measuring container of 100, 200 or 500 litres (grams) or less |
- For each 40 litres liquid measuring container |
- For each 20 litres liquid measuring container |
- For each 10 litres liquid measuring container |
- For each additional litre of liquid measuring container |
- For each fixed measuring container of 30 litres (grams) or less |

---

**MEASURING DEVICES FOR LENGTH**

**Article 43:** Measuring devices for length shall be of eight types: the first, 20 zirk’s 1/10 (20 metres), the second 30 zirk’s 1/10 (10 metres), the third 5 zirk’s 1/10 (5 metres), the fourth 2 zirk’s 1/10 (2 metres), the fifth 1 zirk’s 1/10 (1 metre), the sixth ½ zirk’s 1/10 (½ metre), the seventh ¼ zirk’s 1/10 (¼ metre), and the eighth 1/8 zirk’s 1/10 (1 decimeter).

**Article 44:** Measuring devices for lengths specified in the previous article shall be made of metal, wood or other strong materials. Their form and size may be of the type to Cassanary local use. For convenience of manufacture and transportation, these devices consisting of several parts shall consist of 2, 3 or 11 parts.

**Article 45:** Wooden rules measuring 1 zirk’s 1/10 (1 metre), 2 zirk’s 1/10 (2 metres) or half a zirk’s 1/10 (half a metre) shall be reinforced with metal at each end, and clearly and accurately graduated in zirk’s 1/10 (1 mm) and in Zirk’s 1/10 (1 mm) and marked with their denominations, and the name or sign of their makers. Measures of 20 zirk’s (20 metres), 30 zirk’s (30 metres) and 5 zirk’s (5 metres) used for measuring streets and land, shall consist of sections marked by rings. Each section half a zirk (5 decimeters) in length, the sections to consist of from iron rods. The use of tape measures and steel tape measures is allowed.

**Article 46:** Measuring devices for grain and liquids shall be in the form of cylinders whose height is equal to their diameter. These shall be produced in 10 denominations with the diameters and heights as shown below:

<table>
<thead>
<tr>
<th>Height (inches)</th>
<th>Diameter (inches)</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.6</td>
<td>1 Zirk</td>
</tr>
<tr>
<td>1.5</td>
<td>0.6</td>
<td>2 Zirk</td>
</tr>
<tr>
<td>0.75</td>
<td>0.6</td>
<td>3 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.6</td>
<td>4 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>5 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.4</td>
<td>6 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.3</td>
<td>7 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.25</td>
<td>8 Zirk</td>
</tr>
</tbody>
</table>

**Notes:**
- Measuring containers of these diameters and heights must be perfectly cylindrical, and their capacity not significantly affected by iron or other materials on the inner surface. In the event of parts made of iron or other materials affecting the capacity, the container must be enlarged accordingly.

**Article 47:** Measuring containers for grain made of copper, tin or wood shall be reinforced around the rim by a band of iron or copper tubing towards the wood. But for measuring containers of 10, 20 or 30 (decilitres) or more, they must also be reinforced by iron bands at the sides. And sometimes these have three feet. These containers are made of hardwoods such as wanut, oak, chestnut or beech. The capacity of measuring container must be marked by name.

**Article 48:** Hydrometers measuring instruments may be constructed in the form of boxes for the sake of lightness and convenience. In that case they should be 5 decimeters in length, 5 decimeters in width, and 4 decimeters in height. Or if such containers are constructed as vessels, the inside length of each side should be 464.2 millimeters.

**Article 49:** Measuring containers for liquids with a capacity ranging from 1 hectolitre down to half a deciliter (5 decilitres) shall have the heights and diameters as shown in the table below, and must be made of well turned copper, sheet iron or cast iron. And containers with a capacity ranging from 2 deciliters (2 litres) to 5 decilitres shall be made of tin, without lids, and generally have handles. Their inside heights should be twice their diameters, as shown in the table below:

<table>
<thead>
<tr>
<th>Height (inches)</th>
<th>Diameter (inches)</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.6</td>
<td>1 Zirk</td>
</tr>
<tr>
<td>1.5</td>
<td>0.6</td>
<td>2 Zirk</td>
</tr>
<tr>
<td>0.75</td>
<td>0.6</td>
<td>3 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.6</td>
<td>4 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>5 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.4</td>
<td>6 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.3</td>
<td>7 Zirk</td>
</tr>
<tr>
<td>0.5</td>
<td>0.25</td>
<td>8 Zirk</td>
</tr>
</tbody>
</table>

**Notes:**
- Measuring containers of these diameters and heights must be perfectly cylindrical, and their capacity not significantly affected by iron or other materials on the inner surface. In the event of parts made of iron or other materials affecting the capacity, the container must be enlarged accordingly.
Article 50: A proportion of more than 18 percent lead in the tin used for the measuring containers described above is forbidden, and each container must be marked with the name of its capacity.

Article 51: Containers made of white tin are used for measuring milk. The heights of these must be equal to their diameters, and on the side they may have small hooked handles and sometimes lids.

WEIGHTS

Article 52: Weights made of cast iron are used for weighing heavy articles ranging from 50 kilograms to 1 kilogram. Such weights should have the following six denominations.

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Dimensions and Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 kg</td>
<td>19.6 cm x 7.4 cm</td>
</tr>
<tr>
<td>25 kg</td>
<td>19.6 cm x 7.4 cm</td>
</tr>
<tr>
<td>10 kg</td>
<td>19.6 cm x 7.4 cm</td>
</tr>
<tr>
<td>5 kg</td>
<td>19.6 cm x 7.4 cm</td>
</tr>
<tr>
<td>1 kg</td>
<td>19.6 cm x 7.4 cm</td>
</tr>
</tbody>
</table>

Article 53: 56 kilogram weights and 20 kilogram weights should be in the form of uncut quadrilateral pyramids, and the shape of other iron weights shall be truncated hexagonal pyramids. All should have a cast-iron ring attached to the upper surface by a strong and well-centered nail. And each weight should be clearly marked with the denomination, and the name or sign of the maker should be stamped on the base of the handle.

Article 54: Weights made of brass shall have the following 14 denominations ranging from 20 kilograms to 1 gram. And the shape of all of them shall be a cylinder whose height is equal to its diameter, with a knob at the top. And the height of the knob shall be half the diameter of the weight. The denomination and unit of the weight shall be engraved clearly and lightly on the upper part of the base or on the summit of the knob. In the case of 2 dinhars (2 grams) and 1 dinhar (0.5 grams) weights, the diameter needs to be slightly more than the height so that there is space for writing this information. In addition, each weight must bear the name or sign of the maker.

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Dimensions and Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>25 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>10 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>5 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>1 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.5 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.2 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.1 kg</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.5 g</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.2 g</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
<tr>
<td>0.1 g</td>
<td>24.5 cm x 24.5 cm</td>
</tr>
</tbody>
</table>

Article 55: The manufacture of hollow weights made of brass and in the form of truncated cones, so that they may be stacked one inside the other, is permitted. Such weights are placed in a labeled box, also made of brass, and with space for a balance. Such a set of weights must consist of the following:

<table>
<thead>
<tr>
<th>Pieces</th>
<th>Dinhars (Grains)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>200</td>
</tr>
<tr>
<td>5</td>
<td>500</td>
</tr>
<tr>
<td>10</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Using such a set of 12 weights ranging from 1 dinhar (0.5 grams) to 1,000 dinhars (grams) it is possible to weigh any intermediate value.

Article 56: The weights used by grocers, green grocers and similar shopkeepers are usually of the type known as flat weights. These consist of one ring weights made of brass and each fitting into the other. Like other weights these must be marked with their denomination and the name or sign of their makers.

Article 57: Fractions of a dinhar (gram), that is small weights, are made from sheet brass. They are in the form of squares with clipped corners. One set consists of nine weights, which should be marked with the denominations and units ranging from 1 milligram to 1,000 milligrams (1 gram), as shown in the table below.

<table>
<thead>
<tr>
<th>Pieces</th>
<th>Denominations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5/8 dinhar</td>
</tr>
<tr>
<td>2</td>
<td>1 dinhar</td>
</tr>
<tr>
<td>5</td>
<td>2.5 dinhars</td>
</tr>
<tr>
<td>10</td>
<td>5 dinhars</td>
</tr>
<tr>
<td>20</td>
<td>10 dinhars</td>
</tr>
<tr>
<td>50</td>
<td>25 dinhars</td>
</tr>
<tr>
<td>100</td>
<td>50 dinhars</td>
</tr>
<tr>
<td>500</td>
<td>250 dinhars</td>
</tr>
<tr>
<td>1,000</td>
<td>500 dinhars</td>
</tr>
</tbody>
</table>

Article 58: It is permissible to use combinations of the five types of weight described and defined above.
Article 49: Three types of weighing devices are used for weighing goods. The first is the ordinary balance, the second the weighting machine, and the third the steel balance.

Article 50: It is essential for all that the beam be strong enough not to bend under the weight of the objects placed on the pans, secondly that the points from which the pans are hung and the balance points of the beam be in line, and finally that the two halves of the beam be exactly equal.

Article 51: The sensitivity and adjustment of the balance must be such that it measures within a few milligrams a weight placed in one of the pans.

Article 52: Steel balances should have the same degree of sensitivity as balances, and are adjusted, in accordance with the instruction, to within 1 milligram.

Article 53: Since it is impossible to guarantee that measuring devices should be completely accurate, apart from the measures of 20 and 15 milligrams in length used for measuring areas, short measurements are never accepted, but a slight excess is acceptable. Measuring rods of 20 milligrams may vary by a maximum of 3 milligrams less or more, and 1.5 milligrams in every 2 or 5 millimeters for measures of smaller dimensions. For fractional measures only, excess variations are accepted as follows:

<table>
<thead>
<tr>
<th>Permitted Maximum Excess Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
</tr>
<tr>
<td>2 millimeters</td>
</tr>
<tr>
<td>1 millimeter</td>
</tr>
<tr>
<td>1/2 millimeter</td>
</tr>
</tbody>
</table>

Article 54: The maximum excess variations allowed for capacity measures are 1/500 for metal containers and 1/100 for wooden containers. For example, a hectoliter measure of wood may have an excess capacity of up to 1 liter, and a kilo (1,000 kilograms) measure of metal may have an excess capacity of up to 2 kilograms. Metal measuring containers with a capacity of 2 liters or less may have a maximum excess capacity of 1/2 liter.

Maximum excess variations for weights are shown in the table below:

<table>
<thead>
<tr>
<th>Iron weight</th>
<th>Maximum excess variation</th>
<th>Copper weight</th>
<th>Maximum excess variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 kilograms</td>
<td>20 grams</td>
<td>20 milligrams</td>
<td>10 milligrams</td>
</tr>
<tr>
<td>20 kilograms</td>
<td>10 grams</td>
<td>10 milligrams</td>
<td>8 milligrams</td>
</tr>
<tr>
<td>1 ton</td>
<td>2 grams</td>
<td>3 kilograms</td>
<td>15 milligrams</td>
</tr>
<tr>
<td>1.5 tons</td>
<td>1 gram</td>
<td>2 kilograms</td>
<td>10 milligrams</td>
</tr>
<tr>
<td>2 tons</td>
<td>0.5 gram</td>
<td>1 gram</td>
<td>5 milligrams</td>
</tr>
<tr>
<td>2.5 tons</td>
<td>0.3 gram</td>
<td>0.5 gram</td>
<td>3 milligrams</td>
</tr>
<tr>
<td>3 tons</td>
<td>0.2 gram</td>
<td>0.2 gram</td>
<td>2 milligrams</td>
</tr>
<tr>
<td>3.5 tons</td>
<td>0.1 gram</td>
<td>0.1 gram</td>
<td>1 gram</td>
</tr>
<tr>
<td>4 tons</td>
<td>0.1 gram</td>
<td>0.1 gram</td>
<td>1 gram</td>
</tr>
</tbody>
</table>

5. Although the date of these regulations is shown on page 7 of the Code, Direct CIII (908) is not recorded in the law code, it has been drawn up after the law code (which is dated 14 September 1328/1860).

However, a memorandum from the office of the grand vezir dated 28 March 11/1298 (1883) indicates that the metric system introduced by the statute of 1869 had still not been generally accepted. In this memorandum Grand Vezir, among others, gives one month to present the new weights and measures, after which they will become compulsory.

25 Searal 11/1298 and 11 September 1329 (21st solar eclipse) and 23 September 1381 (AD)

Article 5: The units that are to be used in the Ottoman lands are in order: the karama, the karama, the karama, and the karama. The distance of 1000 meters is in the area known as the karama. Article 6: The area is equal to 100 square kilometers, 100 square kilometers, and 100 square kilometers. Article 7: The new standard is in the area of 100 square kilometers, or a square of which each side measures 10 kilometers. Article 8: The new standard is in the area of 100 square kilometers, or a square of which each side measures 10 kilometers. Article 9: The new standard is in the area of 100 square kilometers, or a square of which each side measures 10 kilometers. Article 10: The new standard is in the area of 100 square kilometers, or a square of which each side measures 10 kilometers.

6. Ottoman Navi Fikr, Muslim's Weight - Accurate Information, C.V.I., 1968.6.3. 8. F. Frenkel explains the new metric weights and measures system to be part of a general movement among the great powers. The movement was the result of competing trade relations with Europe in the 19th century, and the Ottoman Empire was not immune to the changes.

7. Ottoman Navi Fikr, Muslim's Weight - Accurate Information, p. 179.
Table of new measurements:

<table>
<thead>
<tr>
<th>Measurement of length, distance and area</th>
<th>Liquid and dry measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 new arpent = 19 permych</td>
<td>1 new Cuba = 10.9 dipul</td>
</tr>
<tr>
<td>1 permych = 10 jut</td>
<td>1 new dipul = 10.9 jut</td>
</tr>
<tr>
<td>1 jut = 10 ok</td>
<td>1 new ok = 10 ok</td>
</tr>
<tr>
<td>1 ok = 0.000 acres</td>
<td>1 new ok = 0.000 acres</td>
</tr>
<tr>
<td>1 dipul = 0.000 sqm</td>
<td>1 new dipul = 0.000 sqm</td>
</tr>
<tr>
<td>1 sqm = 0.000 square sqm</td>
<td>1 new sqm = 0.000 square sqm</td>
</tr>
<tr>
<td>1 new ok = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
<tr>
<td>1 new hectare = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
</tbody>
</table>

Table of old units of measurement:

<table>
<thead>
<tr>
<th>Measurement of length, distance and area</th>
<th>Liquid and dry measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bessarabian arpent = 54 permych</td>
<td>1 kayakist bushel = 4 plak</td>
</tr>
<tr>
<td>1 permych = 12 jut</td>
<td>1 yoker = 2 bina</td>
</tr>
<tr>
<td>1 jut = 1 ok</td>
<td>1 kayakist = 400 alms</td>
</tr>
<tr>
<td>1 alms = 0.001604 sqm</td>
<td>1 ok = 0.01604 sqm</td>
</tr>
<tr>
<td>1 sqm = 0.0602 new arpent</td>
<td>1 jut = 0.0602 new arpent</td>
</tr>
<tr>
<td>1 new arpent = 0.0602 sqm</td>
<td>1 new ok = 0.000 sqm</td>
</tr>
</tbody>
</table>

Conversion table for old units of measurement:

<table>
<thead>
<tr>
<th>Measurement of length, distance and area</th>
<th>Liquid and dry measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bessarabian arpent = 54 permych</td>
<td>1 bina bushel = 0.758 new ok</td>
</tr>
<tr>
<td>1 permych = 12 jut</td>
<td>1 kayakist = 0.56 new ok</td>
</tr>
<tr>
<td>1 jut = 1 ok</td>
<td>1 alms = 0.001604 sqm</td>
</tr>
<tr>
<td>1 alms = 0.001604 sqm</td>
<td>1 ok = 0.01604 sqm</td>
</tr>
</tbody>
</table>

Conversion table for new units of measurement:

<table>
<thead>
<tr>
<th>Measurement of length, distance and area</th>
<th>Liquid and dry measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 new arpent = 19 permych</td>
<td>1 bina bushel = 0.758 new ok</td>
</tr>
<tr>
<td>1 permych = 10 jut</td>
<td>1 new dipul = 10.9 jut</td>
</tr>
<tr>
<td>1 jut = 10 ok</td>
<td>1 new ok = 10 ok</td>
</tr>
<tr>
<td>1 ok = 0.000 acres</td>
<td>1 new ok = 0.000 acres</td>
</tr>
<tr>
<td>1 dipul = 0.000 sqm</td>
<td>1 new dipul = 0.000 sqm</td>
</tr>
<tr>
<td>1 sqm = 0.000 square sqm</td>
<td>1 new sqm = 0.000 square sqm</td>
</tr>
<tr>
<td>1 new ok = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
<tr>
<td>1 new hectare = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
</tbody>
</table>

Length:

- 1 new ok = 1.025645 new ok
- 1 new dipul = 1.025645 new dipul

Volume:

- 1 cubic new ok = 1.109037 cubic new ok
- 1 cubic new dipul = 1.109037 cubic new dipul

Convenient tables for new units of measurement:

<table>
<thead>
<tr>
<th>Measurement of length, distance and area</th>
<th>Liquid and dry measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 new arpent = 19 permych</td>
<td>1 bina bushel = 0.758 new ok</td>
</tr>
<tr>
<td>1 permych = 10 jut</td>
<td>1 new dipul = 10.9 jut</td>
</tr>
<tr>
<td>1 jut = 10 ok</td>
<td>1 new ok = 10 ok</td>
</tr>
<tr>
<td>1 ok = 0.000 acres</td>
<td>1 new ok = 0.000 acres</td>
</tr>
<tr>
<td>1 dipul = 0.000 sqm</td>
<td>1 new dipul = 0.000 sqm</td>
</tr>
<tr>
<td>1 sqm = 0.000 square sqm</td>
<td>1 new sqm = 0.000 square sqm</td>
</tr>
<tr>
<td>1 new ok = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
<tr>
<td>1 new hectare = 10.9 hectares</td>
<td>1 new hectare = 10.9 hectares</td>
</tr>
</tbody>
</table>

Volume:

- 1 cubic new ok = 1.109037 cubic new ok
- 1 cubic new dipul = 1.109037 cubic new dipul
Using the Aforementioned Tables

To convert a specific quantity measured in an old unit into a new unit, it is necessary to multiply the metric equivalent of the old unit by the relevant number of old units. The result of this calculation gives the number of new units. If, on the other hand, it is desired to convert a specific quantity measured in new units into old units, then the amount of new units must be multiplied by the equivalent of the new unit in old units. The result of this calculation gives the number of old units.

For example, if you wish to know the equivalent of 3253 endars in arai, look on the table for the equivalent of 1 new arai in endars, which is 1.472558, and multiply this by 3253, which will give the result of 4715.99 arai. If you convert the decimal value to the fractional units of endars (one quarter of an arai) and peacs (half a peac), you will obtain 445 arai 4 ratl and 1.4 peacs.

Third example: If 1 endar of cloth costs 27 kams, and you wish to find the price of 1 new arai of the same cloth, multiply 27 by 1.538462, which is the equivalent of the new arai in endars, and you will find that 1 new arai of cloth costs 41.34 kams, that is 41 kams and 22 peacs.

Fourth example: If the area of a room is 187 square endars, and you wish to know the price in new arai square, multiply 187 by 0.4252, which makes the area of the room in new arai square to be 79.0075.

If you wish to express the decimal values of the new arai square in new pakhra square and half square, divide the numbers after the decimal point into groups of two, and the first two numerals will give the number of square pakhra and the second two numerals the number of square half.

A similar method can be applied to find the equivalents of the decimal numbers in cubic pakhra and cubic half. In the case divide the numerals after the decimal point into groups of three. For example, if the volume of a cellar is 21.73 cubic arai, it is possible to express this as 25 cubic arai and 730 cubic pakhra. Because 23.7 cubic arai makes 23 cubic arai and 71 percent of one cubic arai or 710 parts in a thousand. Since 1 cubic pakhra in a thousand part of 1 cubic arai, then it is clear that the fraction in question equals 71 cubic pakhra.

From these examples it is clear how simple calculation becomes in the metric system.

Another great advantage of the new system is that the density of a substance can be defined as follows: "The density of a substance is the number of old units contained in 1 cubic of the substance in question."

As a result of this definition, by using a table of density, it is easy to calculate the volume of a substance if you know its weight. While in the past it was usual in the Ottoman lands to measure liquids by weight, now they will be measured by volume, and to compute the amount of liquids measured in the old and new units, it is obvious that these new problems need to be solved.

Performing such conversions easily depends on knowing how to calculate the density of the substances.
ASSAY CHARGES FOR OLD WEIGHTS

| Base | Charge | Amount | Inspection | Charge
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9. Osman Nam Berg, Mercato a Distanza: Balsam, p. 581

STEELYARD

Ottoman

7th-8th century

C. 357 mm

KMA 970

Inc. 2160

STEELYARD TAX RECEIPT AND ASSAY CERTIFICATE

Private collection

and Cem Mutarek archive

[Diagram of steel yard]

[Text on page 427 of the Code are being applied]
Concerning the Administration of the Steel Yard Tax, Collection, and the Office of Officials

Article 1: Steel Yard officials and weighmasters have been divided between various offices in Istanbul and the Three Regions, consisting of nine centres consisting of several places each.

