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SUNA & İNAN KIRAÇ
RESEARCH INSTITUTE ON
MEDITERRANEAN CIVILIZATIONS

Anatolian Weights and Measures

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FOREWORD

When we founded the Suna and İnan Kıraç 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 to do even 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 Garo Kürkman, 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. Kürkman, he undertook this demanding task, completing it in the projected time.

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

Suna and İnan Kıraç

PREFACE

This book was prepared with the object of publishing the scales and weights in the collection of the Suna and İnan Kıraç 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 universal 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 sufficed with the tables given by researchers in their publications.

I am indebted to Suna and İnan Kıraç for enabling this study to be published, and to Kayhan Dörtlük, director of the Mediterranean Civilizations Research Institute, Çetin Anlağan, director of Sadberk Hanım Museum, and Tanju Anlağan for their constant support.

I wish to thank Dr. Önder Bilgi, lecturer in archaeology at Istanbul University, for his article on weights and measures used in ancient Anatolia; Dr. Meryem Acara 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 Bates, curator in ANS, Zeynep Çelik and Gülendam Nakipoğlu, curators in the Topkapı Palace Museum, Gündağ Kayaoğlu, Cem Mahruki, Dr. Yücel Dağlı, Dr. Bilgin Aydın, Dr. Cemal Pulak, Şeyhmus Dirim, Ömer Diler, Mehmet Tataroğlu, Seyit Ali Kahraman, Professor Dr. Zekeriya Kurşun, Rabbi Yeuda Adoni, Bishop Aram Ateşyan, P. Yeğiya Kervancıyan, Turan Gökyıldırım, İsa Akbaş, Professor Dr. Cengiz Işık, Haluk Perk, Nancy S. Pyle Nichols, Johann-Christoph Hinrichs, Tevfik Soygür and Selamet Taşkın for their invaluable assistance during my research into the Ottoman period; Bahadır Taşkın for his meticulous photography; and Murat Taşkın for his technical assistance.

I am also grateful to Selmin Kangal for her patient and generous assistance at every stage in the preparation of this book, to my dear friend Erkal Yavi for completing its design in such a short time, to Mary Işın for her translations, and to Lokman Şahin and his team at Mas Printing 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 Anatolian weights, scales and other artefacts relating to measurement in the Suna and İnan Kıraç Mediterranean Civilizations Research Institute collection, will throw light on the subject for researchers in many fields.

Garo Kürkman
Istanbul, November 2002

ABBREVIATIONS

AG-CK Anna Gonosová-Christine Kondoleon, *Art of Late Rome and Byzantium, in the Virginia Museum of Fine Arts,* Virginia Museum of Fine Arts, Richmond 1994.

AKMED Mediterranean Civilisations Research Institute.

ANS The American Numismatic Society, New York.

AT Andreas Tietze, *Tarihi ve Etimolojik Türkiye Türkçesi Lugatı,* vol. I, A-E, Istanbul 2002.

Byzans List of some of the units of measurement used in Armenia in the second half of the 7th century according to Ananias of Şirak: H. A. Manandian, *The Trade and Cities of Armenia in Relation to Ancient World Trade*, trans. Nina G. Garsoian, Lisbon 1965.

DLT Besim Atalay, *Divanü Lugat-it-Türk Dizini "Endeks"*, Türk Dil Kurumu, Ankara 1986.

DS *Halk Ağzından Derleme Sözlüğü,* vols. I-XII, Ankara 1963.

EÇ Evliya Çelebi Seyahatnamesi (10 vols.)

Vol. I: ed. Orhan Şaik Gökyay, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 304 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 1996.
Vol. 2: ed. Yücel Dağlı, Zekeriya Kurşun, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 304 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 1999.
Vol. 3: ed. Yücel Dağlı, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 305 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 1999.
Vol. 4: ed. Yücel Dağlı, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 305 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 2001.
Vol. 5: ed. Yücel Dağlı, Seyit Ali Kahraman, İbrahim Sezgin, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 307 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 2001.
Vol. 6: ed. Yücel Dağlı, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Revan 1457 Yazmasının Transkripsiyonu - Dizini,* Yapı Kredi Yayınları, Istanbul 2002.
Vol. 7: ed. Yücel Dağlı, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 308 Yazmasının Transkripsiyonu - Dizini* (forthcoming).
Vol. 8: ed. Yücel Dağlı, Seyit Ali Kahraman, *Evliya Çelebi Seyahatnâmesi, Topkapı Sarayı Bağdat 308 Yazmasının Transkripsiyonu - Dizini* (forthcoming).
Vol. 9: Maarif Vekilliği, Istanbul 1935.
Vol. 10: Maarif Vekilliği, Istanbul 1944.

FD Ferit Devellioğlu, *Osmanlıca-Türkçe Ansiklopedik Lûgat,* Ankara 1982.

Greek Denomination of Greek Weights and Gram Equivalents According to Pernice (Bruno Kisch, *Scales and Weights. A Historical Outline*, New Haven and London, Yale University Press, nd).

H Dates according to the Islamic calendar, beginning with the Hegira

Hİ Halil İnalcık, *Osmanlı İmparatorluğunun Ekonomik ve Sosyal Tarihi,* vol. I, Istanbul 2000.

Hİ2 Halil İnalcık, "Introduction to Ottoman Metrology", *Turcica,* XV, Louvain-Paris-Strasbourg (1983).

HRD Herodotos, *Herodot Tarihi*, trans. M. Ökmen, Istanbul 1991.

Hult According to Hultsch (Hultsch, Friedr, *Griechische und römische Metrologie*, Berlin 1862, table 12).

IAG İbrahim Alaettin Gövsa, *Resimli Yeni Lûgat ve Ansiklopedi (Ansiklopedik Sözlük),* vols. 1-5.

IAM Istanbul Archaeological Museums, Istanbul.

INA Institute of Nautical Archaeology at Texas.

ISAM "Ağırlık" in *Türkiye Diyanet Vakfı İslâm Ansiklopedisi.*

JH Johann-Christoph Hinrichs collection, Germany.

KMA Collection of Mediterranean Civilisations Research Institute Antalya.

MS-UT Metin Sözen-Uğur Tanyeli, *Sanat Kavram ve Terimleri Sözlüğü,* Istanbul 1986.

MZP Mehmet Zeki Pakalın, *Osmanlı Tarih Deyimleri ve Terimleri Sözlüğü.* vols. I-III, Istanbul, 1993.

ML *Meydan Larousse, Büyük Lûgat ve Ansiklopedi.*

MLT "Ölçü Tablosu", *Meydan Larousse, Büyük Lûgat ve Ansiklopedi*, vol. 15, pp. 328-329.

NS Neslihan Sönmez, *Osmanlı Dönemi Yapı ve Malzeme Terimleri Sözlüğü.* Istanbul 1997.

ODB *The Oxford Dictionary of Byzantium,* Oxford, Oxford University Press, 1991.

OS Ottoman Turkish dictionary on the internet.

OŞG Orhan Şaik Gökyay, "Halk Dilinde Ölçü Birimleri", *Türk Folklor Araştırmaları,* 1, (1981), pp. 41-58.

ÖNB Ö. Nasuhi Bilmen, *Hukuki İslamiyye ve Istılahatı Fıkhiyye Kamusu,* vols. I-VIII, Istanbul 1985.

PGİ İnciciyan, P. G., "Tartılar ve Ölçüler", *Hayat Tarih Mecmuası,* vols. 2, 8, (September 1965), pp. 72-4.

Roman Standards of Roman Weights, Denomination of Roman Weights and Gram Equivalents (Bruno Kisch, *Scales and Weights. A Historical Outline*, New Haven and London, Yale University Press, nd).

SB Simon Bendall, *Byzantine Weights, An Introduction*, The Lennox Gallery, London 1996.

SAM Sinop Archaeological Museum, Sinop.

SHM Sadberk Hanım Museum, Istanbul.

SIW Smithsonian Institutions, National Numismatic Collections Washington D.C.

T1 Table of units of weight and their metric equivalents as used in the Ottoman Empire between the 18th and 20th centuries (here p. 113).

T2 Table of metric units of area, grain measures and weight (here p. 14).

TDK *Türkçe Sözlük,* 2 vols., Türk Dil Kurumu Yayınları, Ankara 1988.

Tevrat Units of weight and length, and liquid and grain measures mentioned in the Old Testament.

TIEM Museum of Turkish and Islamic Arts, Istanbul

TSM Topkapı Palace Museum, Istanbul

WH Walter Hinz, "İslamda Ölçü Sistemleri", trans. Acar, Sevim, *Türklük Araştırmaları,* 5, Istanbul 1990, pp. 1-82.

ZK Zeki Kaymaz, "Uşak'ta Ölçü Adları", *21. Yüzyılın Eşiğinde Uşak Sempozyumu (25-27 October 2001),* Istanbul (2001), pp. 79-82.

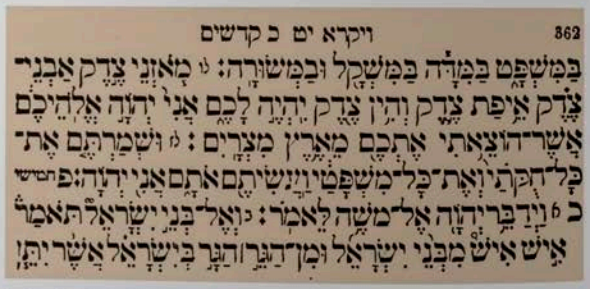
INTRODUCTION

The use of measuring systems for agricultural products and land for the purpose of standardising commercial transactions began in Egypt and Babylon. The ancient Egyptians are known to have used scales around 3500 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 wrecks and archaeological excavations. Finds of this kind on land may have been buried by merchants passing through Anatolia or living there temporarily to prevent them being stolen, or alternatively merchants may have died while 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 *dirhem* weights of the kind used by the Anatolian Seljuks, or in Anatolia of barrel weights of the kind used in Egypt illustrate this phenomenon. Another factor that has led to confusions 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.



Leviticus 19:35-37: 'Ye shall do no unrighteousness in judgment, in meteyard, in weight, or in measure. Just balances, just weights, a just epah, and a just hin, 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.'

1 - Cemal Pulak, *Analysis of the Weight Assemblages from the Late Bronze Age Shipwrecks at Uluburun and Cape Gelidonya, Turkey*, doctorate thesis, Texas, A&M University; George F. Bass – F.H. Doorninck, *Yassı Ada*, vol. 1, Texas 1982; Fred Hocker, *Weight, Money and Weight-Money: The Scales and Weights from Serçe Limanı*, Texas 1993.

Weights and measures in the Bible

Leviticus 19:35-37: 'Ye shall do no unrighteousness in judgment, in *meteyard*, in weight, or in measure. Just balances, just weights, a just *epah*, and a just *hin*, 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 thy estimation shall be according to the seed thereof: an homer of barley seed shall be valued at 50 *shekels* of silver.'

Exodus 38:24-31: '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 730 *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. A *bekah* for every man, that is, half a shekel, after the *shekel* of the sanctuary, for every one that went to be numbered, from 20 years old and upward, for 603,550 men. And of the 100 *talents* of silver were cast the sockets of the sanctuary, and the sockets of the vail; 100 sockets of the 100 *talents*, a *talent* for a socket. And of the 1775 *shekels* he made hooks for the pillars, and overlaid their chapiters, and filleted them. And the brass of the offering was 70 *talents*, and 2400 *shekels*... And the sockets of the court round about, and the sockets of the court gate, and all the pins of the tabernacle, and all the pins of the court round about.'

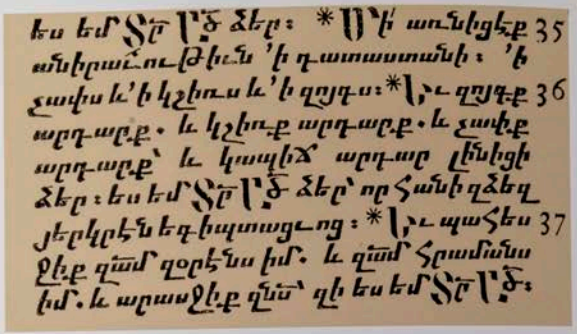
Deuteronomy 25:13-16: 'Thou shalt not have in thy bag divers weights, a great and a small. Thou shalt not have in thine house diverse measures, a great and a small. But thou shalt have a perfect and just weight, a perfect and just measure shalt thou have: that thy days may be lengthened in the land which the Lord thy God giveth thee. For all that do such things, and all that do unrighteousness, are an abomination onto the Lord thy God.'

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

Luke 24:13: 'And behold, two of them went that same day to a village called Emmaus, which was from Jerusalem about 60 furlongs.'

ὑμῶν. 35 οὐ ποιήσετε ἄδικον ἐν κρίσει ἐν μέτροις καὶ ἐν σταθμίοις 35
καὶ ἐν ζυγοῖς· 36 ζυγὰ δίκαια καὶ στάθμια δίκαια καὶ χοῦς δίκαιος 36
ἔσται ὑμῖν· ἐγὼ εἰμι κύριος ὁ θεὸς ὑμῶν ὁ ἐξαγαγὼν ὑμᾶς ἐκ τῆς
Αἰγύπτου.
37 Καὶ φυλάξεσθε πάντα τὸν νόμον μου καὶ πάντα τὰ προστάγ- 37
ματά μου καὶ ποιήσετε αὐτά· ἐγὼ εἰμι κύριος ὁ θεὸς ὑμῶν.

LEVITICUS
19: 35-37
Septuagina, Germany 1979



LEVITICUS
19: 35-37
Bible, Amsterdam 1666

Units of measurement mentioned in the Old Testament and Bible

Units of weight

1	litre	---	327.45 grams
1	gera	---	0.75 gram
10	geras	1 beka	7.5 grams
2	bekas	1 shekel	14.55 grams
60	shekels	1 mina	982.33 grams
60	minas	1 talent	58941 grams

Grain measures

4	logs	1 kab	2.05 litres
6	kabs	1 measure	13 litres
1	omer	---	3.7 litres
10	omers	1 efa	37 litres
10	efas	1 homer = 1 kor	370 litres
1	kile	---	13 litres
1	şinik	---	1 litre

Units of length

4	parmak	1 avuç	0.07 metre
3	avuç	1 karış	0.22 metre
2	karış	1 arşın	0.45 metre
4	arşın	1 kulaç	1.78 metres
400	arşın	1 ok atımı	178 metres
8	ok atımı	1 mil	1480 metres

Liquid measures

1	log	---	0.51 litres
12	logs	1 hin	6.15 litres
6	hins	1 bat	37 litres
10	bats	1 kor	370 litres
1	metriti	---	40 litres

Weights and measures in the Koran

وإلى مدين أخاهم شعيبا قال يا قوم اعبدوا الله ما لكم من إله غيره قد جاءتكم بينة من ربكم فأوفوا الكيل والميزان ولا تبخسوا الناس أشياءهم ولا تفسدوا في الأرض بعد إصلاحها ذلكم خير لكم إن كنتم مؤمنين

'And unto Midian [We sent] their brother, Shu'eyb. He said, "O my people, serve God! You have no god other save Him. Lo! a clear proof hath come unto you from your Lord; so give full measure and full weight and wrong not mankind in their goods, and work not confusion in the earth after the fair ordering thereof. That will be better for you, if ye are believers.' Koran VII:85.

وإلى مدين أخاهم شعيباً قال يا قوم اعبدوا الله ما لكم من إله غيره ولا تنقصوا المكيال والميزان إني أراكم بخير وإني أخاف عليكم عذاب يوم محيط ويا قوم أوفوا المكيال والميزان بالقسط ولا تبخسوا الناس أشياءهم ولا تعثوا في الأرض مفسدين

'And unto Midian [We sent] their brother, Shu'eyb. He said: O my people! Serve God. Ye have no other god save Him! And give not short measure and short weight. Lo! I see you well-to-do, and lo! I fear for you the doom of a besetting 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 XI:84-85.

وأوفوا الكيل إذا كلتم وزنوا بالقسطاس المستقيم ذلك خير وأحسن تأويلا

'Fill the measure when ye measure, and weigh with a right balance; that is meet, and better in the end.' Koran XVII:35.

١: ويل للمطففين ٢: الذين إذا اكتالوا على الناس يستوفون
٣: وإذا كالوهم أو وزنوهم يخسرون ٤: ألا يظن أولئك أنهم مبعوثون

'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 LXXXIII:1-4.

ANATOLIAN WEIGHTS AND MEASURES IN THE PRE-CLASSICAL AGE

ÖNDER BİLGİ

Caves on the Atlantic coast of Europe in particular have revealed tools used by human beings during the ice ages, such as hand axes, blades and scrapers made of pebbles and flints. Tools with new forms and made of new materials as temperatures rose 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 southwest Iran.

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 contrived from the same metals, along with coloured 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 eastern Anatolia, have been found in the eastern Mediterranean coastal regions, while Mediterranean shells have been found in central Anatolia, demonstrating the existence of a barter trade in raw materials in the Near East.[1]

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 in trade. For example, at Troy small gold bars and in particular graduated rods [see Fig 1] seem beyond doubt to show the existence of trade based on measurement.[2]

Fig. 1
GRADUATED RODS
Troy, 3rd millennium BC
1. Gold, 100 mm
IAM, 663 AM.
2. Gold, 145 mm
IAM, 658 M.
3. Gold, 36 mm
IAM, 663 BM.

1 - See Ö. Bilgi "Klasik Çağ Öncesinde Anadolu'da Ticaret", *Palmet* I, VKV Sadberk Hanım Müzesi Yıllığı, Istanbul 1997, pp. 1-36.
2 - See U. Esin, *Heinrich Schliemann'ın Kazı Raporları ve Mektuplarından Seçme Parçalarla Troya*, Istanbul 1991, pp. 36-38.

Archaeological excavations in central Anatolia in particular have uncovered written documents[3] and weights dating from the first quarter of the 2nd millennium BC that reveal extensive organised trade based on a system of weights and measures in Anatolia during the period of the Assyrian Trade Colonies. Moreover, there is some pictorial documentation showing that these weights were used for scales. The finest examples of weights used in this period have been discovered at Kültepe, the ancient Kanesh - Karum, which was a colony founded by Assyrian merchants near Kayseri. Large numbers and types of lead and stone weights that would have been used in the marketplace known as the Karum here have been found.[4]

These finds include lead weights in the form of discs or ovoid shapes tapering to points at either end. Those 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.[5] The ovoid lead weights similar in shape to olive stones are smaller in size and lighter than the discs.[6]

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 colour of these weights is generally dark grey or black, and all are brightly polished. Those with geometric forms are in varying dimensions, and usually ovoid or cylindrical, with either truncated or rounded ends [see Fig 2]. Another type is spherical flattened at top and bottom [see Fig 3]. Rarely, these type of weights have a small hole 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 of varying sizes, with their heads turned back over their bodies.[7] 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 engraved signs and motifs on the base that are thought to identify the owner.[8]

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 Anatolia by Assyrian merchants.[9] Similar weights have also been found at other sites in Anatolia, and were probably produced as the equivalents of units of weights such as the *mina* and *shekel* that were used in the countries of the Near East at this period.[10] That these lead and stone weights were used in scales is known both from the discovery

3 - See V. Donbaz, "Eski Anadolu Koloni Çağında Anadolu'da Ticaret Hayatı", *Palmet* I, VKV Sadberk Hanım Müzesi Yıllığı, Istanbul 1997, pp. 57-71.
4 - See T. Özgüç, *Kültepe-Kaniş*, Ankara 1986, pp. 72-76.
5 - The diameters of these lead weights vary between 3 and 8 cm, and their width between 0.2 and 1.9 cm. Their weight various from 19.40 g to 1012 g. For further details see Özgüç, *Kültepe-Kaniş*, pp. 72-73.
6 - Weights of this type vary in length from 3.2 to 4.1 cm, while their weight various between 25 and 53.5 g. For details see Özgüç, *Kültepe-Kaniş*, p. 73.
7 - It has been suggested that the carved ducks bearing these marks might have been used as seals. For example, see Yağcı, "Anadolu Medeniyetleri Müzesi Koleksiyonundaki Ördek Biçimli Mühürler", *Anadolu Medeniyetleri Müzesi 1994 Yıllığı*, Ankara 1995, pp. 122-133. Duck shaped weights dating from 1 BC have also been discovered. See Yağcı, "Yeni Asur Döneminde Kuzey Suriye'de Ördek Biçimli Taş Ağırlıklara İki Örnek", *Olba* I, Mersin 1998, pp. 187-97. Also see Özgüç, *Kültepe-Kaniş*, pl. 131.
8 - See Özgüç, *Kültepe-Kaniş*, pl. 132, pp. 1-4.
9 - Excavations of the Karum at Kültepe have uncovered graves of Assyrian merchants, whose grave goods include weights.
10 - See Özgüç, *Kültepe-Kaniş*, pp. 75-76.

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 2 HEMATITE WEIGHTS
1 - 70.7 g, ø 30 mm, w: 2.9 mm, l: 66 mm
Haluk Perk collection, 3141
2 - 80 g, ø 23 mm, l: 59.5 mm
Haluk Perk collection, 16
3 - 44.2 g, ø 19 mm, w: 21.5 mm, l: 45 mm
Haluk Perk collection, 20
4 - 26.5 g, ø 18 mm, w: 17 mm, l: 48 mm
Haluk Perk collection
5 - 17.5 g, ø 14.5 mm, w: 16 mm, l: 37.5 mm
Haluk Perk collection, 17
6 - 17.5 g, ø 13.5 mm, w: 15 mm, l: 37 mm
Haluk Perk collection, 18
7 - 8 g, ø 14.5 mm, w: 13.5 mm, l: 25.5 mm
Haluk Perk collection, 232
8 - 9 g, ø 11.5 mm, w: 12.5 mm, l: 23.5 mm
Haluk Perk collection, 25
9 - 1.5 g, ø 8 mm, w: 10.5 mm, l: 19 mm
Haluk Perk collection, 26

Fig. 3 HEMATITE WEIGHTS
1 - 473.40 g, ø 7.44 cm, h: 4.76 cm, SHM 6659
2 - 238.96 g, ø 6.40 cm, h: 3.24 cm, SHM 6658
3 - 102.71 g, ø 4.54 cm, h: 2.95 cm, SHM 6657
4 - 19.00 g, ø 2.38 cm, h: 1.43 cm, SHM 6656
5 - 7.66 g, ø 7.44 cm, h: 4.76 cm, SHM 6750

Fig. 4 DUCK-SHAPED HEMATITE WEIGHTS
1 - 82.17 g, l: 4 cm, h: 2.62 cm, w: 3.3 cm, SHM 8836
2 - 53.31 g, l: 3.45 cm, h: 2.16 cm, w: 3.03 cm, SHM 8833
3 - 21.46 g, l: 2.83 cm, h: 2.05 cm, w: 1.68 cm, SHM 8751

Fig. 5 DUCK-SHAPED WEIGHTS IN MARBLE, AGATE AND HEMATITE
1 - 4.41 g, l: 2.1 cm, h: 1.5 cm, w: 1.1 cm, SHM 8906
2 - 3.73 g, l: 2.14 cm, h: 1.35 cm, w: 1.7 cm, SHM 8907
3 - 5.86 g, l: 2.13 cm, h: 1.61 cm, w: 1.35 cm, SHM 8903
4 - 6.79 g, l: 2.08 cm, h: 1.60 cm, w: 1.35 cm, SHM 8838
5 - 4.39 g, l: 2.03 cm, h: 1.39 cm, w: 1.1 cm, SHM 8904

Fig. 6
CYLINDER SEAL IMPRESSION
The god Ea is depicted as weighing sins in this scene of cult worship. Kültepe
c. 1900 BC.

of bronze scale pans,[11] and from the impression of an ancient Babylonian style cylinder seal[12] depicting scales being used, dating from circa 1900 BC [see Fig 6]. During the period of the Assyrian Trade Colonies silver ingots[13] and graduated rods[14] 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 period, 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 resolved 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 Syrian 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 their limited commercial dealings, the Hittites, like the other countries of the Near East, used silver as a medium of exchange, in the form of rings or rods of specific size and weight. As in earlier times, hematite weights[15] continued to be used to measure *shekel*s and *mina*s, units of weight that originated in Babylon.[16]

11 - See T. Özgüç – N. Özgüç, *Kültepe Kazısı Raporu 1949*, Ankara 1953, pl. LVI, pp. 538-541.
12 - See Özgüç-Özgüç, *Kültepe Kazısı Raporu 1949*, pl. LXII, fig. 693.
13 - See Bilgi, "Klasik Çağ Öncesinde Anadolu'da Ticaret", pl. 56.
14 - See Özgüç, *Kültepe-Kaniş*, pl. 92, p. 4.
15- According to contemporary written documents the Hittites also used weights in the form of eagles. See H. Otten, *Archiv für Orientforschung* 17, 1954/1955, p. 128.
16 - The relative values of the *shekel* and *mina* varied over place and time. In Babylon 60 *shekel*s made a *mina*, while in Anatolia 40 *shekel*s made a *mina* according to written sources. The Babylonian *shekel* was 8.4 g, so the Babylonian *mina* was approximately 500 g. For details see A. M. Dinçol, *Anadolu Uygarlıkları Ansiklopedisi*, pp. 70-71.

Fig. 7
GRAVE STELE OF A MERCHANT
Kahramanmaraş.
7th century BC.
Basalt, h: 550 mm.
Louvre Museum.

Following the migration of the Sea Peoples around 1200 BC, and the 300 year-long dark age which succeeded this event, various tribes in Anatolia began to form political confederations. At this time, the large central Anatolian plateau between the Kızılırmak and Sakarya rivers was inhabited by the Phrygians, eastern Anatolia by the Urartians, and southeastern Anatolia by the Late Hittites, where they settled after the migrations ousted them from their original territories.