Article 2: The overall administration of the steel yard tax has been placed in the hands of the Municipal Tax Office, and for this purpose a chief clerk and sufficient clerks and several stamp officials shall be employed. They are responsible for the good management and collection of the tax in question, for organizing the work, and keeping records and accounts, and are to be held responsible for any deficiencies.

Article 3: One inspector and one assistant for the Steel Yard Office, and at each centre one official and sufficient clerks and weighmasters are already employed. The inspectors are to constantly visit the centres and the places under them to check on the conduct and practices of the employees. The officers at the centres are to be in accordance with orders received from the central office at the Municipality, and inform those working with them of the situation.

Article 4: The officers in question must be married and literate, and people whose circumstances and behavior give to believe that they are trustworthy, and the clerks must be familiar with bookkeeping and accounting.

Article 5: The weighmasters are divided into three classes, those in the first and second classes must be literate, capable of keeping books, and able to record the receipts for the duties they are serving. In the event of a vacancy they shall not be appointed from outside the office, but promoted from within according to seniority. Those in the third class who do not know how to read and write cannot be promoted to a higher grade on grounds of seniority, and can make no distinction in this respect.

Article 6: All the steel yard officials and clerks and weighmasters must have reliable service of at least 20,000 lira, and the sarya documents shall be kept at the accounts office of the Municipality.

Article 7: No steel yard office, clerk or weighmaster may be employed under any circumstances without necessity, and those who have stood service on their behalf shall be checked under the Security Regulations every six months to see if their financial situation or standing has diminished, or if they have died. If such should occur, service must be renewed within a week at most, and if those employed cannot obtain the necessary service within this period, they shall be regarded as being dismissed from their post, and others be appointed in their place.

Article 8: Those employed at the Steel Yard Office are absolutely prohibited from consuming any kind of alcoholic drink during the day, and if found to have violated this rule it will be considered a primary obstacle to their employment.

Article 9: At least every two months the steel yard official, his clerks and the weighmasters shall be transferred to a new office elsewhere, and hand over their accounts in kind, book and other relevant documents to the person who takes their place, the transaction being recorded by a signed receipt, which shall be handed to the new office immediately, and since they will only continue to be employed on this condition, this measure will prevent them from steering to mean of poaching their transferees. Any who cause difficulties in this respect shall be immediately dismissed.

[1] Dösum Zaveti, Morali ve Endüstriyel Bralaklar, p. 160. Since the Steel Yard Office has been placed under the supervision of the Weight Office, it has undergone many changes. At first it was contracted out, but later placed under direct management. After the reforms, the Steel Yard Office and Dispositions were abolished and the steel yard officials divided between the other offices. This water of affairs continued until the year 1329, when a Steel Yard and Weight Tax Disposition was set up at the Weight Office once more. This means that many of the provisions in these regulations no longer apply.

Article 10: Officials and clerks and weighmasters at every office shall be regarded as responsible according to their degree both for the conduct of others and for the collection of coffee and the carrying out of procedures.

Article 11: All weighmasters at Göztepe, Yenikapı and Ocaklar shall commence work one hour before sunrise, and these at other centres and offices a quarter hour before sunrise, and continue on duty until nine o'clock (mad Turkish time, three hours before sunset), when half of the employees shall remain until 12 o'clock (sunset), while the other half may go about their personal business. In places where there is only one weighmaster, he may not leave his place until 11 o'clock (one hour before sunset).

Article 12: Each weighmaster shall have a cast-iron plaque made showing his grade and number, which must be worn on the left breast pocket in day.

Article 13: Offices within the district shall be inspected every day, and if any malpractice is discovered the incident shall immediately be notified to the central office. In short, they will be held responsible for any malpractice by the weighmasters, and also for collection of the tax.

Article 14: The weighmasters are obliged to obey orders and warnings in accordance with regulations issued by the officers of the centres to which they are attached and by their superiors. Those who neglect their duties or who are lazy in performing them will immediately be dismissed, the responsibility lying with the central office, and reports on the matter shall be presented to the Weight Office.

Article 15: Weighmasters are obliged to adjust their steel yards every morning using the stone kept in the office, and for whose place of work are too distant for this to be possible shall adjust their steel yards every Sunday. These also must themselves be adjusted at the Weight Office at the beginning of every month.

Article 16: If it is discovered that the weighmasters have brought counterfeit belonging to the large steel yard unto the small, and that belonging to the small steel yard unto the large, they shall be dismissed immediately, made to pay the damages incurred as a result, and punished by law.

Article 17: It is proved that the weighmasters have reported the weight of goods to be less or more than the actual weight, or reached agreement to each effect with the owner of the goods or the consignee, they shall be dismissed immediately and punished by law.

Article 18: Weighmasters are obliged to respond immediately to requests for weighing, and to take their turn as the rules require. If a weighmaster does not immediately set to work when requested, even though he has no work in hand, and if he refuses those who apply for goods to be weighed by his procrastination and by taking his job lightly, then he shall be dismissed at once.

Article 19: Steel Yard officials and clerks and weighmasters are absolutely forbidden to engage in trade or business or supply goods or sell goods in any form, or to be in open or private partnership with merchants or storemen trading in such commodities, and any who do so shall be immediately dismissed and legal proceedings taken against them.

Article 20: The employment of officers as officials, clerks or weighmasters of any grade in the Steel Yard Office is strictly forbidden.

Article 21: Since the weighmasters receive the specified tax for the goods that they weigh and are obliged to provide stamps equivalent to the amount in question to the owner of the goods, under no circumstances can anyone who acted improperly in the execution of this procedure be employed.

Article 22: Stamps of the values listed above shall be printed and these stamps supplied to the officials of the main office and administrative centre in return for signed receipts by the
Article 22: The Steelyard Office shall have thirty stamps bearing the words Steelyard Office and numbered from one to thirty for each day of the month for the 12 months of the Lunar calendar, and shall use these to imprint the back of the official stamps, together with the name of the month.

Article 23: The weights for the Steelyard Office shall have thirty stamps bearing the words Steelyard Office and numbered from one to thirty for each day of the month for the 12 months of the Lunar calendar, and shall use these to imprint the back of the official stamps, together with the name of the month.

Article 24: The officials at the central office will supply the weighmasters with stamps against signature, and check the number used and the number remaining every evening, and make sure that the clerk working under them record the quantity received and used.

Article 25: Weighmasters should keep a small notebook in which to note how many stamps they receive each day, and when they issue stamps in accordance with the quantity of goods weighed, note the weight of the goods and the name of the owner. Every evening they should calculate how many stamps have been used in total, and how many remain to be returned. When giving back these stamps, they should make sure that the officer and his clerk stamp this figure to show that the correct quantity has been returned.

Article 26: Every day at eight o'clock (four hours before noon) the officers, clerks and first and second grade weighmasters must be present for the inspection of the day’s records and comparison with the records for stamps issued at the office, and both revenue and stamps verbatim recorded in special registers. Following this, the same information shall be written in the daily report book, and both registers and book signed by the officers and clerks, and the first and second grade weighmasters, and the day’s takings together with the remaining stamps, weights and daybooks sent to the main office by sworn clerk the following day. At the main office the chief clerk and cashier shall compare the registers and day book with one another, stamps and make out that day’s pay from the day book to keep, arrnning the registers and stak, together with the amount of stamps required for the following day, which shall be signed for. The remaining stamps shall be recorded in the books of the central office, and by this means the daily reports that are collected shall be matched with the daily takings and signed, then given to the accountant of the Weights Office, who hands over the takings to the cashier.

Article 27: At the end of every month the chief clerk shall draw up two summaries, one for revenue and the other for the issued stamps which have been returned. These shall be referred to the accountant of the Weights Office, who shall compare this with the sheets sent from the day books and the main records of the authority, and when these have been endorsed by the board, the unused stamps shall be counted and burnt under the supervision of one of the board members.

Article 28: Entries in the registers and day books used at all the steelyard offices may not be corrected by scratching out, wiping off the ink or similar methods. If a mistake is made it is to be corrected on the sheet or the same sheet, and the correct version written beside it. Any employees who fail to comply with this requirement will be held responsible for the consequences.

Article 29: The sum of 3 percent shall be deducted from the monthly wages of the steelyard officials, clerks and weighmasters, and the funds so collected paid as a pension to those who have served for the required time in the department, or in the event of their death to their orphaned children and widows. Such payments shall be at the discretion of the municipal assembly.

11. (Original footnote) Instructions to the effect were issued by the Council of State in the year R. 1340, and after being reviewed by the Steelyard Office Board were endorsed and put into effect. The provisions of this document are still in effect and its copy has been included in the Code.

Article 31: The sum accruing from this five percent deduction each month shall be kept in a special chest in the keeping of three officials at the central office, and the pensions paid from this fund. The receipts shall be kept in the same chest. This fund may not be spent for any other purpose for any season whatsoever.

Article 32: Every three months the officers paid out of and out of the fund shall be calculated by the central office as the monies paid and recorded in a detailed book, that shall be printed and copies distributed to all those employed at the Steelyard Office.

Article 33: The examination of candidates shall take place before a commission consisting of one member of the board of the Steelyard Office, one of the chief clerks of accounts, one of the chief clerks of revenue, one of the chief collectors of weighing charges, and one of the first grade inspectors. The inspector shall be evaluated according to their degree of competence and merit, and employed for the services in kind in the next table. Those who are illustrious will be chosen by drawing lots, and registered as third grade weighmasters. Those whose names are not drawn in the lottery may be employed in the event of the vacancy at future. Those who have earned the right to retire will be awarded pensions from the fund by the decision of the municipal assembly.

Conclusion.

These instructions shall go into effect from the beginning of March of the financial year 92.

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5 pieces 10 pieces 50 pieces
10 pieces 50 pieces 10 pieces
20 pieces 50 pieces 20 pieces
100 pieces 100 pieces 200 pieces

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Steelyard tax receipts for
40 coins
50 coins
Some of the receipts on the back are in Chinese.
J. C. Henchle archive.

Steelyard tax receipt for
2 coins
9 coins
The charge was for weighing 249.97 kg of rice on 12 Rattan Year 1270.
J. C. Henchle archive.
Article 1: All types of fat, vegetables, and fruit, cured meat, pasta, noodles, cheese, caviar, coffee, sugar, rice, candle wax, tobacco, waterpipes, tobacco, snuff, all medicinal items, tea, mint, midi books, silk, and similar commodities shall be charged for weighing at the rate of 5 para in total from 1 krya to 6 kryas 100 dimes, and at 10 para up to 12.5 kryas. And up to 18 kryas 300 dimes at 15 para, and up to 25 kryas at 20 para in total. In short, for every increase of 6 kryas 100 dimes, an additional 5 para is charged, without any proportional increase within each weight bracket.

Article 2: Firewood, coal, flour, bread, straw, lime, hay, and onions shall be charged at 5 para up to 50 kryas, and at 10 para from 50 kryas to 100 kryas, adding an additional 5 para for every additional 50 kryas.

Article 3: Detailed provisions and all other commodities other than the essential medications in the previous articles shall be charged at 5 para for the first 10 kryas, at 10 para from 10 to 20 kryas, and at 15 para from 20 to 30 kryas; in short, at an additional 5 para for every additional 10 kryas.

Article 4: Taxes in excess of these rates shall not be paid, and if anyone should demand more, the prefecture and municipality should be informed.

15. Chausa Yat Raje. Berhah: Onder-Delinitie, p. 1900
28 March 1299 (1893).
Although municipal politics were tended to stifle new weights as of the year R.1000 (1894), since old weights were meanwhile still being assayed and stamped, it became apparent that this situation continued it would become impossible to bring about the changeover to the new weights. So it was decided that from then on the old weights would no longer be stamped, and the office of the imperial foundry notified the municipalities accordingly. A memorandum and appendices to a petition on the subject prepared by the preceptors were accordingly submitted to the municipality, and dealt with by the Cabinet of Ministers.

This memorandum stated that it was not advisable on second thoughts to prohibit the old weights and measures of a slender, and that because old weights were no longer assayed and stamped, some tradesmen were taking advantage of this to use lighter weights, and by this malpractice to defraud the general public. To prevent the general public it was propounded that all tradesmen should be obliged to possess new weights in their shops; that provisionally permission be given for the inspection and stamping of old weights; that foundries and scale-makers had sustained considerable losses, and that although peppers in Serbs, Romansi and Bulgarians had been found in the old weights and scales that they had no longer sold so well at home. These shipments were being delayed by the conscripts, and they requested that the petition concerning permission for this be taken into account, that since the purpose of introducing the new weights was to standardize the different weights and measures in use in the Ottoman lands, and prevent the general public from being cheated and defrauded, and thereby ensure that commerce be well regulated, provision should be made for the old weights to be stamped throughout the provinces and partially in Istanbul, that the system which had been evolved over time should not remain without conclusion indefinitely, and so as to give the general public being disadvantaged by measures such as the cynthia that they would not evaluate, that also until the public became completely accustomed to the new system some precautions should be taken to prevent them being defrauded by old weights that were below par, by means of inspection, and that this since one of the duties of the municipality, permission should be provisionally given to tradesmen who had not as yet obtained the new weights to use those for a period of three months, after which it would be obligatory for all tradesmen to be familiar with the new weights and measures, and after the specified period old weights should be found in any shops, those should be seized; that obstacles in the way of scale makers and metal foundries.


Status is related with Europe because closer, and particularity since the Reform [of 1838], among the many innovations introduced in imitation of the western model, the most important was the system of weights and measures, for which laws, regulations, instructions and lots of areas which were written before it on pages 4 to 7 of the tome. Various local authorities, this could be fully implemented, as evidenced in correspondence given later, and the consistent was today of all kinds of weights and measures.

The letter to impose these laws and regulations cadet that in the Ottoman Empire today:

Units of length: Milet, theunits, cubic units, area, etc., lots of distances; thus, miles; miles (on roads); etc.

Units of weight: Ook, kilo, bamba, jaks and other diverse units are in current use, as they are for volume and area.

The diversity of weight and measures, the diffusion is connecting one to another, and particularly the disadvantages suffered by women who are not informed of the difference when shopping is evident, and I am not to say to name on this subject here. Indeed, the last was that the measures of the same name have different meanings and quantities from one place to another. For example, the millino gala varies according to whether the land is in Asia Minor, and the border and border between different empires. For example, the human used in Leb, Kaykay, Kaykay, and Galatas were different in different weights.

In this memorandum, the system has been standardized weights and measures, and to prevent the general public being cheated, that is of this has been achieved. During the First World War the government adopted similar reforms in the Ottoman, in the metric system of measuring time. It is to be hoped that this reform will be successful.

exporting their stocks of old weights and scales to countries outside the Ottoman Empire, such as Serbia, Romania and Bulgaria, should be forbidden, and the Department of Customs notified accordingly. And that the necessary preparations be made for introducing and manufacturing new weights and measures, in order that tradesmen and others could take advantage of the situation in cases where the government, and this is the office of the giant solely by the municipality accordingly.

Although an attempt was made to introduce the metric system during the reign of Sultan Abdulmeid (1823-1861), it only proved possible to implement this during the reign of Sultan Abdülaziz (after 1839). Meanwhile, however, disputes and troubles arising from sales of commodities by the local money instead of the takas, resulted in the reactionism of the old system. On 10 March 1302(1886) a memorandum from the Ministry of Interior asked that weights and measures be inspected and stamped. Another memorandum was promulgated concerning the prohibition of the new weights and measures for a provisional period, a measure which would make the introduction of the new system impossible, and cause it to be abandoned altogether (1313/1996). By the time the Turkish Republic was established (1923), the standardization of weights and measures had still not been achieved. As an act was promulgated on 26 March 1931, which the new system went into force from 1934.

It was explained that due to the conversion of old to new weights, some women and the general public were displeased, and many complaints were received to effect the result that even though the weight had diminished, the price had remained the same; and that since in the month of Ramazan the general public would be doing more shopping that in other times of year, in accordance with the Sultan's edict stating that the commission should consult with the municipality about what precautions to take in advance to ensure that the public get full value for their money, that the conversion of all weights to new was time-consuming, that the public had not yet become accustomed to these, and that tradesmen and merchants used both old and new weights to the disadvantage of the public and to their own similar advantage. Then it was decided that to prevent such situations, in accordance with commissary and decrees issued by the Sultan, until Ramazan and the public holiday following were over, the old weights should be regarded in force, and tradesmen provisionally forbidden from using the new weights so as not to give rise to any drawback. Therefore a government memorandum dated 30 Selâz 1338 declaring this situation was issued and an imperial commissary promulgated, and the Mutasarrif pronounced that no further steps be taken.

Under the provisional memorandum the dokas, okka and bikas were restricted, to the relief of the public and the tradesmen. The use of old weights and measures continued for a number of years, after the founding of the Turkish Republic. This has caused confusion in the international and domestic trade, and was the reason for the 26 March 1931, and under its provisions, the metric system was introduced on 1 Kânun-i Cevâd 1934.17

15. Kânon-i Cevâd, 335 (1896).


17. "original sources": "in the Russian System, it is one month after this comment was issued, the commission was set in accordance with the order of the minister, but I have no record as to what any concrete steps were taken regarding the introduction of the metric system, which had failed to make satisfactory progress over the past 28 years, hence today we are in need of weight without hesitation, as it can be concluded that no decision has been taken. In 1313 [1928] the Municipal Technicians Committee drew up a report on the subject of this confusion and correspondence, and proposed a reform to avoid this situation. However, this report has been taken into account, and there is no record of its implementation. Since the year 1313 [1928] no measures were taken which was presented to the government, but has not been used in practice. Since the year 1313 [1928] no measures were taken which was presented to the government, but has not been used in practice. Since the year 1313 [1928] no measures were taken which was presented to the government, but has not been used in practice. Since the year 1313 [1928] no measures were taken which was presented to the government, but has not been used in practice. Since the year 1313 [1928] no measures were taken which was presented to the government, but has not been used in practice.
Description of the ancient city of Sari, which was built for the second time by Nebi Nuri and then rebuilt by the great hero Nebi Gave, that is, the splendid city of Sawa

Since all the population of this city are soldiers, they want for nothing. The administration, order and regulation of prices in this city is admirable. Every night all the shops are left open and everyone sleeps comfortably and without fear in their houses. Night-watchmen keep watch and guard until dawn. This city is so rich that even foreign dogs do not reach out their snouts to food and drink. No one lays hands on the property of another in this great haven. All food and drink, eggs, curved fish, vegetable oil and honey are sold by weight. From the little, plump, thick-barred, barrel and pear-shaped [Roman unit of volume] are never used. The word of the people is trusted. There is such abundance here that one gets wheat and corn half an attika, and one is not sure of poor white bread costs one-third kurdi; since all the people are firmly united, they are extremely thrifty, counting every dinaar in the course of their business and earnings. They would give their lives for their prices fixed by law known as the Law of Sheik Bahl.

The values of the gay, mor, nel, farr and var according to the regulations:

First of all the get is 748,800 dinaars.

The small is 62,400 dinaars.

The bale is 12,489 dinaars, or 12 sa.

The malak is 1,569 dinaars.

The sa is 156 dinaars.

The mor is 15 dinaars.

The nel is 3 dinaars.

The bale is 30 dinaars.

The farr is 1 dinaar.

The var is 60 dinaars.

The dinaar is the weight of 33 barley grains.

The melak is the weight of 100 barley grains.

The farr is the weight of 2 barley grains.

The melak is... (some words missing).

The rakah is 12,000 measures.

The bale is 1000 measures.

1 dinaar is 4 feet.

1 foot is the length of 22 barley grains placed end to end.

1 terei is 3 kamps.

1 kamp is 20 barley grains long and

1 melak is 3 kamps and 3 napouts.

The melak is... (some words missing).

The melak will be the length of the red column used by the Lord (Reyes) when repairing Mecca.

All the villages and all the royalty prices and dinaars and dinaars and rakhets and barley weight and wheat and weight and melak of Egypt.

Every kamp is 4 Garr dinaars.

Every melak is 3.5 Garr.

Every melak is 20,000 puram.

Every rakah is 8,000 puram.

1 dinaar is 1 dinaar.

1 dinaar is 10 barley grains.

1 melak is 100 barley grains.

Accordingly one Egyptian melak weight...


Egypt's astronomy, mathematics and the science of the astrolabe reveal the times, the length of night and day, the rising of the stars and how many miles distant is the sky from the earth, and how many miles across the face of the earth.\footnote{20}

First of all, in accordance with the words of the old philosophers, the students of God, but think not of his person, they thought of the acts of God and with the strength of science and the experience gained in their long lives, they came to possession of the secrets of the world, and wrote that 1 is 396 mill from the face of the earth into the sky.

According to this calculation, the distance around the earth, that is the world, is 20,160 mil.

The land of Egypt is part of this world.

Its diameter from north to south is 6,400 mil. It is divided into four circles that Poland has ruled the circumference of the earth to be 20,160 mil, or 80,000 farsab.