The Urartians were governed by a centralist theocratic system, and we know something about their units of volume from cuneiform inscriptions and geometric symbols on in-situ storage pithoi that specify the volume they contained [see Figs 9, 10].[17] A relief carving on a Late Hittite grave stele depicts a pair of scales [see Fig 7].[18]

17 - These inscriptions and marks on baked clay vessels found at many Urartian sites refer to Urartian units of volume called *aqarqi*, *tersusi* and *arusi*. A. M. Dinçol, "Çavuştepe Kazısında Çıkan Yazıtlı Küçük Buluntular-I", *Anadolu* XVIII (1974), AÜ, Dil Tarih ve Coğrafya Fakültesi Dergisi, pp. 105-114.
18 - See E. Akurgal, *Hatti ve Hitit Uygarlıkları*, İzmir 1995, pl. 152.

Fig. 8
URARTIAN STORAGE JARS
Upper Anzaf Fortress, Van.
Late 9th century BC, Storeroom no II.
Oktay Belli's archive.

Fig. 9
URARTIAN POTTERY JAR (PITHOS)
Cuneiform writing specifies the volume of the jar.
Upper Anzaf Fortress, Van.
Late 9th century BC.
Oktay Belli's archive.

Fig. 10
SYMBOLS EXPLAINING THE VOLUME AND CONTENTS OF AN URARTIAN JAR
Oktay Belli's archive.

GREEK AND ROMAN PERIODS

Compiled by GARO KÜRKMAN

HEMITETARTON WEIGHT
(above left)
101.23 g, 41 x 39.5 mm
Private collection.

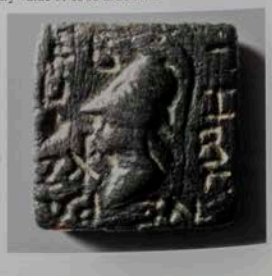
HEMITRITON WEIGHT
(above right)
145.08 g, 42 x 42 mm
Private collection.

1 DRACHM WEIGHT
(above centre)
4.29 g, 12 x 13 mm
Private collection.

The laws of Solon were implemented not only around Athens in the Greek period but also in Anatolia. Solon ruled that the weight *talent* should be 3 *mina*s heavier than the monetary *talent*, distributing the difference between the constituent parts of the weight *talent*. The *stater* is the unit of weight regarded as equivalent to the old currency unit, the *didrachmon*. Therefore the currency *drachm* was to the currency *didrachmon* what the stater unit of weight was to the *mina* unit of weight. That the stater was a unit of weight is proved by the existence of fractional weights of the *stater*, and records of payments for goods by weight. For example, one such record reveals that one *talent* was equivalent to 30 *stater*s, and that these *stater*s could not have been equivalent to the silver unit of weight, the *tetradrachm*. It appears that raw materials like miltos (red earth used for extracting vermilion), gum and iron were sold by the *stater*, and finished goods by the *mina*. Solon's ruling that the *talent* of weight should be 5% higher than the weight of the monetary *talent* meant that the weight value of a *talent* of 6000 *drachm*s was equal to a monetary value of 6300 *drachm*s.

1 DRACHM WEIGHT
(right)
3.41 g
10.5 x 10.5 x 4.2 mm
KMA 027 (cat. 005)

3 DRACHM WEIGHT
(far right)
14.11 gr
20.7 x 20.7 mm
KMA 1290 (cat. 010)



1 MINA WEIGHT
Greek, 1st-2nd century BC
492.03 g, 75.5 x 79 mm
KMA 548 (cat. 022)

2.5 DRACHM WEIGHT
Greek, 1st-2nd century BC
11.07 g, 13.2 x 6.7 mm
KMA 587 (cat. 008)

UNCIA WEIGHT (obverse and reverse)
Greek, 1st-2nd century BC
25.61 g, 26.2 x 25.5 mm
KMA 534 (cat. 014)

STEELYARD WEIGHT
Late archaic or pre-classical Greek period
270 g, ø 55.5 mm
h: 80.5 mm
KMA 1286 (cat. 001)

UNCIA WEIGHT
Greek, 1st-2nd century BC
26.72 gr
21.5x21.5 mm
KMA 533 (cat. 013)

Similarly 100 *drachms* by weight was equivalent to 1 *mina* of weight (105 monetary *drachms*), and 100 *didrachms* by weight was equivalent to 1 *stater* by weight (or 105 monetary *didrachms* or *stater*). Further proof of the existence of discrepant standards is found in a decree dating from the late 2nd century BC, according to which the new *mina* was to be equivalent to 150 monetary *drachms*. This derives from a *mina* equivalent to 138 *drachms*.[1]

Friedrich Hultsch's table of Greek units of weight from his book *Griechische und römische Metrologie* published in Berlin in 1862 is reproduced below:

1 talent	ταλαντον	60 minas	μναι	26.196 kilograms
1 mina	μνα	100 drachms	δραχμαι	435.6 grams
1 drachm	δραχμη	6 obols	οβολοι	4.366 grams
1 obolus	οβολος	2 hemiobols	ημιοβολοι	
		8 chalkoi	χαλκοι	0.728 gram
1 chalkous	χαλκους			0.091 gram

1 - Mabel, Lang–Margaret, Crosby, *Athenian Agora Weights, Measures and Tokens*, New Jersey 1964.

BRONZE WEIGHTS IN THE FORM OF DUCKS
Mesopotamia
3rd century BC

(left)
41.20 g
l: 38 mm
h: 25 mm

(right)
3.33 g
l: 15.3 mm
h: 10 mm
KMA 562 (cat. 004)

The table reproduced below from B. Kisch's *Scales and Weights, A Historical Outline* (New Haven, London 1964) comes originally from Erich Pernice's book entitled *Griechische Gewichte* published in Berlin in 1894:

ΣΤΑΤΗΡ	stater	873.2 grams
ΤΡΙΤΗΜΟΡΙΟΝ	tritemorion	291.07 grams
ΗΜΙΤΡΙΤΟΝ	hemitriton	145.53 grams
ΗΜΙΣΥΗΜΙΤΡΙΤΟΝ	hemisyhemitriton	72.77 grams
ΤΕΤΑΡΤΗΜΟΡΙΟΝ	tetartemorion	218.3 grams
ΗΜΙΤΕΤΑΡΤΗΜΟΡΙΟΝ	hmitetartemorion	109.15 grams
ΗΜΙΣΥΗΜΙΤΕΤΑΡΤΟΝ	hemisyhemitetarton	54.57 grams

ΜΝΑ	mna	436.60 grams
ΤΕΤΑΡΤΟΝ	tetarton	109.15 grams
ΕΚΤΗΜΟΡΙΟΝ	hektemorion	72.77 grams
ΟΓΔΟΟΝ	ogdoon	54.57 grams
ΔΡΑΧΜΗ	drachm	4.37 grams
ΔΙΔΡΑΧΜΟΝ	didrachmon	8.73 grams
ΤΡΙΔΡΑΧΜΟΝ	tridrachmon	13.10 grams
ΤΕΤΡΑΔΡΑΧΜΟΝ	tetradrachmon	17.46 grams
ΠΕΝΤΑΔΡΑΧΜΟΝ	pentadrachmon	21.83 grams

The following table is from Heinrich Nissen's article entitled 'Griechische und römische Metrologie' about Greek weights and the symbols and marks inscribed on them which was published in *Handbuch der classischen Altertumswissensvhaft* (ed. Ivan Müller, 2nd ed, Leipzig, 1877):

T	ταλαντον	talanton	6000 drachmas
⋲	πεντακισχιλιαι	pentakischiliai	5000 drachmas
X	χιλιαι	chiliai	1000 drachmas
⋱	πεντακοσιαι	pentakosiai	500 drachmas
H	εκατον	hekaton	100 drachmas
⋮	πεντηκοντα	pentekonta	50 drachmas
D	δεκα	deka	10 drachmas
G	πεντε	pente	5 drachmas
⊢			1 drachma
I			Obolos
C	ημισυ	hemisy	1/2
T	τεταρτημοριον	tetartemorion	1/4
X	χαλκους	chalkus	1/8

The Romans introduced their own system of weights based on the *libra* to Anatolia. According to this system one *libra* was originally equivalent to 12 *unciae*, 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.

1 libra	12 unciae	288 grams
1/2 libra	6 unciae	144 grams
1/3 libra	4 unciae	96 grams
1/4 libra	3 unciae	72 grams
1/6 libra	2 unciae	48 grams
1/12 libra	1 unciae	24 grams

LIQUID MEASURING STONE
This stone hollowed out into different sized cups for measuring liquids by volume was discovered at Kaunos in 1998. On the side are engraved the words hemihekton, himemedimnos and medimnos.
141 x 58 x 37 cm
(Photograph: Kayhan Dörtlük)

Friedrich Hultsch's table of Roman weights from his book *Griechische und römische Metrologie:*

1 siliqua			0.189 gram
1 obolus	3 siliquae	1 dimidium scripulum	0.568 gram
1 scripulum	2 oboli	6 siliquae	1.137 grams
1 dimidia sextula	2 scripula	4 oboli	2.274 grams
1 drachm	3 scripula	6 oboli = 18 siliquae	3.411 grams
1 sextula	4 scripula	8 oboli	4.548 grams
1 sicilicus	6 scipula	2 drachma	6.822 grams
1 semuncia	2 sicilici	4 drachma	13.644 grams
1 uncia	4 sicilici	8 drachma	27.288 grams
1 sescuncia	1.5 uncia	6 sicilici	40.930 grams
1 sextans	2 unciae		54.580 grams
1 quadrans	3 unciae		81.860 grams
1 triens	4 unciae		109.150 grams
1 quincunx	5 unciae		136.440 grams
1 semis	6 unciae		163.730 grams
1 septunx	7 unciae		191.020 grams
1 bes	8 unciae		218.300 grams
1 dodrans	9 unciae		245.590 grams
1 dextans	10 unciae		272.880 grams
1 deunx	11 unciae		300.160 grams
1 libra	12 unciae		327.450 grams

Roman weights as given by Karl Pink in his article entitled 'Römische und byzantinische Gewichte in österreichischen Sammlungen,' published in *Sonderschr. des österr. archaeol. Institute* (Vienna, 1938):

Name	*As*	*Ounce*	*Symbol*	*Gram*
As (pondo)	1	12	I	327.45
Deunx	11/12	11	S=-	300.16
Dextans	5/6	10	S=	272.88
Dodrans	3/4	9	S- or S=I	245.59
Bes	2/3	8	S= or -S-	218.30
Septunx	7/12	7	S-	191.02
Semis	1/2	6	S	163.73
Quincunx	5/12	5	=- or =-=	136.44
Triens	1/3	4	=	109.15
Quadrans	1/4	3	= - or =I	81.86
Sextans	1/6	2	-	54.58
Sescuncia	1/8	1.5	-ℒ or ℒ-	40.93
Uncia	1/12	1	·	27.29
Semuncia	1/24	1/2	ℒ (Σ)	13.64
Sicilicus	1/48	1/4	¡ Ɔ	6.82
Sextula	1/72	1/6	I or ~	4.55
Dimidia sextula	1/144	1/12	ǂ or ∽	2.27
Scripulum	1/288	1/24	϶(϶, ǂǂ)	1.14

14 DRACHM WEIGHT
Greek, 1st-2nd century BC
61.35 g, 31x32 mm
h: 6.5 mm
KMA 549 (cat. 020)

14 MILIARENSE WEIGHT
Roman, 4th-6th century
71.83 g, 36.5x38.9 mm
h: 6.5 mm
KMA 544 (cat. 021)

Bruno 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:

Name	*Symbol*	*Name*	*Symbol*
As=pound=12 ounce	I	Sescuncia	ℒ , Σ·
Deunx	S:·.	Uncia	•, ·, ⁘, ⁖
Dextans	S:·	Semuncia	ℒ , Σ, Ɛ
Dodrans	S:.	Duella	ϑ
Bes	S:	Sicilicus	Ɔ
Septunx	S.	Sextula	ƨ
Semis	S	Dim.Sextula	ƨ
Quincunx	:·.	Scripulum	϶ , ∃
Triens	:·		
Quadrans=1/4 as=3 ounce	:.		
Sextans=1/6 as=2 ounce	:		

Units of measurement used by Herodotus[2]

Length:
stadium: 600 Greek feet. The Athens stadium was equivalent to 177.6 metres.
foot: 29.6 cm (the modern foot is 30.48 cm)
cubit: 1.5 feet, 0.444 metres
fathom: 6 feet, 4 cubits, 1.776 metres
plethron: 100 feet
finger: one sixteenth of a foot, 0.0185 metres
palm: one quarter of a foot, 6 palms equal one cubit
skenes: Egyptian unit equivalent to 60 stadiums, 10.656 km
parasang: Iranian unit equivalent to 30 stadiums, 5.328 km

Weight and Monetary Values:
The *talent* (*talanton*) and *mana* (*mna, mina*) used by the Greeks varied in value from place to place.
Talent: In Athens, after the introduction of the Solonian standard, this was equivalent to 36.39 kg when weighing commodities. As a monetary unit, it was equivalent to metal weighing 25.92 kg. *mina*: one sixtieth of a *talent*.

Liquid Measures:
katule: 0.27 litres
amphora: 19.44 litres

Dry Measures:
khonix: 1.08 litres
medimnos: 51.84 litres

2 - Herodotos, *Herodot Tarihi*, trans. Müntekim Ökmen, Istanbul 1991, p. 502.

BYZANTINE PERIOD

MERYEM ACARA ESER

Considerable information is to be gleaned from written texts, coins, weights and other artefacts 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.[1] 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.[2]

Under this system the Byzantine pound was based on the late Roman pound (*litra*). The original *litra* (327.45 g) as recognised by Constantine I, was equivalent to 12 *ounces* or 72 *solidi*. The *solidus* of the Romans was known as the *nomisma* by the Byzantines, and its weight defined by Constantine I as 1/72 of a *litra*, that is 4.55 g, for the purposes of setting the coinage standard.[3] The *nomisma* continued in use over later centuries, but although its official value was supposed to be 4.55 g, making the pound equivalent to 327.60 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, 322 g between the 6th and 7th centuries, 320 g between the 7th and 9th centuries, and 319 g between the 9th and early 13th centuries, afterwards falling to below 319 g.[4]

36 SOLIDI WEIGHT
Square weight equivalent to 36 solidi or 6 ounces.
Bronze
160.49 g, 41.5x42.1x10.5 mm
Private collection.

1 - One of the most important sources on this subject is a text by Saint Epiphanius (315-403), who was bishop of Constantia (Salamis) in Cyprus between 367 and 402 (*Epiphanius' Treatise on Weights and Measures, The Syriac Version*, trans. James Elmer Dean, Chicago 1935, pp. 11-12). In this Syriac text various units of measurement are defined; for example, the assarion as 100 *lepta*, the *nomisma* as 60 *assaria*, the *libra* as 12 *ounces* or 2 *stater*, and the *stater* as 4 *zuzé*.
2 - Erich Schillbach, "Metrology", *The Oxford Dictionary of Byzantium*, Oxford University Press, Oxford 1991, vol. 2, pp. 1358-9.
3 - Gladys R. Davidson, *Corinth XII, The Minor Objects*, Princeton, New Jersey 1952, p. 205.
4 - Christopher Entwistle, "Byzantine Weights", *Byzantium, Treasures of Byzantine Art and Culture from British Collections*, (ed. D. Buckton), London 1994, pp. 14-15; Simon Bendall, *Byzantine Weights, An Introduction*, London 1996, pp. 6-7; Researchers have come to different conclusions on this subject. According to T. Mommsen a pound was equal to 327.45 g, and according to N. Dürr, author of the catalogue for the collection of weights at the Museum of Geneva, 348 g. Examples in the collection of Byzantine weights purchased by Munz Zentrum weigh 344 g. The first detailed study of Byzantine weights was carried out by Schillbach, who says that in the 6th and 7th centuries a Byzantine pound weighed 313-322 g, and that in the provinces this value dropped to around 285 g. According to the same researcher Byzantine coins struck in the provinces were lighter than those struck in the capital by around 12 percent. In other words, the weight of a provincial *solidus* was 4 g rather than 4.5 g. The weights discovered in a shipwreck of Yassa Ada in the Marmara Sea are even lighter. G. K. Samms, who has studied these finds, says that this should not be regarded as significant, however, since the weights have been eroded by seawater over the centuries. Just one of the pound weights found here weighs 284 g, all

In the Greek and earlier periods of antiquity balance (*libra*), in the Roman and Byzantine periods we find the balance and the steelyard (*statera*) 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 (B1) with a maximum capacity of 400 Roman pounds among the finds at Yassı Ada has an arm 146 cm in length marked as follows:[4]

A	E	I	E	K	E	A	E	M	E	N	E	X	E	O	E	Π	E	Ϙ	E	P
1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

The steelyard was used to weigh foodstuffs like meat, fish and vegetables, and also amphoras, as the finds at the Serçe Limanı wreck indicate. Unlike balances, the two parts of a steelyard are not equal.[6] For the most part the arms of medieval steelyards are 35-45 cm in length, with a maximum capacity of 35-60 *litras* (11-19 kg).[7]

A balance or scales consists of a horizontal beam pivoted onto 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.[8] Scales used by tax collectors had to be held by two fingers, leaving three fingers free and not pressing down on the weights.[9]

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 monasteries.[10] On the steelyard found at the Yassı Ada wreck is the name of the ship's captain Georgeos.[11] A weight in the form of a bust 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 protects the owner of this weight.' Weights sometimes bore the names of monasteries because it was against standard weights kept at these and other official institutions that weights used by merchants and retailers were checked for accuracy.[12]

1.5 SOLIDI WEIGHT
Early Byzantine
4th-6th century
6.48 g, 14x14x4 mm
KMA 579 (cat. 039)

the others being far lighter. For example, two *ounce* weights that should be equivalent to 27.2 g actually weigh 19.2 and 17.5 g respectively. Samms has made use of the data given by Schillbach in this respect, and proposed that a second weight system existed, whereby there were 14 rather than 12 *ounces* to a pound, and 7 rather than 6 *nomismata* to an *ounce*. Seven pound weights at the Museum of Geneva and Munz Zentrum vary in weight from 324.53 to 279.9 g. Of the 63 weights in Munz Zentrum, 11 are heavier than these examples and 52 are lighter. Of the Byzantine pound weights at the Athens Numismatic Museum, one weighs 392 g, 30 percent weigh between 325 g and 315 g, 55 percent weigh between 310 and 325 g, and 28 percent are less than 50 g. Fred Hocker, "Weight, Money, and Weight-Money: The Scales and Weights from Serçe Limanı", *INA (Institute of Nautical Archaeology) Quarterly*, 20.3.1993, p. 16: 'in the 11th century the Byzantine *litra* varied between 312 and 324 g.'

5 - Bass-Doorninck, *Yassı Ada*, p. 225.

6 - Christine Kondoleon, *Antioch. The Lost Ancient City*, Princeton University Press, Princeton 2000, p. 87; Hocker, "Weight, Money, and Weight-Money", p. 19.

7 - Hocker, "Weight, Money, and Weight-Money", p. 15.

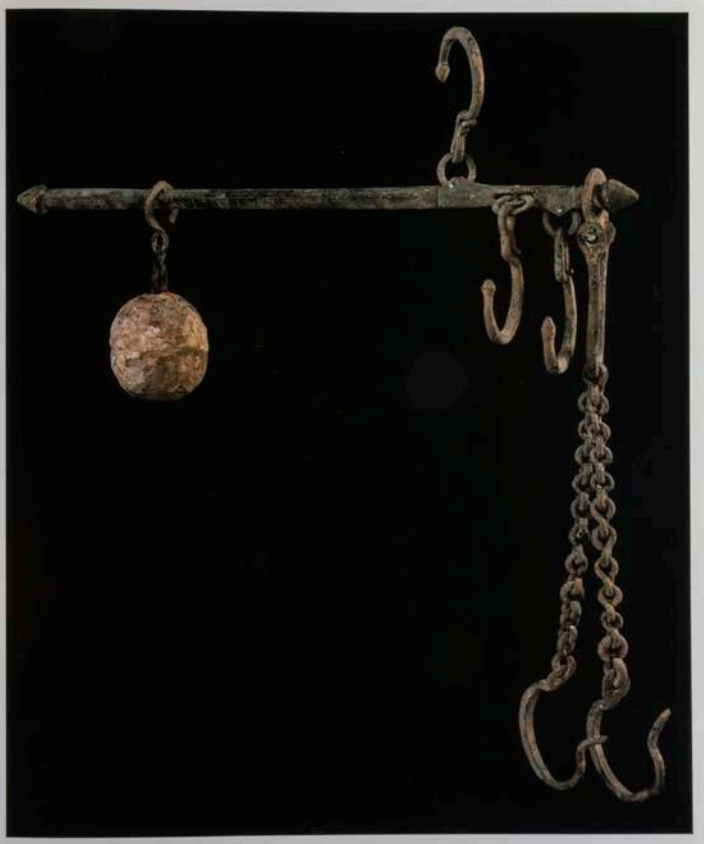
8 - Hocker, "Weight, Money, and Weight-Money", p. 17.

9 - Gary Vikan and John Nesbitt, *Security in Byzantium: Locking, Sealing, and Weighing, Dumbarton Oaks Collection*. 10 - Publications, No.2, Washington, D.C. 1980, p. 29.

10 - Marvin C. Ross, *Catalogue of the Byzantine and Early Medieval Antiquities in the Dumbarton Oaks Collection*. Harvard University Press, Washington, D.C. 1962, vol. 1, p. 62.

11 - George Bass, "Underwater Excavations at Yassıada: A Byzantine Shipwreck", *Archaeologischer Anzeiger*, 1962, p. 559.

12 - Yıldız Meriçboyu and Sümer Atasoy, *İstanbul Arkeoloji Müzesindeki Büst Şeklinde Kantar Ağırlıkları, Steelyard Weights in the Form of Busts, Archaeological Museum of Istanbul*, Arkeoloji ve Sanat Yayınları, Istanbul 1983, p. 12.



STEELYARD
Early Byzantine, 5th-7th century
l: 365 mm
KMA 630 (cat. 030)

1/2 SOLIDI WEIGHT
Glass weight used as a standard for coinage.
Byzantine
1.92 g, ø 17 mm
Private collection.
The word Pavlov is written inside the monogram.

Most of the weights in the form of busts 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 museums outside Turkey actually appear to have been produced in Constantinople and its environs.[13] Some researchers believe that Constantinople was the production centre for steelyards and weights, Ross in particular asserts that these busts and statuettes have a connection with the art of sculpture in the Byzantine capital, and that examples exported from here were used as models by provincial workshops.[14]

Counterfeiting was a common offence in the Byzantine era, and the state was constantly battling against bribery, embezzlement 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.[15] In the CXXVIII Novella promulgated in the year 545 by the Emperor Justinian, praetorian prefects were held responsible for weights, and the *comes sacrarum largitionums* for coinage standards. The weight standards used for assaying commercial weights were at first kept at post stations, but later in 'the most holy church of each city'.[16] Later on, according to Tommaso Bertelè's book,[17] Venetian merchants used to keep their own weights and measuring instruments in the church where Rüstem Paşa Mosque now stands (Mordtmann says that this was the church of St. Akindino). In addition, the Emperor Julianus decided that an official known as a *zygostates* should be appointed in every city to settle disputes between sellers and purchasers.[18]

Standard weights were manufactured in the imperial mints at the command of certain high-ranking officials, and elegant examples were used only by important personage.[19] They were marked with their values and the titles of those with authority over their manufacture: the emperor, *eparch/prefect*, *proconsul* and *comes sacrarum largitionum*. Some examples bear imperial monograms or anonymous imperial busts. There are three imperial weights of this type made of metal in the British Museum in London.[20]

One of the officials with authority over the production and assaying of weights was the governor (*eparch* or *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 confined to the assay of

13 - Meriçboyu and Atasoy, *Büst Şeklinde Kantar Ağırlıkları*, p. 12.
14 - Ross, *Catalogue of the Byzantine and Early Medieval Antiquities in the Dumbarton Oaks Collection*, pp. 62-63.
15 - Vikan and Nesbitt, *Security in Byzantium: Locking, Sealing, and Weighing*, p. 29.
16 - *The Theodosian Code and Novels and The Sirmondian Constitutions*, (trans. Clyde Pharr), New York 1952, p. 375, (act dated 3 October 383): the Emperor Theodosius declared, 'weight and measure standards must be kept in each post station, so that those intending to commit forgery might not have access to them.' Entwistle, "Byzantine Weights", *Byzantium, Treasures of Byzantine Art and Culture from British Collections*, pp. 14-15.
17 - Tommaso Bertelè, *Istanbul'da Venedik Sarayı, Istanbul'daki Venedik Elçilerinin Sarayı ve Tarihi Hatıraları*, translation and additions by: Prof. Dr. Mahmut H. Şakiroğlu.
18 - *The Theodosian Code*, p. 378, 12.7.2 (act dated 23 April 363); Michael F. Hendy, *Studies in the Byzantine Monetary Economy*, Cambridge 1985, pp. 317-318; Bendall, *Byzantine Weights*, p. 9.
19 - Kurt Weitzmann (ed.), *Age of Spirituality, Late Antique and Early Christian Art, Third to Seventh Century. Catalogue of the Exhibition at The Metropolitan Museum of Art*, November 19, 1977, through February 12, 1978, The Metropolitan Museum of Art, New York 1979, p. 301.
20 - Bendall, *Byzantine Weights, An Introduction*, p. 13: the earliest is an *ounce* weight dating from the period of Justin II (565-578); another dates from the reign of Maurice Tiberius (582-602), and another is a silver weight from the reign of the Empress Theodora (1055-56).