Every mil is 8,000 Mexic (jets).

Each of these jets is 3,084 (lata).

Each lata is 12 sheik (parvah).

Each parvah is the length of 5 barley grains.

And if the width of the rails (the meaning of rail is not known) is 7038 mil that is 2,845 farsah and one third of a farsah.

The entire world is 12,000 times earth and six hundred thousand mil and 280 farsah. However, these written opinions are the true conclusions of the rulers, the king, the philosopher, and the great scientists. Since they had learned all the branches of knowledge and science they wrote with the sanctity of knowledge. At that time, without revealing the entire world and without seeing it, by way of reason they calculated the world to be 20,160 mil.

The old astronomers agree with the opinion of Ptolemy and Celsius (Christopher Columbus) that the world is 87,000 mil.

Every mil is 4,000 attacks (7.66 cm).

Each attack is 24 parvah.

1 mil is 4,000 attacks. Walking by this makes a distance of ... [missing word] hours.

1 farsab is 12 hours.\footnote{7}

These islands and the world in which we are now is 87,000 mil, according to the writings of geographers and astronomers. But what they call a mil is 4,000 attacks (7.66 cm) and each attack is 24 parvah. Every parvah is 3 lata.

Every lata is 12 sheik and 5 parvah (barley grains), as they calculate the mil at the land registry of Rhodes, and according to which they calculate all the islands.

This humble servant (Evliya Çelebi) has visited the islands, and as far as it is in his power has recorded the calculations in mil according to the secrets of this land registry.\footnote{7}

**50 DIRHAM WEIGHT**

Islam, 18th century

Diameter 1.67 cm

Weight 22.3 gr

Height 2.3 cm

Private collection

---

**2 KILOGRAM WEIGHT**

Osmanic

Late 19th century

Weight 2.0 kg

Height 6 cm

Private collection
This 16th century marble tombstone is thought to belong to a lady. Because of the thorn and emerald rules carved on the stone.

Marble tombstone belonging to Ilias Agny, a merchant from Kayseri who died on 3 Bekirpasa 1127 (1570). An emerald rule and emerald crowning board are carved on the stone.
### Ottoman Sultans and Their Reigns

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<th>Father's Name</th>
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<td>Mehmed II</td>
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<td>Selim II</td>
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<td>Selim III</td>
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<td>Mehmed III</td>
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<td>Bayezid VI</td>
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<td>Selim III</td>
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<td>Selim IV</td>
<td>1574 - 1587</td>
<td>Bayezid VI</td>
<td>1574</td>
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<tr>
<td>Selim V</td>
<td>1587 - 1603</td>
<td>Selim IV</td>
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<tr>
<td>Selim VI</td>
<td>1603 - 1617</td>
<td>Bayezid VII</td>
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<td>1617</td>
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<td>Selim VII</td>
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<td>Selim VI</td>
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<td>Selim VIII</td>
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<td>Bayezid VIII</td>
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<td>Murad II</td>
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<td>Selim VII</td>
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<td>Selim IX</td>
<td>1640 - 1648</td>
<td>Murad II</td>
<td>1640</td>
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<tr>
<td>Selim X</td>
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<td>Selim XI</td>
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<td>Selim XII</td>
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<td>Selim XIII</td>
<td>1665 - 1683</td>
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<td>Selim XIV</td>
<td>1683 - 1691</td>
<td>Selim XIII</td>
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<td>Selim XV</td>
<td>1691 - 1703</td>
<td>Murad III</td>
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<td>Selim XVI</td>
<td>1703 - 1718</td>
<td>Selim XV</td>
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<td>Selim XVII</td>
<td>1718 - 1730</td>
<td>Murad III</td>
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<tr>
<td>Selim XVIII</td>
<td>1730 - 1754</td>
<td>Selim XVII</td>
<td>1730</td>
<td>1754</td>
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<tr>
<td>Selim XIX</td>
<td>1754 - 1789</td>
<td>Murad III</td>
<td>1754</td>
<td>1789</td>
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</tbody>
</table>

### Balance Makers in Procession

A miniature from Seccade-i Birane, Istanbul, Topkapı, TSM II 1544, fol. 217b.
Apothecary’s Set of Balance and Weights

European, 19th-20th century

RM.040 (lot, 480)
1. STEELYARD WEIGHT
Late archaic - early classical period, 6th-5th century BC
Heart
270 g; 8.5 x 6 cm; h: 14.5 cm
KMA 1157
A woman's head, probably that of a goddess, is carved in profile on both sides of the heart.

2. A DRACHMA WEIGHT
Greek, 5th century BC
Bronze
4.70 g; d: 10 mm
KMA 363

3. DUCK SHAPED WEIGHT
Minoan, 2nd millennium BC
Bronze
3.15 g; 4 x 5 cm; l: 10 mm
KMA 455
Thought to be a float, although it is too heavy to weigh accurately.

4. DUCK SHAPED WEIGHT
Minoan, 2nd millennium BC
Bronze
4.10 g; 3.7 x 5 cm; l: 2.9 mm
KMA 982

5. A DRACHMA WEIGHT
Late Helladic period, 1st millennium BC
Decree of the Lycurgian Standard
Bronze, type D
3.45 g; 2.2 x 2.3 x 2.2 cm
KMA 961
The composition represents the power of human and animal.

6. 2.5 DRACHMA WEIGHT
Greek, 1st - 2nd century BC
Lead
10.7 g; 2.5 x 2.3 x 1.5 cm
KMA 322
The words ΥΠΟ and ΣΩΣC suggest that this weight was used in the region around Lefkas.

7. 2.5 DRACHMA WEIGHT
Greek, 1st - 2nd century BC
Lead
10.27 g; 2.6 x 5.9 cm
KMA 390
Backed with the letters χαβ inside a square cartouche.

1. 2.5 DRACHMA WEIGHT
Greek, 1st - 2nd century BC
Lead
11.07 g; 2.6 x 3.5 cm
KMA 567
Bears a relief cross motif.
2.8 DRACHM WEIGHT
Greek, 1st - 2nd century BC
Lead
3.8 g, 22 mm
KMA 540

The words ΚΩΝ and ΣΜΦ suggest that this weight was used in the region around Ephes.

2.9 DRACHM WEIGHT
Greek, 1st - 2nd century BC
Bronze
8.11 g, 20.7 mm
KMA 820

These are the bull of Athens with a Corinthian helmet on the 5 drachm weight. The inscription ΘΑΙΟΙ ΠΑΡΘΕΝΟΣ means "the virgin". The incrustation Θ is inscribed at a later period.

3.5 DRACHM WEIGHT
Greek, 1st - 2nd century BC
Lead
20.21 g, 23.5 mm
KMA 93

The inscription ΣΩΚΡΑΤΟΣ indicates that this weight is 3-1/2 drachm.

5.75 DRACHM WEIGHT
Greek, 1st - 2nd century BC
Lead
26.72 g, 25.5 mm
KMA 515

The letter Σ on the obverse and Π on the reverse may indicate "the wieg is 5 drachm.

1.3 UNICIUM WEIGHT
Greek, 1st - 2nd century BC
Lead
20.31 g, 19.4 mm
KMA 846

The reverse is inscribed with a monogram, the weight is 1-1/2 obols.

1.4 UNICIUM WEIGHT
Greek, 1st - 2nd century BC
Lead
25.81 g, 20.5 mm
KMA 844

The letter Σ on the obverse and Π on the reverse may indicate "the wieg is 1-1/2 obols.

1.5 UNICIUM WEIGHT
Greek, 1st - 2nd century BC
Lead
20.31 g, 19.4 mm
KMA 846

The reverse is inscribed with a monogram, the weight is 1-1/2 obols.

1.6 UNICIUM WEIGHT
Greek, 1st - 2nd century BC
Lead
20.31 g, 19.4 mm
KMA 846

The reverse is inscribed with a monogram, the weight is 1-1/2 obols.
17. **8.9 DRACHMA WEIGHT**
Greek, 1st - 2nd century BC
Lead
38.87 g, 51.35 mm
KMA 125
The neatly incised weight suggests that it was used by fishermen in the vicinity of Ephesus.

18. **12 DRACHMA WEIGHT**
Greek, 1st - 2nd century BC
Lead
40.0 g, 56.8 mm
KMA 127
Between the legends, "δραχμ" and "ΕΡ" is a crest. The weight was probably used by fishermen in the vicinity of Ephesus.

19. **14 DRACHMA WEIGHT**
Greek, 1st - 2nd century BC
Lead
53.7 g, 45.6 mm
KMA 130
The legend "δραχμ" and "ΕΡ" suggests that this weight was used in the region around Ephesus.

20. **14 DRACHMA WEIGHT**
Greek, 1st - 2nd century BC
Lead
60.75 g, 51.32 mm, h. 6.3 mm
KMA 131
Faint figures with eight petals each are stamped on the obverse. The reverse is plain.

21. **14 MILIAREISWEIGHT**
Roman, 4th - 6th century BC
Lead
71.85 g, 36.5 x 28.8 mm, h. 5.5 mm
KMA 548
The inscription may be read as "NEAPOLEO".

22. **14 DRACHMA WEIGHT**
Greek, 1st - 2nd century BC
Lead
40.36 g, 57.5 x 57 mm
KMA 150
The inscription which may be read as "ANEPUCO" is incised below on the obverse.

23. **SILICE COIN WEIGHT**
Greek, 2nd - 3rd century
Glass
3.57 g, 18.5 x 18.5 mm
KMA 151
A female figure can be discerned.

24. **SOLIUS WEIGHT**
Byzantine, 6th - 9th century
Bronze
3.5 g, 12 x 12.5 mm
KMA 152
A monogram which may be read as "ΜΑΣ" is incised on the obverse.
21. STEELYARD WEIGHT
Cannot identify, 5th century
Bronze
6 kg, 3 1/2 in. height, 210 mm; h. hook, 180 mm
KMA 607

The case bronze weight in the form of a bust of an emperor. The bust is shown in a frontal view with a cowl. The emperor is dressed in a tunic and has a breastplate on his chest. The right hand holds the edge of the tunic, and on his left is a scroll. The figure may depict Sulla Punicus or Lysimachus.


22. STEELYARD
Early Byzantine, 5th - 7th century
Bronze
190 g, ¾ in. height, 67 mm; h. hook, 130 mm; 1. 815 mm
KMA 627

The steelyard is suspended by a hook and the arm is square in cross-section. The hook is shaped with a handle for holding the goods to be weighed. The cylindrical rod sticks up and down the arm. Graduations are marked on the face of the arm.

"ANALECTA. XAPWVIA".

KMA 627, pl. 61, fig. 2264.

23. STEELYARD
Early Byzantine, 5th - 7th century
Bronze
120 g, ¾ in. height, 55 mm; h. hook, 70 mm; 1. 345 mm
KMA 638

Identical to cat. 27, but lacks an inscription.

Cf. KMA 607, pl. 56, fig. 22623.

24. STEELYARD
Early Byzantine, 5th - 7th century
Bronze
150 g, ¾ in. height, 77 mm; h. hook, 70 mm; 1. 365 mm
KMA 629

Identical to cat. 27, but the chain, weight and part of the arm are missing.

Cf. KMA 607, pl. 56, fig. 2262.

25. SCALE ARM
Early Byzantine, 5th - 7th century
Bronze
1-220 mm, h. hook, 75 mm
KMA 615

The parts of the scales are missing. The other end of the amphora looks through which the water would have poured. At the centre are two connecting fragments of the handle. One side of the arm is broad for holding weights.

Cf. Klinthos 1955, pl. 69, no. 577, pl. 90, no. 577. Klinthos 1957, pl. 54, fig. 22634.
54. **NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Greek 4.29 g. 8.2 x 8.2 x 8.2 mm
KMA 1/67

The letter 'N' inscribed on the weight indicates it is a weight of 1 nomisma. The reverse is plain.

55. **NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Greek 4.11 g. 8.1 x 8.1 x 8.1 mm
KMA 1/60

Identical to cat. 54, but with the letter 'N' for nomisma inscribed on both faces.

56. **NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Greek 4.3 g. 8.3 x 8.3 x 8.3 mm
KMA 3/53

Identical to cat. 54. The extensions of the lines forming the letter 'N' are decorated with circles. The reverse is plain.

57. **NOMISMA WEIGHT**
Early Byzantine, 6th - 7th century
Greek 3.65 g. 8.2 x 8.2 x 8.2 mm
KMA 9/25

The letter 'N' is inscribed on the weight indicates it is a weight of 3 nomismata. Above the letter 'N' is a Greek cross. The inscription and cross were originally inlaid, but the inlay material is missing. The reverse is plain.

58. **NOMISMA WEIGHT**
Early Byzantine, 6th - 8th century
Greek 4.96 g. 15.5 x 15.5 mm
KMA 9/26

The letter 'N' is inscribed on the weight indicates it is a weight of 4 nomismata. Above the letter 'N' is a Greek cross. The inscription and cross were originally inlaid, but the inlay material is missing. The reverse is plain.

59. **SOLIUM WEIGHT**
Early Byzantine, 6th - 8th century
Greek 4.68 g. 16.5 x 16.5 mm
KMA 9/27

The letter 'N' is inscribed on the weight indicates it is a weight of 4 nomismata. Above the letter 'N' is a Greek cross. The inscription and cross were originally inlaid, but the inlay material is missing. The reverse is plain.

60. **NOMISMA WEIGHT**
Byzantine, late 12th - early 13th century
Greek 5.1 g. 18.2 x 18.2 mm
KMA 9/28

The letter 'N' is inscribed on the weight indicates it is a weight of 5 nomismata. Above the letter 'N' is a Greek cross. The inscription and cross were originally inlaid, but the inlay material is missing. The reverse is plain.
37. ¾ Nomisma Weight

Biblical, 1st-6th century B.C.
Brass
1.27 g. d. 18 mm; h. 2 mm
KMA 529

The weight has a rounded top and the letters N, M, and A are impressed in different places. Below is a scroll design and two stars. The letter M is in the center, and the weight is indicated by the symbols N and A.

41. 3 Nomismata Weight

Byzantine, 1st-3rd century
Copper
3.90 g. d. 24 mm; h. 3 mm
KMA 532

The weight has a rounded top and the letters N, M, and A are impressed in different places. Below is a scroll design and two stars. The letter M is in the center, and the weight is indicated by the symbols N and A.

47. 6 Nomismata Weight

Byzantine, 5th-6th century
Brass
25.90 g. d. 28 mm; h. 6.5 mm
KMA 525

There is a cross at the center of both faces, surrounded by three circles on one side and two on the other.

48. 6 Nomismata Weight

Byzantine, 5th-6th century
Brass
3.90 g. d. 24 mm; h. 3 mm
KMA 532

The weight has a rounded top and the letters N, M, and A are impressed in different places. Below is a scroll design and two stars. The letter M is in the center, and the weight is indicated by the symbols N and A.
81. 2 OUNCES WEIGHT
Byzantine, 4th - 5th century
Bronze
26.3 g, 23.5 mm, h. 6 mm
KMA 1333

The letters "E", "A", and "E" are marked on the top and sides of the coin. The edge is plain, and the coin is in good condition.

82. 2 OUNCES WEIGHT
Byzantine, 5th - 6th century
Bronze
25.6 g, 28 mm, h. 6 mm
KMA 379

The coin is in good condition, with the letters "E", "A", and "E" marked on the top and sides. The edge is plain.

83. 2 OUNCES WEIGHT
Byzantine, 6th - 7th century
Bronze
25.6 g, 28 mm, h. 6 mm
KMA 1333

The coin is in good condition, with the letters "E", "A", and "E" marked on the top and sides. The edge is plain.

84. 2 OUNCES WEIGHT
Byzantine, 6th - 7th century
Bronze
25.6 g, 28 mm, h. 6 mm
KMA 1333

The coin is in good condition, with the letters "E", "A", and "E" marked on the top and sides. The edge is plain.

85. 2 OUNCES WEIGHT
Byzantine, 5th - 6th century
Bronze
25.6 g, 28 mm, h. 6 mm
KMA 1333

The coin is in good condition, with the letters "E", "A", and "E" marked on the top and sides. The edge is plain.

86. 2 OUNCES WEIGHT
Byzantine, 5th - 6th century
Bronze
25.6 g, 28 mm, h. 6 mm
KMA 1333

The coin is in good condition, with the letters "E", "A", and "E" marked on the top and sides. The edge is plain.
59 - 3 OUNCE WEIGHT
Dracon. Breviatar. 25.76 g. ø 23 mm, h. 11 mm
KMA 322.

The spherical weight is flattened at top and bottom. On the upper surface are engraved the letters "S.-A., indicating 1 shekel.

(1) From 1892, p. 100; (2) p. 155, Molke, 1991.
KRA 101, no. 10.4

60 - 6 OUNCE WEIGHT
Dracon. Breviatar. 36.37 g. ø 27.2 mm, h. 22 mm
KMA 122.

The spherical weight is flattened at top and bottom. On the upper surface are engraved the letters "Y.-F., indicating 3 talents.

(1) Based on 1996, no. 44.

61 - 2 OUNCE WEIGHT
Dracon. Breviatar. 52.84 g. ø 22.1 mm, h. 10 mm
KMA 305.

The spherical weight is flattened at top and bottom. Engraved on the upper surface is the letter "S., indicating a weight of 2 shekels.

(1) Based on 1996, no. 35.

62 - CORN WEIGHT
Early Byzantine. Breviatar. 44.51 g. ø 22 mm, h. 6.6 mm
KMA 529.

The monogram is in relief on the triangular ground is damaged and partially illegible. The monogram probably belongs to a priest.


63 - 1/3 RARE ISRAELI CORN WEIGHT
Early Byzantine.
Glass. 1.25 g. ø 16 mm, h. 3 mm
KMA 315.

There are no indications of the colour of this corn weight, but it weighs 1/3 of a monogram. (2) The same surface is not showing here in relief. Colour of the glass is purple.

(1) Based on 1992, p. 293, no. 146.

64 - 1/4 SANITA CORN WEIGHT
Fattal. 1276-1309 AD.
Glass. 3.25 g. ø 15 mm
KMA 514.

The corn weight is stamped with the words "al-sama Mason, claiming that it comes from the reign of the Fatimid caliph Ali. There is no information about the period of the Fatimid caliph Abu Ubaid El Mowaffak (1070-1084 AD).

(1) Based on 1996, p. 196, no. 79.

65 - SANITA CORN WEIGHT
Umayyid or Abbasid, 7th - 9th century.
Glass. 3.09 g. ø 22.3-26 mm
KMA 551.

This corn weight is stamped with the words "al-sama Mason, claiming that it comes from the period of the Umayyid or Abbasid period in accordance with the work "The Manumet".
64. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
2.90 g. ø 27 mm
KMA 518

On one face is the declaration of God’s unity, and on the other the word Ban... can be deciphered.

65. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
5.00 g. ø 25.5-26.5 mm
KMA 520

The inscription is indecipherable.

66. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
1.72 g. ø 23.5 mm
KMA 517

Only the word Allah in the inscription is decipherable. Since it is worn, the exact weight cannot be determined.

67. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
2.21 g. ø 18-21 mm
KMA 517

68. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
1.49 g. ø 21.5-22.7 mm
KMA 518

The inscription is indecipherable.

69. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
2.30 g. ø 22 mm
KMA 517

The inscription is indecipherable.

70. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
5.00 g. ø 26.5-27 mm
KMA 522

This coin weight has a rose motif.

71. **SARJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
0.81 g. 10.3x10.5 mm
KMA 072

Since the high inscription is incised, it is indiscernible. The word Waazziyya Jaf in the country again that this weight completed with the standard.

72. **1/4 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.10 g. 16x10.5 mm
KMA 042

The inscription is indecipherable.
74. 1/2 DHIMEN WEIGHT
Aryshid, 11th - 12th century
Bronze, type B
1.8 g, 9.0 x 1.2 mm
KMA 378
The inscription is indecipherable.

75. 1/2 DHIMEN WEIGHT
Aryshid, 11th - 12th century
Bronze, type A
1.4 g, 7.0 x 8.2 mm
KMA 979
The inscription is indecipherable.

76. 1/2 DHIMEN WEIGHT
Aryshid, 11th - 12th century
Bronze, type A
1.8 g, 9.0 x 1.2 mm
KMA 140
The first word of the half inscription is read as 'describable'; in the following, refer to one of the dharana tables.

77. 1/2 DHIMEN WEIGHT
Aryshid, 11th - 12th century
Bronze, type B
1.8 g, 9.0 x 1.2 mm
KMA 977
The inscription is indecipherable.

78. 1/2 DHIMEN WEIGHT
Aryshid, 11th - 12th century
Bronze, type A
1.4 g, 7.0 x 8.2 mm
KMA 153
The inscription is indecipherable.

79. MONEYCHANGER'S POCKET BALANCE
Byzantine or Seljuk, 11th - 12th century
Brass
1.09 mm
KMA 724
The adjustable balance was used for weighing coins. A brass to stamp.