STEELYARD
Early Byzantine, 5th-7th century
l: 260 mm
KMA 1338 (cat. 032)

STEELYARD
Early Byzantine, 5th-7th century
l: 235 mm
KMA 631 (cat. 031)

1 OUNCE WEIGHT
Early Byzantine, 4th-6th century
26.24 g, 24x23.6x6 mm
KMA 542 (cat. 051)

1 OUNCE WEIGHT
Early Byzantine, 6th-7th century
23.67 g, ø 25 mm, h: 6 mm
KMA 550 (cat. 054)

12 SOLIDI WEIGHT
Early Byzantine, 4th-6th century
53.69 g, 29.5x28x8 mm
KMA 525 (cat. 037)

3 OUNCE WEIGHT
Byzantine, 7th-9th century
81.11 g, ø: 39 mm
KMA 551 (cat. 055)

glass weights, whereas in the middle Byzantine period his jurisdiction expanded significantly. The *proconsul* was the governor of a special province. This title also probably designated the head of the administration of the city of Constantinople until 359 when it was replaced by the *prefect*. The *comes sacrarum largitionum* was a high-ranking official responsible for financial affairs. This title first came into use around 318, but was documented for the first time in 342-345. He was responsible for customs and excise, mines, state workshops and mints and related payments, in which latter capacity he was also responsible for coinage standards. The importance of this official declined at the end of the 5th century, and the title is last mentioned during the reign of the Emperor Phocas (602-610).[21]

During the Byzantine period, eminent figures were rewarded by the conferment 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 *gloriosus/endoxototos* which comes to the fore with respect to weights in the mid-6th century, was granted to senators, governors, *magistri militums*, *magistri officiorums*, *quaestors* and other high-ranking officials. Another title given to officials responsible for weights and measures was *spectabilis/peribleptos*, which was a second ranking senatorial title first used in the year 365, and last mentioned in a document dated 710. The title *clarissimus /lamprotatos* was granted to all senators between 450 and 530, after which it gradually fell into decline.[22]

Sets of flat weights and scales were kept in low 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 Yassı Ada wreck in Turkey. The boxes generally had sliding lids 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 cross beneath an arch; this composition that also appears on flat weights of the same period. Some examples of such flat weights and lids are inscribed with the words 'Grace of God,' taken from the First Epistle of Paul the Apostle to the Corinthians I, 15:10: 'By the grace of God I am what I am.' So the inscription is saying in effect that true weight and the prosperity that this brings are the gift of God.[23] Infrequently inscriptions in the form of appeals to the saints such as 'St Theodore help,' or citing the name of the city *prefect* of the time, such as 'In the time of the most distinguished Eparch of the City, Gerontius' (circa 560) are encountered.[24]

Weights were of two types, depending on whether they were made for steelyards or balances; those for the former in the form of a bust or a statuette, and those for the latter flat for conveniently piling in the balance pans. The earliest of many surviving weights dating from the 5th-7th centuries mainly portray the emperor, empress and the goddess Athena (Minerva), and weigh approximately four Roman pounds.[25]

21 - Bendall, *Byzantine Weights*, p. 13.
22 - Bendall, *Byzantine Weights*, pp. 13-14.
23 - Gary Vikan, "Weight Box", *The Oxford Dictionary of Byzantium*, vol. 3, p. 2194.
24 - Vikan and Nesbitt, *Security in Byzantium: Locking, Sealing, and Weighing*, p. 36.
25 - Gary Vikan, "Weights", *The Oxford Dictionary of Byzantium*, vol. 3, p. 2194.

Roman period steelyard weights could be spherical, polygonal, or in the form of a bust or a statuette. Bronze steelyards of various sizes and weights were the preferred weighing device in many countries because of their easy portability.[26] The weights for hanging on the steelyard arm were hollow-cast in bronze by the lost-wax process, and then filled with sufficient lead to give the desired weight. While in the early Byzantine period figures of the emperor or the goddess Athena were most common, busts of empresses became popular in the second quarter of the 5th century.[27] The reason for the choice of emperors and empresses or gods and goddesses for steelyard weights was the fact that these represented truth and honesty for the seller and reliability for the purchaser.[28]

The large number of flat weights, archaeological, epigraphic and written material dating from the Byzantine period in museums and collections has made the reliable classification and evaluation of weights possible. Flat weights are made of three materials: bronze, lead or glass. Bronze weights are of three shapes: spherical, squares and disks. In addition there are weights used as standards for coins in multiples of *nomisma* known as *exagia*, and larger weights for merchandise in multiples of *ounces* or *litras* (pounds) known as *pondera*.[29]

Fewer examples of Roman spherical stone weights dating from the first century BC have survived. But this form was widely used until the 4th century AD, when square weights began to be used, and these in turn were supplanted gradually by disk-shaped weights from the second half of the 6th century onwards.[30] The stratigraphy of the Corinth excavations shows that production of disk weights continued until the end of the 12th century. The most common type was made of bronze, and in Corinth these have generally been found at sites dating from the 9th-12th centuries.[31]

Whether *litra* (pound), *ounce* or *solidus/nomisma* weights, all bear inscriptions and various decorative motifs. The letters, symbols and motifs engraved on weights are inlaid with silver or copper. The inscriptions include the names of officials, phrases concerning justice, and prayers. Emperors portrayed on early examples dating from the 4th-5th centuries are generally shown standing together with co-emperors. Such weights are known as *imperial weights*. Weights dating from the 5th-7th centuries often have simple decoration in the form of crosses, leaves, wreaths, arches or columns. Pairs of figures of Tyche are frequently depicted side by side in later examples, and symbolise an invitation to hunting or prosperity.[32] Some examples have symbolic hunting scenes or busts encircled by wreaths of victory.[33] Such symbols and motifs were an assurance of the reliability of the state, and that the weights were in compliance with the values laid down by law.

Another material used for making weights was glass, and in the 6th-7th centuries glass weights have been unearthed at various places in the eastern Mediterranean, Constantinople, Anatolia, along the Danube and in Egypt. It is not known for certain where these were made.

6 SOLIDI WEIGHT
Byzantine, 5th-6th century
25.30 g, ø: 28 mm
KMA 529 (cat. 045)

26 - Meriçboyu and Atasoy, *Büst Şeklinde Kantar Ağırlıkları*, p. 6.
27 - Meriçboyu and Atasoy, *Büst Şeklinde Kantar Ağırlıkları*, p. 6.
28 -Meriçboyu and Atasoy, *Büst Şeklinde Kantar Ağırlıkları*, p. 11; Vikan, "Weights", p. 2194.
29 - Vikan, "Weights", p. 2194.
30 - Entwistle, "Byzantine Weights", *Byzantium, Treasures of Byzantine Art and Culture from British Collections*, p. 15.
31 - Davidson, *Corinth*, XII, p. 206.
32 - Vikan and Nesbitt, *Security in Byzantium: Locking, Sealing, and Weighing*, p. 36; Vikan, "Weight Box", p. 2194; Bendall, *Byzantine Weights*, p. 14.
33 - Vikan, "Weights", p. 2194.

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.[34] Byzantine period glass weights are generally in the form of disks pressed from glass while it was hot and malleable. Glass weights had several advantages. They were cheap to produce, revealed any attempt at debasement, and were not subject to oxidation or corrosion. They are generally stamped with a monogram or an inscription concerning the prefect of the capital. According to a study of over two hundred glass weights by the numismatist G. Miles, the *solidus* (4.55 g), *semissis* (2.27 g) and *tremissis* (1.52 g) were used as standards for gold coins.[35] The production of *semissis* and *tremissis* weights ended in the 9th century.[36]

More than twenty types of monogram and motif occur on glass weights, but these can be classified into seven main categories: 1. Box monograms, 2. Cruciform monograms, 3. Box or cruciform monograms and inscriptions, 4. Figures of emperors, 5. Bust of an eparch and inscription, 6. Signs or monograms indicating a name, 7. Plain busts.[37] Stamped box or cruciform monograms are the most common. In the first half of the 6th century, box monograms were widespread, continuing until the reign of Justinus II (565-578), when cruciform monograms also began to appear on weights. The use of box monograms on coins and weights ended in 578.[38]

obverse

reverse

2 SOLIDI WEIGHT
Byzantine
8.38 g
16.9x17 mm
KMA 024

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 *prefect* is most common, while a few examples feature a bust of the emperor.[39] Non-figurative designs on glass weights are restricted to monograms.[40]

Portrayals of emperors and empresses are of importance for dating Byzantine weights of the 6th-7th centuries. The weights manufactured between 363 and 491, and particularly those dating from the second half of the 5th century, can be defined as examples issued by the emperors. Weights of the reign 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 Marcius (450-457) and Leo I (457-474) bear their monograms, which also appear on coins of the period.[41]

When dating weights, excavations whose stratigraphy and other 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 Yassı 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 three steelyards that can be dated approximately. The gold coins belong to the reigns of Phocas (602-610) and Heraclius I (610-641). Since the latest copper coin was struck in the sixteenth year of Heraclius' reign, the *terminus post quem* for the wreck and its finds is 625 or 626.[42]

34 - Bass and Doorninck, Jr., *Yassı Ada, Vol.I, A Seventh-Century Byzantine Shipwreck*, p. 211.
35 - Vikan and Nesbitt, *Security in Byzantium*, pp. 36-37.
36 - Oğuz Tekin, *Yapı Kredi Koleksiyonu Bizans Sikkeleri/Byzantine Coins The Yapı Kredi Collection*, Istanbul 1999, p. 37.
37 - Entwistle, "Byzantine Weights", *Byzantium, Treasures of Byzantine Art and Culture from British Collections*, p. 15.
38 - Bendall, *Byzantine Weights*, p. 10.
39 - Vikan and Nesbitt, *Security in Byzantium*, p. 37, figs. 84-85 .
40 - Vikan and Nesbitt, *Security in Byzantium*, p. 37, figs. 86-87.
41 - Bendall, *Byzantine Weights*, p. 9.
42 - Bass and Doorninck, Jr., *Yassı Ada*, p. 211.

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 *ounce* inscribed with the name of the Empress Theodora (1055-56). Five small bronze weights dating from the 10th-11th centuries and weights dating from the 9th-12th centuries discovered at Corinth are among the examples from this period. The latest examples portray Andronicus II (1272-1282) and Michael IX (1295-1320).

Anania of Sirak gives the following values for some units of weight used in Armenia during the Byzantine-Sassanian period:[43]

Barley grain	1/4 carat	0.04 13/18 gram
Assarion or lepton	2 barley grains	0.09 4/9 gram
Pşit	3 barley grains	0.14 1/6 gram
Keration	4 barley grains	0.18 8/9 gram
Snig	4 carats	0.75 5/9 gram
Grammarion	6 carats	1.13 3/9 grams
Trimission	8 carats	1.51 1/9 grams
Semission	12 carats	2.26 2/3 grams
Sater or drachma	17 carats	3.4 grams
Dram	1/80 litre	4.08 grams
Dahekan or *nomisma*	24 carats	4.53 1/3 grams
Siklos	36 carats	6.8 grams
Stater	4 dram	16.32 grams
Ounce	4 siklos	27.2 grams
Litra	12 ounces [unciae]	326.4 grams
Payvasik	50 litres	16.320 grams
Kentênarion	100 litres	32.640 grams
Talent	10.000 dram=125 litres	40.80 kilograms
Khankhar	10.000 dahekan=138 8/9 litres	45.333 1/3 grams

3 OUNCE WEIGHT
Early Byzantine
84.63 g, ø 27.2 mm
h: 22 mm
KMA 620 (cat. 060)

2 OUNCE WEIGHT
Byzantine, 10th-13th century
52.25 g, ø 32.6 mm
KMA 545 (cat. 057)

43 - H. A. Manandian, *The Trade and Cities of Armenia in Relation to Ancient World Trade*, trans. Nina G. Garsoian, Lisbon 1965, p. 117.

SET OF WEIGHTS
Byzantine, 10th-13th century
Private collection.

Seven of the weights illustrated above form a set whose values are given in the table below. Although the other two weights were found in the same container, they do not seem to belong to the set. Their details are given at the bottom of the table. The monograms Γ.Γ, Γ.B, Γ.A and I.B stamped on the weights show that they were used for commercial purposes, while the monograms N.B, N.E and N.Γ indicate that they were used as coin weights.

72 Scripula Grammata	3 Ounces	84.05 grams	Γ.Γ	ø 41.5 mm	h: 8.8 mm
48 Scripula Grammata	2 Ounces	55.01 grams	Γ.B	ø 36.5 mm	h: 8 mm
24 Scripula Grammata	1 Ounce	27.77 grams	Γ.A	ø 26 mm	h: 7.5 mm
24 Scripula Grammata	1 Ounce	27.74 grams	Γ.A	ø 26 mm	h: 8 mm
12 Scripula Grammata	1/2 Ounce	14.10 grams	I.B	ø 22 mm	h: 5.5 mm
8 Scripula Grammata	2 Solidi	9.39 grams	N.B	ø 18 mm	h: 5.2 mm
8 Scripula Grammata	2 Solidi	9.00 grams	N.B	ø 18 mm	h: 5.2 mm
	5 Solidi	22.42 grams	N.E	ø 26 mm	h: 6.3 mm
	3 Solidi	12.36 grams	N.Γ	17.5x17.5 mm	h: 5.1 mm

1 NOMISMA WEIGHT
Byzantine, late 6th century
4.35 g; ø 13 mm
h: 3.7 mm
KMA 536 (cat. 041)
On the reverse is an inscription reading IOVCTINOV.

obverse

reverse

The table of Byzantine weights given by Simon Bendall in his book *Byzantine Weights* printed in London in 1996 and the units of weight given by Nicolas Dürr in his *Catalogue de la Collection Lucien Naville au Cabinet de Numismatique du Musée d'Art et d'Histoire de Genève* (Geneva, XII, 1964, 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:

Units of weight	*Late Roman and early Byzantine commercial weights*	*Monograms inscribed on Byzantine commercial weights*	*Monograms inscribed on Byzantine coin weights*	*Monograms inscribed on Roman coin weights*	*Metric equivalent*	*Equivalent in litras or pounds*	*Equivalent in ounces*	*Equivalent in solidi or nomismata*
Pondus/Libra	↑A	AA	NOB		327.60	1	12	72
			NM		182			40
Semis	ϐς	Γς	ℕS	SOL XXXVI	163.80	1/2	6	36
			NA		136.50			30
			NKS		118.30			26
			NKE		113.75			25
Triens	ϐΔ	ΓΔ	NKΔ	SOL XXIV SOL XXIIII	109.20	1/3	4	24
			NK		91			20
Quadrans	ϐΓ	ΓΓ	ℕIH	SOL XVIII	81.90	1/4	3	18
			NIZ		77.35			17
			NIE		68.25			15
Sextans	ϐB	ΓB	ℕIB	SOL XII	54.60	1/6	2	12
			N I		45.50			10
			N Θ		40.95			9
			N H		36.40			8
			N Z		31.85			7
Uncia/Ounqia	ϐA	ΓA	NS	SOL VI SOL Ç	27.30	1/12	1	6
			N E		22.75			5
			NΔ		18.20			4
Semiuncia	I B		NΓ	SOL III	13.65	1/24	1/2	3
			N B	SOL II	9.10	1/36	1/3	2
		S			6.82			1.5
Sextula Solidi			N	SOL SOL I	4.55	1/72	1/6	1
Semissis	12 siliquae		IB ?		2.27			1/2
Tremissis	8 siliquae		H / T		1.51			1/3

Compiled by Meryem Acara Eser and Garo Kürkman.

1 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 4th-6th century
26.39 g, 25.6x25.2x4.9 mm
KMA 539 (cat. 050)

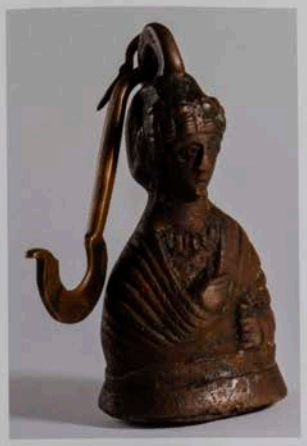
12 NOMISMATA COIN WEIGHT
Early Byzantine, 4th-6th century
53.69 g, 29.5x28x8 mm
KMA 525 (cat. 037)

2 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 5th-6th century
55.07 g, ø 33 mm, h: 7.5 mm
KMA 535 (cat. 056)

4 NOMISMATA COIN WEIGHT
Byzantine, 17.69 g, ø 25 mm, h: 5 mm
KMA 547 (cat. 046)

1 OUNCE COMMERCIAL WEIGHT
Early Byzantine, 6th-7th century
23.67 g, ø 25 mm, h: 6 mm
KMA 550 (cat. 054)

3 NOMISMATA COIN WEIGHT
Early Byzantine, 4th-6th century
12.57 g, 19x19x4.1 mm
KMA 566 (cat. 038)



STEELYARD WEIGHT
Bust of the Empress
Aelia Eudocia.
Byzantine, 5th century
6000 g, h: 210 mm
KMA 605 (cat. 025)

Steelyard weights in the form of busts date from between the 2nd and 7th centuries AD. In the early part of this period the majority of steelyard weights portrayed emperors or the goddess Athena, and towards the end of the 5th century began to portray empresses. Weights in the form of busts in the collection of Istanbul Archaeological Museums are given in the table below from *Istanbul Arkeoloji Müzesindeki Büst Şeklinde Kantar Ağırlıkları, Steelyard Weights in the Form of Busts Archaeological Museum of Istanbul* (Istanbul 1983) by Yıldız Meriçboyu and Sümer Atasoy:

	Date	*Height*	*Accession no.*
Heracles	2nd century AD	110 mm	İAM 31
A Nubian	3rd century AD	133 mm	İAM 6186
Helmeted woman	4th century AD	178 mm	İAM 5942
Head of an emperor	400 AD	86 mm	İAM 6187
Aelia Eudocia	5th century AD	23 mm	İAM 5940
Aelia Eudocia	5th century AD	192 mm	İAM 5239
Licinia Eudoxia	5th century AD	208 mm	İAM 6253
Galla Placidia	5th century AD	138 mm	İAM 5415
Galla Placidia	5th century AD	161mm	İAM 1333
Bust of an empress	5th century AD	75 mm	İAM 73.157
Galla Placidia	5th century AD	18 mm	İAM 76.87
Aelia Pulcheria	5th century AD	16 mm	İAM 29
Bust of an empress	5th century AD	165 mm	İAM 6184
Bust of an empress	5th century AD	-	İAM 6079
Bust of an emperor	6th century AD	12 mm	İAM 6812
Athena	7th century AD	208 mm	İAM 77.35

GLOSSARY OF TERMS FOR THE BYZANTINE PERIOD

Anthypatos: (ODB) (Gr.) (Lat. Proconsul) A governor of some special provinces. The term also probably designated the head of the administration of the city of Constantinople until 359.

Clarissimus: (SB) When Constantine created the Senate in Constantinople, he granted the new senators the title €lari. On weights the title appears as VC (Vir Clarissimus).

Comes sacrarum largitionum: (ODB.) High-ranking financial official.

Diadem: (MS-UT) Crown in the form of a narrow band.

Endoxototos: see *Gloriosus.*

Eparch: (SB) The Prefect of Constantinople. He was responsible for the maintenance of law and order; and he controlled trade and industry and, indeed, the city's whole economic life.

Exagion: (ODB) A unit of weight equal to 1/72 of the heavy Roman *libra* or Byzantine *logarike litra* (=4.44 g). *Exagion* can also refer to weights used as standards for gold coins.

Gloriosus: (ODB and SB) The highest title bestowed on Senators and high officials such as Prefects, Magister Militum, Magister Officiorum and Quaestores from the middle of the 6th century.

Himation: (AG-CK) A loose mantle worn in ancient Greece.

Illustris: (SB) From the last quarter of the 4th century until the middle of the 6th century this was the highest senatorial rank, bestowed upon such officials as the Praetorian Prefect, the City Prefect, Magister Militum and Consuls. On weights the title appears as VL (Vir Illustris).

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

Lamprotatos: see *Clarissimus.*

Litra: (ODB) (Lat. *Libra*). 1. The most important Byzantine measure of weight, equivalent to 319-324 g. Established by Constantine I in 309 or 310 as the basis of the monetary system: 1 *logarike litra* of gold=72 *solidi or exagia*=12 *ounqiai*=1.728 *keratia*=6.912 *sitokokka*=1/100 *kentenarion*. 2. The *Soualia litra*, was a special unit reserved for weights of oil or wood=4/5 *logarike litra*=256 g.=30 *soualiai litrai* of olive oil= 1 *thalassion* METRON. 3. In regions such as Cyprus and Trebizond, which had regular contact with Islamic lands, a special *argyrike* (silver) *litra* of 12.5 *logarikai ounqiai* (=333 g). It was apparently related to the Arab *ratl* of 337.6 g.

Loros: (AG-CK) A long sash studded with precious stones worn by Byzantine emperors and empresses, originally draped in an "X" over the upper body with one end hanging down in front and the other over the left arm.

Magister Militum: (ODB) Commander in chief of the armies in the late Roman Empire.

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

Nomisma: (ODB) (plu.*nomismata*) a word meaning 'coin' generally, but specifically used of the standard gold coin of 24 *keratia* which formed the basis of the late Roman and Byzantine monetary system. It was thus identical with the coin called in Latin a *solidus*. Circa 4.55 g.

Novella: (ML) Statutes added to the Codex which had earlier been promulgated by the same emperor.

Ounqia: (ODB) (Gr.) Unit of weight derived from Lat. *uncia*=1/12 *litra*. Accordingly, the *ounqia*, as 1/12 of the *logarike litra* of 320 g, weighed 26.7 g.

Periblebtos: see *Spectabilis.*

Pondera: (ODB) A weight used for commercial goods.

Pound: (SB) A Roman unit of weight used for commercial goods. 4 Roman pounds were equal to 1 *litra*. 1 *litra* was equivalent to 12 ounces or 72 *solidi*, approximately 320-324 g.

Praetorian prefect: (ODB) Commander of the emperor's bodyguard under the principate, but from the 4th century an important regional civil functionary responsible for a praetorian prefecture. Their responsibilities included taxation, justice, grain provision, trade, prices, and higher education.

Proconsul: see *Anthypatos.*

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

Semissis: (ODB) In late Roman and Byzantine times a small gold coin weighing 2.78 g. and worth half a *solidus*.

Solidus: (ODB) (plu. *solidi*) Initially the name of a gold coin struck by Diocletian. It was introduced under Constantine I at the mint of Trier in 309. In Greek it was known as a *nomisma*, but numismatists have been accustomed to use the Latin word *solidus* for the coin down to the 10th century. Also see *Nomisma.*

Spectabilis: (ODB and SB) The title of second-ranking senators in the late Roman Empire, between *Illustris* and *Clarissimus*. Bestowed primarily upon Proconsuls, Vicars and Duces. The term first appears in documents in 365 and for the last time in 710.

Tremissis: (ODB) A small gold coin weighing 1.52 g, worth a third of a *solidus*, introduced in the 380s during the reign of Theodosios I.

Tyche: (AG-CK) A concept of fate and fortune in antiquity, often taking the form of a female personification. Its most familiar appearance is that of a female goddess personifying a city, as Rome, Constantinople and Antioch.

Zygostates: (ODB) Public weigher, a municipal official who, according to a law of Julian (Cod. Just. X73.2), was to check the quality of *solidus*.

ISLAMIC PERIOD

GARO KÜRKMAN

COIN WEIGHTS USED BY THE UMAYYADS, ABBASIDS, FATIMIDS AND AYYUBIDS

SANJAS

1 DIRHEM WEIGHT
Ayyubid, 11-12th century
2.95 g, ø 21 mm
KMA 518 (cat. 066)

The word *sanja*, meaning a weight used not for weighing goods, but for checking the weight of silver coins, is an Arabic word whose first letter could either be *sad* (ص) or *sin* (س), deriving from the Persian *seng*, meaning stone. 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 weighed the same as the Byzantine *dinar* or *solidus*, being equivalent to 68 grains (4.406 grams). The Arabic *dirhem* was equivalent to 66 grains or 4.276 grams.

Among the Arabs, coin weights were first produced between the years H 74-77 by Abdülmelik b. Mervan as a means of standardising coinage weights, and were also produced in Egypt during the Byzantine period for the same purpose. The latter coin weights sometimes bear the names of governors of Egypt. Excavations at Fustat and Fiyum have revealed coin weights made in Damascus and other parts of Syria. On Abbasid coin weights we find the name of the caliph (*emir el mü'min*), governor or official known as *şurta* who was responsible for assaying weights and measures. Some researchers have interpreted these names as belonging to the craftsmen who made them, but the validity of this claim is questionable.[1]

In time, Islamic coin weights attained their classical forms. Some bore Arabic inscriptions such as *Aslahü Allah, Ekremehü Allah* or *Emta' Allah Lehü*, or quotations from the Koran. Two coin weights that we encountered in the course of our research bear both decoration and monograms of the Roman period and Islamic legends.