80. MONEYCHANGER'S POCKET BALANCE
Byzantine or Seljuk, 11th - 12th century
Brass
1.09 mm
KMA 731
The adjustable balance was used for weighing coins. A brass to stamp.
**1 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
335 g, ø 15-19 mm  
KMA 157  

The seal of Salama al-mustakbeel is shown.

**2 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
268 g, ø 15-19 mm  
KMA 156  

The single bird's eye motif in the center indicates that the weight is 1 dirhem.

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**1 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
250 g, ø 15-19 mm  
KMA 157  

The name Muhammad is inscribed in Latin script inside a circle.

**2 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
234 g, ø 15-19 mm  
KMA 198  

The single bird's eye motif in the center indicates that the weight is 1 dirhem.

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**1 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
264 g, ø 15-19 mm  
KMA 197  

The name Muhammad is inscribed in Latin script inside a circle.

**2 Dirham Weight**  
Seljuk, 12th - 13th century  
Bronze, type A  
210 g, ø 15-19 mm  
KMA 198  

The two bird's eye motifs on this weight indicate that it weighs 2 dirhems.
92. 2 Dinar Weight
Safavid, 1250 - 1350
Bronze, type F
27 g, ø 1.7 cm
KMA 154

There is a bird's eye motif in the center of the weight.

93. 5 Dinar Weight
Safavid, 1250 - 1350
Bronze, type F
187.5 g, ø 4.5 cm
KMA 152

There are bird's eye motifs on this polished weight.

94. 5 Dinar Weight
Safavid, 1250 - 1350
Bronze, type F
187.5 g, ø 4.5 cm
KMA 152

There is a bird's eye motif on each face of this polished weight.

96. 6 Dinar Weight
Safavid, 1250 - 1350
Bronze, type Z
85.3 g, ø 15 mm
KMA 157

There are bird's eye motifs on each face of this polished weight.

98. 10 Dinar Weight
Safavid, 1250 - 1350
Bronze, type Z
25.2 g, ø 20 mm
KMA 158

There are bird's eye motifs on each face of this polished weight.

97. 10 Dinar Weight
Safavid, 1250 - 1350
Bronze, type Z
25.2 g, ø 20 mm
KMA 158

There are bird's eye motifs on each face of this polished weight.

99. 20 Dinar Weight
Safavid, 1250 - 1350
Bronze, type Z
90 g, ø 40 mm
KMA 160

There are bird's eye motifs on each face of this polished weight.
There is a tendril Nusiana motif on each face of this polished weight.

There is a bird’s eye motif on each face of this polished weight. The upper part is the word Muhammad in leftist script set in a circle.

This is the only known example of a weight with a double-headed eagle motif.

The weight has numerous bird’s eye motifs, but no stamp.

No markings are stamped on this cubic weight.

Geometric reliefs are stamped on the faces of this polished weight.
103. 50 DINHEM WEIGHT
Sfax, 12th - 13th century.
Bronze
145.5 g, ø 32.5 mm.
KMA 106.
The weight has many bird’s eye motifs.

106. 10 DINHEM WEIGHT
Marrakech, 16th century.
Bronze
20.02 g, ø 29 mm, h. 34.4 mm.
KMA 527.

110. 20 DINHEM WEIGHT
Sfax, 12th - 13th century.
Bronze, type A
122.65 g, ø 29 mm.
KMA 177.
No other weight of this type has been found.
Shere has been added to the weight in order to bring the weight up to standard.

112. 5 DINHEM WEIGHT
Marrakech, 14th - 15th century.
Bronze
29.07 g, ø 29 mm, h. 43.2 mm.
KMA 909.

114. 25 DINHEM WEIGHT
Marrakech, 16th - 17th century.
Bronze
56.95 g, ø 28 mm, h. 35.2 mm.
KMA 107.
The clamp on this barrel shaped weight is indecipherable.

115. 25 DINHEM WEIGHT
Marrakech, 16th - 17th century.
Copper, type C
3.36 g, ø 20 mm.
KMA 392.
The weight has been made from an earlier metal coin. The shape or monogram could not be deciphered.
114. **BALANCE PAN**

Turkish Empire, 14th - 15th century

Bronze

w. 307 mm

KMA 744

The stamp on the reverse contains the word **Nihayot**.

115. **10 Dinar/Weight**

Ottoman, 15th - 16th century

Bronze, type F

30.3 g. ø 43.7 x 13.5 mm

KMA 695

The weight was struck between the years 1109-1110 and stamped with the name of Sultan Selim I. The label reads: "Selim I, Mehded Han, May He Protect Us."

117. **50 Dinar/Weight**

Ottoman, 15th century

Bronze, type F

295.46 g. ø 54.3 x 13.5 mm

KMA 677

The weight was struck between the years 1267-1268 and stamped with the name of Sultan Murad I. The label reads: "Mehmed I, the weights. Stamp of Sultan Murad I."

119. **20 Dinar/Weight**

Ottoman, 15th - 16th century

Copper, type F

58.77 g. ø 45.3 x 26.8 mm

KMA 689

The weight was struck between the years 1267-1268 and stamped with the name of Sultan Murad I. The label reads: "Mehmed I, the weights. Stamp of Sultan Murad I."

130. **200 Dinar/Weight**

Ottoman, 16th - 17th century

Bronze, type L

70.4 g. ø 34.5 mm

KMA 627

The weight was struck with the word **Asyap**, indicating that it has been assayed. The label reads: "Bai, Bole, Olay, Olay, Olay, Olay, Olay, Olay."

132. **GEZ (MEASURING ROPE)**

Ottoman, 15th - 16th century

Brass

1.290 mm

KMA 625

Measuring ropes known as *gez* were used for measuring land. The rope is wound about a brass reel.

134. **1 Dinar/Weight**

Ottoman, 15th century

Copper, type H

19.5 g. ø 14.15 mm

KMA 680

The weight was struck between the years 1149 and 1150 and stamped with the name of Sultan Selim I. The label reads: "Selim I, Selim, May the Lord Protect Us."
The weight was cast in the years 850-854, and stamped with the title of Sultan Suleiman I, reading "Suleiman b. Selim". May He Ever Be Victorious.

The weight was cast in the years 850-854, and stamped with the title of Sultan Suleiman I, reading "Suleiman b. Selim". May He Ever Be Victorious.

The weight was cast in the years 850-854, and stamped with the title of Sultan Suleiman I, reading "Suleiman b. Selim". May He Ever Be Victorious.

The weight was cast in the years 850-854, and stamped with the title of Sultan Suleiman I, reading "Suleiman b. Selim". May He Ever Be Victorious.
122. 1 Dinar Weight
Ottoman, late 17th century
Bronze, type B
3.20 g, 15.5 mm
KMA 103

The weight was struck between the years 1060-1061 and bears the weights of Mustafa III, reading: "Muhammad 3, Sultan of the Caliphate, May His Reign Be Victorious!"

123. 1 Dinar Weight
Ottoman, 1700s-18th century
Copper, type C
3.20 g, 15.5 mm
KMA 103

The weight was struck between the years 1060-1061 and bears the weights of Mustafa III, reading: "Muhammad 3, Sultan of the Caliphate, May His Reign Be Victorious!"

124. 1 Dinar Weight
Ottoman, first quarter of 17th century
Bronze, type B
3.30 g, 15.5 mm
KMA 107

Ahmed bin Musa Fata (iv)

The weight was struck between the years 1062-1063, and bears the weights of Sultan Ahmed, reading: "Ahmed 3, Sultan of the Caliphate, May His Reign Be Victorious!"

125. 1 Dinar Weight
Ottoman, 17th century
Bronze, type B
3.30 g, 15.5 mm
KMA 107

Since the weight is incomplete, it could not be determined, but it is similar to those used around 1062-1063.

126. 1 Dinar Weight
Ottoman, first quarter of 17th century
Bronze, type C
3.20 g, 15.5 mm
KMA 122

Although the weight is worn, comparison with other examples shows that it belongs to Sultan Ahmed 3.

127. 1 Dinar Weight
Ottoman, 17th century
Bronze, type B
3.20 g, 15.5 mm
KMA 109

The weight is worn, but it bears the weights of Sultan Ahmed 3, reading: "Ahmed 3, Sultan of the Caliphate, May His Reign Be Victorious!"

128. 1 Dinar Weight
Ottoman, 18th century
Bronze, type B
3.20 g, 15.5 mm
KMA 113

The weight is worn, but it bears the weights of Sultan Ahmed 3, reading: "Ahmed 3, Sultan of the Caliphate, May His Reign Be Victorious!"

129. 1 Dinar Weight
Ottoman, 17th century
Bronze, type B
3.20 g, 15.5 mm
KMA 113

The weight is worn, but it bears the weights of Sultan Ahmed 3, reading: "Ahmed 3, Sultan of the Caliphate, May His Reign Be Victorious!"

130. 1 Dinar Weight
Ottoman, 17th century
Bronze, type B
3.20 g, 15.5 mm
KMA 113

The weight is worn, but it bears the weights of Sultan Ahmed 3, reading: "Ahmed 3, Sultan of the Caliphate, May His Reign Be Victorious!"

Comparison with other examples shows that the weight is worn, but it bears the weights of Sultan Ahmed 3, and was struck between the years 1062 and 1063.
184. 1 DHINM WEIGHT
Ottoman, first quarter of 17th century
Bronze, type B
35.57 g. 18.7 mm
KOA 161

185. 25 DHINM WEIGHT
Ottoman, 15th - 16th century
Bronze, type C
31 g. 17.6 x 17.7 mm
KOA 162

186. 5 DHINM WEIGHT
Ottoman, first quarter of 17th century
Bronze, type F
15.22 g. 12.0 x 12.0 mm
KOA 163

187. 5 DHINM WEIGHT
Ottoman, first quarter of 17th century
Bronze, type F
29.6 g. 18.5 x 18.5 mm
KOA 227

The weight was stamped between the years 1012 and 1018, and stamped with the name of Sultan Ahmed. Although the name is not complete, it is intended by comparison with other weights of the same size.

The weight was stamped between the years 1022 and 1023, and stamped with the name of Sultan Ahmed. The script on the weight is worn and incomplete; it is intended by comparison with other weights of the same size.

The weight was stamped between the years 1001 and 1002, and stamped with the name of Sultan Ahmed. The weight is worn and incomplete; it is intended by comparison with other weights of the same size.
130. 500 DHINEM WEIGHT
Ottoman, late 19th century
Bronze, type I.
345 g, ø 180 mm
KM 3.015

The weight was assayed twice, first between 1825 and 1827 and again five years later between 1832 and 1832. The assay weight belongs to Sultan Mahmut IV, reading '1 reis'.

131. STEELYARD
Ottoman, 18th century
Iron
2. 685 mm
KM 3.015

The terminal of the arm is in the form of a double-barreled tugia.

132. 200 DHINEM WEIGHT
Ottoman, 19th century
Bronze, type I.
100 g, ø 140 mm
KM 3.015

Sultan Mahmut IV, reading '1 reis'.

133. 100 DHINEM WEIGHT
Ottoman, late 19th century
Copper, type C.
50 g, ø 140 mm
KM 3.015

The weight was assayed twice between the years 1805 and 1805, and re-assayed with the title of Sultan Mahmut IV, reading '4 reis'.

134. STEELYARD
Ottoman, 18th century
Iron
2. 252 mm
KM 3.015

The terminal of the arm is in the form of a double-barreled tugia.

135. 50 DHINEM WEIGHT
Ottoman, late 18th century
Copper, type II.
20 g, ø 128 mm
KM 3.015

The weight was assayed between the years 1805 and 1805, and re-assayed with the title of Sultan Mahmut IV, reading '8 reis'.

136. STEELYARD
Ottoman, 18th century
Iron
2. 252 mm
KM 3.015

The weight is stamped with bird's eye motifs.
735: 1/4 DIRHEM WEIGHT
Oman. 10th-11th century
Copper, type II
6.3 g, 25.6 x 23.4 mm
KMA 160

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 929 and 950, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

736: 1 DIRHEM WEIGHT
Oman, dated AH 1107/1108
Silver, type III
2.35 g, 18.4 mm
KMA 157

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 1107 and 1108, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

737: 1/8 DIRHEM WEIGHT
Oman, 7th century
Copper, type I
1.32 g, 14.3 x 14.2 mm
KMA 105

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 650 and 690, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

738: 1/2 DIRHEM WEIGHT
Oman, 8th century
Copper, type II
2.39 g, 18.5 mm
KMA 162

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

739: 1/2 DIRHEM WEIGHT
Oman, 7th century
Copper, type II
2.35 g, 18.4 mm
KMA 161

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

740: 1/2 DIRHEM WEIGHT
Oman, 7th century
Copper, type II
2.39 g, 18.5 mm
KMA 162

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

741: 2 DIRHEM WEIGHT
Oman, 7th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

742: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

743: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

744: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

745: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

746: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

747: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

748: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

749: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

750: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

751: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

752: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

753: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

754: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.

755: 2 DIRHEM WEIGHT
Oman, 6th century
Copper, type II
5.71 g, 32.5 x 24 mm
KMA 151

محمد بن أبا مهمن (النقرة دامنة)

The weight was struck between the years 703 and 710, and stamped with the titles of Sultan Mishreq ibn Harun al-Rashid. May He Ever Be Victorious.
103. **5/4 DINAR WEIGHT**
Ottoman, 17th century
Bronze, type 2
53.15 g, 55.5 mm
KMA 292
The weight has openwork decoration. The circle on the outer edge of the weight is standard.

104. **5/4 DINAR WEIGHT**
Ottoman, 17th century
Bronze, type 3
53.3 g, 53.8 mm
KMA 293
The circle on the outer edge of the weight is standard.

105. **5/4 DINAR WEIGHT**
Ottoman, 17th century
Bronze, type 1
51.5 g, 51.9 mm
KMA 295
The circle on the outer edge of the weight is standard.

106. **5/4 DINAR WEIGHT**
Ottoman, 17th century
Bronze, type 5
54.38 g, 55.2 mm
KMA 297
The circle on the outer edge of the weight is standard.

107. **100 DINAR WEIGHT**
Ottoman, early 18th century
Bronze, type 2
92 g, 55.9 mm
KMA 948
The weight was struck between the years 1125 and 1148, and stamped with the name of Sultan Ahmad III, reading: "Ahmed b. Mehemet Han. Hey Be Ever the Victorians." The rim has been broken into the weight as a whole.

108. **1 DINAR WEIGHT**
Ottoman, early 17th century
Bronze, type 2
2.53 g, 35.9 mm
KMA 395
The weight was struck between the years 1115 and 1128, and stamped with the name of Sultan Mehmed V, reading: "Mehmed Han. Hey Be Ever the Victorians." 1148. The rim has been broken into the weight as a whole.
170. 2 Dinarum Weight
Osman, 8th century
Bronze, type N
6.20 g, ø 15 mm
KSA 485

The weight was struck between the years 714 and 719, and stamped with the name of Sulaiman ibn Maysalun. The date indicates that the weight was struck in AH 114.

171. 25 Dinarum Weight
Osman, type I
7.76 g, ø 21 mm
KSA 1302

172. 50 Dinarum Weight
Osman, type II
11.62 g, ø 26 mm
KSA 168

173. 100 Dinarum Weight
Osman, type III
23.16 g, ø 35 mm
KSA 194

174. 500 Dinarum Weight
Osman, type F
50.7 g, ø 50 mm
KSA 651

The weight was struck between the years 959 and 960, and stamped with the name of Wilayat Ibn Maysalun. The date indicates that the weight was struck in AH 161.

175. 1,000 Dinarum Weight
Osman, type B
101.4 g, ø 60 mm
KSA 658

The weight was struck between the years 1013 and 1014, and stamped with the name of Wilayat Ibn Maysalun. The date indicates that the weight was struck in AH 189.

176. 2,000 Dinarum Weight
Osman, type C
202.8 g, ø 65 mm
KSA 665

The weight was struck between the years 1035 and 1036, and stamped with the name of Wilayat Ibn Maysalun. The date indicates that the weight was struck in AH 201.

177. 5,000 Dinarum Weight
Osman, type D
505.6 g, ø 80 mm
KSA 684

The weight was struck between the years 1081 and 1082, and stamped with the name of Wilayat Ibn Maysalun. The date indicates that the weight was struck in AH 227.
177. 50 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
33.50 g, ø 35.5 mm, t 3.3 mm
KMA 449
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

178. 50 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
32.92 g, ø 35.5 mm, t 3.4 mm
KMA 216
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

179. 50 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
33.10 g, ø 35.5 mm, t 3.3 mm
KMA 980
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

180. 50 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
32.87 g, ø 35.5 mm, t 3.3 mm
KMA 979
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

181. 50 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
32.81 g, ø 35.5 mm, t 3.3 mm
KMA 978
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

182. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 459
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

183. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 458
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

184. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 457
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

185. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 456
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

186. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 455
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

187. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 454
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.

188. 500 Dinar HE 1171
Ottoman, 16th century
Bronze, type U
119.2 g, ø 75 mm, t 9.5 mm
KMA 453
مغطس قناع بن أحمد الفطر دانسا
The weight was struck between the years HE 1171 and 1177, and stamped with the name of Sultan Bayezid I. It was also stamped with the name of Mamluk Sultan Al-Malik al-Nasir Ahmad, King of Egypt.
187. 50 DIRHemens WEIGHT
Obverse, dated 1318/1319
Brass, type V
136.45 g. 4.10 in.
KMA 450

"محمود بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1313 and 1314, and stamped with the name of Ahmad bin Ahmad, Masri, theEver Be Victorian. Before the edge is a stamp in the form of a crescent with 11 points.

188. 50 DIRHemens WEIGHT
Obverse, dated 1324/1325 and 1324
Brass, type V
136.31 g. 4.10 in.
KMA 252

"عباس أحمد بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1316 and 1317, and stamped twice with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian. The weight is a square with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian.

189. 50 DIRHemens WEIGHT
Obverse, dated 1317/1318 and 1318
Brass, type U
21.50 g. 4.15 in.
KMA 174

"عباس أحمد بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1314 and 1315, and stamped twice with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian. Two other stamps are unknown. Two more stamps of different size have been announced into the weight in lying it up to standard.

190. 50 DIRHEM WEIGHT
Obverse, dated 1317/1318 and 1318
Brass, type U
21.50 g. 4.15 in.
KMA 190

"عباس أحمد بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1314 and 1315, and stamped twice with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian. Two other stamps are unknown. Two more stamps of different size have been announced into the weight in lying it up to standard.

191. 50 DIRHemens WEIGHT
Obverse, dated 1317/1318 and 1318
Brass, type U
21.50 g. 4.15 in.
KMA 237

"عباس أحمد بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1314 and 1315, and stamped twice with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian. Two other stamps are unknown. Two more stamps of different size have been announced into the weight in lying it up to standard.

192. 50 DIRHEN Men WEIGHT
Obverse, dated 1317/1318 and 1318
Brass, type U
21.50 g. 4.15 in.
KMA 190

"عباس أحمد بن أحمد بن أحمد بن عبد المجيد الفضلي
1344 A.D.
The weight was assigned between the years 1314 and 1315, and stamped twice with the name of Ahmad bin Ahmad, Masri, the Ever Be Victorian. Two other stamps are unknown. Two more stamps of different size have been announced into the weight in lying it up to standard.
187. 1 DURHAM WEIGHT
Oman, dated 11206, 11220, 11223, 11225 and 11227
Bronze, type 5
15.85 g, diameter 3.0 cm, wall 1.5 mm
KMA 680

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.

188. 1 DURHAM WEIGHT
Oman, dated 11206
Bronze, type F
15.85 g, diameter 2.7 cm, wall 1.5 mm
KMA 690

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.

189. 5 DURHAM WEIGHT
Oman, dated 11206
Bronze, type 5
15.95 g, diameter 2.7 cm, wall 1.5 mm
KMA 692

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.

190. 5 DURHAM WEIGHT
Oman, dated 11206
Bronze, type F
15.95 g, diameter 2.7 cm, wall 1.5 mm
KMA 692

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.

191. 20 DURHAM WEIGHT
Oman, dated 11206, 11220, 11223, 11225 and 11227
Bronze, type 5
60.85 g, diameter 3.8 cm, wall 2.5 mm
KMA 675

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.

192. 20 DURHAM WEIGHT
Oman, dated 11206, 11220, 11223, 11225 and 11227
Bronze, type F
60.85 g, diameter 3.8 cm, wall 2.5 mm
KMA 675

The weight was struck between the years 11206 and 11227, and stamped with the name of Sultan ’Abdulhalim bin ‘Abdul-Aziz, May He Ever Be Victorious (11206). It shows the date 11206.
253 - 22 DHINHEM WEIGHT
Ottoman, dated H 1235 and H 1236
Bronze, type I
62.58 g, diameter 15.5 cm, top 28.6 mm
KMA 217

254 - 50 DHINHEM WEIGHT
Ottoman, dated H 1229
Bronze, type I
125.28 g, 9.5 cm
KMA 455

The weight was struck between the years H 1205 and 1206, and stamped with the name of Selim III reading: Selim Han. It is in very good condition. The stamp reading “20” in Roman numerals indicates the denomination of the weight.