The word (يشنعه) 'to manufacture' which appears on Islamic coin weights has been extensively debated, and interpreted by some scholars as (يشبعه) 'to stamp'. In our opinion, however, the former reading is correct, and so we have similarly read (صنعه) as 'manufactured'.[2]

Sanja dies 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 *miskal* or *mizan*, sanjas bear words referring to the coin or its fractions for which they were intended to provide a standard: *dinar, diner, nısıf diner* [half diner], *sülüs* [third], *sülüseyn, dirhem, dirhem sülüseyn, fals* [copper], *fals el kebir, kırat* [carat], *kırt, krarit* and *hurube*. Some sanjas also bear the words *caiz* or *vaf* (وافٍ), which like the word *sah* stamped on assayed silver objects asserted their compliance with legal standards.[3]

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 while producing dies by carving the motifs and inscriptions in mirror image on the tiny surface. 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.[4]

Sanjas of different colours were obtained by the addition of different chemicals; copper and iron oxide for blue, sulphur and carbon for amber, and manganese for dark blue.

1 - Abdelrahman Fehmi Muhammed, *Senc el Sikke Fi Fecr el Islam, Mecmuat Mathaf El Fen El Islami Tabaat Dar El Kütub El Misriyye*, 1957, trans. (Şeyhmus Dirim, unpublished).
2 - Muhammed, *Senc el Sikke*, p. 16
3 - Muhammed, *Senc el Sikke*, pp. 16-17.
4 - Muhammed, *Senc el Sikke*, pp. 16-17.

Sanjas provided standards for three kinds of Islamic coins: the gold dinar and its fractions, the silver *dirhem*, and copper *fals*. The weight of classical Islamic gold dinars can be calculated accurately not by examining the coins themselves, but by means of the coin weights used to check them. Glass weights in the best condition dating from the 780s vary amongst themselves by at most one-third. Measurements of these demonstrate that the average weight of the *dinar* was 4.231 grams or 65.3 grains.[5] This value is confirmed by the measurements of several hundred undamaged glass weights carried out by P. Casanova.[6] E. C. Abdülkadir states that a glass weight of 18 *miskals* weighs 76.23 grams.[7]

1/2 DIRHEM WEIGHT
Ayyubid, circa 700
Bronze, 1.46 g, 10x9.2x2 mm
KMA 1288 (cat. 71)

1/2 COIN WEIGHT
Fatimid, circa 411-427
1.48 g, ø 15-16 mm
KMA 516 (cat. 064)

1/4 DIRHEM COIN WEIGHT
Fatimid, circa 427-487
0.736 g, ø 15 mm
KMA 514 (cat. 063)

5 - W. M. F. Petrie, "Glass Weights", *The Numismatic Chronicle*, 4. Serie Bd. XVIII, London, 1918, p. 115.
6 - P. Casanova, "Dénéraux en verre arabes", *Melanges offerts à M. Gustave Schlamberger*, Paris 1924, p. 299.
7 - Emir Cafer Abdülkadir, "Monnaies musulmanes et poids en verre inédits", *Melanges Syriens offerts à Monsieur Renk Dussaud*, vol. I, Paris 1939, p. 400.

UMAYYAD AND ABBASID GLASS WEIGHTS USED IN TRADE

GLASS WEIGHT
Umayyad, dated [1]18
ø 110 mm (approx.), h: 22 mm
ANS 75.93.859

The inscription on this *ratl* weight tells us that it was made when Al-Qasim b. 'Ubaydullah was serving as minister of finance (H 116-124/734-742 AD). Since it is broken we do not know what substances it was used to weigh.

GLASS WEIGHT
Umayyad, 8th century
63x35 mm
ANS 1993.84.2

Since the stamped inscription is worn it is only partially illegible, but tells us that it dates from the time when 'Ubaydullah b. al-Habhab was minister of finance (H 102-106/720-734 AD). The words *'ratl lahm vaf* mean 'full weight for meat weighing a *ratl*'. Since it is broken its original weight is unknown.

GLASS SEAL
Umayyad, early 8th century
ø 34 mm
ANS 1917.215.4488

The seal bears the words 'Usamah bin Zayd' and '*rub qist zayt* (a quarter measure of olive oil), telling us that it dates from the time when Usamah b. Zayd was minister of finance (H. 96-99, 714-717 AD), and that it was used for stamping measuring cups for olive oil.

GLASS WEIGHT
Umayyad, dated H. 122
stamp: ø 39 mm
ANS 70.93.856

The inscription on the weight gives the name of Al-Qasim b. 'Ubaydullah, who served as minister of finance (H. 116-124/734-742 AD), and tells us that it was stamped in H. 122 by the *shurta* (Abbasid assay official) Zaffar b. Shabba. The weight is broken, but it is thought to have weighed a *ratl*.

GLASS WEIGHT
Abbasid, 9th century
approx. 759.76 g, 93x62x25 mm
ANS 1965.144.57

This weight is thought to be a double *ratl*, and bears two worn stamps, from which we learn that it dates from the time of the Abbasid caliph el-Vasik (H. 227-232/842-847 AD).

SELJUK, EMIRATE AND OTTOMAN PERIODS

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, *Divanu Lugâti'l-Türk*, is an important source of information about units of weight and measurement, defining the *artık* as half a *yük* (load), the *kırklım* as a pile, the *sagu* as a measure of cereals, the *kawçí* as equivalent to 10 *ratls*, the *batman* as a measurement of weight, and the *yigaç* as a measurement of length, along with diverse local units used for the measurement of land area.[1]

The most important source of information about Seljuk period weights and measures are the deeds of pious endowments. From these we learned that the *ukiyye, irdeb, müd* and *batman* were the basis of the measuring system of this period.[2]

10 DIRHEM WEIGHT
Seljuk, 12th-13th century
28.73 g, 15.3x19 mm
KMA 1282 (cat. 102)
On the upper face is the word Muhammed in kufi script set in a circle.

The expansion of trade relations between the western Anatolian Turkish emirates of Menteşe and Aydınoğulları 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,[3] the account of Anatolia written by the 14th century Memluk historian and geographer Ibn Fazlullah al-Omari on the basis of information obtained in Cairo from a Genoese slave named Domenichino Doria included in *Mesâlikü'l-ebsar fî memâliki'l-emsâr*,[4] and *La Pratica della Mercatura*,[5] written by the Italian Balducci Pegolotti who travelled to the Levant in the first half of the 14th century for the purpose of identifying Anatolia's trade goods and preparing a guide for merchants are all sources that provide important information about the weight sand measures of this period. Pegolotti even gives a table comparing the units of measurement used in Alanya and Alexandria with those of Italy.[6]

Sources dating from the 14th century reveal that the pre-Ottoman Anatolian system of measurements was based on the *lodra*, an Iranian-Ilkhanid unit of weight, the *kantar, okka* and *batman (menn)*, and that the main units of grain measurement were the *kile* and *müdd*. 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.

Manuals written in the 16th century for the guidance of Ottoman fiscal authorities are valuable as the first comprehensive sources of information about Ottoman weight sand measures. Among these is an arithmetic book written in Greek in Salonica around 1500 showing that by this time the Byzantines system of weights had been abandoned. *Mecma'u'l-Kava'id*, which was to set an example for subsequent books about accounting, was written by Muhyiddin Mehmed bin Hacı Atmaca in H 899/1493 AD under the influence of Arabic and Persian accounting handbooks, and gives contemporary Ottoman units of measurement.[7] Another of these accounting books entitled *Risale-i Kenaniye* (Süleymaniye Library, Şehit Ali Paşa Kitaplığı, No 1979) thought to date from the 16th century and written by Yusuf bin 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, miskal* and *dirhem*; large units of weight, *kantar, lidre, batman* and *kıyye*; units of volume, *müdd, keyçe, şinik, taşar* and *müdd-i öşrî*; and units of length and area, *zira* and *mesâha* respectively.[8]

1- Halil İnalcık, "Introduction to Ottoman Metrology", *Turcica*, XV, 1983, pp. 313-314.
2- İnalcık, "Introduction to Ottoman Metrology", pp. 313-314.
3- İbn Battuta, *Seyahatname*, trans. Mehmed Şerif, I-II, Istanbul 1333, 1335.
4. ed. Fuat Sezgin, I-XXVII, Frankfurt, 1408/1988, facsimile print.
5- A. Evans (ed.), Cambridge 1936.
6- Şerafettin Turan, *Türkiye-İtalya İlişkileri*, Kültür Bakanlığı, Ankara 2000, 2nd ed., p. 98, 114, 140.
7- İnalcık, "Introduction to Ottoman Metrology", p. 315.
8- Halil Sahillioğlu, "Osmanlı Devlet Muhasebe Sisteminde Birimler", *Osmanlı Türk Diplomatiği Semineri (30-31 May 1994)*, Istanbul 1995.

1 DIRHEM WEIGHT
Seljuk, 12th-13th century
2.90 g, 10.5x10x4 mm
KMA 497 (cat. 085)
The word 'Muhammed' in kufi script is stamped on the weight.

DIRHEM WEIGHTS WITH BIRD'S EYE MOTIFS
20 Dirhem, cat. 106
10 Dirhem, cat. 098
10 Dirhem, cat. 097
5 Dirhem, KMA 360
5 Dirhem, cat. 093
2 Dirhem, cat. 088

DIRHEM WEIGHTS WITH BIRD'S EYE MOTIFS
15 Dirhem, cat. 105
10 Dirhem, cat. 099
5 Dirhem, cat. 094

10 DIRHEM WEIGHTS
Abbasid-Seljuk, 10th-13th century
29.56 g
18.3x19.5x10.1 mm
29.33 g
19x18.8x10 mm
Private collection. These are thought to have been used for weighing silk, since they are stamped with the words 'balya tam?'.
Far right:
29.63 g
15x14.5x7.2 mm
Private collection. The inscription reads '... el-imam'.

STEELYARD
Ottoman, 16th-18th century
l: 193 mm
KMA 693 (cat. 148)

50 DIRHEM WEIGHT
Seljuk, 12th-13th century
145.34 g, ø 32.5 mm
KMA 108 (cat. 108)

WEIGHTS AND MEASURES

DIRHEM

The *dirhem* was introduced into Anatolia with the spread of Islam, but for a long time the Byzantine *solidus* continued to be used alongside this new unit of weight. The *dirhem* 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 Seljuks adopted the *dirhem* system as used by the Umayyads, Abbasids and Iranians, but the unit was not fully standardised, and its value varied from region to region and period to period. These discrepancies in the values of the *dirhem* and *miskal*, the units of weight used in Islamic societies, is evident from information in local sources.[1]

Both the *dirhem* and *miskal* were based on multiples of the *kırat* (carat). According to Sahillioğlu, 1 *dirhem* was equivalent to 14 *kırats*, and 1 *miskal* to 20 *kırats*, a ratio of 7:10.

Walther Hinz explains that the Islamic weight measurement system was based on the *dirhem*, 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 *dirhem* was 7:10 in theory, and 2:3 in practice. The values of all other units depended on the accurate determination of these two units.[2]

Since the earliest periods of Islam, the *rıtl* had been the foremost unit of weight. An Umayyad period *rıtl* weight used in Syria in the year 744 weighs 337.55 grams. A *rûmi rıtl* may have been equivalent to 72 Roman *solidi* or *miskal*. Since one *dirhem* was regarded as equivalent to 1.5 *miskals*, the weight *dirhem* is equivalent to 3.125 grams.[3] When we look at the glass *kırat* (also known as the *harruba*) weights used by the Abbasids in Egypt, we find that these weigh 0.195 grams. Therefore a *dirhem* of 16 *kırats* makes 3.125 grams.[4]

A Fatimid period *rıtl* weight equivalent to 140 *dirhems* in the Louvre Museum weighs 437.2067 grams. From this, we can conclude that one *dirhem* was equivalent to 3.123 grams.[5]

Meanwhile V. Queipo calculates the value of a *dirhem* at approximately 3.125 grams.[6] Halil Sahillioğlu calculates the weight of the *dirhem* on the basis of the Mongol *dinar* coin and the Seljuk *dirhem* coin used around the 13th century as follows: 1 Mongol *dinar* coin was equivalent to 6 Seljuk *dirhem* coins, and during the reign of the Ilkhanid Mongol ruler Gazan Mahmud (H 694-703/1295-1304) 1 *dinar* coin was equivalent to 3 *miskals* and a Tabriz *miskal* was equivalent to a Pontus (Trabzon) *miskal* of 4.608 grams. Gazan Han decided to make the Tabriz *miskal* the standard unit of weight and ruled that it should be equivalent to 2 *dirhems*. The Ottomans, on the other hand, regarded the Tabriz *miskal* as equivalent to 1.5 *dirhems*.[7]

In the early Ottoman period, however, the *dirhem* was not fully standardised. Various sources tell us that until the year H 1100 (1688-89) the *dirhem* was equivalent to 3.072 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 883, 129 gold coins were minted from 100 *miskals* of gold. If

1 - Halil Sahillioğlu, "Dirhem", *DİA*, vol. 9, p. 369.
2 - Walter Hinz, "İslam'da Ölçü Sistemleri", *Türklük Araştırmaları*, trans. Acar, Sevim, p. 1.
3 - R. Ettinghausen, "An Umaiyad Pound Weight", *The Journal of the Walters Art Gallery*, II, Baltimore-Maryland, 1939, pp. 73-76.
4 - E. T. Rogers, "Unpublished Glass Weights and Measures", *JRAS* X, New Serie 1878, s. 102-4; W. M. F. Petrie, p. 114. a.a.O.
5 - ez-Zehebi - H. Sauvaire, *JA* 8 IV, 1884, p. 310.
6 - Don V. Vazquez Queipo, *Essai sur les systèmes métriques et monétaires* II, Paris 1859, p. 221, 222, 225, 231, 240.
7 - Sahillioğlu, "Dirhem", p. 369.

we assume 1 *miskal* to be 4.608 grams, then 100 *miskals* is equivalent to 460.8 grams, which when divided by 129 means that one gold coin weighed 3.57209 grams. Since 1 *miskal* equalled 1.5 *dirhems*, then 1 *dirhem* was equivalent to 3.072 grams.[8] Halil İnalcık refers to the table of weights and measures given by Muhyiddin Mehmed in his book *Mecma'u'l-Kava'id* in 1493, where he defines 1 *miskal* as 1.5 *dirhems*.[9]

An Egyptian commission set up by the khedive of Egypt Mehmed Ali Paşa in 1845 reported that the *dirhem* weight was equivalent to 3.0998 grams.[10] H. Sauvaire, 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. Decourdemanche claims that the value given by the Egyptian commission was erroneous,[11] and should have been 3.148 grams.[12] In 1924 the Egyptian government officially announced that the *dirhem* would be regarded as equivalent to 3.12 grams.[13]

12.5 DIRHEM WEIGHT
Ottoman, 18th-19th century
40.57 g, ø 51.5 mm
KMA 282 (cat. 163)

MONEYCHANGER'S BALANCE AND WEIGHTS
Ottoman, 19th century
197x113x40 mm
KMA 601 (cat. 478)

8 - Sahillioğlu, "Dirhem", p. 369.
9 - İnalcık, "Introduction to Ottoman Metrology", p. 318.
10 - Mahmoud Bey, "Le systeme metrique actuel d'Egypte", *JA*, 7 I, 1873 p. 75; Sahillioğlu, "Dirhem", p. 369.
11 - *Revue Numismatique* 4, XII, 1908, p. 222 : "M. Sauvaire a pris pour base la donnée complétement fausse, de la commission egyptienne, au sujet d'un poids de 3 gr 0898, a donner au dirhem legal".
12 - *Revue Numismatique* 4, XII, 1908, p. 216 and p. 224.
13 - *Mitt. Sem. Orient. Sprachen, Westasiatische Studien*, Berlin 1925, p. 25.

BOXES FOR MONEYCHANGER'S BALANCES AND WEIGHTS
Ottoman, 18th-19th century
139x86x26 mm (top); 139x80x24 mm (above)
KMA 600 (cat. 268) and KMA 602

Setting aside all the controversial discussion outlined above, we weighed all the 1 *dirhem* weights used in the Ottoman period that we came across, and drew up the following table of our findings. The average weight of the 32 *dirhem* weights we examined was found to be 3.14875 grams. Even when reduction in weight caused by wear over the centuries is taken into account, it is clear that the *dirhem* cannot have been equivalent to the 3.072 grams specified by Sahillioğlu.

	Reign/Period	*Date*	*Weight*	*Material*	*Collection*
1	Mehmed II	857	3.14 grams	Copper	KMA 73
2	Bayezid II	886	3.4 grams	Bronze	SAM 9.2.83
3	1 dirhem weight made from a Seljuk coin	c. 900	3.10 grams	Copper	KMA 82
4	Selim I	918	3.42 grams	Bronze	SIW 75460531
5	Süleyman I	926	3.19 grams	Brass	KMA 70
6	Süleyman I	926	2.83 grams	Copper	KMA 69
7	Süleyman I	926	3.07 grams	Bronze	KMA 75
8	Süleyman I	926	3.30 grams	Copper	KMA 62
9	Süleyman I	926	3.30 grams	Copper	KMA 88
10	Seljuk/Ottoman, 13-16th century	c. 926	3.35 grams	Bronze	KMA 121
11	Murad III	982	3.50 grams	Copper	KMA 65
12	Murad III	982	3.39 grams	Bronze	KMA 63
13	Murad III	982	3.14 grams	Copper	KMA 73
14	Osmanlı, 16th century	c. 1000	3.37 grams	Bronze	KMA 135
15	Ahmed I period	1012	3.26 grams	Bronze	KMA 122
16	Ahmed I	1012	3.38 grams	Bronze	KMA 71
17	Ahmed I	1012	3.37 grams	Bronze	KMA 67
18	Ahmed I	1012	3.39 grams	Bronze	KMA 80
19	Murad IV	1032	3.30 grams	Copper	KMA 64
20	Mehmed IV	1058	3.39 grams	Bronze	Private collection
21	Mehmed IV	1058	3.41 grams	Bronze	KMA 61
22	Mehmed IV	1058	3.36 grams	Bronze	KMA 115
23	Mehmed IV	1071	3.25 grams	Copper	KMA 87
24	Mahmud I	1143	3.21 grams	Bronze	KMA 45
25	Mustafa III	1171	2.99 grams	Bronze	KMA 38
26	Abdülmecid	1267	3.10 grams	Copper	KMA 151
27	Abdülmecid	1273	3.20 grams	Brass	KMA 53
28	Abdülmecid	1275	3.18 grams	Brass	KMA 51
29	Abdülaziz	1277	3.18 grams	Brass	KMA 58
30	Abdülaziz	1277	3.21 grams	Copper	KMA 55
31	Abdülaziz	1281	3.07 grams	Copper	KMA 47
32	Abdülhamid II	1293	3.21 grams	Brass	KMA 144

EXAMPLES OF DIRHEM WEIGHTS USED BETWEEN THE REIGNS OF BAYEZID II AND MEHMED IV

1 DIRHEM WEIGHT
Ottoman, first half of 16th century
Tuğra of Suleyman I
3.19 g, ø 14.5 mm
KMA 070 (cat. 124)

1 DIRHEM WEIGHT
Ottoman, 15th-16th century
Tuğra of Bayezid II
3.40 g, ø 13.5 mm
SAM 9.2.83

1 DIRHEM WEIGHT
Ottoman, late 16th century
Tuğra of Murad III
3.39 g, 15x15 mm
KMA 063 (cat. 132)

1 DIRHEM WEIGHT
Ottoman, 17th century
Tuğra of Mehmed IV
3.41 g, ø 15 mm
KMA 061 (cat. 157)

1 DIRHEM WEIGHT
Ottoman, second half of 16th century
Tuğra of Selim II
2.83 g, 14x15 mm
KMA 069 (cat. 123)

1 DIRHEM WEIGHT
Ottoman, 17th century
Tuğra of Murad IV
3.30 g, ø 14.5 mm
KMA 064 (cat. 150)

1 DIRHEM WEIGHT
Ottoman, 15th-16th century
Tuğra of Murad III on the obverse and
Mehmed II on the reverse
3.14 g, ø 15.5 mm
KMA 073 (cat. 133)

1 DIRHEM WEIGHT
Ottoman, first half of 16th century
Tuğra of Süleyman I
3.07 g, ø 14.5 mm
KMA 075 (cat. 125)

1 DIRHEM WEIGHT
Ottoman, first quarter of 17th century
Tuğra of Ahmed I
3.38 g, ø 15 mm
KMA 071 (cat. 134)

1 DIRHEM WEIGHT
Ottoman, dated H [11]71
Tuğra of Mehmed IV
3.25 g, ø 14.5 mm
KMA 087 (cat. 156)

2 DIRHEM WEIGHT
Ottoman, first half of 16th century
Tuğra of Süleyman I
5.90 g, 15x16.4 mm
KMA 068 (cat. 128)

2 DIRHEM WEIGHT
Ottoman, first half of 16th century
Tuğra of Süleyman I
6.08 g, 16.5x13x3.5 mm
KMA 072 (cat. 129)

12.5 DIRHEM WEIGHT
Ottoman, dated H 1250
37.51 g, ø 46.7 mm
KMA 17 (cat. 226)

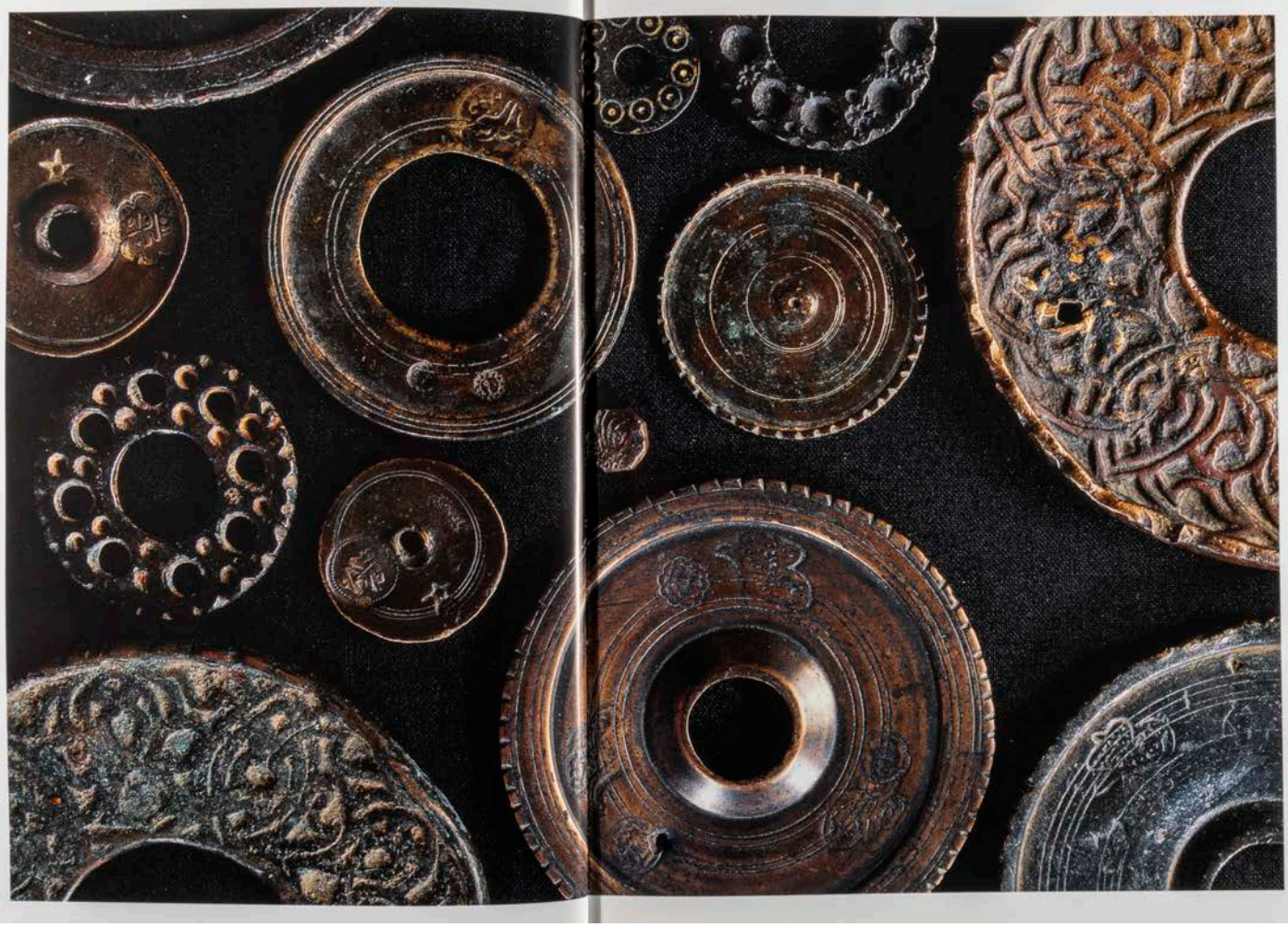
In order to calculate the equivalent of the *dirhem* in grams, a table was drawn up of *dirhem* weights in multiples other than one in the AKMED collection. The findings for weights denominated as multiples of 400, 200, 100, 50, 25, 20, 15, 12.5, 10, 5, and 2 *dirhems* are given chronologically below.

It emerges from this table that 1 *dirhem* was equivalent to just over 3.103 grams. If discrepancies according to region are ignored, this may be taken as the average value.

Dirhem weight	*Reign/Period*	*Date (Hegira)*	*Date (AD)*	*Weight (gr)*	*Weight equivalent to 1 dirhem (gr.)*	*Material*	*Collection*
100	Mehmed II	869	1464	299.46	3.00	Bronze	KMA 037
20	Bayezid II	886	1481	58.37	2.92	Copper	KMA 090
10	Bayezid II	886	1481	30.24	3.02	Bronze	KMA 095
2	Süleyman I	926	1520	5.90	2.95	Copper	KMA 068
2	Süleyman I	926	1520	6.08	3.04	Copper	KMA 072
200	Süleyman I	926	1520	530.00	2.65	Bronze	KMA 003
	Mehmed IV	1058	1648				
100	Murad III	982	1575	314.00	3.14	Bronze	KMA 001
5	Ottoman	1012	1603	15.22	3.05	Bronze	KMA 040
50	Ahmed I	1012	1603	158.53	3.17	Bronze	KMA 101
100	Mustafa I	1026	1617	319.07	3.19	Bronze	KMA 005
100	Mustafa I	1031	1622	310	3.10	Bronze	KMA 015
200	Murad IV	1032	1622	582.00	2.91	Bronze	KMA 004
200	Mehmed IV	1058	1648	571.35	2.85	Bronze	KMA 002
2	Mehmed IV	1058	1648	5.90	2.95	Bronze	KMA 052
10	Ahmed II	1102	1690	30.96	3.10	Bronze	KMA 092
100	Ahmed III	1115	1703	303.97	3.04	Bronze	KMA 010
200	Ahmed III	1115	1703	596.0	2.98	Bronze	KMA 1278
2	Mahmud I	1143	1730	6.29	3.15	Bronze	KMA 084
25	Mahmud I	1143	1730	73.96	2.96	Bronze	KMA 1303
100	Mahmud I	1143	1730	308.66	3.09	Bronze	KMA 169
10	Osman III	1168	1754	31.52	3.15	Bronze	KMA 089
100	Mustafa III	1171	1757	302.00	3.02	Bronze	KMA 011
10	Mustafa III	1171	1757	30.50	3.05	Bronze	KMA 039
10	Mustafa III	1171	1757	31.19	3.12	Bronze	KMA 086
5	Mustafa III	1171	1757	15.82	3.16	Bronze	KMA 093
200	Mustafa III	1171	1757	612.66	3.06	Bronze	KMA 170
25	Mustafa III	1171	1757	77.40	3.10	Bronze	KMA 178
100	Mustafa III	1171	1757	319.72	3.20	Bronze	KMA 409

400	Mustafa III	1171	1757	1278.45	3.20	Bronze	KMA 298
200	Abdülhamid I	1187	1774	607.29	3.04	Bronze	KMA 180
100	Abdülhamid I	1187	1774	156.43	3.13	Bronze	KMA 201
12.5	Abdülhamid I	1187	1774	39.83	3.19	Bronze	KMA 259
50	Selim III	1203	1788	153.45	3.07	Bronze	KMA 014
20	Selim III	1203	1789	63.86	3.19	Bronze	KMA 031
20	Selim III	1203	1789	63.95	3.20	Bronze	KMA 117
5	Selim III	1203	1789	15.96	3.19	Bronze	KMA 119
50	Selim III	1203	1789	152.18	3.04	Bronze	KMA 166
12.5	Selim III	1203	1789	39.11	3.13	Bronze	KMA 176
400	Selim III	1203	1789	1240.60	3.10	Bronze	KMA 179
25	Selim III	1203	1789	78.18	3.13	Bronze	KMA 216
100	Selim III	1203	1789	313.15	3.13	Bronze	KMA 407
200	Selim III	1203	1789	618.71	3.09	Bronze	KMA 401
100	Mustafa IV	1222	1807	309.61	3.10	Bronze	KMA 257
100	Mustafa IV	1222	1807	317.39	3.18	Bronze	KMA 482
2	Mahmud II	1223	1808	6.25	3.13	Bronze	KMA 041
10	Mahmud II	1223	1808	31.72	3.17	Bronze	KMA 060
200	Mahmud II	1223	1808	622.55	3.11	Bronze	KMA 169
25	Mahmud II	1223	1808	75.24	3.01	Bronze	KMA 213
20	Mahmud II	1223	1808	63.93	3.2	Bronze	KMA 429
50	Mahmud II	1223	1808	156.20	3.12	Bronze	KMA 403
100	Mahmud II	1223	1808	281.45	2.85	Bronze	KMA 379
400	Mahmud II	1223	1808	1261.55	3.15	Bronze	KMA 299
400	Abdülmecid	1255	1839	1257.01	3.14	Bronze	KMA 393
20	Abdülmecid	1255	1839	63.73	3.19	Bronze	KMA 440
12.5	Abdülmecid	1255	1839	39.26	3.14	Bronze	KMA 018
2	Abdülmecid	1255	1839	6.36	3.18	Bronze	KMA 147
100	Abdülmecid	1275	1858	311.78	3.12	Bronze	KMA 156
10	Abdülaziz	1277	1861	31.56	3.16	Bronze	KMA 447
50	Abdülaziz	1277	1861	161.19	3.22	Bronze	KMA 022
2	Abdülaziz	1277	1861	6.33	3.17	Bronze	KMA 123
2	Abdülaziz	1277	1861	6.40	3.20	Bronze	KMA 149
50	Abdülaziz	1277	1861	318.83	3.19	Bronze	KMA 404
50	Abdülhamid II	1293	1876	160.37	3.20	Bronze	KMA 421
200	Abdülhamid II	1293	1876	624	3.12	Bronze	KMA 006
100	Abdülhamid II	1293	1876	316	3.16	Bronze	KMA 008
100	Abdülhamid II	1293	1876	317.84	3.18	Bronze	KMA 157
400	Mehmed V	1327	1909	1283.67	3.21	Bronze	KMA 269
2	Mehmed V	1327	1909	6.59	3.30	Brass	KMA 059
200	Mehmed V	1327	1909	641.51	3.20	Bronze	KMA 168
100	Mehmed V	1327	1909	313.18	3.13	Bronze	KMA 202

6 DIRHEM WEIGHT
Ottoman, dated H [12]49
19,02 g, ø 35 mm
KMA 16 (cat. 220)



50 DIRHEM WEIGHT
Ottoman, dated H [1]277
161.46 g, 25x27x70 mm
KMA 508 (cat. 248)

200 DIRHEM WEIGHT
Ottoman, dated H [1]239
632.71 g, 41x41.5x91 mm
KMA 321 (cat. 258)

400 DIRHEM WEIGHT
Ottoman, early 19th century
1250 g, 54x56x115 mm
KMA 322 (cat. 266)

50 DIRHEM WEIGHT
Ottoman, 16th-17th century
Tuğra of Ahmed I
158.53 g, ø 32.5 mm
KMA 101 (cat. 145)

DIFFICULTY OF DATING DIRHEM WEIGHTS WITH ANATOLIAN MOTIFS

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 assay marks have been found on any weights, measuring rods or measuring cups.

The *dirhem* 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 *dirhem* and 200 *dirhems*. With one exception it has proved impossible to date the *dirhem* weights which we have examined by reference to their motifs. The weights are generally decorated with animal motifs, geometric patterns or kufi inscriptions. Only one 12.5 *dirhem* weight (cat. 104) in the collection of the Mediterranean Civilisations Research Institute with a figure of a double-headed eagle can be dated with certainty to the Seljuk period by its motif.

50 DIRHEM WEIGHT
Ottoman, 17th century
Tuğra of Mustafa I
Bronze, 146.72 gr
exterior ø 86 mm
interior ø 39 mm
Private collection.
The weight has the assay mark 'Ayaryud' stamped over the tuğra.

20 DIRHEM WEIGHT
Seljuk, 12th-14th century

(top)
58.20 gr
19x19.1x18.5 mm
Private collection

(above)
58.62 gr
20x18.8x19 mm
Private collection

Decorated ring weights with nominations of 12.5, 25, 50, 100, 200 and 400 *dirhems* were manufactured. Most researchers have assumed that these weights were Iranian, perhaps due to the fact that some of them have Persian inscriptions. But not one of the nearly forty ornamented *dirhem* weights of various denominations published in various works or which we have examined bear a stamp to confirm the supposed connection with Iran. These *dirhem* weights with Anatolian motifs were produced by casting. Although this technique may have been borrowed from the Seljuks, there are no stamps or inscriptions allowing us to identify the period. So far we have encountered five examples with Persian inscriptions, two of which are stamped with the tuğra of Sultan Selim I reading 'Selim Şah', and two of which are stamped with the tuğra of Sultan Süleyman the Magnificent. The fifth has no stamp.

Nancy Pyle, who has studied ring-shaped *dirhem* weights, says that they vary in diameter from 6.25 cm to 15.4 cm,[14] whereas our findings put this measurement at between 4.7 cm and 16 cm. In terms of weights, our findings again differ from hers. While Pyle finds their weight to vary between 30 grams and 1290 grams, our study of numerous *dirhem* weights with denominations of between 12.5 and 400 *dirhems* reveals a weight range of 36.59 grams to 1248 grams.

100 DIRHEM WEIGHT
Early Ottoman, 15th-16th century
297 g, ø 115 mm
Nancy S. Pyle collection

below right:
Detail of the tuğra of Bayezid II
below far right:
Detail of the tuğra of Selim I

14 - Nancy Pyle, "Anatolian Ring Weights", *Journal of Turkish Studies*, vol. 2, 1978, pp. 97-106.

FRUIT SELLER WITH HIS BALANCE AND WEIGHTS
Detail of an Ottoman miniature from *Baharistan*, late 16th century. TSM H 1711, fol. 14r.

FRUIT SELLER'S STALL AT THE 1582 CELEBRATIONS
Detail of an Ottoman miniature from *Surname-i Hümayun*, TSM H 1344, fol. 168v.

200 DIRHEM WEIGHT
Ottoman, dated H [10]84
Tuğras of Süleyman I and Mehmed IV
530 g, ø 134 mm
KMA 003 (cat. 130)

100 DIRHEM WEIGHT (detail)
Two stamps reading [A]yar[şud] 84 from the dirhem in the Nancy S. Pyle collection.

Nancy S. Pyle has made some errors in her reading of the stamps on these weights. The worn stamp on one of these (illustrated above), which she has read as 'İşaret 808', should in fact be read as 'Ayarşud [10]84'. This stamp dates from the reign of the Ottoman Sultan Mehmed IV, and was struck after the year H 1084 (see cat. 135 and 130).

The Ottomans continued to stamp *dirhem* weights that had been used at earlier periods. For example, a weight dating from the reign of Süleyman II (H 926-974) bears the assay date stamp 'Ayar[şud] 1100', and another weight dating from the reign of Mahmud II (H 1223-1255) bears the assay stamps 'Ayarşud [1]224' and 'Ayarşud [1]235' (cat. 187). Another weight dating from the reign of Sultan Abdulaziz (H 1277-1293) has the assay stamp 'Ayarşud [12]87' (cat. 335), and one dating from the reign of Abdülhamid II (H 1293-1327) has the assay stamp 'Ayarşud [1]299' (cat. 359).

The stamp which Pyle reads as 'Qakhan 620' should in our view be read as 'İmtihan [10]62', 'imtihan' meaning '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 rifles after being inspected.

In her article the author says that the oldest tuğra found on an Ottoman *dirhem* weight is that of Süleyman I, and that the tuğra stamped on a 100 *dirhem* weight in her own collection is that of Süleyman I. In fact, however, this tuğra belongs to Bayezid II. On the same weight there is a second tuğra reading 'Selim Şah b. Bayezid Han, May He Ever Be Victorious' (see p. 72) and two assay stamps reading 'Ayarşud [10]84' (see p. 75).

200 DIRHEM WEIGHT (detail)
Stamps reading 'Imtihan 62' and '[Aya]r[ş]ud'
580 g, type L
TIEM 3925

SET OF DIRHEM WEIGHTS
100 Dirhem, KMA 037
50 Dirhem, KMA 125
50 Dirhem, KMA 325
25 Dirhem, KMA 090
25 Dirhem, KMA 326
10 Dirhem, KMA 039
10 Dirhem, KMA 327
5 Dirhem, KMA 093
2 Dirhem, KMA 362
1 Dirhem, KMA 363

SET OF DIRHEM WEIGHTS
200 Dirhem, KMA 329
50 Dirhem, KMA 332
20 Dirhem, KMA 491
20 Dirhem, KMA 483
10 Dirhem, KMA 060
10 Dirhem, KMA 435
10 Dirhem, KMA 450
2 Dirhem, KMA 093
2 Dirhem, KMA 085
1 Dirhem, KMA 067

DIRHEM WEIGHTS WITH ANATOLIAN MOTIFS

200 DIRHEM WEIGHT
13th-16th century
556 g, ø 150 mm
KMA 1280 (cat. 121)

12.5 DIRHEM WEIGHT
36.59 g, external ø 47 mm, internal ø 16 mm
Private collection
Tuğra reading 'Selim b. Suleyman...' on the reverse.

12.5 DIRHEM WEIGHT
39.30 g, external ø 48 mm, internal ø 15 mm
TİEM 3996
Similar motifs on obverse and reverse.

25 DIRHEM WEIGHT
71.88 g, external ø 63 mm, internal ø 27 mm
TİEM 3995
No stamp on the reverse.

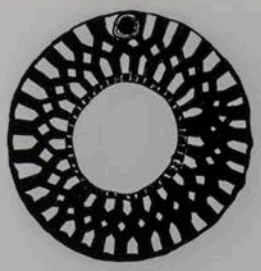
25 DIRHEM WEIGHT
81.67 g, external ø 73 mm, internal ø 40 mm
TİEM 3986
No stamp on the reverse.

25 DIRHEM WEIGHT
71.88 g, external ø 63 mm, internal ø 27 mm
TİEM 3995
No stamp on the reverse.

25 DIRHEM WEIGHT
81.67 g, external ø 73 mm, internal ø 40 mm
TİEM 3986
No stamp on the reverse.

50 DIRHEM WEIGHT
1 - 137.01 g, external ø 98 mm, internal ø 36 mm
Private collection.
2 - 113.49 g, external ø 80 mm, internal ø 34 mm
TİEM 1325
3 - 141.34 g, external ø 105 mm, internal ø 44 mm
SHM HK 612-3675
Tuğra reading 'Süleyman Şah b. Selim Şah Han, May He Ever Be Victorious,' stamped on the reverse.

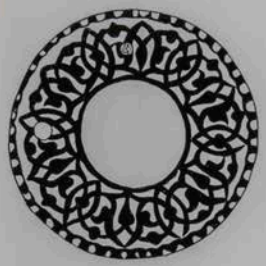
50 DIRHEM WEIGHT
1 - 150 g, external ø 92 mm, internal ø 39 mm
SHM 614-3576
2 - 142.54 g, external ø 92 mm, internal ø 39 mm
SHM HK 599-3662
3 - On the back of a 50 dirhem weight in the Nancy Pyle collection is a tuğra reading 'Mehmed bin İbrahim...'



50 DIRHEM WEIGHT
124.65 g, ø 105 mm
KMA 512 (cat. 110)

100 DIRHEM WEIGHT
1 - 268.72 g, external ø 120 mm, internal ø 45 mm
TİEM 4173
2- 286.17 g, external ø 115 mm, internal ø 47 mm
SHM HK 600-3663
3 - 304.44 g, external ø 112 mm, internal ø 51 mm
Three tuğras on the reverse read 'İbrahim b. Ahmed Han, May He Ever Be Victorious,' 'Mehmed b. İbrahim Han, May He Ever Be Victorious,' and 'Mustafa b. Mehmed Han, May He Ever Be Victorious.' Private collection.
4 - 302.05 g, external ø 120 mm, internal ø 56 mm
TİEM 2951a

100 DIRHEM WEIGHT
1 - 290.91 g, external ø 125 mm, internal ø 50 mm
TİEM 4174
Tuğra reading 'Mustafa b. Mehmed Han, May He Ever Be Victorious,' stamped on the reverse.
2 - 297.89 g, external ø 122 mm, internal ø 50 mm
TİEM 2951b
Tuğra reading 'Ahmed b. Mehmed Han, May He Ever [Be Victorious],' stamped on the reverse.
3 - 281.44 g, external ø 132 mm, internal ø 59 mm
TİEM 2951
Assay mark reading 'Ayarşud 84' stamped on the reverse. This indicates the year H 1284.



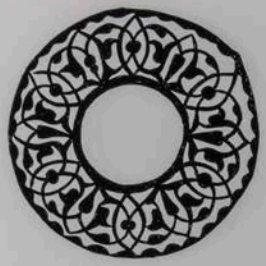
200 DIRHEM WEIGHT
1 - 604.27 g, external ø 135.5 mm, internal ø 58 mm
SHM M962-9069
'İmtihan' stamped once and 'ayar tam' stamped twice on the obverse.
2 - 568.17 g, external ø 148.5 mm, internal ø 64 mm
SHM HK610-3673
3 - 580.67 g, external ø 150 mm, internal ø 64 mm
SHM1085-12303
4 - 580 g, external ø 150 mm, internal ø 60 mm
TİEM 3925

200 DIRHEM WEIGHT
1 - 595 g, external ø 133 mm, internal ø 57 mm
TİEM 3721
2 - 530 g, external ø 152 mm, internal ø 70 mm
E. Kolaşın collection.
Worn tuğra of Sultan Ahmed I on the reverse.
3 - 570 g, external ø 131 mm, internal ø 58 mm.
A.Kayabek collection, no. 133
Worn tuğra of Mehmed IV on the reverse.

200 DIRHEM WEIGHT
1 - 485 g, external ø 131 mm, internal ø 48 mm
TİEM 3929
2 - 590 g, external ø 131 mm, internal ø 47 mm
Private collection.
3 - 552.5 g, external ø 131 mm, internal ø 44 mm
A. Kayabek collection, no. 130
On the reverse is the assay mark 'Ayar şud 84' for the year H 1284.

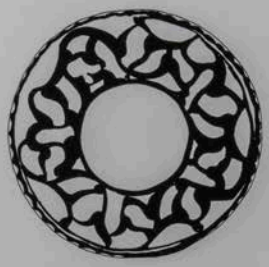
200 DIRHEM WEIGHT
1 - 549.30 g, external ø 151 mm, internal ø 73 mm
SHM HK 609-3672
Tuğra of Süleyman I on the reverse reading "Süleyman b. Selim şah han el-muzaffer daima".
2 - 599 g, external ø 151 mm, internal ø 72 mm.
A. Kayabek collection, no. 122
Tuğra of Selim I and his son Süleyman I on the reverse.
3 - 560 g, external ø 160 mm, internal ø 75 mm
Private collection.

400 DIRHEM WEIGHT
1 - 1150 g, external ø 152 mm, internal ø 69 mm
TİEM 3719
2 - 1215.20 g, external ø 141 mm, internal ø 60 mm
SHM HK595-3658
Tuğra reading 'Sultan Murad b. Ahmed Han' stamped twice on the reverse.
3 - 1305 g, external ø 152 mm, internal ø 55 mm
A. Kayabek collection, no. 123
4 - 1165.20 g, external ø 153.5 mm, internal ø 57 mm
SHM HK-597-3660



400 DIRHEM WEIGHT
1 - 1194.44 g, external ø 139 mm, internal ø 56 mm
SHM 596-3659.
2 - 1234.45 g, external ø 135.5 mm, internal ø 55 mm
SHM HK611-3674.
3 - 1225 g, external ø 146 mm, internal ø 64 mm
A. Kayabek collection, no. 126.
Tuğra reading 'İbrahim b. Ahmed Han, May He Ever Be Victorious,' stamped twice on the reverse.

400 DIRHEM WEIGHT
1248 g, external ø 163 mm, internal ø 76 mm
TİEM 2957



400 DIRHEM WEIGHT
1170 g, external ø 165 mm, internal ø 67 mm
A. Kayabek collection, no. 121

400 DIRHEM WEIGHT
1225 g, external ø 160 mm, internal ø 73 mm
TİEM 4034
Inscription on the obverse. Tuğra reading 'Selim Şah b. Bayezid Han, May He Ever Be Victorious,' stamped twice on the reverse.

راستی کر میزد که نرستی کر مار
سعدیست هیلدوز
پس تو زسعادت نزدید

Râstî ger mîzed ki, ne-restî ger mâr
Sa'dîst hildûz,
pes tû zi-sa'âdet ne-zedîd

If truth comes to your door, dismiss it not, be it yet a snake.
The happy man is he who weighs even a grain of cardamom. So fight not against happiness.

TUĞRAS

OTTOMAN ASSAY MARKS

محمد بن مراد خان المظفر دائماً

Mehmed b. Murad Han, May He Ever Be Victorious

The earliest tugra 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 *muhtesib* appointed for this purpose inspected weighing 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.

Sultan Mehmed II

Sultan Mehmed II

Sultan Bayezid II

Sultan Bayezid II

Sultan Selim I

Sultan Selim I

Sultan Süleyman I

Sultan Süleyman I

Sultan Selim II

Sultan Selim II

Sultan Murad III

Sultan Murad III


Sultan Murad III


Sultan Ahmed I


Sultan Ahmed I


Sultan Mustafa I ?


Sultan Mustafa I


Sultan Murad IV


Sultan Mehmed IV


Sultan Mehmed IV


Sultan Ahmed III


Sultan Ahmed III


Sultan Mahmud I


Sultan Mustafa III


Sultan Mustafa III


Sultan Abdülhamid I


Sultan Abdülhamid I


Sultan Selim III


Sultan Selim III


Sultan Mustafa IV


Sultan Mahmud II


Sultan Mahmud II


Sultan Abdülmecid


Sultan Abdülmecid


Sultan Abdülaziz


Sultan Abdülaziz


Sultan Abdülhamid II


Sultan Abdülhamid II


Sultan Mehmed V


Sultan Mehmed V

TUĞRAS AND ASSAY STAMPS ON THE BASE OF A 5 OKKA WEIGHT
Ottoman, 20th century
6417.87 g
KMA 193 (cat. 442)

WEIGHT MAKERS AND MARKS STRUCK ON WEIGHTS

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 tuğra of the reigning sultan, the names of assay officials or their numbers, assay marks consisting of various words signifyig that the weights have been checked and found to be accurate, such as *'ayarşud'*, *'imtihan'*, *'hak'*, *'tam'* or *'ayar tam'*, 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 maker or to an assayer. Names of assayers identified in the cause of our research are Cenab, Ahmed, Emin, Mustafa, Arif and Mehmed. The name Mustafa stamped only on a 20 *dirhem* weight (cat. 329) in the collection of the Mediterranean Civilisations Research Institute has been shown to belong to an assay official who is mentioned in archive records as Mustafa Efendi (BOA, A.MKT,NZD 392 84 1278.B.16). Some of the names clearly belong to the maker as in the case of stamps bearing the names Osman, Ahmed Sabri, Ali, Osman Küçük, Foti and Garabet.

All the weights which began to be produced at Tophane, the imperial foundry, from the year H 1299 onwards, are stamped not only with the Sultan's tuğra, but also 'the year 1299' and 'Tophane', so there is no doubt about their place of manufacture.

SET OF WEIGHTS MADE AT THE IMPERIAL FOUNDRY
below: the date 1299 and the Tophane stamp on this weight.
KMA 390 (cat. 381)

Amel-i Foti [Made by Foti]

Osman Küçük

Garabet

Dökmeci Hatib [Foundryman Hatib]

Ahmed Sabri

Ali

Osman

Dökümcü Şirketi [Foundry Company]

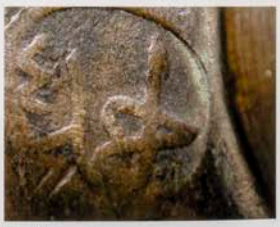
EXAMPLES OF ASSAYERS' MARKS

During the Ottoman period assayers sometimes stamped weights and measuring equipment with their names, numbers, or both. On examples which we have examined so far, the names Cenab, Ahmed, Emin, Mustafa, Arif and Mehmed occur.

Emin 1

Mehmed 3

Arif 7



Ahmed 4

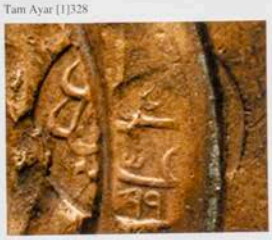
Mustafa 8

EXAMPLES OF ASSAY MARKS

Ayar şad [10]84

Tam Ayar [1]328

İmtihan [10]62

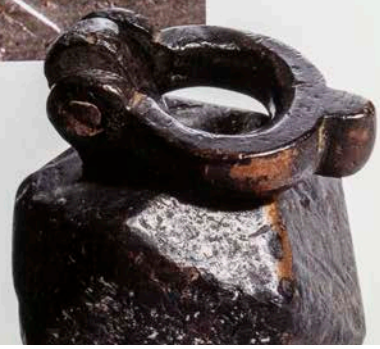


Ayar şad [1]299

Hak

Tam

Ayar şad 84



WEIGHTS AND MEASURES INSPECTOR

This illustration of a *muhtesib* 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 *Surname-i Hümayun*
TSM, H. 1344, fol. 296r.