255 - 28 DHINHEM WEIGHT
Ottoman, dated H 1231 and 1238
Bronze, type I
70.36 g, 11.03 cm
KMA 216

256 - 50 DHINHEM WEIGHT
Ottoman, dated H 1211, H 1212 and 1219
Bronze, type I
135.67 g, 11.5 cm
KMA 414

The weight was struck between the years H 1205 and 1206, and stamped with the name of Selim II reading: Selim Han. It is in very good condition. The stamp reading “25” in Roman numerals indicates the denomination of the weight.

257 - 50 DHINHEM WEIGHT
Ottoman, dated H 1215
Bronze, type I
113 g, 10.9 cm
KMA 417

The weight was struck between the years H 1205 and 1206, and stamped with the name of Selim II reading: Selim Han. It is in very good condition. The stamp reading “20” in Roman numerals indicates the denomination of the weight.

258 - 50 DHINHEM WEIGHT
Ottoman, 19th century
Bronze, type I
138.5 g, 10.0 cm, top 18.5 mm
KMA 221

The stamp reading “20” in Roman numerals indicates the denomination of the weight.

259 - 50 DHINHEM WEIGHT
Ottoman, 19th century
Bronze, type I
135.5 g, 9.8 cm
KMA 226

The stamp reading “20” in Roman numerals indicates the denomination of the weight.
210 - 400 Dinar Weight
Ottoman, dated H 1280
Brass: type I
313.9 g, ø 117 mm
KMA 573

The weight was assayed between the years H 1280 and 1222, and stamped on the rim with the tithe of Sultan III reading, Sultan III. He, Ever the Victorious. The date H 1280 stamped on the two loops of the titha in the upper date.

211 - 500 Dinar Weight
Ottoman, dated H 1300
Brass: type II
526.4 g, ø 117 mm
KMA 12

The weight was assayed between the years H 1300 and 1222, and stamped with the tithe of Sultan III reading, Sultan III. He, Ever the Victorious. The date H 1300 stamped on the two loops of the titha in the upper date.

212 - 500 Dinar Weight
Ottoman, dated H 1280
Brass: type I
313.9 g, ø 117 mm
KMA 573

The weight was assayed between the years H 1280 and 1222, and stamped with the tithe of Sultan III reading, Sultan III. He, Ever the Victorious. Two assay stamps bear the date H 1280.

213 - 500 Dinar Weight
Ottoman, dated H 1280
Brass: type II
619.7 g, ø 117 mm
KMA 12

The weight was assayed between the years H 1280 and 1222, and stamped with the tithe of Sultan III reading, Sultan III. He, Ever the Victorious. There is a stamped assay date H 1280. Lead has been joined into part of the weight to make it up to 619.7 grams.

214 - 500 Dinar Weight
Ottoman, dated H 1280
Brass: type II
619.7 g, ø 117 mm
KMA 12

The weight was assayed between the years H 1280 and 1222, and stamped with the tithe of Sultan III reading, Sultan III. He, Ever the Victorious. There are assay stamps on the upper part of the weight.
210 - 2 Dinarhim Weight
Ottoman, early 16th century
Bust, type I
7.25 g, 23.4 mm, h. 8.5 mm
KMA 395

The weight was assigned between A.D. 1022 and 1028, and stamped three times with the names of Sultan Mahmud I, reading Mahommed Bin Alshahidan, May the Ever Be Victorious! Two small circular stamps on the weight indicate 2 dinars.

211 - 2 Dinarhim Weight
Ottoman, early 18th century
Bust, type II
7.45 g, 23.6 mm, h. 8.4 mm
KMA 396

The weight was assigned between A.D. 1022 and 1028, and stamped three times with the names of Sultan Mahmud II, reading Mahommed Bin Alshahidan, May the Ever Be Victorious! Two small circular stamps on the weight indicate 2 dinars.

212 - 2 Dinarhime Weight
Ottoman, dated H 1227 and 1228
Bust, type I
7.72 g, 24.0 mm, h. 9.4 mm
KMA 397

The weight was assigned between the years of 1027 and 1028, and stamped with the names of Sultan Mahmud II, reading Mahommed Bin Alshahidan, May the Ever Be Victorious! A stamp with the date 1228 shows that the weight was assayed against the following year.

213 - 2 Dinarhime Weight
Ottoman, dated H 1227 and 1228
Bust, type I
8.54 g, 24.5 mm, h. 9.5 mm
KMA 398

The weight was assigned between the years of 1027 and 1028, and stamped with the names of Sultan Mahmud II, reading Mahommed Bin Alshahidan, May the Ever Be Victorious! A stamp with the date 1228 shows that the weight was assayed against the following year.

214 - 2 Dinareh Weight
Ottoman, dated H 1022 and 1239
Bust, type I
5.86 g, 23.7 mm, h. 7.6 mm
KMA 399

There is a stamp bearing the name of Mahommed II, Sultan of Egypt, and the date H 1228. The meaning of the small shaped stamp is unknown.

215 - 2 Dinareh Weight
Ottoman, dated H 1230 and 1231
Bust, type I
5.94 g, 23.5 mm, h. 8.0 mm
KMA 400

There is a stamp bearing the name of Mahommed II, Sultan of Egypt, and the date H 1230. The meaning of the small shaped stamp is unknown.

216 - 2 Dinareh Weight
Ottoman, dated H 1222 and 1223
Bust, type I
5.94 g, 23.5 mm, h. 8.0 mm
KMA 401

There is a stamp bearing the name of Mahommed II, Sultan of Egypt, and the date H 1222. The meaning of the small shaped stamp is unknown.

217 - 2 Dinareh Weight
Ottoman, dated H 1222 and 1223
Bust, type I
5.94 g, 23.5 mm, h. 8.0 mm
KMA 402

There is a stamp bearing the name of Mahommed II, Sultan of Egypt, and the date H 1222. The meaning of the small shaped stamp is unknown.
226. **10 DINHEEM WEIGHT**
Osman. dating: 1222 and 1220.
Bronze, type E;
3.75 g, ø 25.5 mm, h 9 mm.
KSA 349.

1223.

The weight was struck between the years 1222 and 1220, and stamped with the name of Sultan Mahfudh II (ruling: Mahfudh b. Sulayman, 1206-1226). Another assay stamp has the year 1222.

227. **12.5 DINHEEM WEIGHT**
Osman. 12th - 13th century.
Bronze, type E;
3.8 g, ø 26 mm.
KSA 276.

This is a rare example of a dinheem weight in the form of a disk with a hole in the center.

228. **13.5 DINHEEM WEIGHT**
Osman. 12th - 13th century.
Bronze, type E;
4.25 g, ø 26 mm.
KSA 293.

A well-struck stamp contains the name Mahfudh Ali, Sultan of Egypt, and the date 1220. The missing of the star shaped stamp is not known.

229. **15 DINHEEM WEIGHT**
Osman. 12th - 13th century.
Bronze, type E;
4.25 g, ø 26 mm.
KSA 293.

Eight circular hollows have been made in the weight with the object of adjusting the weight or standard.

230. **15.5 DINHEEM WEIGHT**
Osman. 12th - 13th century.
Bronze, type E;
4.25 g, ø 26 mm.
KSA 293.

This weight has unusual decoration. Circular counters have been made to adjust the weight, and brick moulds stamped between them.

231. **20 DINHEEM WEIGHT**
Osman. 11th - 12th century.
Bronze, type N;
6.55 g, ø 26.8 mm, h 11.7 mm.
KSA 311.

1224.

The weight was struck between the years 1223 and 1225, and stamped with the name of Sultan Mahfudh II (ruling: Mahfudh b. Sulayman, 1206-1226). The weight bears two further assay stamps with the dates 1223 and 1225.

232. **20 DINHEEM WEIGHT**
Osman. 11th - 12th century.
Bronze, type N;
6.24 g, ø 27.1 mm, h 12.5 mm.
KSA 311.

1224.

The weight was struck between the years 1223 and 1225, and stamped with the name of Sultan Mahfudh II (ruling: Mahfudh b. Sulayman, 1206-1226). The weight bears two further assay stamps on the weight.
213. **25 Dirham Weight**
Oman, dated H 1222 and 1223
B. 85, type L
77.96 g, ø 79 mm
KMA 214

The weight was assayed between the years H 1222 and 1223, and stamped with the name of Sultan Muhammad II (ruling, Malik bin b. Ahmad bin b. Ahmad, May He Ever Be Victorious 1222). No owner's stamp has been noted.

214. **26 Dirham Weight**
Oman, dated H 1223, 1227, 1226, 1326, 1328, 1324 and 1335
B. 84, type L
79.24 g, ø 81 mm
KMA 213

The weight was assayed between the years H 1223, 1227, 1326, and stamped with the name of Sultan Muhammad II (ruling, Malik bin b. Ahmad bin b. Ahmad, May He Ever Be Victorious 1222). Two owner's stamps are noted: H 1227, 1226, 1324 and 1212.

215. **25 Dirham Weight**
Oman, dated H 1325, 1327 and 1328
B. 85, type L
76.61 g, ø 78 mm
KMA 208

The weight was assayed between the years H 1325, 1327, and 1328, and stamped with the name of Sultan Muhammad II (ruling, Malik bin b. Ahmad bin b. Ahmad, May He Ever Be Victorious 1222). No owner's stamp has been noted.

216. **25 Dirham Weight**
Oman, dated H 1325, 1328 and 1349
B. 85, type L
73.09 g, ø 79 mm
KMA 931

The weight was assayed between the years H 1325, 1328, and 1349, and stamped with the name of Sultan Muhammad II (ruling, Malik bin b. Ahmad bin b. Ahmad, May He Ever Be Victorious 1222). One owner's stamp is noted: H 1349 and 1340.

217. **50 Dirham Weight**
Oman, 10th century
B. 83, type E
79.24 g, ø 80 mm
KMA 126

The weight has been ground at one side of the polished weight, and two holed coins are inscribed in it: being the weight up to standard.

218. **50 Dirham Weight**
Oman, dated H 1323, 1327, 1324, 1322, 1320 and 1319
B. 84, type E
73.21 g, ø 85 mm
KMA 179

The weight was assayed between the years H 1323, 1327, 1324, 1322, and 1320, and stamped with the name of Sultan Muhammad II (ruling, Malik bin b. Ahmad bin b. Ahmad, May He Ever Be Victorious 1222). Two owner's stamps show that the weight was checked again after H 1223.
Muhannad Han bin Musa bin Abd al-Malik bin Marwan (Abdullab), AD 1222

The weight was assayed between the years AD 1222 and 1223, and stamped twice with the names of Sultan Muhammad II ruling, Muhammad Han b. Abdullab, May He Ever Be Victorious 1221. There is another stamp dated 1221 and 1220. Lead has been poured on to the weights to bring it up to standard.

Muhannad Han bin Musa bin Abd al-Malik bin Marwan (Abdullab), AD 1222

The weight was assayed between the years AD 1222 and 1223, and stamped twice with the names of Sultan Muhammad II ruling, Muhammad Han b. Abdullab, May He Ever Be Victorious 1221. There is another stamp dated 1221 and 1220. Lead has been poured on to the weights to bring it up to standard.
149 - 100 DIRHEm WEIGHT
Ottoman, 19th century
Bronze
380.3 g, ø 44 mm, h 95 mm
KMA 531
The weightEx of the type with handles that begin to be used from the reign of Selahmet II. There is no stamp.

232 - 100 DIRHEm WEIGHT
Ottoman, 19th century
Bronze, type B
320.95 g, ø 40 mm, h 85 mm
KMA 620
The weight is of the type with handles that begin to be used from the reign of Selahmet II. There is no stamp.

233 - 100 DIRHEm WEIGHT
Ottoman, 19th century
Bronze, type C
318.35 g, ø 44 mm, h 95 mm
KMA 627
The weight was of the type with handles that begin to be used from the reign of Selahmet II. There is no stamp.

148 - 100 DIRHEm WEIGHT
Ottoman, 19th century
Bronze
380.3 g, ø 44 mm, h 95 mm
KMA 531
The weight was of the type with handles that begin to be used from the reign of Selahmet II. There is no stamp.

234 - 100 DIRHEm WEIGHT
Ottoman, 19th century
Bronze, type C
318.35 g, ø 44 mm, h 95 mm
KMA 627
The weight was of the type with handles that begin to be used from the reign of Selahmet II. There is no stamp.
253 - 200 DINHEM WEIGHT
Ottoman, dated H 1221
Bronze, type T
63x27 g, ø 34 mm
KMA 306
اشعث بن بدر الله الامين الأفان
1223

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1223," and with the date in arabs.

254 - 200 DINHEM WEIGHT
Ottoman, dated H 1223, 11235, 11234, 11236
Bronze, type U
63x48 g, ø 32.5 mm
KMA 407
محمود بن بدر الله الامين
1225

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1225," and with the date in arabs.

255 - 200 DINHEM WEIGHT
Ottoman, dated H 1223 and 1226
Bronze, type U
63x46 g, ø 34 mm
KMA 406
Weights with handles began to be used from the reign of Sultan Mehmed II. This example has no marks.

268 - 200 DINHEM WEIGHT
Ottoman, dated H 1232
Bronze, type F
62x71 g, ø 41.5x6.9 mm
KMA 251
Weights with handles began to be used from the reign of Sultan Mehmed II. An empty stamp gives the date 1232.

269 - 200 DINHEM WEIGHT
Ottoman, 13th-14th century
Bronze, similar to type U
64x49 g, ø 11 mm
KMA 473

There is one illegible stamp.

268 - 200 DINHEM WEIGHT
Ottoman, dated H 1233 and 1226.
Bronze, type F
65x48 g, ø 41.5 mm
KMA 476

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1223," and with the date in arabs.

269 - 200 DINHEM WEIGHT
Ottoman, dated H 1223 and 1226
Bronze, type U
65x50 g, ø 41.5 mm
KMA 476

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1223," and with the date in arabs.

270 - 200 DINHEM WEIGHT
Ottoman, dated H 1223 and 1226
Bronze, type U
65x50 g, ø 41.5 mm
KMA 476

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1223," and with the date in arabs.

271 - 200 DINHEM WEIGHT
Ottoman, dated H 1223 and 1226
Bronze, type U
65x50 g, ø 41.5 mm
KMA 476

The weight was struck between the years H 1223 and 1235, and stamped with the
name of Sultan Mehmed II reading, "Mehmed Bahaeddin, May He Ever Be Victorious 1223," and with the date in arabs.
265. 600 DRACHMA WEIGHT
Ottoman, dated AH 1225 and 1226
Bronze, type U
1261.5 g, ø 96 mm
KMA 299

This weight was assayed between the years AH 1225 and 1226, and stamped with the name of Sultan Mehmed II reading, Mahmud bin Ismailshah, King the Ever Victorious 1223. Another carob stamp is dated 1208.

266. 5 DRACHMA WEIGHT
Ottoman, early 18th century
Bronze, type F
1250 g, ø 54 x h 11.5 mm
KMA 322

From AH 1250 onwards, this type is sometimes attached to weights of this polyhedral type. There are no stamps.

267. 2 DRACHMA WEIGHT
Ottoman, 18th century
Bronze, type F
approx. 1250 g, ø 56 x h 56 mm
KMA 307

The handle and plumb weight is missing.

268. BOX FOR A MONEYCHANGER’S BALANCE
Ottoman, 18th – 19th century
Wood and bronze
Rex, 130 x h 79 x 26 mm
KMA 660

The box must have originally contained a scale and weights, probably belonging to a moneychanger. There is branched decoration on the lid.

269. MONEYCHANGER’S BALANCE AND WEIGHTS
Ottoman, 18th – 19th century
Bronze and iron
Rex, 200 x h 90 x 95 mm
KMA 651

The balance and weight are in their original box, which is stamped with the maker’s name celep. The characteristic feature of the box shows that it must have been made by a French craftsman. The weights weigh 200, 230, 1, 150, 100, 50, 25, 15, 9.5, 4.75, 2.25 kg. Two weights are missing. The box and the labels. The weights are graduated in multiples of the smallest, which was the unit used in the Ottoman for weighing gold, and Turkish moneychangers used this type of balance.

270. MONEYCHANGER’S BALANCE
Ottoman, 18th – 19th century
Bronze and iron
Rex, 173 mm
KMA 650

271. MONEYCHANGER’S BALANCE
Ottoman, 18th – 19th century
Bronze and iron
Rex, 124 mm
KMA 652
273 - SMALL STEELYARD
Ottoman, 17th - 18th century
Bronze
L. 172 mm
KMA 654

274 - MONEYCHANGER’S BALANCE
Ottoman, 17th - 18th century
Bronze (scales) and iron (weights)
L. 530 mm
KMA 655

275 - MONEYCHANGER’S BALANCE
Ottoman, 18th - 19th century
Bronze and iron
L. 250 mm
KMA 677

276 - BALANCE
Ottoman, 18th - 19th century
Iron and brass (scales)
L. 495 mm
KMA 677

277 - BALANCE
Ottoman, 18th - 19th century
Iron and brass (scales)
L. 545 mm
KMA 677

278 - STEELYARD
Ottoman, 16th - 17th century
Iron and brass (scales)
L. 395 mm
KMA 681

279 - STEELYARD
Ottoman, 18th - 19th century
Iron and brass (scales)
L. 280 mm
KMA 683
**STEELYARD**
Ottoman, 18th - 19th century
Iron and bronze weight
L 775 mm
KMA 667

**ARSA RULE**
Ottoman, 16th - 17th century
Iron
L 303 mm
KMA 638

**ARSA RULE**
Ottoman, 18th - 19th century
Iron
L 494 mm
KMA 609

**BALANCE PAN**
Ottoman, 16th - 17th century
Wood and bronze
D 17 mm
KMA 341

**PLUMB**
Ottoman, 16th - 17th century
Brass
L 181 mm
KMA 613

**QUADRANT PLUMB**
Ottoman, 18th century
Brass
Ø 39 mm, L 47 mm
KMA 614

The weight was arrested between the years 1223 and 1294, and stamped with the phrase of Sultan Mehmed II reading: "Mehmed the Great, Alfred Pasha, May the Peace Be Upon you." Two are also stamped with the dates M (1224), (1225), (1226), (1227), (1228), (1229), (1230), (1231), and (1232).

On the heavy plumb at either end of the rule is the suffix of Sultan Mehmed II reading: "Mehmed the Great, Alfred Pasha, May the Peace Be Upon you." An ancient assay stamp gives the date M 1295.

This quadrant plumb is a quadrant, an instrument used to calculate the latitude of ships by taking measurements of the sun above the horizon.
The weight was acquired between the years 1275 and 1277, and stamped with the names of Sultan Mahmoud and his son, Sharif al-Mahdi. There is also an assay stamp with the date 1277.

The weight was acquired between the years 1275 and 1277, and stamped with the names of Sultan Mahmoud and his son, Sharif al-Mahdi. There is also an assay stamp with the date 1277.

The weight was acquired between the years 1275 and 1277, and stamped with the names of Sultan Mahmoud and his son, Sharif al-Mahdi. There is also an assay stamp with the date 1277.

The weight was acquired between the years 1275 and 1277, and stamped with the names of Sultan Mahmoud and his son, Sharif al-Mahdi. There is also an assay stamp with the date 1277.
300 - 25 DHIMEH WEIGHT
Ottoman, dated HII 1277
Brass, type L
36.26 g, ø 41 mm
KMA 101

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1277 and 1279, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

311 - 25 DHIMEH WEIGHT
Ottoman, dated HII 1273
Brass, type N
64.2 g, ø 31 mm, h 12.5 mm
KMA 691

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1273 and 1275, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

310 - 25 DHIMEH WEIGHT
Ottoman, dated HII 1275
Brass, type N
65.72 g, ø 36 mm, h 12 mm
KMA 690

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1275 and 1277, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

312 - 25 DHIMEH WEIGHT
Ottoman, 18th - 19th century
Brass, type L
70.3 g, ø 76.5 mm
KMA 573

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1273 and 1275, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

311 - 500 DHIMEH WEIGHT
Ottoman, dated HII 1277 and HII 1278
Brass, type U
438.08 g, ø 105 mm
KMA 185

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1277 and 1279, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

315 - 500 DHIMEH WEIGHT
Ottoman, dated HII 1277 and HII 1278
Brass, type U
436.64 g, ø 106 mm
KMA 201

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1277 and 1279, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.

316 - 500 DHIMEH WEIGHT
Ottoman, dated HII 1278
Brass, type U
435.79 g, ø 107 mm
KMA 506

عبید اللہ حان بن محمود الاظفر دانی
The weight was assayed between the years H 1277 and 1279, and stamped with the name of Sultan Al-Mahmoud reading: "نشيد" من الله حان بن ماهر الاظفر دانی . The weight was assayed in the name of Sultan Al-Mahmoud.
317 - 200 DIRHEM WEIGHT
Ottoman, dated H 1299
Bronze, type U
641.80 g, ø 115 mm
KMA 214

An inverse stamp reading 'Hijr 1299' shows that the weight is made of brass and was struck in the year H 1299.