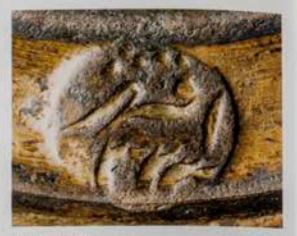
LIST OF MUNICIPAL ASSAY STAMPS

Denomination (dirhem)	*Town*	*Date*	*Reign*	*Type*	*Collection*
100	ADANA			L	Private collection
12.5	AKŞEHİR	[1]328	Mehmed V	L	KMA 019
50	AKŞEHİR			L	JH
100	ANKARA			U	JH
25	AYVALIK	[13]34			JH
100	AYVALIK	[1]325			JH
200	BAHCECIK	[19]26	Abdülhamid II	U	KMA 006
10	BALIKESİR				JH
12.5	BALIKESİR			L	JH
25	BİLECİK				JH
100	BOLU			U	Private collection
100	BURHANIYE	1928			JH
200	CELALİYE	1319			JH
50	ÇİVRİL				JH
100	DEVREKANİ			U	Private collection
100	EDREMİD	[1]218?		L	Private collection
100	ERZİNCAN	[1]233			JH
5	GEMLİK	[1]333	Mehmed V	N	JH
100	İZMİD			U	JH
100	İZMİR		Abdülhamid II	U	Private collection
100	KARAMAN	---	---	L	KMA 1275
100	KARAMÜRSEL		Abdülhamid II	U	Private collection
12.5	KAYSERİ			U	KMA 103
100	KAYSERİ	[1]297	Mehmed V	U	JH
400	KAYSERİ	[1]297		L~	KMA 241
100	KULA			U	Private collection
25	KÜTAHYA			U	JH
100	KÜTAHYA			U	JH
200	KÜTAHYA			U	Private collection
200gr	KÜTAHYA			U	JH
25	MALKARA			U	JH
100	MALKARA			U	JH
25	MERZİFON			U	JH
100	MERZİFON			U	KMA 245
200	MERZİFON			U	JH
25	MİDİLLİ	1319			JH
200	MİDİLLİ	1327	Mehmed V	U	JH
100	MİHALİÇ	---	---	U	KMA 023
50	NEVŞEHİR			U	Private collection
200	OSMANCIK			U	JH
50	OSMANIYE		Mustafa III	L	KMA 266
100	SANDIKLI	[1]312		U	Private collection
200	SANDIKLI			U	Private collection
100	SELÇUK			U	Private collection
100 g	SINDIRGI	1299	Abdülhamid II	V	JH
200 g	SINDIRGI	1299	Abdülhamid II	V	JH
25	SİVAS			U	KMA 251
66	SİVAS			U	JH
100	SİVAS			U	Private collection
200	SİVAS			U	Private collection
25	SİVRİ HİSAR			U	JH
50	TATAYİ (Daday)			U	Private collection
20	TOKAT			N	KMA 033
50	TOKAT			U	JH
50	ÜNYE			U	JH
25	YENİŞEHİR			L	Private collection
25	ZONGULDAK	[1]340	[19]29	L	Private collection

KÜTAHYA MUNICIPAL ASSAY STAMPS
KMA 253 (cat. 458)

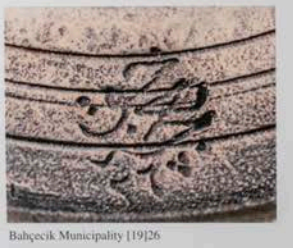
MUNICIPAL ASSAY STAMPS


Adana 1926


Akşehir [1]323


Ankara Municipality


Ayvalık Municipality


Bahçecik Municipality [19]26


Balıkesir


Burhaniye 1928


Bursa [12]98


Bolu [1]323


Edremid Municipality [1]318


Gemlik Municipality [1]333

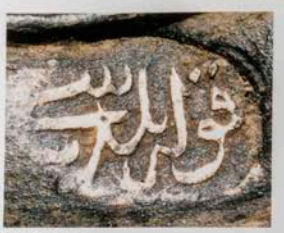

İzmid 7


Kayseri Municipality [1]297


Karamürsel 9 and tuğra of Abdülhamid II.


Karaman Municipality


Kütahya Damga-i Asli


Kula Municipality


Malkara 1310


Merzifon Municipality


Midilli Municipality


Mihaliç


Osmancık Municipality


Osmaniye


Sandıklı [1]312


Sivas Municipality

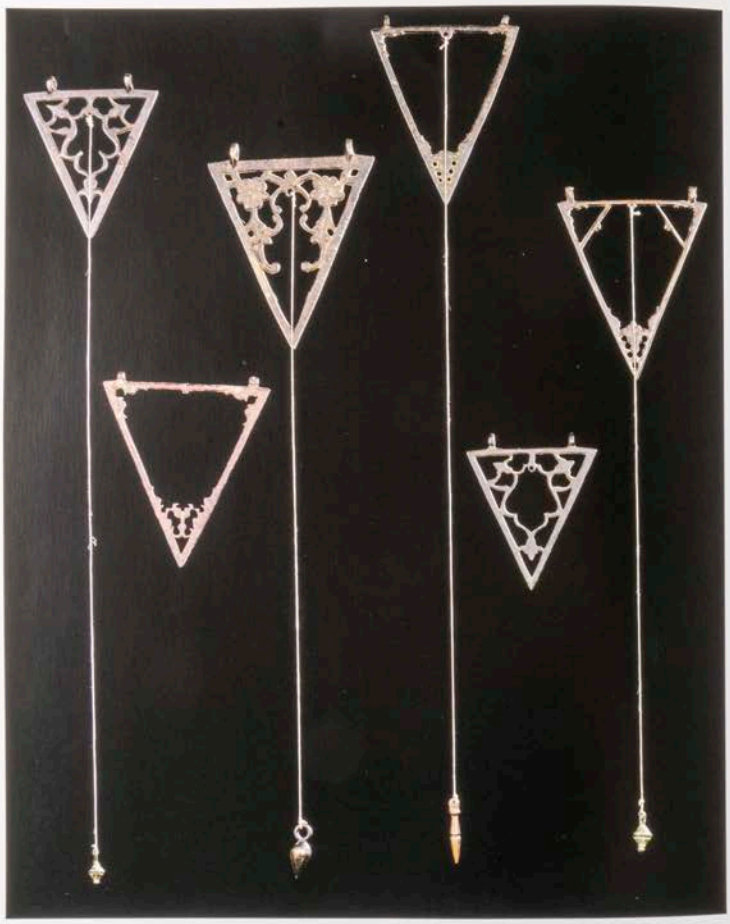

Bilecik Municipality


Sındırgı


Tokat Municipality


Ünye Municipality [19]41


Yenişehir [1]319



PLUMB LEVELS
Ottoman, 14th-19th century
Private collection

PLUMB WEIGHTS
Ottoman, 16th-19th century
KMA 613, 611, 614, 447,1296, 615, 612, 446, 449

THE MISKAL

The *miskal* was a unit of weight used by the Ottomans for the precise measurement of small quantities. Moneychangers 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 Çelebi's *Seyahatname*. A 16th century manual entitled *Risale-i Kenaniye* explains that gold and pearls were measured in *miskals* and *kırats* (carats), and even when gold was measured in *dirhems*, the result was always calculated in *miskals*.

It is difficult to determine the weight of the *miskal* and *dirhem* 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. Togan uses a slightly smaller value of 4.25 grams,[17] and this is confirmed by F. B. Pegolotti of Florence, who flourished in the 1330s.[18]

BOX FOR A BALANCE AND WEIGHTS
Iranian, 18th century
Lacquered decoration. Around the border are the symbols of the zodiac and their Persian names.
Private collection.

15 - Walter Hinz, "Islamda Ölçü Sistemleri", trans. Acar, Sevim, *Türklük Araştırmaları Dergisi*, 5, 1989, pp. 6-7.
16 - A. Markov, *Katalog dzelairidskich monet*, St. Petersburg, 1897, p. XXVII, IXXX.
17 - A.Z.V. Togan, "Moğollar devrinde Anadolu'nun iktisadi vaziyeti", *THTM*, vol. 1, Istanbul, 1931, p. 12.
18 - F.B. Pegolotti, *La pratica della mercature, Della decima e delle altre gravezze*, Bd III Lissabon/Lucca 1766, p. 12.

SET OF BALANCE AND WEIGHTS
Iranian, 18th century
Large box: 32x19.5x7.5 cm
Small box: 11.5x7.2x2.3 cm
Large beam l: 37.7 cm
Small beam l: 9.7 cm
Iron pointer (consisting of two sections), l: 523 mm
Private collection.

While the ratio between the Ottoman dirhem and *miskal* was 1.5, in Iran this 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 1.66 grams.

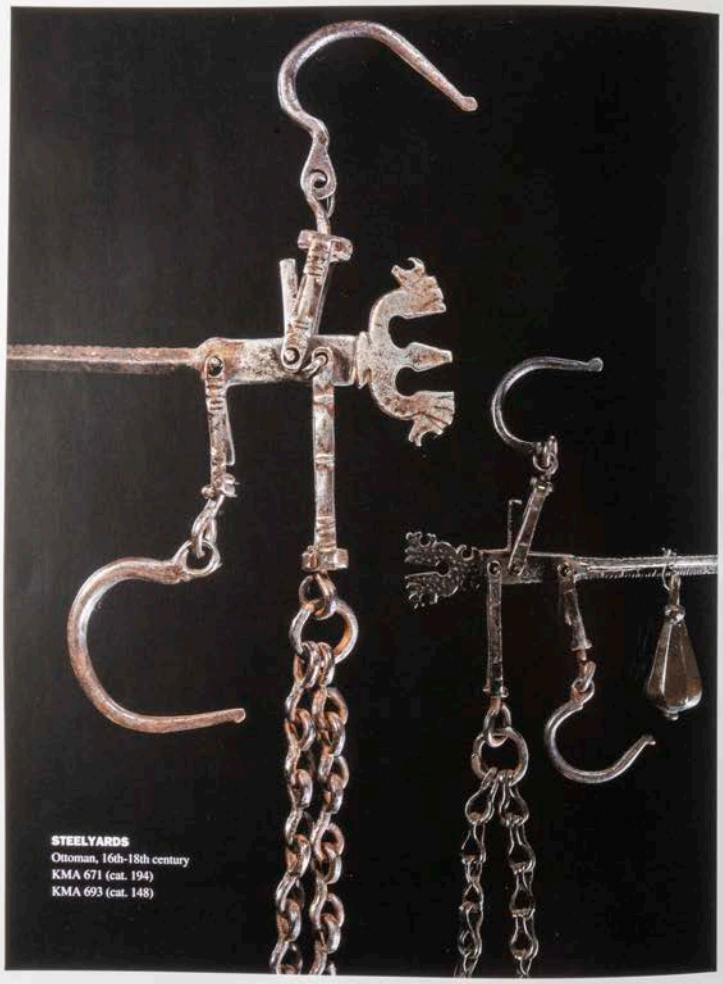
Weights in the balance set

1 Dirhem	3.50 grams
1 Miskal	4.62 grams
2 Miskals	9.21 grams
3 Miskals	13.82 grams
4 Miskals	18.46 grams
5 Miskals	22.94 grams
10 Miskals	45.93 grams
20 Miskals	91.92 grams
30 Miskals	137.79 grams
50 Miskals	231.00 grams
100 Miskals	461.00 grams

BALANCE PAN
Seljuk, 13th century
Copper, ø 16 cm
Private collection

The pan is stamped with a partially legible mark reading '... paşa' and 'Municipality [1]211'. On the underside is engraved inscriptions giving the name of the owner and the date: 'Property of Mustafa b. Ali [10]87.'

DETAIL OF OWNER'S INSCRIPTION
'Property of Mustafa b. Ali [10]87.'



STEELYARDS
Ottoman, 16th-18th century
KMA 671 (cat. 194)
KMA 693 (cat. 148)

THE NUGI

NUGI
Seljuk, 12th-13th century
660 g, 49.5x49.5 mm;
h: 72 mm
KMA 102 (cat. 111)
There is stippled decoration and crossed diagonal lines on the facets.

From the medieval period onwards Anatolian Christians and Muslims used a unit of weight called the *nugi*, which was equivalent to 200 *dirhems*. Walter Hinz says that the *nugi* as used in the southeast Anatolian city of Mardin in 1518 was equivalent either to 200 *dirhems*, in other words to 641.4 grams, or to 78 *dirhems*, or 250.1 grams. During the same period he says that the *nugi* of Çermik was again equivalent to 200 *dirhems* or 641.4 grams. This shows how the same name can refer to different units of weight in different places."[19]

From the provisions in some provincial law codes, we learn that the *nugi* was a unit of weight used in various parts of the Ottoman Empire during the reign of Sultan Selim I, particularly in the eastern provinces. Local practices in this eastern region can often be traced back to earlier civilisations. For example, the law code for the district of Bayburt dating from H 937 (1530) is significant in showing that units of weight used by the Akkoyunlu Turkish state (1308-1508) continued to be used by the Ottomans without any modification:

'And in the aforementioned district, the *batman* [a unit of weight] in general use is

19 - Walter Hinz, "İslam'da Ölçü Sistemleri".

equivalent to 12 *nugis*, and the *nugi* to 200 *dirhems*, so that one batman is equivalent to 2400 *dirhems*, and from ancient times to the present day the local people have made their weights accordingly, so let them be made as described, not one *dirhem* more or less.'[20]

The law code for the province of Georgia also states that the *nugi* used in the region was equivalent to 200 *dirhems*, and that one *batman* was equivalent to 12 *nugis*.[21] In the law code for the subprovince of Eastern Karahisar dated H 977 (1569) it states that the Tokat *nugi* is used in the region, and that this unit of weight is identical to the Georgian *nugi*. With respect to the *nugi*, this code explains: 'And pasturing dues are 2 akçes per household, or a Tokat *nugi*, which is 200 *dirhems*, and one *nugi* of butter has always been accepted, and let this limit not be exceeded.'[22]

A code for the province of Zülkadriyye says, 'And if anyone's nugi should weigh below standard, let one akçe be fined for each *dirhem* of that sold and let the punishment required by canonical law also be imposed.'[23]

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 debased 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 '44, half French', '50, half Ottoman' and '55, half English, and the full values as '88, full French', '100, full Ottoman', and '110, full English'. Balances of this type vary slightly according to the period when they were made.

THREE BEAM MONEYCHANGERS POCKET BALANCE
Ottoman, 17th-19th century
74x41 mm
KMA 722 (cat. 162)

20 - Ahmet Akgündüz, *Osmanlı Kanunnameleri ve Hukuki Tahlilleri*, , vol. V, İstanbul 1992, p. 515.
21 - Akgündüz, *Osmanlı Kanunnameleri*, vol . VII, p. 581.
22 - Akgündüz, *Osmanlı Kanunnameleri*, vol. VII, p. 570.
23 - Akgündüz, *Osmanlı Kanunnameleri*, vol. VII, p. 158.

MONEYCHANGERS' POCKET BALANCES
Ottoman, 19th-20th century
Wood and bone
KMA 727, 713, 732, 716, 728, 714, 726, 715, 729

MONEYCHANGERS' POCKET BALANCES
Seljuk, 11th-12th century
KAM 711, 725, 712, 724
(cat. 82, 81, 83, 80)

MONEYCHANGER'S POCKET BALANCE
Ottoman, 19th century
l: 109 mm
KMA 715 (cat. 402)

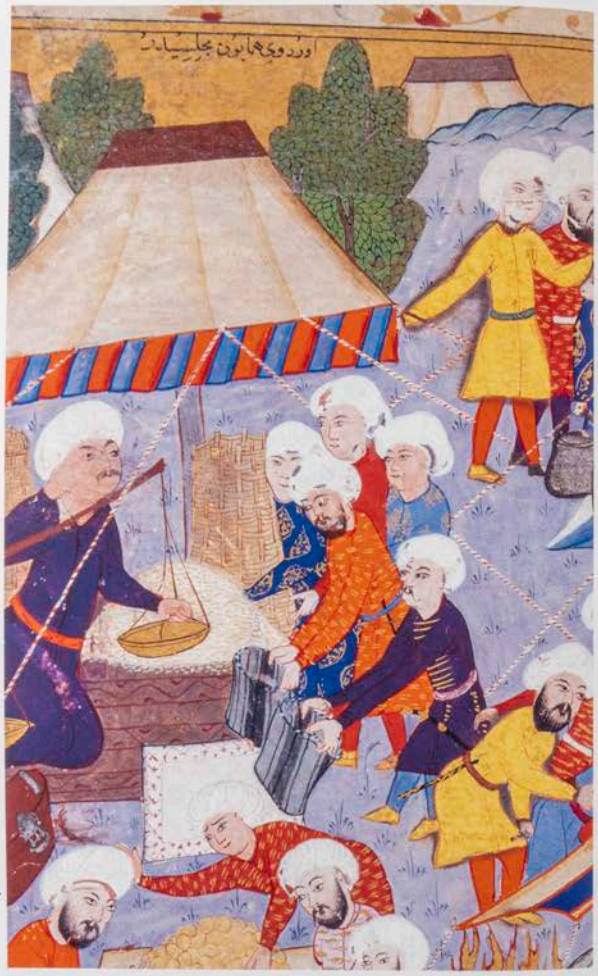
Units of weight used in and around Istanbul in the 18th-20th centuries

1 Çeki	4 Kantar=195 Okka	250 kg
1 Kantar	44 Okka or Kıyye	56.4496 kg
1 Batman	6 Okka	7.69767 kg
1 Okka	400 Dirhem	1.282945 kg
1 Lodra	176 Dirhem	564.4959 g
1 Dirhem	4 Dang = 16 Kırat	3.207363 g
1 Dang	4 Kırat	0.801840 g
1 Kırat	4 Şa'ir	0.20046 g
1 Miskal	24 Kırat=96 Şa'ir=6 Dang	6000 barley grains
1 Miskal	1,5 Dirhem	4.81104 g
1 Rıtl	876 Dirhem	2.809 kg

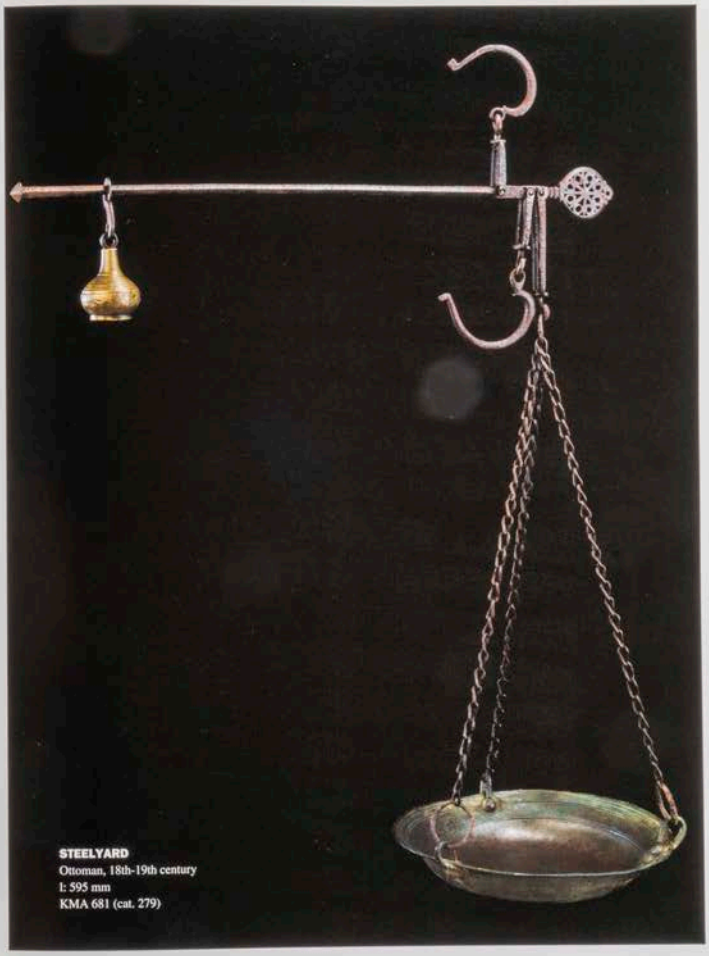
UNITS OF WEIGHT AND THEIR METRIC EQUIVALENTS

SET OF GRAM WEIGHTS
Dated H 1299 (1882)
KMA 390 (cat. 381)

The metric system was introduced under a law passed in H 1286 (1869), and this set of weights was produced in Istanbul at the imperial foundry of Tophane. The set is incomplete, missing the 20 gram weight.



ARMY MARKET AT AN ENCAMPMENT DURING A MILITARY CAMPAIGN
Miniature from the *Nusretname*, 1584
TSM, H. 1365, fol. 93r.



STEELYARD
Ottoman, 18th-19th century
l: 595 mm
KMA 681 (cat. 279)

UNITS OF LENGTH

ARŞIN

The word *arşın* comes from the Persian *erş*, meaning cubit, the length from the elbow to the tip of the middle finger. Three types of *arşın* were used by the Ottomans, the mimari arşın (architect's *arşın*), the *çarşı arşın* (market *arşın*) and the *endaze*. Although the *arşın* was used throughout the Ottoman Empire, like units of weight it varied from region to region. Even the Istanbul *arşın*, which was recognised as the standard, has been found to vary over time. The Istanbul *arşın* originally measured 67.3 cm, but in the 19th century has been found to measure 68.579 cm.[24]

ARCHITECT'S ARŞIN

Arşın measuring rods were made of boxwood, ebony, ivory, iron or steel. Those used for measuring land or buildings under construction were known as the builder's *arşın* or the architect's *arşın*. In connection with the measurement of buildings, gardens or fields, the term *arşın* always referred to the architect's *arşın*. Around the 16th century the architect's *arşın* is thought to have been 75.8 cm, which exceeds both the market *arşın* and the *endaze*. However, on the basis of documents concerning the construction of Süleymaniye Mosque, Ömer Lütfi Barkan calculates the 16th century architect's *arşın* at 73.3333 cm.

Attempts were made to standardise units of measurement for both weight and length and Sultan Selim III (1789-1807) had an architect's *arşın* measuring rod made from ebony to serve as the standard. This measuring rod was kept at the Imperial Artillery College. It was marked on one side in 24 *parmak*, each divided into 12 *hat*, and on the other divided into twenty equal parts, each subdivided into 10 *hat*, which in turn were divided into 10 *nokta*.

ARŞIN MEASURING RODS
Above: The date H 1252 is stamped on the body, and at either end is the tuğra of Mahmud II.
l: 679.5 mm
KMA 706 (cat. 294)

Below: On the unbroken terminal is the maker's mark, 'Hadd-ı Artin'.
l: 663 mm
KMA 701 (cat. 492)

DETAILS OF THE MARKS
Left: Tuğra of Sultan Mahmud II
KMA 706 (cat. 294)

Right: Maker's mark reading 'Hadd-ı Artin.'
KMA 701 (cat. 492)

24 - Mehmet Erkal, "Arşın", *DİA*, vol. III, p. 412.

In other words:
1 architect's *arşın*= 24 *parmak* = 288 *hat* = 3456 *nokta*.
Metric equivalents:
1 architect's *arşın*= 75.8 cm
1 *parmak* = 3.158 cm
1 *hat* = 0.263 cm
1 *nokta* = 0.0219 cm

An architect's *arşın* rule made of iron during the reign of Sultan Selim III is today in the collections of Topkapı Palace Museum (TSM 27/88). This rule is dated H 1215 (1800) and is stamped with two names, 'Master Süleyman', whom we assume to have owned it, and 'Hasan Bey', who is thought to be the maker. The rule has 16 knops and is 62.3 cm long. The same museum also has a 37.9 cm long half- *arşın* rule made of ebony with 12 knops (TSM 2/3313), and a 73.5 cm long architect's *arşın* rule made of ebony with 24 knops (TSM 27/67).

For excavation purposes, another unit of length called the *kadem* was used.
1 *kadem* = 1/2 architect's *arşın*= 12 *parmak*

The *kulaç* (fathom) was used for excavations, boring wells, and measuring the depth of water. One *kulaç* was equivalent to 2.5 architect's *arşın*.

Other units of length were as follows:
1 mil (mile) = 100 *kulaç* = 2500 architect's *arşın*
1 *fersah* (league) = 3 *mil* = 7500 architect's *arşın*
1 *berit* or *menzil* = 4 *fersah*
1 *merhale* = 2 *berit*
1 *metre* = 1.3192661 architect's *arşın* or 1 architect's *arşın*+ 7 *parmak* + 7 *hat* + 11 *nokta*.

GEZ
A measuring rope with two seals stamped with a tuğra at either end, used for measuring land.
KMA 625 (cat. 122)

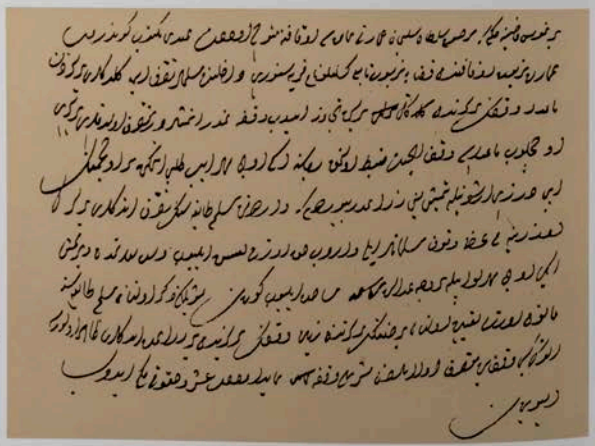
In the 19th century we learn from various archive documents that examples of standard units of length were sent to provincial towns and cities for the purpose of checking those in use locally, as was the case for weights. A letter dated 26 Safer 1276 addressed to the *kaymakam* or head district official of Teke reports that two stamped *arşın* measures required for checking those used locally had been manufactured at the Imperial Mint at a cost of 40 kuruş and sent to Teke:

> Mâliye Nezâret-i Celîlesine ve Hazîne-i Hâssa Nezâret-i Celîlesine ve Teke Kaymakamına
> Meclisde bulunmak ve lüzûmu hînde esnâfın yedlerinde bulunan arşınlar ayar ve mu'âyene olunmak üzere (1) Teke meclisinden bâ-mazbata vâki' olan iş'âr üzerine Darbhâne-i mire'de i'mâl ettirilen iki aded damgalı arşının masârif-i i'mâliyesi (5) olduğu Hazîne-i Hâssa Nâzırı devletli paşa hazretleri tarafından beyân olunan kırk kuruşun Hazîne-i Celîle'den tesviye ve i'tâsı husûsuna himmet buyurula deyü.
> (1) Ka'imakam-ı mûmâ-ileyhe iki aded damgalı arşının lüzûmu tevârüd eden mazbata me'âlinden münfehim olmuş ve ol vecihle Darbhâne-i mire'de i'mâl ettirilen iki aded damgalı arşın bu kere tarafımıza gönderilmiş olduğu beyânıyla şukka.
> (5) Hazîne-i Hâssa'ya olan kırk kuruşun Hazîne-i Celîle-i Mâliye'den tesviyesi husûsu vâki' olan iş'âr-ı vâlâları vecihle Mâliye Nâzırı devletli paşa hazretlerine havâle ve iş'âr kılınmış olduğu beyânıyla tezkire.

DOCUMENT CONCERNING A STAMPED ARŞIN MEASURE SENT BY THE AUTHORITIES IN ISTANBUL
BOA, A.MKT.MHM 166/22.26. S.1276 [24.09.1859]

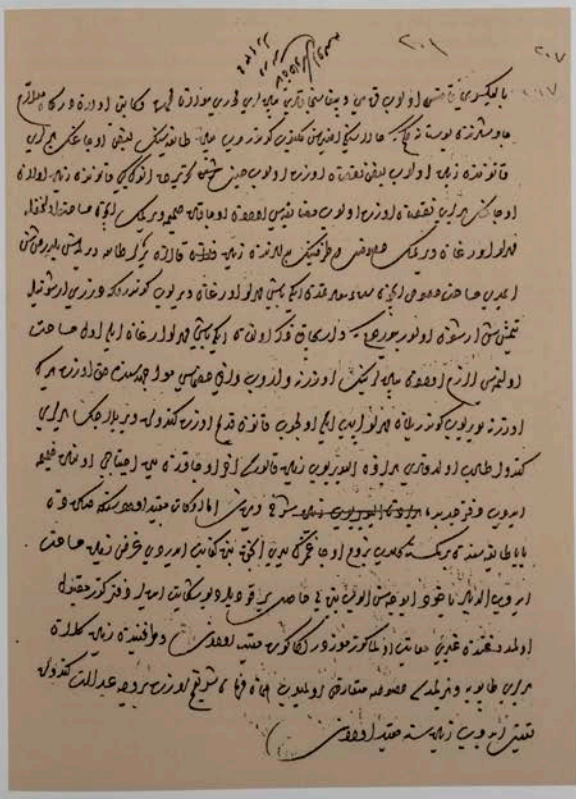
From various sources we learn that measurement of land was carried out by means of measuring ropes known as *gez*, both ends of which bore seals. When local people encroached on land belonging to the pious endowment of Sultan Süleyman Imaret in the town of Bergos, the board of trustees complained to the Council of State, which sent an *arşın* measuring tape and a rope measuring 75 *zira* (*arşın*) sealed at both ends, ordering the kadı of Bergos to measure the endowment land and resolve the dispute (BOA, Mühimme defteri, no. 22, p. 207).

A measuring rope of identical length was used for resolving a dispute over lands held by an infantry division in Balıkesir. When it was discovered that the lands did not accord with the



DOCUMENT CONCERNING A MEASURING ROPE SEALED AT EITHER END SENT TO THE KADI OF BERGOS FOR MEASURING LAND
BOA, Mühimme defteri, no. 22, p. 207.

legal boundaries, some overstepping them and others falling short, a measuring rope of one *terzi arşın* (tailor's *arşın*, used for textiles) and a rope measuring 75 *zira* (*arşın*) sealed at both ends were sent. The *kadı* of Balıkesir, Mevlânâ Mehmed, and land registry clerk, Bostan, were asked to measure the lands, and by adding those 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 (BOA, Mühimme defteri, no. 34, p. 185, h. 386).



DOCUMENT CONCERNING A SEALED ROPE SENT FROM ISTANBUL TO BALIKESIR FOR MEASURING LANDS HELD BY THE INFANTRY DIVISION
BOA, Mühimme defteri, no. 34, p. 185, h. 386.

That the farm estates which were the basis of the Ottoman land system were also measured using sealed ropes is evident from an order written to the superintendent and clerk who carried out the land survey in the subprovince of Bolu. According to this border, the land was divided into three categories based on the quality of the soil, and it was ruled that a farm estate should consist of 80 *dönüm* (approximately 1000 m²) of top-quality land, 100 *dönüm* of average quality land, and 130 or 150 *dönüm* of poor quality land (BOA, Mühimme defteri, no. 7, order 1279). When measuring vineyards, two different types of *arşın* were employed, using a sealed rope of either 55 terzi *arşın* or 45 *benna arşın*, as we see from two different orders written to the *kadı* of Bolu responsible for the land survey (BOA, Mühimme defteri, no 7 order 1796).

The same means of measuring land continued into the 19th century, except that chains replaced ropes. According to a memorandum dated 12 Rebiyülevvel H 1277, a chain stamped at both ends required for measuring land in the subprovince of Kütahya was supplied by the Land Registry.(A. MKT.MHM No:196/80)

DOCUMENT CONCERNING THE DELIVERY OF A SEALED MEASURING ROPE
BOA, Mühimme Defterleri, no. 7, h. 1628.

The document concerns the delivery of a sealed measuring rope requested for the measurement of military land and land disputed by fief holders in places where a land survey has been commanded.

Yazıldı.

Mesîh Çavuş'a virildi. Fî 3 Muharrem, sene: 976 [28.06.1568]

Burusa sancağı beğine hüküm ki:
Hâliyâ mektûb gönderüp; "tahrîri fermân olunan yirlerde yaya vü müsellem tâyifesinün mutasarrıf oldukları yaya vü müsellemlik yirleri ile erbâb-ı tîmârun tîmârları toprağında nizâ'ları mesâha olunmağıçün memhûr ip virilmesi lâzim idüğin" bildürmişsin. İmdi; Südde-i Sa'âdetüm'den iki başı mühürlü urgan virilüp irsâl olundı. Buyurdum ki:
Varıcak, bu husûsda nizâ'ların olup mesâha olunması lâzim olan yirleri gönderilen memhûr ip ile hakk üzre mesâhat idüp eger yaya vü müsellem ve eger sipâhî yirleridür; tem[y]îz ü ta'yîn eyleyüp kimesneye hılâf-ı şer' u kânûn dahl ü ta'arruz itdürmeyüp tarafeynün ahvâlin ber-vech-i adâlet fasleyleyesin.

DOCUMENT CONCERNING THE MEASUREMENT WITH A SEALED ROPE OF FARM ESTATES HELD IN BOLU
BOA, Mühimme Defterleri, no. 7, h. 1279.

The document concerns the measurement of farm estates held in Bolu with the sealed rope that has been sent, so that one farm estate should consist of 80 *dönüm* of good land, 100 *dönüm* of average land, and 130 or 150 *dönüm* of poor land, and so set down in the register.

Yazıldı.

Bolı sancağın mücedde[de]n tahrîr eyleyen emîn ve kâtibe hüküm ki:
Dergâh-ı Mu'allâm'a âdemi gönderüp; "livâ-i mezbûrda müceddeden tahrîr olunan yirlerde ba'zı çiftlik tasarruf idenlerün çiftlikleri ziyâde olup ölçilüp kanûn üzre çiftlikleri ta'yîn olması bâbında mühürlü urgan [virilmesin" bildürdüğün ecilden] ihrâc olup âdemüne teslîm olunup irsâl olundı. Buyurdum ki:
Livâ-i mezbûrda müceddeden tahrîr olunan yirlerde amın gibi ziyâde çiftlik tasarruf eyleyüp mühürlü urgan ile mesâhat olunup kanûn-ı kadîm muktezâsınca a'lâ yirden seksen dönüm ve evsat yirden yüz dönüm ve ednâ yirlerden yüz otuz ve yüz elli dönüm birer çiftlikdür; ana göre ta'yîn idüp defter-i cedîd-i hâkânîye kaydı-desiz. Ammâ; bu bahâne ile kimesneye hımâyet olunmayup zulm ü hayf olmakdan hazer idesiz.

CONCERNING A SEALED ROPE SENT FOR MEASURING VINEYARDS WITH DISPUTED BOUNDARIES IN RUSE
BOA, Mühimme Defterleri, no. 7, h. 1796.

The document concerns the dispatch of a sealed rope requested for measuring the disputed vineyards on the lands of Vezir Pertev in Ruse; measurement of the vineyards with this rope and the granting of rights as due to Pertev Paşa; and a warning that no one be allowed to violate the law.

Yazıldı.

Ulaşdurmak içün İdrîs Çavuş'a virildi.

Fî 29 M. sene: 976 [24.07.1568]

Ruscuk kâdîsına hüküm ki:
Düstûr-ı mükerrem Vezîrüm Pertev Paşa edâma'llâhü te'âlâ iclâlehûnun taht-ı kazânuzda vâkı' olan hâslarında ba'zı müslimân bâğları olup ölçmeğe muhtâc idüği mümâ-ileyh tarafından i'lâm olunup mühürlü urgan taleb olundı. İmdi; bâğ ölçmesi-nün ipi derzî arşınıyla elli beş ağaçdur –ki, bennâ arşınıyla kırk beş ağaç olur–; ana göre mühürlü ip virilüp buyurdum ki:
demi vardukda, ehl-i vukûf u mu'temedün-aleyh bî-garaz müslimânlarıla bi'z-zât mahall-i nizâ'um üzerine varup husumâ muvâcehesinde onat vechile hakk üzre tef[t]îş idüp nizâ' olunan kimesnelerün bâğların gönderilen ip ile ölçüp her kimesnenün bâğının dönümi ne mikdâr ise ma'lûm idinüp dahı şer' u kânûn u defter mûcebince müşârun-ileyhe âyid ü râci' olan hak ne ise alıvirüp hılâf-ı şer' u kânûn u defter kimesneye iş itdürmeyesin.

CONCERNING A ROPE SENT FOR MEASURING VINEYARDS
BOA, Mühimme Defterleri, no. 7, h. 2028.

The document concerns the dispatch of a sealed rope for measuring vineyards in the subprovince of Bolu during a land survey; exhorting that the measurements be taken carefully so that no one would later complain.

Yazıldı.

Bolı sancağın tahrîr iden kâdîsına hüküm ki:
Vilâyet-i mezbûre bâğları mesâha olunmağa muhtâc olduğın arzolunup ol bâbda dönüm ipi taleb olunmağın iki başı mühürlü ip irsâl olundı ki, bennâ arşını ile kırk beş arşın, derzî arşını ile elli beş arşındur. Buyurdum ki:
Vardukda, defterde resm-i dönüm kaydolunup mesâhati lâzim olan bâğlarun üzerine bi'z-zât varup tûlen ve arzan dikkat ü ihtimâmla ma'lûmun olduğı üzre sâhibleri muvâcehesinde mesâhat idüp her kişinün bâğı ne mikdâr dönüm olduğı zâhir olursa hakîkati ile ma'lûm idinüp dahı ana göre deftere kaydidesin. Ammâ; hîn-i mesâhatde kimesneye meyl ü muhâbâ itmeyüp hakîkati üzre yazasın. Şöyle ki; sonra gelüp; "Benüm bâğum az idi; ziyâde yazdılar." diyü şikâyet ideler, mu'âteb olursın.

From another document dated H 1277 (1861) we learn that chains stamped at either end were sometimes used instead of ropes for the measurement of land.

CONCERNING THE USE OF A MEASURING CHAIN STAMPED AT BOTH ENDS
BOA, A.MKT.MHM 196/80, 12 Ra 1277 [28.09.1860]

Kütahya sancağında mesahe-i arazi için iki başı tamgalı talib olunan bir adet zincirin irfası hakkında Defter Emaret-i behiyyesi tarafından mevcûd tezkire üzerine Ticaret Nezâret-i celîlesiyle muhâbereyi şâmil olan tezkire-i senâvesî manzûr-ı vâlâları buyurulmak üzere leffen irsâl kılınmış olunmağla tezkire-i mezran iktizâsının icrâsı husûsuna himmet buyurmaları siyâkında tezkire.

ÇARŞI ARŞIN

The *çarşı arşın* or *market arşın* was, as the name implies, used in shops and markets for retail goods, such as fabrics and carpets. This unit of measurement was based on an average arm'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 *arşın* measuring rods were made, like architect's *arşın* rods, of boxwood, iron or steel. One market *arşın* was divided into eight equal parts, each referred to as a *rubu* or *urup*, and these in turn were divided into two parts known as *girah*. These fractional units arose from the need for more precise measurements.

1 market *arşın* = 8 *rubu* = 16 *girah*
1 market *arşın* = 68 cm
1 metre = 1.470588 market *arşın*, that is 1 market *arşın* + 3 *rubu* + 1.5 *girah*.

As a precaution against fraudulence, the Ottoman authorities inspected the *arşın* measures 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 Cemaziyelevvel H 985 (25 July 1577) concerns a fraud perpetrated by the *yayabaşı* (infantry captain) of Salonica, when purchasing broadcloth from Jewish traders in the city for the annual needs of the janissaries. By measuring the broadcloth with a measure that was longer than the legal standard, he defrauded the traders of their rightful due. An order was sent to the *kadı* of Salonica commanding him to measure the broadcloth with a stamped *arşın* rod (Mühimme Defteri, no. 31, p. 193, h. 494).

CONCERNING THE STAMPING OF MEASURING RODS IN PHILIPOPOLIS
BOA, Mühimme Defterleri, no. 12, h. 460.

A document written to the kadı of Philipopolis commanding that the lengths of coarse woollen cloth produced in Philipopolis conform with the measurements of ancient custom, and that the measuring rods used be inspected and stamped.

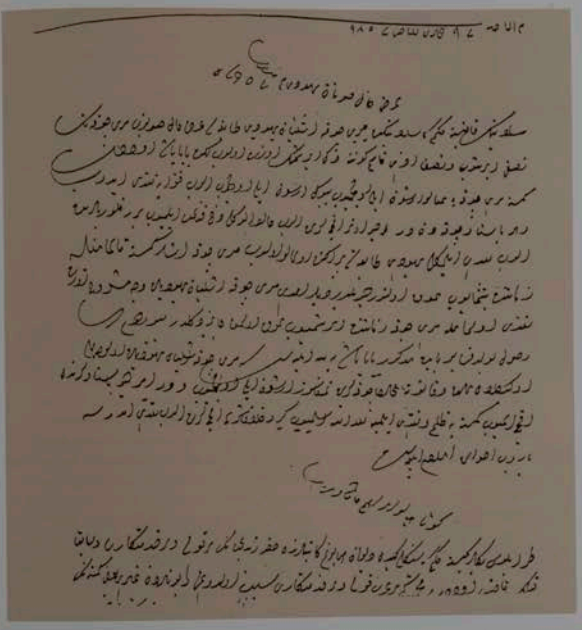
Filibe kâdîsına hüküm ki:

Dergâh-ı Mu'allâm çavuşlarından olup Filibe Nâzırı olan; "ahâlı tâ'ifesinün âdet-i kadîme üzre abâları on ikişer zirâ' gelüp hâlâ sekiz ve tokuz zirâ' gelür ve zirâ'ları" ve ma'mûl olunan dirhemleri tamgasız olup tamga lâzım olduğın" bildürmeğin buyurdum ki:Vusûl buldukda göresin; arzolundığı gibi olup âdet-i kadîme[ye] muhâlif abâları eksük olup ve zirâ' u dirhemleri tamgasız ise kadîmden kaç zirâ' idegelmişler ise abâların ol mikdâr işledüp ve zirâ' u dirhemlerin dahı kânûn-ı kadîme üzre tamgaladasın.

CONCERNING THE USE OF STAMPED WEIGHTS BY TRADESMEN IN SAMSUN
BOA, A.MKT. MVL 100-94.

Canik Mutasarrıfına

Samsun Kasabası iskele ve ticâret mahalli bulunması dolayısıyla vapurlarla gelen ve Anadolu'dan gelip Samsun'da kalan ve durumu bilinmeyen adamlar kefilsiz istedikleri işi yapmakta ve halkı zarara uğratmakta olduklarından ve esnâfın kullandıkları terazilerinde ise damgalı dirhem olmayıp insâfına göre tahmîni taşlar kullanıldığından orada da Dersaadet usûlünce esnâfa birer tezkire verilerek inzibâtın sağlanması Hazîne-i Celîleye dahi menfaat temin edeceğinden şimdilik beş-altı bin adet yeni tezkirenin gönderilmesi mazbata ile bildirilmiş ve Dersaadet ve bilâd-ı selâsede (Eyüp, Galata ve Üsküdar'da) bulunan bütün esnâfa her sene Mart başında yeniden ve bir dükkândan diğer dükkana naklinde değiştirilerek muhtelif fiyatlar ile ve Şehremâneti kontrolünde matbû' tezkire



CONCERNING BROADCLOTH PURCHASED IN SALONICA FOR JANISSARY SOLDIERS
BOA, Mühimme defteri, no. 31, p. 193, h. 494.

verilmesi nizâm gereği olup bu faydalı usulün taşrada da yaygınlaştırılması her tarafta gerekli olan nizam ve inzibatı sağlayacağı aşikâr olduğundan ve bundan elde edilecek büyük gelir şehir ve kasabaların bakım ve temizlik işlerine ve kaldırım ve köprü ta'mîri gibi ıslah çalışmalarına karşılık tutulmak üzere inhada gereğince talep olunan altı bin adet matbû' tezkirenin usûlüne uygun olarak zât-ı sa'âdetlerine zimmet kaydedilerek gönderilmesi ve bu hususta alınacak tezkire ücretlerinin ayrıca defteriyle ve mazbata ile Hazîne-i Celîleye gönderilmesi hususunda savb-ı sa'âdetlerine bildirilmesi ve bu uygulamanın diğer mahâllerde de icrâ edilmesi için durumun her tarafa bildirilmesi Meclis-i Muhâsebe-i Mâliye ve Meclis-i Vâlâ'da kararlaştırılarak padişah iradesi de o şekilde çıkıp durumi lâzım gelenlere bildirilmiş ve istenilen tezkirelerin gönderilmesi hususu da Mâliye Nezâreti'ne bildirilmiş ve bu tezkireler üç derece kabul edilerek birincisinden on ve ikincisinden yedi buçuk ve üçüncüsünden beş kuruş tezkire harcı alınması münâsib görülerek bu hususta lâzım olan görüş ve ihtârları takdîre şayan olduğundan bu şekilde gereğinin en iyi şekilde yapılmasıyla zikr olunan defterin ayrıca mazbata ile gönderilmesine dair şakka.

Vali ve mutasarrıflarla ve diğer icap edenlere Dersa'âdet'de olduğu gibi taşrada da bütün esnâfa nizâmı üzere her sene Martın girişiyle yeniden ve bir dükkândan diğer dükkâna naklinde değiştirilerek çeşitli fiyatlar ile matbû' tezkireler verilmesi gerekli zâbıta kaidesini kuvvetlendireceği

aşikâr olduğundan, bundan elde edilecek gelir şehir ve kasabaların bakım ve temizlik işlerine ve kaldırım ve köprü ta'mîri gibi ıslah çalışmalarına karşılık tutulmak ve bu hususta alınacak tezkire ücretlerinin ayrıca defteriyle ve mazbata ile Hazîne-i Celîleye gönderilmek üzere ne mikdâr mathû' tezkire gönderilmesi lâzım geleceğinin bütün memurlardan sorulması Meclis-i Muhâsebe-i Mâliye ve Meclis-i Vâlâ'da kararlaştırılıp onaylanarak padişah iradesi de o şekilde çıkıp durum lâzım gelenlere bildirilmek ve bunlar üç derece kabul edilerek birincisinden on ve ikincisinden yedi buçuk ve üçüncüsünden beş kuruş tezkire harcı alınması kararlaştırılmış ve irâde gereğince adı geçen usûlün orada da icrâsı ve ne kadar tezkire gönderilmesi gerekeceğinin acilen bildirilmesi için şukka yazılıp gönderildi.
27 Muharrem sene [12]75.

CONCERNING THE CASTING OF WEIGHTS AT ODUN KAPISI IN ISTANBUL
BOA, A.MKT. MVL 121-35.

Şehremâneti Behiyyesiyle Altıncı Daire Müdürüne

Dökme dirhem i'mâli eskiden beri Odunkapısı içindeki dökmecilere ait olduğu hâlde Aram isimli kimse Galata'da bulunan dükkânında dirhem i'mâl ettiğinden yasaklanması için dökmeci esnâfı tarafından dilekçe verilmiş ve adı geçen Aram'ın imal edip Altıncı Dâ'ireye damgalattırmış olduğu birkaç adet noksan dirhemler de dökmeci esnâfı tarafından gösterilmiş olduğundan gereğinin yapılması için, gönderilen bir tezkire ile izin istenilmiş, eğer adı geçen Aram'ın ticâret serbestisi kâ'idesince dükkânının kapattırılması ve diğer esnâfın da bu ticâretden men'i mümkün olamaz ise de dökümcü esnâfının eskiden beri yaptıkları dirhemlere umûmen tamga memuru tarafından damga vurulması usûl gereği olduğu hâlde Altıncı Dâ'ire tarafından dirhemlerin eksik ve fazlasına bakılmayarak damga vurulması kâ'ideye aykırı olduğu gibi halkın zarar görmesine sebep olacağına ve bu tür eşyaya damga vurulmasındaki asıl maksat hasârdan koruma [düşüncesi]olduğu için vurulan damga dahi hükûmetçe bir tasdîk işareti olmasıyla her kim olursa olsun i'mâl edeceği dirhem ve terazi fesadlı veya eksik ve fazla olursa kabul olunmayıp ve damga vurulmayıp red olundukdan sonra damgasız dirhem satan olur ise bunlar hakkında dahi belediye nizamı ve devletçe i'lân edilen kâ'ideye uymamasından dolayı kanuni işlem yapılması gerekeceğinden bundan böyle Altıncı Dâ'ire tarafından dirhemlere damga vurulmayıp her kim dirhem i'mâl eder ise etsin Şehremaneti'nde bu işle görevli me'mûr tarafından her türlü fesâddan uzak olduğu tebanlaşıldıktan sonra damga vurulması gerekeceği Meclis-i Vâlâ'dan mazbata ile ifâde olunmuş ve durum Altıncı Dâ'ire müdürüne de bildirilmiş ve gereğinin yapılması için Şehremaneti ile Altıncı Dâ'ire müdürüne tezkire yazılmış 2 Rebiulâhir sene [1]277.

CONCERNING THE STANDARDISATION OF WEIGHTS AND MEASURES USED BY TRADESMEN
BOA, A.MKT. MHM 159-9.

Hazîne-i Hâssa Nezâret-i Celîlesine ve Şehremâneti behiyyesine

Altıncı dâ'ire-i belediyede esnâfın kullandıkları çeşitli yerli ve yabancı ağırlıkların bundan sonra kullanılması yasaklanıp Altıncı dâ'ire-i belediyeye verilen nizâmnâme gereğince Osmanlı devletinde kullanılan ve geçerli olan ağırlık ve dirhemler kullandırılacağından bunların kontrol edilip düzeltilmesiyle damga usûlünün işbu yetmiş beş senesinden i'tibâren uygulanması ve bunun için alınacak harc ve resmin mikdarını bildiren ta'rifenin Şehremaneti tarafından gönderilmesi ve vurulacak damgaların Darbhâne-i Âmire'de i'mâl ettirilmesi gerekeceği Altıncı dâ'ire müdürü tarafından ifâde olunmuş olduğundan ve usûlü gereğince yapılması hususunda gayret gösterilmesi ve gelen ta'rifenin yazdırılarak gönderilmesi için tezkire.

THE ENDAZE

ENDAZE RODS
Ottoman, 18th-19th century
l: 513 mm
KMA 698 (cat. 292)

Endaze 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 three *endaze* rods in Topkapı Palace Museum, one made of ebony, with knops, and measuring 64.6 cm (TSM 27/100), one of ivory measuring 64.4 cm (TSM 27/116), and another of inlaid ivory measuring 64.5 cm (TSM 27/77).

Like the market arşın, the *endaze* was divided into eight equal parts known as *rubu*, which were divided in turn into two parts known as *girah*. While the market *arşın* was equivalent to 68 cm, the *endaze* measured 65 cm. The similarity between the two units of length led to constant confusion.

1 *endaze*= 8 *rubu*= 16 *girah*
1 *endaze*= 65 cm
1 *rubu*= 8.125 cm
1 *girah*= 4.06 cm
1 metre = 1.538462 *endaze*, or 1 *endaze*+ 4 *rubu*+ 0.6 *girah*.

STRAW DEALERS
Detail from a miniature in *Surname-i Hümayun*
TSM, H 1344, fol. 355r.

UNITS OF VOLUME

One of the units of volume used as a grain measure by the Ottomans was the *kile*. Other grain measures were the *şinik* and *kutu*. As in the case of other measures, the *kile* varied according to place and time, and even according to the type of grain. The Istanbul *kile*, which was equal to 4 *şinik*, and 1 *şinik* to 2 *kutu*, was the most commonly used unit of volume for grain. Measuring containers for the *kile* and its fractions were cylindrical, and their diameters were equal to their height.