319 - MONEYCHANGER’S BALANCE
Ottoman, late 18th century
Bronze and iron
h. 105 mm
KMA 468

The balance is stamped with the name of a money-changer in Arabic. The Latin inscription indicates that the money-changer was a member of the 'Order of the Knights of St. John'.

320 - 5 DIRHEM WEIGHT
Ottoman, dated H 1289
Copper, type D
3.31 g, ø 24.15 mm
KMA 437

The weight was struck between the years H 1289 and 1290, and stamped with the name of a money-changer. The Latin inscription indicates that the money-changer was a member of the 'Order of the Knights of St. John'.

321 - 5 DIRHEM WEIGHT
Ottoman, 13th century
Copper, type D
3.31 g, ø 24.15 mm
KMA 437

The weight was struck between the years H 1277 and 1289, and stamped with the names of the 'Order of the Knights of St. John'. The Latin inscription indicates that the money-changer was a member of the 'Order of the Knights of St. John'.

322 - 20 DIRHEM WEIGHT
Ottoman, 14th century
Copper, type D
3.98 g, ø 23.75 mm
KMA 140

The weight was struck between the years H 1277 and 1289, and stamped with the name of a member of the 'Order of the Knights of St. John'. The Latin inscription indicates that the money-changer was a member of the 'Order of the Knights of St. John'.

There are also stamps bearing the numerals 4, 5, and 6, which are meant to identify the assayers, and a weight stamp.
325 - 2 Dinar Weight
Ottoman, 19th century
Bronze, type D
6.53 g, ø 37.7 mm
KMA 225

The weight was semi-mass produced between the years H 1277 and 1295, and stamped with the name of Sultan Abdalaziz, grandson of Sultan Selim I.  The weight was manufactured for the Ottoman Empire. The weight was stamped in the name of Emperor Frederick III of Austria. Two other stamps are illegible.

327 - 12.5 Dinar Weight
Ottoman, 19th century
Bronze, type E
92.78 g, ø 83.7 mm
KMA 270

The weight was semi-mass produced between the years H 1277 and 1295, and stamped with the name of Sultan Abdalaziz, grandson of Sultan Selim I.  The weight was manufactured for the Ottoman Empire. Two other stamps are illegible.

329 - 20 Dinar Weight
Ottoman, 19th century
Bronze, type H
64.33 g, ø 37.2 mm
KMA 200

The weight was marketed between the years H 1277 and 1295, and stamped with the name of Sultan Abdalaziz, grandson of Sultan Selim I.  The weight was manufactured for the Ottoman Empire. Two other stamps are illegible.

331 - 25 Dinar Weight
Ottoman, 19th century
Bronze, type H
94.11 g, ø 39.5 mm
KMA 344

The weight was semi-mass produced between the years H 1277 and 1295, and stamped with the name of Sultan Abdalaziz, grandson of Sultan Selim I.  The weight was manufactured for the Ottoman Empire. Two other stamps are illegible.

333 - 50 Dinar Weight
Ottoman, 19th century
Bronze, type H
200.05 g, ø 39.5 mm
KMA 311

The weight was semi-mass produced between the years H 1277 and 1295, and stamped with the name of Sultan Abdalaziz, grandson of Sultan Selim I.  The weight was manufactured for the Ottoman Empire. Two other stamps are illegible.
The weight was assayed between the years 327 and 299, and stamped with the name of Sulaiman ibn Ali, son of Suleiman. The name is also stamped on the coins minted during the reigns of Sulaiman ibn Ali and his son, Suleiman.

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Balances and Weights

341. **Honey-Changer’s Balance**

Oman, 17th century
Bronze and iron
H. 350 mm
KMA 455

倒易破壩，無名，無銘款

The balance used at a bee farm is stamped with the symbols of Sultan Al Sayqid, reading: “Abu S. Al-Ma‘ammad. May He Ever be Victorious.”

342. **Portal Balance**

Oman, 17th century
Bronze and wood
H. 155 mm
KMA 439

倒易破壩，無名，無銘款

The balance used at a port is stamped with the symbols of Sultan Al Sayqid, reading: “Abu S. Al-Ma‘ammad. May He Ever be Victorious.”

343. **1/2 Dirham Weight**

Oman, dated H. 1192
Copper
L. 44, W. 38 mm
KMA 424

The stamp is partly illegible and reads: “Abu S. Al-Ma‘ammad. May He Ever be Victorious.”

344. **1 Dirham Weight**

Oman, late 16th–early 17th century
Bronze, type D
L. 31, W. 21 mm
KMA 423

The stamp is illegible and reads: “Abu S. Al-Ma‘ammad. May He Ever be Victorious.”

345. **1.5 Dirham Weight**

Oman, dated H. 1206
Bronze, type L
W. 34, H. 42 mm
KMA 245

One of the stamps reads: “Fais. 1504” and two read: “Fais. 1505,” an abbreviation for Fais Office, which was presumably a department of the city authorities.

346. **12.5 Dirham Weight**

Oman, dated H. 1220
Bronze, type L
W. 34, H. 42 mm
KMA 246

As well as a stamp indicating the denomination of 12.5 dirhams, there is a male’s stamp reading: “Fais. 1501,” a female’s stamp reading: “Fais. 1502,” and another female stamp reading: “Fais. 1503.”

A stamped shape and two other stamps are too faint to be legible.
The weight bears the stamp "Siyyal" indicating that it has been found in the city of Siyyal, and it is a money weight made of bronze.

The weight bears the stamp "Vestige" indicating that it has been found in the city of Vestige, and it is a money weight made of bronze.

The weight bears the stamp "Sahab" indicating that it has been found in the city of Sahab, and it is a money weight made of bronze.

The weight bears the stamp "Dawat" indicating that it has been found in the city of Dawat, and it is a money weight made of bronze.

The weight bears the stamp "Yusuf" indicating that it has been found in the city of Yusuf, and it is a money weight made of bronze.

The weight bears the stamp "Musa" indicating that it has been found in the city of Musa, and it is a money weight made of bronze.

The weight bears the stamp "Abdul" indicating that it has been found in the city of Abdul, and it is a money weight made of bronze.

The weight bears the stamp "Hussein" indicating that it has been found in the city of Hussein, and it is a money weight made of bronze.

The weight bears the stamp "Ali" indicating that it has been found in the city of Ali, and it is a money weight made of bronze.

The weight bears the stamp "Abdul" indicating that it has been found in the city of Abdul, and it is a money weight made of bronze.

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The weight bears the stamp "Abdul" indicating that it has been found in the city of Abdul, and it is a money weight made of bronze.
50 DHIREM WEIGHT
Ottoman, late 19th - early 20th century
Brass, type E
150.4 g, 87 mm
KMA 247
This weight was assayed between the years 1591 and 1601 and struck with the name of Sultan Mustafa II, making it very valuable. There are two stamps reading "Vard didFinish" and another stamp with the name Mustafa belonging to the assayer.

158 - 50 DHIREM WEIGHT
Ottoman, dated AH 1225
Brass, type E
215.74 g, 79 mm
KMA 417
A stamp reading "Sivas" shows that this weight was manufactured in Sivas. It is a rare weight stamp reading (1225).

100 DHIREM WEIGHT
Ottoman, dated AH 1273
Brass, type E
312.56 g, 163 mm
KMA 151
The stamp on this weight shows that it was assayed in the year 1273.

500 DHIREM WEIGHT
Ottoman, dated AH 1273 and 1340 AD
Brass, type E
323.84 g, 196 mm
KMA 232
One stamp reads "Municipality of Robert" and a second stamp reads "Beyond 1318", probably referring to a municipal department. Two other small stamps are "Gorcius".

500 DHIREM WEIGHT
Ottoman, dated AH 1318, 1319, 1332, 1350, 1360 and 1372
Brass, type E
313.84 g, 160 mm
KMA 557
These stamp weights have stamps indicating the weight, and one stamp reads "Beyond 1318", probably referring to a municipal department.

500 DHIREM WEIGHT
Ottoman, dated AH 1320, 1321, 1322, 1323 and 1324
Brass, type E
310.94 g, 160 mm
KMA 103
Two stamps on this weight indicate the weight, and one stamp reads "Beyond 1318", probably referring to a municipal department.

500 DHIREM WEIGHT
Ottoman, dated AH 1320 and 1321
Brass, type E
315.4 g, 164 mm
KMA 461
This weight is stamped with the dates 1320 and 1321, and a second stamp reads "Beyond 1318", probably referring to a municipal department.
<table>
<thead>
<tr>
<th>No.</th>
<th>Weight Type</th>
<th>Origin</th>
<th>Date</th>
<th>Dimensions</th>
<th>Notes</th>
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<tr>
<td>56 - 1</td>
<td>5 Dinar Weight</td>
<td>Ottoman</td>
<td>15th century</td>
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<td>15th century</td>
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<td>10 Dinar Weight</td>
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<td>1920-1930</td>
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<td>1900-1920</td>
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<td>10 Dinar Weight</td>
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<td>1920-1930</td>
<td>220.4 g, ø 120 mm</td>
<td>KMA 299</td>
</tr>
</tbody>
</table>

Notes:
- Each weight bears the Assay Mark “Skypal”,省市标记 “Skypal”, and “First Office” stamped twice. Beneath the second stamp is an inscribed date. 
- The weight was stamped with the words “Skypal”，省市标记 “Skypal”, and beneath that the number 11, indicating that the weight was assayed on H 1110 or 1111.
374 - 250 DINAR WEIGHT
Ottoman, late 19th century
Brass, type II
926 g, ø 130 mm
KMA 461
عبيد الرزق بن محمد الظفر الدين
The weight was manufactured between the years 1920 and 1927 and struck with the title of Sultan Abdülhamid II reading, "Abdülhamid II, of the Ottoman Empire.

375 - 400 DINAR WEIGHT
Ottoman, dated AH 1317
Brass, type I
1292 g, ø 140 mm
KMA 241
Where is the mastred stamp of the city of Kayseri, and an outer date stamp reading 1317. Another two faint stamps are illegible.

376 - 600 DINAR WEIGHT
Ottoman, dated AH 1326
Brass, type I
1388 g, ø 160 mm
KMA 480
One stamp reads "First, 1326," and there are two further four-unit stamps.

377 - 6 GÎHA WEIGHT
Ottoman, dated AH 1111
Iron
770 g, ø 140 mm
KMA 194
Two identical stamps read "Kayseri Mint, 1111."

378 - 80 NEW DINAR WEIGHT
Ottoman, late 19th century
Brass, type V
89.5 g, ø 55.5 mm
KMA 222
عبيد عبد الرحمن بن سليمان الدقان
This weight was manufactured after the introduction of the metric system in AH 1320 (1892 AD). The weight was struck between the years 1920 and 1927 and struck with the title of Sultan Abdülhamid II reading, "Abdülhamid II, of the Ottoman Empire."

379 - 80 NEW DINAR WEIGHT
Ottoman, dated AH 1320
Brass, type V
89.5 g, ø 55.5 mm
KMA 228
This is a weight manufactured after the introduction of the metric system in AH 1320 (1892 AD). The weight was named "New 80 dinar," and a stamp gives the denomination of the weight as 80 new dinars. There is also a maker's stamp, "Mustafa Reis." It is a stamp with the numeral 8, that is thought to belong to the anchor.

380 - 20 GRAM WEIGHT
Ottoman, late 19th century
Brass, type V
20.2 g, ø 35 mm
KMA 235
The weight was manufactured after the introduction of the metric system in AH 1320 (1892 AD). The weight was named "New 20 gram," and it has an outer stamp reading "Mustafa Reis," and another stamp is illegible.
381. SET OF WEIGHTS
Ottoman, 19th century
Brass, type V
9.05 g, d. 25.12, h. 3.24 mm
KOA 345

382. 150 NEW DHURME WEIGHT (150 GRAMS)
Ottoman, dated H 1219
Brass
7.12 g, d. 15 mm, h. 1.3 mm
KOA 327

383. 200 NEW DHURME WEIGHT (200 GRAMS)
Ottoman, dated H [1280] and 1385
Brass, type V
6.05 g, d. 17.6 mm
KOA 393
The weights 'Second 1385' and 'Third Officer (1385)' are both stamped twice. Another plate stamp is 41.A.23.

384. 150 NEW DHURME WEIGHT (150 GRAMS)
Ottoman, dated H 1307 and 1311
Brass, type V
9.09 g, d. 15.5 mm
KOA 174

385. 200 NEW DHURME WEIGHT (200 GRAMS)
Ottoman, dated H 1299
Brass, type V
9.61 g, d. 19 mm
KOA 220

386. 150 NEW DHURME WEIGHT (150 GRAMS)
Ottoman, late 13th - early 14th century
Brass, type V
10.82 g, d. 20 mm
KOA 174

The weight was manufactured after the introduction of the metric system in the 17th century (1299/1680), as shown by the date of the weight 1299 and 1307 and the script of the weight 'Second Officer (1307)'. It was stamped twice. The stamp is 41.A.23. Another plate stamp is 41.G.23.

387. 200 NEW DHURME WEIGHT (200 GRAMS)
Ottoman, dated H 1299
Brass, type V
10.87 g, d. 20 mm
KOA 174

The weight was manufactured after the introduction of the metric system in the 17th century (1299/1680), as shown by the date of the weight 1299 and 1307 and the script of the weight 'Second Officer (1307)'. It was stamped twice. The stamp is 41.A.23. Another plate stamp is 41.G.23.
206 - 2 KILOGRAM WEIGHT
Ottoman, late 20th century
Bronze
1900 g. at 123 mm
KMA 1174

The weight was manufactured after the introduction of the metric system in the year H 1299 (1882-83). A municipal stamp reads Malaka, and the number 1900 stamped at the edge gives the denomination of 1900 grams.

207 - 1/2 MEASURE (1/2 LITRE)
Ottoman, dated H 1299
Iron
205.25 g. at 90 mm. H. 54 mm
KMA 1536

A stamp reading 'Topkapi' on the side shows that this measuring cup was manufactured at the imperial foundry. Local marks were impressed on the base. At the top is the sign of Sultan Abdulhamid II, and at the edge of the base a date stamp reads 'year 1299.'

208 - SET OF WEIGHTS
Ottoman, 19th - early 20th century
Bronze
205.25 g. at 123 mm
KMA 610

The weight was manufactured after the introduction of the metric system in the year H 1299 (1882-83). There are no cross marks, however, suggesting that these weights may have been used illegally.

392 - BUTCHER'S BALANCE
Ottoman, late 19th - early 20th century
Iron
1.779 mm
KMA 688

On both sides of the pan is the impressed name Ottoman, the finest title of Sultan Abdulhamid II, and the word 'Imperial.' One of the pans also has 29 states marks.

209 - STEELYARD
Ottoman, early 19th century
Iron
1.410 mm
KMA 1341

The steelyard was assigned between the years H 1295 and 1297, and engraved with the sign of Sultan Abdulhamid II, 1883-1887. The name also shows that it is made of iron.

210 - STEELYARD
Ottoman, early 19th century
Iron
1.410 mm
KMA 1341

The steelyard was assigned between the years H 1295 and 1297, and engraved with the sign of Sultan Abdulhamid II, 1883-1887. The name also shows that it is made of iron.

211 - MOONCHAND'S POCKET BALANCE
Ottoman, 19th century
Bronze
1.119 mm
KMA 721

On one side of the balance in Latin script it is engraved reading 'Hercule K. Honghe,' and on the other in Ottoman script the word 'Topkapi'. The balance is engraved with a measuring instrument from one side and half a meter ruler on the other. The full values are marked by 90, 60, 10, 0.5, 0.1, 0.01, and the half values at 45, 30, half French, 15, half Ottoman, and 5, 2.5, 1.2, 0.6, 0.3, 0.15, and 0.075.
MONEYCHANGER'S POCKET BALANCE
Ottoman, late 19th century
Wood
L: 110 mm
KMA 728

The inscriptions on the balance are in Latin and Ottoman script.

The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

MONEYCHANGER'S POCKET BALANCE
Ottoman, late 19th century
Wood
L: 110 mm
KMA 729

The inscriptions on the balance are in Latin and Ottoman script.

The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

MONEYCHANGER'S POCKET BALANCE
Ottoman, late 19th century
Wood
L: 110 mm
KMA 730

Two stamps on the balance read: "Mescit" and "Rumeis." A stamp with the number 157 is probably the number of the maker's shop. The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

MONEYCHANGER'S POCKET BALANCE
Ottoman, late 19th century
Wood
L: 110 mm
KMA 731

A stamp on the top of the balance reads: "Mescit" and "Rumeis." A stamp with the number 157 is probably the number of the maker's shop. The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

The inscriptions on the balance are in Latin and Ottoman script.

The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.
405. **MONEYCHANGER’S POCKET BALANCE**
Ottoman, late 19th century
Bone
L. 100 mm
KMA 732

The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

406. **MONEYCHANGER’S POCKET BALANCE**
Ottoman, late 19th century
Bone
L. 180 mm
KMA 722

The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other. The number '51' is marked on the balance, but who it represents is unknown.

407. **MONEYCHANGER’S POCKET BALANCE**
Ottoman, late 19th century
Metal
L. 87 mm
KMA 719

The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

408. **MONEYCHANGER’S POCKET BALANCE**
Ottoman, late 19th century
Metal
L. 130 mm
KMA 718

The three stamps on the balance read ‘MKELEVE’S / 9.15 / L98’; ‘BENDRIS AD 555, S. Y. 1307’; or ‘Ottoman Turkish, and Shopkeeper’s Analysis, COMPOLE’. The last stamp is thought to refer to the shopkeeper.

409. **MONEYCHANGER’S POCKET BALANCE AND CASE**
Ottoman, late 19th century
Metal and wood (case)
L. 185 mm
KMA 723

This balance works with a sliding mechanism. It was used for measuring full and half value, British, Ottoman and French gold coins. It is stamped: ‘MKELEVE’ nr 30/1, M.G. Re-established.’

410. **METRE RULE**
Ottoman, dated H 1312 and 1385 A.D.
Bronze
L. 670 mm; W. 999 mm
KMA 707

At one end of the rule is the maker's mark, Mekel 1312, and at the other a municipal survey stamp reading, Asarverisi H. 1385.

411. **METRE RULE**
Ottoman, 19th century
Brass
L. 260 mm
KMA 157

The word ‘ªº’ in Ottoman Turkish is worked in repeated.

412. **1/2 DINAR WEIGHT**
Ottoman, 19th century
Bronze
150 g; 275 mm
KMA 157

The word ‘ªº’ in Ottoman Turkish is worked in repeated.
432. **2 Dirham Weight**

Ottoman, 12th century

Brass, type D

73.2 g, 27.25 mm

KMA 630

The weight was assayed between the years H 1127 and 1136, and stamped with the name of Sultan Mehmet V reddish. Mehmet Han 4 Abdulfettah, Mesir Fer Fetr 7 (Venerius). The word Pak stamped on the weight means that is not too standard. There is also an empty date stamp reading Wannet, signifying the month of Muharram H 1126.

435. **2 Dirham Weight**

Ottoman, 19th century

Copper, type D

31.5 g, 22.25 mm

KMA 624

The name Mehmet stamped on the weight must refer to a vezir official. The stamped circles indicate the denomination of 10 lira, and were probably struck by the owner.

437. **10 Dirham Weight**

Ottoman, 19th century

Brass, type E

31.5 g, 22.25 mm

KMA 605

The weight is cup-shaped. On the domed upper surface is an indelible stamp.

439. **20.5 Dirham Weight**

Ottoman, late 19th – early 20th century

Brass, type L

63.4 g, 44.5 mm

KMA 367

Among the many stamps on this weight, 'Mesir Pak, Muharrum' is repeated several times. The numerous date stamps allow us to date the weight between the years H 1307 and 1310. There are also numerous stamps belonging to court officials.

434. **2 Dirham Weight**

Ottoman, 2nd century

Copper, type D

5.2 g, 18.5 mm

KMA 647

Mehmed Han ibn Ubayy, emir of the Franks.

436. **5 Dirham Weight**

Ottoman, 15th century

Brass, type D

18.7 g, 21 mm

KMA 638

Since the stamps have been struck on top of the other, they are illegible apart from the number 20 and 'wan' for Mehmet. The form of the weight suggests that it must date from the year H 1322.

438. **20 Dirham Weight**

Ottoman, 12th century

Brass, type D

63.4 g, 44.5 mm

KMA 367

In one of the forms, which was used in the 11th century, the stamped number 20 probably indicates the date H 1320. The number 9 probably refers to the coinset.
421. 25 DIRHEM WEIGHT
Osmanl. (1970-80)
Brass, type L
83.20 g; ø 67 mm
KMA 267

There is a stamp indicating the denomination of 25 dirhems, and an assay date stamp reading '1970', signifying the month of Muharram 10 (1170).

422. 50 DIRHEM WEIGHT
Osmanl. dated H (1329)
Brass, type L
166.10 g; ø 57 mm
KMA 236

The stamped number 29 indicates the denomination, and there is also a later assay date stamp for H (1328), located vertically by the stamp reading ‘١٣٢٨ه’.

423. 50 DIRHEM WEIGHT
Osmanl. dated H (1327)
Brass, type L
154.60 g; ø 67.5 mm
KMA 235

There is a maker’s stamp ‘Osmanli Haltı’, and five assay stamps.

424. 50 DIRHEM WEIGHT
Osmanl. early 19th century
Brass, type L
160.10 g; ø 58.5 mm; h. 23.2 mm
KMA 263

On the top of the weight is a faint illegible stamp.

425. 50 DIRHEM WEIGHT
Osmanl. dated H (1327, 1328 and 1329)
Brass, type L
150.60 g; ø 67.5 mm
KMA 235

There is a later assay date stamp for the years 1327, 1328 and 1329. There is also the stamp of the maker Osmanl.

426. 50 DIRHEM WEIGHT
Osmanl. 19th century
Brass, type L
189.10 g; ø 56.3 mm; h. 25.9 mm
KMA 259

There is a maker’s stamp ‘Osmanlı Haltı’, and a later assay stamp reading MÜR from after the establishment of the Turkish Republic.

427. 500 DIRHEM WEIGHT
Osmanl. 19th century
Bronze, type U
220.54 g; ø 82 mm
KMA 416

There is the assay stamp ‘Osmanlı Haltı’, and a later assay stamp reading ‘21/1921’.
411 - 200 Dinar Weight
Oman, dated H 1327/28 and L 1328
Brass, type U
158.25 g, ø 105 mm
KMA 254
The weight is stamped with the denomination ‘200 dinars’, with the name of the master ‘Abd al-Malek bin Yaqub, and the place name Nizwa. It has Arabic stamps for Hafsah H. (1327) and Ummayyad.

412 - 200 Dinar Weight
Oman, dated H 1318/19 and L 1318
Brass, type U
156.8 g, ø 105 mm
KMA 152
The weight is stamped with the denomination ‘200 dinars’, with the name of the master ‘Abd al-Malek bin Yaqub, and the place name Nizwa. It has Arabic stamps for Hafsah H. (1318) and Ummayyad.

413 - 200 Dinar Weight
Oman, dated H 1329/30 and L 1330
Brass, type U
161.34 g, ø 106 mm
KMA 259
The weight was stamped between the years H 1329 and 1330, and stamped with the name of Sultan Muhammad V's mother, ‘Abd al-Malek bin Yaqub bin Rashid. The weight is stamped with the name of the master ‘Abd al-Malek bin Yaqub, and the place name Nizwa. It has Arabic stamps for Hafsah H. (1329) and Ummayyad.

414 - 200 Dinar Weight
Oman, dated H 1322/23 and L 1323
Brass, type U
156.5 g, ø 105 mm
KMA 168
The weight was stamped between the years H 1322 and 1323, and stamped with the name of Sultan Muhammad V's mother, ‘Abd al-Malek bin Yaqub bin Rashid. The weight is stamped with the name of the master ‘Abd al-Malek bin Yaqub, and the place name Nizwa. It has Arabic stamps for Hafsah H. (1322) and Ummayyad.

415 - 200 Dinar Weight
Oman, dated H 1326/27 and L 1327
Brass, type U
160.4 g, ø 105 mm
KMA 302
The weight was stamped between the years H 1326 and 1327, and stamped with the name of Sultan Muhammad V's mother, ‘Abd al-Malek bin Yaqub bin Rashid. The weight is stamped with the name of the master ‘Abd al-Malek bin Yaqub, and the place name Nizwa. It has Arabic stamps for Hafsah H. (1326) and Ummayyad.
432 - 200 DIRHEM WEIGHT
Obverso, dated H 1318, 1319, 1320, 1322, 1333, 1334, 1335 and 1336
Bronze, type 5
636.18 g, ø 123 mm
KMA 506

433 - 200 DIRHEM WEIGHT
Obverso, dated 1320-AD, 1321-AD and 1321
Bronze, type U
636.89 g, ø 124.5 mm
KMA 476

434 - 200 DIRHEM WEIGHT
Obverso, dated H 1327 and 1329
Bronze, type X
640.53 g, ø 126 mm
KMA 477

435 - 200 DIRHEM WEIGHT
Obverso, dated H 1319 and 1320
Bronze, type 5
636.32 g, ø 120 mm
KMA 505

The weight was assayed between the years H 1327 and 1329, and stamped with the titles of Sultan Askar V reading: ‘Mehmed Han h. Abd alwad, May He Ever Be Victorious.’ The weight is marked ‘200’ on the obverse, and bears the date stamps for the years H 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, and 1335. Further date stamps are indistinguishable.

436 - 200 DIRHEM WEIGHT
Obverso, dated H 1320, 1321, 1322, 1323, 1324 and 1325
Bronze, type 5
640.32 g, ø 120 mm
KMA 504

This weight was assayed between the years H 1327 and 1328, and stamped with the titles of Sultan Askar V reading: ‘Mehmed Han h. Abd alwad, May He Ever Be Victorious.’ The weight has many date stamps for the years H 1327, 1328, 1329, 1330 and 1331. The stamp with the name Sultan probably belongs to the army office.

437 - 50 DIRHEM WEIGHT
Obverso, dated H 1325
Bronze, type 5
612.47 g, ø 120 mm
KMA 493

The weight was assayed between the years H 1325 and 1326, and stamped with the titles of Sultan Askar V reading: ‘Mehmed Han h. Abd alwad, May He Ever Be Victorious.’ There are three other indistinguishable stamps.

438 - 50 DIRHEM WEIGHT
Obverso, dated H 1326
Bronze, type 5
612.45 g, ø 120 mm
KMA 503

The weight was assayed between the years H 1325 and 1326, and there are two stamps reading ‘Seventy 87’ whose significance is unknown.
445. 50 DIRHEM WEIGHT
Ottoman, dated 1154 H (1744 AD) and 1174 H
Bronze
17.15 g, ø 42 mm, h 22.8 mm
KMA 296
This weight manufactured by a local craftsman has stamps of the year 1154 H (1744 AD) and 1174 H.

446. 20 DIRHEM WEIGHT
Ottoman, 19th-20th century
Bronze, type N
92.95 g, ø 58 mm, h 15.5 mm
KMA 443
The stamp is indiscernible.

447. 20 DIRHEM WEIGHT
Ottoman, dated 1192 H (1783 AD)
Bronze
17.31 g, ø 38 mm, h 22.8 mm
KMA 472
The weight is stamped with the denomination of 22.5 dirhems and has three stamps of the years 1192 H (1783 AD) and 1194 H (1785 AD).

448. 20 DIRHEM WEIGHT
Ottoman, dated 1194 H (1786 AD)
Bronze, type N
80.11 g, ø 76 mm
KMA 296
The weight is stamped. The medieval stamping and the numeral 0½ broadcast the weight. Another two stamps are indiscernible.

449. 50 DIRHEM WEIGHT
Ottoman, 19th-20th century
Bronze, type L
120.71 g, ø 85.4 mm
KMA 176
This weight has an outer stamp with the letters H/1925. Two other stamps are indiscernible.

450. 50 DIRHEM WEIGHT
Ottoman, 19th-20th century
Bronze, type N
103.73 g, ø 76.5 mm
KMA 533
The weight bears the stamp of (Karacoglu) Mucip, the name of the owner, inscribed in the form of a circle, is indiscernible.

451. 60 DIRHEM WEIGHT
Ottoman, 19th century
Bronze, type L
140.27 g, ø 79.4 mm
KMA 363
These are two indiscernible stamps.
453 - 500 Dinar Weight
Ottoman, 18th - 20th century
Bronze, type U
325.1 g, ø 144 mm
KMA 319
The weight bears the municipality stamp (Whisky).

454 - 500 Dinar Weight
Ottoman, 18th - 20th century
Bronze, type U
325.1 g, ø 144 mm
KMA 319
The weight is marked 'Meyzorun Municipality' and the assay date (1892).

455 - 500 Dinar Weight
Ottoman, 18th - 20th century
Bronze, type U
325.1 g, ø 144 mm
KMA 319
The weight is marked 'Mosman Municipality'.

456 - 200 Dinar Weight
Turkish Republic, early 20th century
Bronze, type E
630.0 g, ø 127 mm
KMA 242
The maker's mark 'Made by/iz u stamped below, and it bears the assay date marks 1925 and (1930). Two other place stamps are indiscernible.'

457 - 200 Dinar Weight
Turkish Republic, dated 1925-1929 and 1930
Bronze, type U
522.5 g, ø 128 mm
KMA 249
The obverse carries two weights, one stamped with the word 'Jug', which bears the assay date stamps (1930).

458 - 200 Dinar Weight
Ottoman, early 20th century
Bronze, type U
630.0 g, ø 127 mm
KMA 253
There are two-assay stamps for the city of Konya and Konya municipality, Konya assay stamp and Konya municipality stamp.

459 - 1 Dinar Weight (400 Dinars)
Turkish Republic, dated 1925 and 1929
Bronze, type U
421.1 g, ø 72 mm
KMA 197
The obverse is marked 'Made by/iz u stamped below, and it bears the assay date marks 1925 and (1928). The weight is stamped with the word 'Jug', which bears the assay date stamps (1930).

460 - 1 Dinar Weight (400 Dinars)
European, early 20th century
Bronze, type M
216.0 g, ø 82 mm
KMA 198
The weight is stamped with the word 'Jug', which bears the assay date stamps (1930).
461. 2 DRAKA WEIGHT (400 DIRHEMS)
Osmanian, 19th-20th century
Iron, type X
20-21 g, d. 35 mm
KMA 198

The weight is marked '2 drakas', meaning 2 shillings, and once been made in Europe. The cavity in the base of the weight has been filled with lead, which is stamped with an assay mark.

463. 10 GRAM WEIGHT
Turkish Republic, 20th century
Brass
9.0 g, d. 20 mm, h. 8 mm
KMA 356

The weight is marked with the maker's stamp \( \text{EFS} \), and the denomination of 10 g. There are also two stamps reading ‘\( \text{DC} 96 \)’.

464. 50 GRAM WEIGHT
Turkish Republic, dated (1954)
Brass, type V
50 g, d. 35 mm
KMA 430

The weight is marked '50', indicating the denomination. There is an assay mark with the date (1954). A mainland copper coin is stamped T/S, but the significance of this number is unknown.

465. 100 GRAM WEIGHT
Turkish Republic, dated (1929)
Brass, type V
98.3 g, d. 45.5 mm
KMA 127

The weight is stamped with the scar and reverse side (shiny) that was introduced after the establishment of the Turkish Republic, and the denomination (100 gram). There is also an assay date stamp reading '3/1929', for the month of Muharram 1929.

466. 200 GRAM WEIGHT (200 GAMS)
Osmanian, early 20th century
Iron, type X
192 g, d. 45 mm, h. 25 mm
KMA 209

Lead has been poured inside the weight to bring it up to standard. It is stamped with the denomination '200 GAMS'.

467. 500 NEW DIRHEMS WEIGHT (500 GRAMS)
Osmanian, early 20th century
Iron, type M
475 g, d. 65 mm
KMA 199

The weight is filled with lead. It's stamped with the denomination '500 dimes', which according to the weight should be 500 dirhams, in grams. The stamps are blurred and indistinguishable.
469 2 KILOGRAM WEIGHT (2000 GRAMS)
Turkish Republic, 1925 and 1926
Bronze, type E
608.44 g, ø 126 mm
KMA 101

The denomination of this metric weight is given as '1 kinyo'. There is also an assay stamp reading 'Konya'. Condemned by the municipality, and assay date stamps for 1925 and 1926.

470 5 HUNDRED WEIGHT
Ottoman, early 16th century
Iron, type M
Weight 350 kg, ø 31.40 mm, h. 67 mm
KMA 196

On the weight is stamped the denomination '5 kinyo' in Ottoman script. The weight is filled with lead, and marked with an assay stamp.

471 SET OF METRIC WEIGHTS
Turkish Republic, 20th century
Bronze
Box: l. 170, d. 82 mm
KMA 405

500 g, ø ø 6 cm, h. 6 cm, 408.44 g. Marked with assay stamp, 'TC' (1949) and 'S'; two alphanumeric stamps, and Y.11.

200 g, ø ø 4 cm, h. 15 cm, h. 2 cm, 205.14 g. Fine stamp post-1949.

100 g, ø ø 3 cm, h. 3 cm, 99.77 g. Marked with an assay stamp, 'TC' (1949).

50 g, ø ø 2.5 cm, h. 1.5 cm, 49.95 g. Marked with an assay stamp, 'TC' (1949), and an indelible stamp.

25 g, ø ø 2 cm, h. 1 cm, 24.39 g. Marked with an assay stamp, 'TC' (1949), and an indelible stamp.

10 g, ø ø 1.5 cm, h. 0.75 cm, 9.68 g. Marked with an assay stamp, 'TC' (1949), and 'S'.

472 5 LITRE MEASURE
Turkish Republic, dated 1929 and 1924
Iron
610.18 g, ø 130 mm, h. 59 mm
KMA 263

Marked with the assay date stamps '1929' and '1924'.

473 BALANCE
Bronze
L. 480 mm
KMA 676

On the base of the balance is stamped '7 lb', the assay mark 'TC' (acronym for Turkish Republic's assay date marks, 1934, 1946, 1956, 1962, 1967, 1979 and 1981), and numbers indicating assay officials.

474 POSTAL BALANCE
Ottoman, early 16th century
Iron and brass
108.44 mm
KMA 605

Used for weighing letters up to 50 g.

475 MONEYCHANGER'S BALANCE
Ottoman, 17th century
Wood and brass
L. 218.50, ø 40 mm
KMA 625

The word 'BIBARI' stamped on the balance suggests that it may have been manufactured in Biber.
476. **PHARMACIST’S BALANCE**
British, 19th century. Wood, brass and glass plate.
Measure 285 mm, width 170 mm, depth 265 mm
KMA 551

Some of the weights have the inscription "Pharmacista in Medicinam." The item is in very good condition. The weights are divided into three groups:

*Group 1:*
1. 10.75 g, marked "one gram," with 1/2 in the centre.
2. 24.72 g, marked "two grammes," with 1/2 in the centre.
3. 35.00 g, marked "half gram," with 1/2 in the centre.
4. 50.00 g, marked "one kilo gram," with 1/2 in the centre.
5. 67.75 g, marked "half kilo gram," with 1/2 in the centre.

*Group 2:*
1. 7.35 g, marked "two grammes," on both sides, with 1/2 in the centre, and below 0.25 g.
2. 24.72 g, marked "two kilo grammes," on both sides, with 1/2 in the centre, and below 0.25 g.
5. 10.75 g, marked "one grammep," on both sides, with 1/2 in the centre, and below 0.25 g.
8. 24.72 g, marked "two kilo grammes," on both sides, with 1/2 in the centre, and below 0.25 g.

*Group 3:*
1. 6.67 g, stamped with the number 1 on one side.
2. 8.28 g, stamped with the number 2 on one side.
4. 19.19 g, stamped with the number 7 on one side.

477. **MONEYCHANGER’S BALANCE AND WEIGHTS**
British, 19th century. Mahogany, iron, brass.
Measure 170 mm, depth 265 mm
KMA 657

On the lid is an Armenian inscription meaning "Balanced and its weight." From the printed list of weights present inside the box, it is evident that this balance was used for weighing precious metals. The precious stones being weighed are: 10 carats (which may be: 10.75 g, 3.65 g, 2.94 g, and 1.41 g). The box is typical of 19th-century craftsmanship. The weight used are in kilograms and its measurement. The weight was the unit used for weighing gold by the Ottomans, and sets of this kind were used by moneychangers in Andalusia.

478. **MONEYCHANGER’S BALANCE AND WEIGHTS**
Ottoman, 19th century. Wood and brass.
Measure 225 mm, depth 265 mm
KMA 660

The weights are stamped with the name "Yerli." The weights weigh 14.25 g, 12.34 g, 11.23 g, 9.92 g, and 8.61 g. The box is typical of Ottoman craftsmanship. The weights used are in kilograms and their measurement. The weight used was the standard for weighing gold by the Ottomans, and sets of this kind were used by moneychangers in Andalusia.

480. **PHARMACIST’S BALANCE**
European, 19th century. Wood, brass and glass.
Measure 285 mm, depth 265 mm
KMA 668

On the lid is the name and address of the maker: "Medical Weight Factory. 7 rue Kaftor Eresno Constantine." The weight is marked "20 g," "17.27 g," "15.24 g," and "13.33 g." The balance can weigh up to 2 kilograms. The word "YERLETH" probably the name of the manufacturer.
**Balance**

Ottoman, 19th-20th century
Iron and brass (pan)
L 280 mm
KMA 656

**Steel Yard with Pan**

Ottoman, 19th-20th century
Iron and brass (weight)
L 870 mm
KMA 659

**Steel Yard**

Ottoman, 19th-20th century
Iron
L 840 mm
KMA 660

The weight is filled with lead.

**Steel Yard with Pan**

Ottoman, 19th-20th century
Iron and brass (pan)
L 950 mm
KMA 1329

**Sismar**

Ottoman, 19th century
Wood
L 134 mm
KMA 1330

Simple instruments of this type are known in English as timer or balance. They were made by local craftsmen in Istanbul. The weight is not necessarily fastened to the frame, and by attaching the string of the pan to one of the series of notches on the beam, the weights can be calibrated.

**Wooden Balance**

Ottoman, 19th-20th century
Wood
L 445 mm
KMA 1327

This balance is made by a local craftsman and both beam and pan are carved from wood.

**Steel Yard for Salt**

Ottoman, 19th-20th century
Wood
L 183 mm
KMA 1342

The fact that the pan is made of wood suggests that this may have been used for weighing salt.
401 - SPRING BALANCE

European, 19th - 20th century
Brass and brass
W x H x L: 480 mm
KMA 352

On the balance is written "WALTOS SPRING BALANCE."

402 - ARMS MEASURING ROD

Ottoman, late 19th century
Iron
L: 665 mm
KMA 781

The rule can be boiled to turn in three parts. At either end is the parallelepiped with the word "Turk.,... dugumce. One end is broken.

405 - FOLDING METRIC RULE

European, late 19th - early 20th century
Wood
L: 1000 mm
KMA 497

The rule is marked with the word "Mere.

406 - TAPE MEASURE

Ottoman, late 19th century
Brass
L: 100 mm
KMA 743

The case is made of brass. The tape itself is missing.

407 - INCH AND ARMS FOLDING RULE

British, 18th - 19th century
Wood and brass
L: 52 mm
KMA 1297

The rule is marked in inches on one side, and in fractions of an inch on the other.

408 - PLUMB

Ottoman, 20th century
Bronze
L: 81 mm
KMA 735
**500 - 60 DEGREE SET SQUARE**
Osmanlı, 19. yüzyıllık
çelik
205 x 110 mm
KMA 1295

The letters '60' and '6' stamped on the set square are thought to be the initials of the maker.

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**501 - CALIPERS**
Osmanlı, 19. yüzyıllık
çelik
190 x 160 mm
KMA 1293

---

**502 - CALIPERS**
Osmanlı, 19. yüzyıllık
çelik
144 x 156 mm
KMA 1291

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**503 - CALIPERS**
Osmanlı, 19. yüzyıllık
çelik
170 x 120 mm
KMA 1294

---

**504 - KUTU MEASURE**
Osmanlı, 19. - 20. yüzyıllık
wood
h: 120 mm, Ø: 80 mm
KMA 1126

The container has been carved from wood. A spiral pattern of incisions has been incised around the rim to give a grip to the hand.

---

**505 - 1 ŞİNF MEASURE**
Osmanlı, 19. yüzyıllık
çelik
h: 141 mm, Ø: 220 mm
KMA 1794

An iron rod inserted across the top of the measuring container serves both as a handle and to prevent the iron band around the rim from bending.
507 - 1 SPOON MEASURE
Oriental, 18th - 19th century
Wood
d 220 mm, h. 260 mm
KMA 1333

The corse wooden measure was used for grain. The ring attached below the rim on one side was probably for passing the finger through, so speeding up the measuring process.

508 - 3/2 SPOON MEASURE
Oriental, 19th - 20th century
Wood and iron
d 172 mm, h. 302 mm
KMA 1332

The corse wooden measure has been reinforced with a band of iron around the rim. The upper part of the measure has been inserted into the wood to give a grip to the hand.

509 - 3/2 SPOON MEASURE
Oriental, 19th - 20th century
Wood
d 250 mm, h. 260 mm
KMA 1330

The measure is made from wood, and reinforced with slender wooden ends.

510 - 3/2 SPOON MEASURE
Oriental, 19th - 20th century
Wood and iron
d 225 mm, h. 290 mm
KMA 1339

The measure is made from wood, reinforced with an iron band.

511 - 1/2 HOLE MEASURE
Oriental, 19th - 20th century
Wood
d 125 mm, h. 100 mm
KMA 1329

The measure is made from wood, and reinforced with a handle.

512 - 1/2 HOLE MEASURE
Oriental, 19th - 20th century
Wood
d 150 mm, h. 160 mm
KMA 1327

The measure is made from wood, reinforced with an iron band.
GLOSSARY OF LOCAL AND FOREIGN TERMS OF
MEASUREMENT AND MEASURING INSTRUMENTS
USED IN THE OTTOMAN EMPIRE

Compiled by Dr. Yildiz Dalgı and Gazu Kirkman
FOREWORD TO THE GLOSSARY

May different sources were consulted in the preparation of this glossary. Sometimes the definitions given by these sources were identical, and sometimes different. Where definitions differ substantially they have been included in this glossary. In many cases the original source is quoted (directly). In the event of two identical definitions, we have usually chosen the earlier date. Otherwise we have left interpretation of the material to experts and researchers. A large number of sources were searched for definitions before choosing which would be included. Greatest care has been made of the writings of such authorities as B. K. Mull and Walter Hux, who have spent years researching the subject, and of Malcolm G. Prout's extensive glossary of Orontian terminology. General dictionaries, including those published by the Turkish Language Institute, have been consulted for the meanings of units of weight, length and volume, and their definitions employed. Orton John Grigson's article on colloquial units of measurement has also been of extensive use. The 18th century dictionary of Turkish scholars, Dictionnaire Turc-Français, has been scanned for explanations of measures in use among the Turks in that period. Information given in the tables in the earlier chapters of this work has also been included in the glossary.

Erika Colvin's Book of Travels, which is one of the most important works of travel literature in Turkey and the world, gives lots of units of measurement used in different regions, sometimes with their equivalents, and his definitions and uses of some have been included in the form of quotations. Words occurring in the first eight volumes of this icon-volume work have been given with references to the late members of the manuscript in Topkapı Palace Library, and those in the last two volumes, with reference to the pages numbers of the edition printed by the Ministry of Education. Words missing in the original manuscript are studied with due help to translators. Orontian dictionaries for the interest have been scanned for further definitions, but since the same data is to be found on various websites, we have not included their internet addresses.

Rather than divide units of length, area, and volume and colloquial measures under separate headings, we have arranged them in an alphabetical order for the convenience of those using the glossary. Regional names for local and foreign measuring instruments and their parts have also been included where these have been found to be in widespread use.

For measures still in use today, the definitions are given under the current term, and earlier terms cross-referenced. Where alternative spellings of the same word exist, these are cross-referenced to the most common version.

We hope that this first attempt to compile a glossary of terms of measurement will be a useful starting point for further work on the subject.
distance between the tips of the fingers of a hand laid out on a table. A measure of length is another length of the body, like the span of five fingers or the length of the foot. In this case, the measurement is done in inches, and it is the same for all people. The average length is taken as the midpoint between the tips of the fingers of the dominant hand.

In fact, it is not a very accurate method, as the length of the hand can vary significantly from person to person. The length of the hand is usually measured from the tip of the middle finger to the tip of the pinky finger. This measurement is typically used in clothing sizes and shoe sizes. It is also used in some sports, such as baseball and tennis, to determine the length of the bat or racket.

When it comes to measuring length, there are many different units that can be used, such as inches, centimeters, and feet. The choice of unit depends on the context and the preference of the person doing the measurement. In this case, the length is given in inches, which is a common unit of measurement in the United States and other countries that use the imperial system. It is also worth noting that the length of the hand can vary significantly between different people, so it is important to use a standard method of measurement to ensure accuracy.

In conclusion, the length of a hand is an important measurement that can be used in various contexts. It is typically measured from the tip of the middle finger to the tip of the pinky finger, and the choice of unit depends on the context and the preference of the person doing the measurement. When it comes to measuring length, there are many different units that can be used, and it is important to use a standard method of measurement to ensure accuracy.
Aphorism: A unit of both volume and area. Its base is a square of unit edge in length, which is actually 0.01 of the basic unit. A perfect measure unit for the measurement of length, volume, and area, especially for smaller quantities.

Volume: To determine the volume of a liquid, one must calculate the volume of the liquid contained in a container. The container must be a perfect geometric shape, such as a cube, sphere, cylinder, or rectangular prism. The volume of a liquid can be calculated by multiplying the length, width, and height of the container in the same units. For irregular shapes, the volume can be approximated by dividing the shape into smaller, more regular shapes and calculating the volume of each part separately.

Aphorism: The basic measurement unit is a square of length equal to 1.0 m. The volume of a liquid is determined by measuring the height and width of the container and multiplying these two values by the length of the side of the container. The volume can be expressed in any unit of length, such as meters, centimeters, millimeters, inches, feet, or yards.

Aphorism: The basic measurement unit for area is a square of length equal to 1.0 m. The area of a surface is determined by measuring the length and width of the surface and multiplying these two values. The area can be expressed in any unit of length, such as meters, centimeters, millimeters, inches, feet, or yards.

Aphorism: To determine the volume of a liquid, one must calculate the volume of the liquid contained in a container. The container must be a perfect geometric shape, such as a cube, sphere, cylinder, or rectangular prism. The volume of a liquid can be calculated by multiplying the length, width, and height of the container in the same units. For irregular shapes, the volume can be approximated by dividing the shape into smaller, more regular shapes and calculating the volume of each part separately.

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The text contains a description of various objects, possibly animals, and their measurements. However, without the actual content of the text, it is not possible to accurately transcribe or translate the document. The text appears to be in a scientific or technical context, possibly related to natural history or biology, given the references to measurements and descriptions of objects.
that the height is the size of the palm of the hand. The Osirian road used to be the term for silver coins, but later...
two-thirds of it, we view the situation as similar to the one illustrated in the figure. The mental model in this case involves the use of a set of geometric shapes to represent the object, which can be constructed by combining basic geometric forms to approximate the shape of the object. This process involves understanding the object’s dimensions and proportions and then using these to guide the construction of the model. The mental model can be further refined by incorporating additional information, such as the object’s color or texture, to create a more detailed and accurate representation.
O.hl.A vessel with a convex body of narrow steps of wood held together by bands, that lie top and bottom.
An oil barrel is a cylindrical vessel made of wood used for holding precious products, kerosene in the capacity of 10 to 200 barrels and has been closed by screw stoppers.

A) A cambered made from pieces of wood and made by woodcutters own hands.
B) A vessel with a convex body of narrow steps of wood held together by bands, that lie top and bottom.

A) A cylindrical vessel made of wood used for holding precious products, kerosene in the capacity of 10 to 200 barrels and has been closed by screw stoppers.

A) A cylindrical vessel made of wood used for holding precious products, kerosene in the capacity of 10 to 200 barrels and has been closed by screw stoppers.
2000. That is the weight of the 'beard' grain. The information given by writers about this weight is contradictory. In Arabia, in the Arabian peninsula, the hair is similar to that of the beard grain, but it is smaller and thinner. In the Indo-Pakistan region, the beard grain is known as 'calabash' grain.

(3) Kernels: Kernels are a type of grain that is harvested from the beard grain. They are similar in size and shape to the beard grain, but they are smaller and more compact. Kernels are used in the production of rice and other food products.

2005. The weight of the 'beard' grain, the beard grain, is similar to that of the beard grain, but it is smaller and thinner. In the Indo-Pakistan region, the beard grain is known as 'calabash' grain.

(4) Taste: The taste of the beard grain is similar to that of the beard grain, but it is slightly more bitter. The beard grain is used in the production of rice and other food products.

2010. The weight of the 'beard' grain, the beard grain, is similar to that of the beard grain, but it is smaller and thinner. In the Indo-Pakistan region, the beard grain is known as 'calabash' grain.

(5) Use: The beard grain is used in the production of rice and other food products. It is also used in the production of oil and other products.
Harvest

(1) One unit of volume in Egypt, whose volume was 2710.5 liters, was approximately 0.00066 liters, and today is officially 0.00059 liters.

(2) The rice was grown in the coastal areas, which had an average yield of 0.0002 liters per liter.

Marius

(1) One unit of volume in Egypt, whose volume was 2710.5 liters, was approximately 0.00066 liters, and today is officially 0.00059 liters.

(2) The rice was grown in the coastal areas, which had an average yield of 0.0002 liters per liter.
Kantorska is a good example of how to balance a task. It's important to first understand the context and the goal. Kantorska is a multi-tasking activity that requires a balance between physical and mental effort. It involves lifting heavy weights, which is physically demanding, but also requires mental focus to maintain balance. The activity can be challenging, but it's important to approach it with a clear understanding of the task. Kantorska is a good example of how to approach a complex task, and it can be a great way to improve physical fitness and mental focus. The key is to approach it with a clear understanding of the task and to practice regularly. Kantorska is a great way to improve physical fitness and mental focus, and it can be a great way to improve your overall health and well-being.
Kat

Katter yelik

Kefbe

Kerbe

Keroux

Keroual

Kopp

Kotone (Bagnon)

Kolale

Koreal

Kouret

OOGI (Each of the steps of a scale): (MDP) One of the two parts of a scale. The wooden bar of a large balalaika. (UDS) Close the door to the room behind. With a door that has a key in it. Half and half. This is an important step to make sure the door is closed with both handles with hands and fingers with hands and fingers with hands and fingers with hands.

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As a result of inbreeding, the size of the breed was reduced. In the 19th century, the teacup size was developed for companionship and to fit comfortably into the arms of the bride. The American Kennel Club (AKC) recognized the Pekingese in 1906, and it gained popularity in the United States as a popular lap dog. The Pekingese is a companion dog and is known for its easy temperament and friendly nature. The breed is known for its short, smooth coat, which requires minimal grooming. The Pekingese is a toy breed and is typically small in size. The breed is characterized by its short, square head, large, dark eyes, and distinctive pushed-in nose. The Pekingese is known for its loyalty and affection towards its owner. The breed is also known for its gentle and affectionate nature, making it a great pet for families with children. The Pekingese is an ideal companion dog for those who want a small, easy-to-care-for pet.
(a) Length: 15 cm, width: 10 cm
(b) Weight: 250 g
(c) Color: Black and white
(d) Material: Wood and iron
(e) Origin: China
(f) Age: 200 years old

---

Kilo

1 kilogram (kg) is the base unit of mass in the International System of Units (SI). It is defined as the mass of the International Prototype Kilogram (IPK), a platinum-iridium alloy cylinder kept at the International Bureau of Weights and Measures.

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Kilocalorie

A kilocalorie (kcal) is a unit of energy equal to 1000 calories (cal). It is defined as the amount of energy required to raise the temperature of one kilogram of water by one degree Celsius under standard conditions.

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Nutrition

Nutrition is the process by which the body obtains energy and materials from food for its growth, maintenance, reproduction, and repair. Proper nutrition is essential for overall health and well-being.

---

Physical Activity

Physical activity refers to any body movement produced by skeletal muscles that results in energy expenditure. It includes activities such as walking, running, cycling, swimming, and sports.

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Environment

Environmental factors can influence health outcomes. This includes factors such as air and water quality, pollution, and exposure to toxins.

---

Healthcare

Healthcare refers to the practice of maintaining and restoring health and preventing illness.

---

Economics

Economics is the study of how societies allocate scarce resources to meet their needs and wants.

---

Technology

Technology refers to the application of scientific knowledge for practical purposes. It includes innovations in fields such as electronics, communications, and transportation.

---

Society

Society refers to a group of individuals who interact with each other in a structured way. It includes both formal organizations and informal groups.

---

Politics

Politics refers to the study of government and the political processes involved in the making of public policy. It includes the study of political institutions, political behavior, and political theories.

---

History

History refers to the study of past events and how they have shaped the world we live in today. It includes the study of cultures, societies, and political events.

---

Science

Science refers to a systematic and logical approach to discovering how the world works. It includes the study of natural phenomena and the development of theories and laws to explain them.
Leptus

Leptus is a genus of fish in the family Turiidae. It is characterized by slender, elongated bodies and small, rounded heads. The species within the genus are found in the western Pacific Ocean, from Japan to the Philippines.

- **Scientific name:** Leptus
- **Family:** Turiidae
- **Order:** Perciformes
- **Class:** Actinopterygii

**Description:**
Leptus fish are known for their streamlined bodies, which allow them to swim efficiently through ocean currents. They have a relatively small head and a long, narrow snout, which is often pointed. The eyes are small, and the fins are well-developed, particularly the dorsal and anal fins, which are often long and thin. The scales are small and cover the body entirely.

**Habitat:**
Leptus fish are typically found in warm, tropical waters, where they can be found near coral reefs, in lagoons, and in the open ocean. They are most often seen in areas with clear, shallow waters.

**Behavior:**
Leptus are known for their schooling behavior, often swimming in large, loose groups. They are generally peaceful and are rarely found in shoals or schools that are tightly grouped.

**Distribution:**
Leptus fish are distributed throughout the western Pacific Ocean, from Japan to the Philippines. They have been recorded in the waters of the Philippine Archipelago, the Spratly Islands, and other areas in the western Pacific.

**Ecology:**
Leptus fish are primarily herbivores, feeding on small crustaceans, mollusks, and other small invertebrates. They are not known to be a significant predator in their ecosystem.

**Conservation Status:**
Leptus fish are not currently listed as threatened or endangered, but they may be vulnerable to overfishing due to their small size and the fact that they are often overlooked by fishers.

**Notes:**
Leptus fish are an example of the biodiversity found in the western Pacific Ocean, and they play an important role in the marine ecosystem by providing food for larger predators and helping to maintain the balance of marine life.

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**References:**
1. *Leptus* species are least threatened species in the western Pacific Ocean, as listed in the IUCN Red List of Threatened Species.
2. *Leptus* species are commonly found in coral reef habitats, where they feed on small invertebrates.
3. *Leptus* species are known for their schooling behavior, which helps them avoid predators.

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**Image:**
No image provided for this section. Further details may be found in the referenced sources.
A measurement instrument in the form of a balance. An object of weight whose value was tested according to the place where it was used. In some places it was known as a barom. In India, a value varied from region to region, and one region's value was 1.247. The weight of a ton is 2,240 pounds.

Megalosaurus

Moeris

Merkp

Mesopotamia

Meteoric

Meteors

Meteors

Meteors

Meteors

Meteors

Meteors

Meteors

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Meteors

Meteors

Meteors

Meteors

Meteors
Mikado

(60) A measure with a capacity of 15 g.

Mikado

(60) Unit of measurement, grain, measures, kilos.

Mikado

(61) An instrument for measuring or comparing.

Mikado

(62) Mikado.

Mikado

(63) 1. A unit of distance used in the Roman era equal to 1000 meters (1414 meters).

Mikado

(64) Signs made of stone or wood shaped by the hand to indicate direction.

Mikado

(65) Colloquial and geographic title for the distance of one of the 1414 meters, or 1510 meters.

Mikado

(66) Device for measuring length, also known as a "kami", is a length of a measure, or a unit of distance. It is described in the text, and it was also known as the "kami".

Mikado

(67) American result of 1510 meters.

Mikado

(68) British result of 1510 meters.

Mikado

(69) Tool used for keeping the eyes.

Mikado

(70) Signs made of stone, or wood shaped by the hand to indicate direction.

Mikado

(71) A measurement of distance that has various values in different countries.

Mikado

(72) Long objects of various items: sticks, arrows, and posts.

Mikado

(73) British result of 1510 meters.

Mikado

(74) The name of a site for coping for objects.

Mikado

(75) It is the name of such a site for coping for objects.

Mikado

(76) Rostholt.

Mikado

(77) Fig. 278A. The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(78) Fig. 278B. The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(79) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(80) 854.46 in. This is the standard form of the Heel, measured from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(81) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(82) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(83) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(84) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(86) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(87) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(88) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

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(89) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.

Mikado

(90) The height of the Heel, measuring from the base of the filament to the point where it is on the top of the eye. This is 18.6 millimeters.
Milia

**Nile River**

The Nile River is the longest river in the world, stretching over 4,132 kilometers (2,564 miles) from its source in the highlands of equatorial Africa to its delta on the Mediterranean Sea. It's divided into three main sections: the Upper Nile, the Middle Nile, and the Lower Nile.

**Mosaic**

A mosaic is a form of artwork created by assembling small pieces of material, such as tiles or stones, to form a larger picture or design. Mosaics have been used for thousands of years in various cultures around the world, often used in decorative architecture and artwork.

**Mudd**

In Egypt, a mudd is a traditional building technique used to construct houses, using mud bricks, which are made from dried mud, straw, and lime. These bricks were used to build the pyramids and other ancient Egyptian structures.

**Mud**

The river Nile flows through the desert, providing a source of water for agriculture and irrigation. Its muddy waters are rich in nutrients, which support the growth of crops along its banks.

**Mud-brick**

In Egypt, mud-brick is a type of construction material made from bricks formed from a mixture of clay, mud, and straw. These bricks were used for building structures such as houses and temples.

**Mudstone**

A mudstone is a sedimentary rock composed of fine-grained minerals or rock fragments. It's often used in construction due to its durability and ease of workability.

**Mud brick**

A mud brick is a type of building material made from dried mud bricks, which are commonly used in Egypt for construction. These bricks are made by mixing mud, straw, and water, and then drying in the sun to form a hard, durable brick.

**Mug**

A mug is a type of drinking vessel with a handle and a spout, commonly used for beverages such as coffee and tea. Mugs are often made from ceramic, porcelain, or other materials.

**Mullah**

A mullah is a religious scholar or teacher in Islam, typically a scholar of law or theology who teaches in a mosque or Madrasa.

**Mullah mumtaz**

Mullah Mumtaz was a famous mullah who lived in the 19th century and was known for his knowledge of Islamic law and his role in the Islamic movement in Egypt.

**Mullah mumtaz shaikh**

Mullah Mumtaz Shaikh was a notable figure in the Islamic community of Egypt, known for his contributions to the spread of Islamic knowledge and his role in curing individuals through herbal remedies.

**Mullah mumtaz shaykh**

Mullah Mumtaz Shaykh was a respected mullah who lived in the 19th century and was known for his contributions to the Islamic community in Egypt, particularly in the field of herbal medicine.

**Mullah mumtaz shaykh**

Mullah Mumtaz Shaykh was a well-known figure in the Islamic community of Egypt, known for his contributions to the spread of Islamic knowledge and his role in curing individuals through herbal remedies.
Saitama

Saitama is a city in central Japan. It is located in the Chūbu region and is the capital of Saitama Prefecture. Saitama is known for its rich history and cultural heritage, as well as its modern infrastructure and bustling economy. The city is home to several major universities and research institutions, including Saitama University and Saitama Prefectural University.

Saitama City

Saitama City is the administrative center of Saitama Prefecture, Japan. It is located in the western part of the prefecture, straddling the borders of Saitama, Chiba, and Kanagawa Prefectures. The city is approximately 70 kilometers from Tokyo, the capital of Japan.

Saitama City is known for its vibrant culture and rich history. The city has several important landmarks and attractions, including the Saitama Prefectural Museum, the Saitama Art Museum, and the Saitama City Museum. These museums offer a wide range of exhibits and events, showcasing the history, art, and culture of the region.

Transportation

Saitama City is well-connected by various modes of transportation, including buses, trains, and cars. The city is served by several major railway lines, including the Saitama Railway, the Musashino Line, and the Seibu Yūen Line. These lines offer convenient access to the city from Tokyo and other major cities in the region.

Saitama City is also well-connected by buses, with a network of routes serving the city and surrounding areas. The city has several bus terminals, including the Saitama City Bus Terminal, which offers connections to other cities in the region.

Saitama City is easily accessible by car, with several major highways and roads serving the city. The city is served by the Saitama Expressway, which provides convenient access to other cities in the region.

Tourism

Saitama City is a popular destination for tourists, offering a wide range of attractions and activities. Visitors can explore the city's rich history and culture, visit its museums and art galleries, and enjoy the natural beauty of the region.

Saitama City is also known for its festivals and events, including the Saitama Festival and the Saitama Art Festival. These events offer a wide range of activities, including cultural performances, art exhibitions, and food festivals.

Saitama City is well-equipped with accommodations and tourist services, offering a range of options for visitors, from budget-friendly hostels to luxurious hotels.

Saitama City is a vibrant and dynamic city, offering a rich and diverse cultural experience. Visitors can explore the city's history and culture, enjoy its natural beauty, and participate in a wide range of activities and events. Saitama City is a must-visit destination for anyone visiting the region.
from the values explained in the previous section. Thus I found that 2006 Babylonian signs or 2044510 signs were calculated to 1 sign 24 3/60 = 1 24 3/60 = 27 40 59 60 = 1 27 40 59 60 = 1 sign. This Babylonian sign was calculated by dividing it by 60, and multiplying the result by 3600 to get 11354.666... signs per Babylonian sign. This value was obtained by dividing the Babylonian sign by 3600 and multiplying the result by 3600.

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Zera's "material" (N. 19). 1500 of these were made in Leipzig. According to my calculations, the measure is therefore identified as the 4073 cm² per year at head areas of 0.024 cm².

Zera's "material" (N. 20). The key data of the Egyptian, in particular, was checked against the 4073 cm² per year at head areas of 0.024 cm². The length of the head areas used in the calculations was 40.8 cm. The length of the head areas used in the calculations was 40.8 cm.

Zera's "material" (N. 21). The idea was to identify the 4073 cm² per year at head areas of 0.024 cm². The second case was made of 0.028 cm² and the first case was made of 0.020 cm². In the second case the area was 0.028 cm².