	Diameter and height	*Volume*
Kile	361 mm	37 dm^3
1/2 Kile/2 Şinik	286 mm	18.5 dm^3
Şinik	227 mm	9.25 dm^3
2 Kutu	180 mm	4.625 dm^3
Kutu	143 mm	2.3125 dm^3

1/2 KILE MEASURE
Ottoman, 19th century
ø 335 mm
h: 260 mm
KMA 1327 (cat. 513)

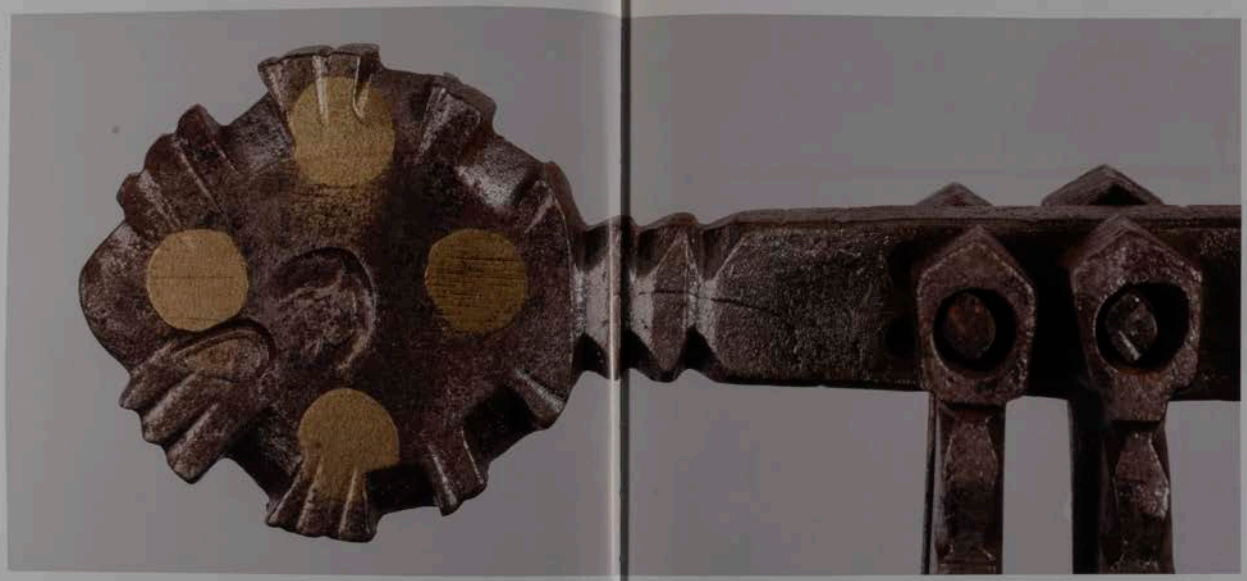
KUTU MEASURE
Ottoman, 19th century
ø 125 mm
h: 175 mm
KMA 1335 (cat. 506)

1/2 KILE MEASURE
Ottoman, 19th century
ø 340 mm
h: 225 mm
KMA 1331 (cat. 509)

1/2 KILE MEASURE
Ottoman, 19th-20th century
ø 325 mm
h: 295 mm
KMA 1328 (cat. 512)

1/2 MEASURE (1/2 LITRE)
Ottoman, dated H 1299
Produced at the Tophane imperial foundry.
ø 90 mm
h: 94 mm
KMA 604 (cat. 391)

WEIGHTS AND MEASURES, INSPECTORS, ASSAYING, STAMP TAXES AND DOCUMENTS



DETAIL OF A STEELYARD
Stamped with the tuğra of Abdülhamid II
Ottoman, 18th century
KMA 662 (cat. 393)

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 vezir Nizamülmülk wrote in his *Siyasetname* that rulers should appoint inspectors (*muhtesib*) to check scales and prices in every city: 'Inspectors must check weights and so encourage honesty and prevent dishonesty.'[25]

The royal patent awarded to Necmeddin Ebu Bekir upon his appointment as superintendent of guilds and markets in Konya during the Anatolian Seljuk period (1075-1318) 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.[26]

A warrant for the office of superintendent of guilds and markets found in *Teressül* by Hafız Kırımî is an interesting example, illustrating that the traditions of the Anatolian Seljuks continued in later periods. In a collection of letters entitled *Rüsûmü'r-Resâil* (İstanbul, Üsküdar Selim Ağa Library, Nurbanu Valide Sultan no 122) thought to have been written in the late 13th century, another such warrant mentions the official inspection of weights and measures, and demands that their accuracy be ensured.[27]

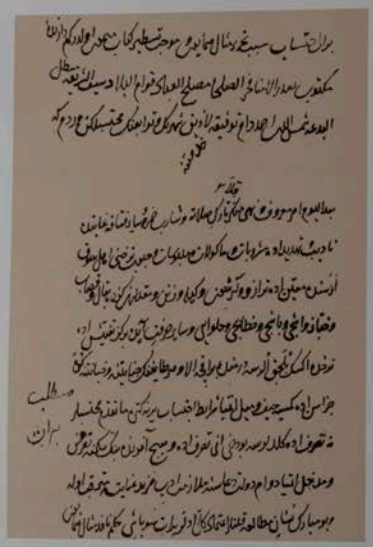
The warrant in *Teressül*, a work on the art of letter writing thought to have been written at the court of the Germiyanoğlu emirate in Kütahya in the late 14th or early 15th century, asks that the inspectors pay attention to measuring devices for length and weights, and that if these are found to be below standard, the culprits be punished.

25 - Nizamülmülk, *Siyasetname*, ed. Mehmet Altay Köymen, Ankara 1990, p. 56.
26 - Osman Turan, *Türkiye Selçukluları Hakkında Resmi Vesikalar*, Ankara 1988, p. 35.

27 - The warrant for the office of superintendent of guilds and markets published by Şinasi Tekin is one of the oldest Turkish language documents (*Ottoman Manual* I, Harvard University 2002, pp. 70-71). For *Rüsûmü'r-Resâil* see Mehmet Erkal, "Arşın", *DİA*, vol III, p. 412.

STEELYARD
Ottoman, 18th-19th century
l: 410 mm
KMA 677 (cat. 285)

DETAIL
KMA 677 (cat. 285)



The muhtesib's responsibilities at this period covered public morals as well as commercial practices, as the transcription of the warrant's text shows:[28]

Sebeb-i tahrîr-i misâl-i hümâyûn ve mûceb-i tasfîr-i kitâb-ı meymin oldur kim dârende-i mektûb sadrü'l-ümenâ fahrü's-sülehâ muslihü'l-'ibâd kıvâmü'l-bilâd seyfü'ş-şerî'a mubtülü'l-bid'a Şemse'd-dîn Ahmed -dâme tevfîkuhu- hidmetine Lâdîk şehrinüñ ve tevâbi'inüñ muhtesibligin virdüm ki (146a) ba'de'l-yevm emr-i ma'rûf ve nehy-i münker kıla. Târik-i salâta ve şârib-i hamra ve sâyir-i fussâka gâyetde te'dîb ü tehdîd ide. Meşrûbât ve me'kûlât ve meibûsât ve hubûb narhını ehl-i sûk arasında mu'ayyen ide.

Terâzû ve ârşûn ve kîle vezninde ve mikdârında gözede. Bakkâl ve kassâb ve habbâz ve aşçı ve bayçı ve haşşâbçı ve helvâyî ve sâyir-i hırfeti ayda bir gez teftîş ide. Narhda egsük bulacak olursa direminde bir akçe ala ve her şâyifenüñ cinâyetine ve hıyânetine göre cezâsın ide. Kimseye hayf u meyl itmeye. Şerâyiş-i ihtisâbı yirine getüre. Mâ-tekaddem muhtesibler ne tasarruf ide geldilerise, bu dahi anı tasarruf ide.

Ve hiç âferîde bunuñ hükmine ta'arruz" ve medhal itmeye. Devâm-ı devlet du'âsına mülâzemet idüp mezîd-i 'inâyete müterakkıb ola.

Ve bu mübârek nişânı mütâla'a kılanlar i'timâd-ı külli ideler.

28 - Şinasi Tekin, *Ottoman Manual* II, Harvard University 2002, pp. 70-71.

CONFECTIONERS
A detail from *Surname-i Hümayun*.
TSM H, 1344, fol. 161r.

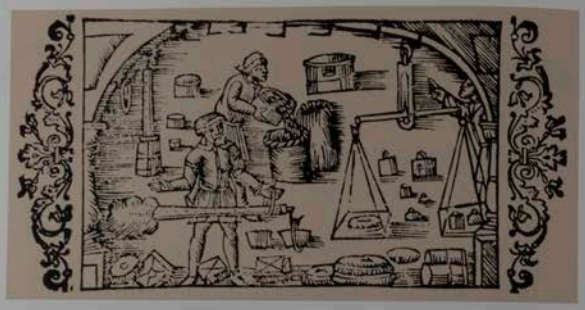
Summary:

Head of superintendents who are granted warrants, pride of the just and pious, who sets men on the path of righteousness, support of cities, sword of canonical law, who eliminates innovations contrary to religion, Şemseddin Ahmed, may his merits last forever, is appointed as inspector of guilds and markets for the city of Ladik and its environs. From this day onwards let him enforce the law. Let him severely punish those who omit to pray, drinkers of wine and other sinners. Let him set the prices for food, drink, clothing and grain.

Let him watch the amount of weights, arşın and *kile* measures. Let him inspect tradesmen like the grocers, butchers, bakers, cooks, sellers of cooked sheep's heads, firewood sellers and *helva* makers once a month. If he should find their measures to be wanting, let him fine them two *akçe* for every *dirhem*, and punish each according to his crime and dishonesty. Let him neither do injustice nor give preferential treatment to any. Let him perform his duties of inspection to the full. Whatever inspectors before him charged, let him charge the same amount.

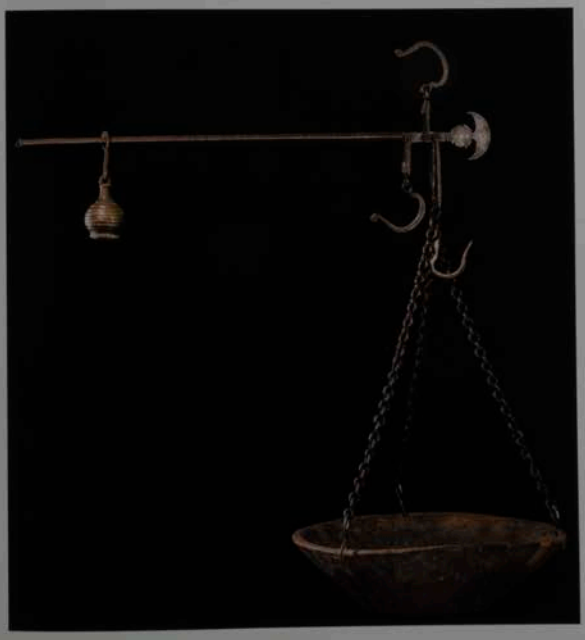
Let no one object to his decisions and interfere. May he go on praying for the continuity of the state and earn the right to many rewards.

ENGRAVING SHOWING BISMAR
by Olaus Magnus, 1555. The figure at the left is using a bismar or notched balance for weighing.



BISMAR
Ottoman, 19th-20th century
l: 340 mm
ø (pan) 280 mm
KMA 1339 (cat. 489)

SET OF WEIGHTS
Ottoman, 19th-20th century
200 dirhem (cat. 263)
100 dirhem KMA 026
50 dirhem (cat. 249)



STEELYARD FOR SALT
Ottoman, 18th-19th century
l: 883 mm
KMA 1342 (cat. 490)

And may those who read this holy edict have complete faith in him.

Charges made for assaying weights and measures 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 Anatolia in H 937 (1530) refers to a tax called *kile* duty among these revenues in the city of Isparta.

Farmers purchased a stamped *kile* measure from the superintendent, and paid a fee to him for the produce which they measured with it.[29] The *kile* and *şinik* measuring containers produced by tradesmen in Istanbul were checked for accuracy and stamped. The assay charges made for this service were among the revenues of the office of superintendent of guilds and markets in Istanbul.[30]

Assay duties were also among the revenues of the same office in Rhodes, and were payable to the pious endowment of Rhodes Imaret. An order written to the kadı of Rhodes says that the failure to assay the weights and measures used by tradesmen selling food and other goods had resulted in a considerable reduction in these revenues, to the disadvantage of the pious endowment; and the kadı is commanded to prevent the use of unstamped weights and measures, and punish those found using them.

CONCERNING THE PUNISHMENT OF THOSE FOUND USING UNSTAMPED WEIGHTS AND MEASURES
BOA,
Kamil Kepeci tasnifi,
no: 63, p. 589, h. 2

Rodos kādısına hüküm yazıla ki
Haliya Rodos imaret-i amire mütevellisi Cafer Dergah-ı Muallam'a arz gönderüp Rodos kalesinin ihtisabı imaret-i amire evkafından olup etrafdan şehre bey' olunmak içün varid olan alat ve sair meta' ve me'kulat bey'inde ölçeklerin ve arşunların damga itdirmeden bey' olunmağla kıst-ı ihtisaba küllî noksan müretteb olup vakfa gadr olup mühtesib marifetsiz terakki verilmeyüp damgasız ölçek ve arşun istihdam etdirilmemek içün emr-i şerif verilürse mukataa-i mezbure terakki itmek mukarrerdir deyu bildirmiş imdi buyurdum ki hükm-i şerifim varuldukda onat vecihle tenbih ve tekid eyleyesiz ki meta' ve gallat bey' iden kimesnelerin arşunların ve kilelerin damgalanmayınca kullan-mayalar şöyle ki ba'det't-tenbih damgasız arşun ve kile isti'mal idenler zahir olduktan sonra haklarından geldiresiz şöyle bilesiz deyu tahriren fi Cumadi'l-ahir sene 960.

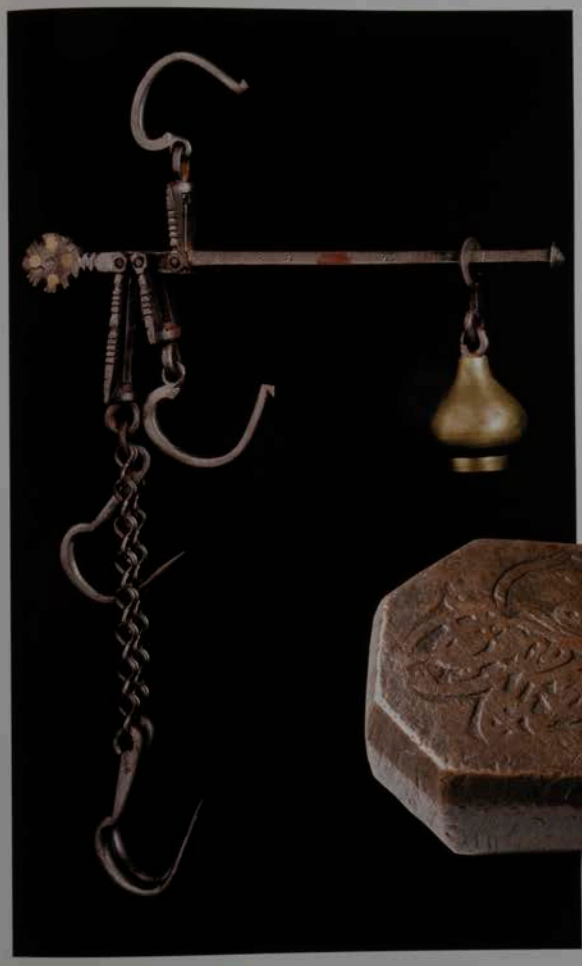
At the end of the 16th century tithes for provisioning the army were collected in the province of Damascus by the kadıs. He delivered them to the commissary-general, who loaded these supplies onto ships from Cyprus. An order written to the kadı of Tripoli in Syria specifies that the *kile* measure used during collection of the tax-in-kind in the province of Damascus was larger than the measure used during delivery, and that the *kile* measures being used must be measured, and the amount they contained recorded.

CONCERNING THE KILE MEASURE TO BE USED IN DAMASCUS FOR THE COLLECTION OF TITHES FOR PROVISIONING THE ARMY
BOA,
Mühimme defterleri,
c. 12, h. 463.

Yazıldı

Trablus kādısına hüküm ki:
Vilâyet-i Şâm'dan ihrâc olunan nüzûl kabzı husûsında isti'mâl olunan kile büyük kile olup ve teslîm kilesi andan küçük olduğı i'lâm olundı. İmdi; ne makûle kile ile kuzâdan alınup ve Kıbrıs'dan gelen gemilere kangı kile ile teslîm olunduğı ma'lûm olmak lâzım olmağın buyurdum ki:
Vardukda, te'hîr itmeyüp ber-vech-i isti'câl nüzûl eminînden nüzûl kabzıdüğı kileyi getürdüp dahı sen müşârün-ileyh çavuşumla veznidürüp kaç vukıyye idüğin sicill eyleyüp bir sûretin Sûdde-i Sa'âdetlüm'e gönderesin. Bu bâbda basîret ü ittibâh üzre nüzûl husûsında ma'mûl olup isti'mâl olunan kileden gayri gafletle eyleyesin ve bu bahâne ile celb ü ahz olunup ve nüzûlden bel' u ketm olunmışdır, nicedür; mufassal ü meşrûh yazup Sûdde-i Sa'âdetlüm'e arzeyleyesin.

29 - *438 Numaralı Muhasebe-i Vilayet-i Anadolu defteri [937 /1530]* I index and facsimile print, Ankara 1993, p. 289.
30 - Cevdet Belediye no 48, dated 5 Safer 1139 / 3 December 1726, related by Baltacı, op cit p. 171.



STEELYARD
Ottoman, 18th century
Stamped with the tuğra of Abdülhamid II
l: 285 mm
KMA 662 (cat. 393)

20 DIRHEM WEIGHT
Ottoman, 18th century
Stamped with the tuğra of Selim III
Dated H 1203 and 1215
KMA 031 (cat. 200)

OTTOMAN STEELYARD TERMINALS

AKMED collection

cat. 291

cat. 148

cat. 485

cat. 290

cat. 287

cat. 279

cat. 286

cat. 283

Private collection

cat. 490

cat. 149

The lack of a standard for the *kile* was a frequent cause of complaint in the 16th century. The *kadı* of Balya explained in a letter to the Council of State 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 wished the Istanbul *kile* to be used in the district. Upon this, an order was sent to the *kadı* of Marmara, who had carried out the land survey for the subprovince of Biga, asking him to investigate the situation and arrange for whichever *kile* measure was to the advantage of the country and the treasury to be used.

CONCERNING THE USE OF WHICHEVER KILE MEASURE IS TO THE ADVANTAGE OF THE COUNTRY AND THE TREASURY
BOA, Mühimme defterleri, no. 12, h. 969.

Yazıldı.

Çavuşun ademisi Osmân'a virildi. Fî 21 Rebî'u'l-evvel, sene: 979

Biga sancağını tahrîr eyleyen Marmara Kâdîsı Mevlânâ Ramazân'a hüküm ki:
Hâliyâ Balya kâdîsı Dergâh-ı Mu'allâm'a mektûb gönderüp; "Balya kazâsında isti'mâl olunan kilenün ahvâli tamâm muhtell olup mukarrer ü mu'ayyen olmamağla re'âyâ vü fukarâ bey' u şirâda zarar u ziyân çeküp ve andan mâ'adâ ba'zı mukâta'âtun hubûbâtından öşr ü sâlâriyye alınmalu oldukda emîn olanlar; "İltizâmımuza küllî zarar müterettib olur; eger etrâf kasabâtda fermân olunduğı üzre kazâ-i mezbûrda dahı İstanbul kilesi câri olmak buyurılursa re'âyânun ahvâli muntazam olup mîrî cânibine dahı küllî fâyide olmak mukarrerdür." diyü arzeylemiş'ler. İmdi; buyurdum ki:
Vardukda, bu husûsı onat vechile tetebbu' u tefahhus idüp göresin; arzolun-dugı gibi ise memleket ü vilâyete ve mâlumia enfa' olan kile kankısı ise anunla amel idüp deftere kaydeyleyüp emr-i şerîffüme mugâyir kimesneye nizâ' itdürmeyesin.

TUĞRA OF SULTAN MAHMUD II AND DATE STAMPS ON A BRASS BALANCE PAN
Ottoman, 19th century
KMA 743 (cat. 295)

APOTHECARY'S BALANCE
British, 19th-20th century
230x120x335 mm
KMA 634 (cat. 476)

SET OF METRIC WEIGHTS
200 g, 500 g and 1 kg. Stamped 'Bursa the year [1]312' and the tuğra of Sultan Abdülhamid II.
Private collection.

BUTCHER'S BALANCE
Ottoman, 19th-20th century
l: 770 mm
KMA 688 (cat. 392)

SWINDLERS BEING PUNISHED BY THE INSPECTOR OF MARKETS

16th century illustrations taken from *16. yüzyılda İstanbul, Kent, Saray, Günlük Yaşam* by Metin And, Istanbul 1993.

CONCERNING MALPRACTICES IN THE SALE OF FLOUR AND BREAD

Records of the Court of Üsküdar, No: 1, vr. 19b, 1.Ca.920/24.06.1514; No: 1, vr. 22a, 20-30. C.920/12-21.08.1514

Malpractices and deceptions in weights and measures by tradesmen and market stall holders were recorded by the court, and the officers 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, Osman of Üsküdar sold 1.5 kile of flour which turned out to be 500 dirhem short. The misdemeanour was recorded in the court register. The second case concerns a baker named Karaca, whose loaf was found to be 100 dirhem short, and this was recorded in the register.

Sebeb-i Tahrîr-i hurûf oldur ki,
Üsküdar'dan Osman veled-i Zekeriyya bir buçuk kile un satup 500 dirhem eksik çıkup ba'de's-subût cürüm hükm olundığı sebebden deftere ketb olundu. Tahriren fî garre-i Cumadi'l-evvel sene ışrın ve tis'a mie [1.Ca.920/24.06.1514]
Şuhûdü'l-hâl: Şah Bâlî, Ali b. Hasan, Çalap Virdi

Sebeb-i Tahrîr-i hurûf oldur ki,
Kasaba-i Üsküdar'da Karaca nâm kimesnenin etmeği yüz dirhem eksik gelip deftere ketb olundu.
Tahriren fî evâhir-i Cemaziyelâhir sene 920 [20-30.C.920/12-21.08.1514]
Şuhûdü'l-hâl: Evrenos, Ekmekçi Ali ve Kasab Mahmûd

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 H 1179 relates that a baker named Hüseyin in Eyüp who was found guilty of producing short weight bread was imprisoned for 24 hours in Boğazkesen 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).

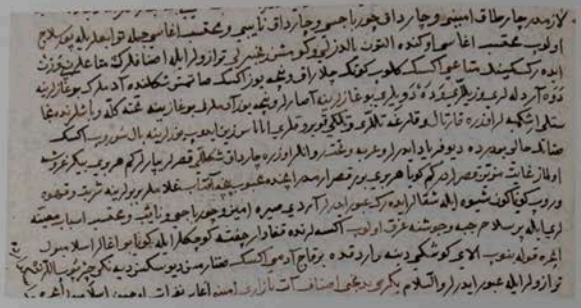
Malpractices concerning bread were sometimes punished more severely. When the grand vezir was inspecting the tradesmen of Istanbul incognito, he discovered insufficiently baked bread in one bakery, and had the owner of the bakery nailed to a nearby wall by the ear as a warning to others.[31] Four janissaries who ran a bakery in the vicinity of Kasımpaşa and Tersane and whose loaves were found to be 14-15 dirhem short of the declared weight, were sentenced to imprisonment in Seddülbahr Castle.[32]

It appears that sometimes the inspector of guilds and markets or his men misused their powers to harass tradesmen. An order written to the kadı of Aleppo states that a butcher named Ahmed in the city had been harassed by the inspector's men. He claimed that they had wrongly accused him of selling short weight meat, taken him before the kadı, 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 kadı of Aleppo was commanded to ensure that meat that had been weighed and sold by the shopkeeper should not be taken away and checked for short weight in another place outside the shop, but weighed by the inspector's men inside the shop (BOA, Kamil Kepeci, Ahkâm defterleri, No: 67, s. 1187, 13 Zilkade 980 / 17 Mart 1573).

31 - Ziya Kazıcı, Osmanlılarda İhtisab Müessesesi, Istanbul 1987, p 96, from the Hatt-ı Hümayun of Abdülhamid I no 647.
32 - Kazıcı, *Osmanlılarda İhtisab Müessesesi*, p. 97.

A shopkeeper nailed by the ear to a post for selling short weight, 160x127 mm. (Garo Kürkman's archive).

ACCOUNT BY EVLIYA ÇELEBI OF PUNISHMENT FOR USING FRAUDULENT SCALES



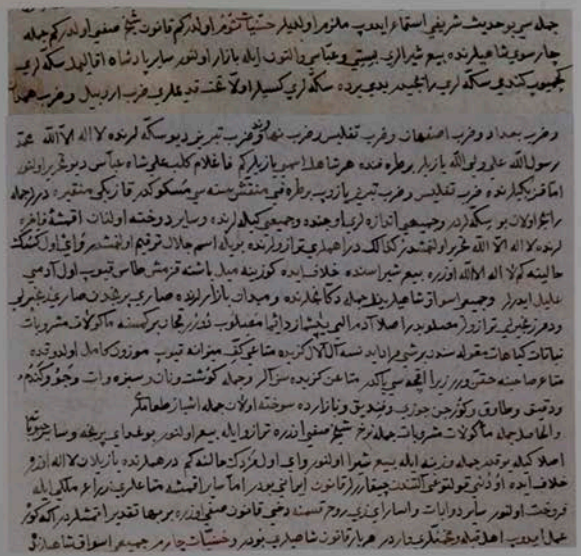
This account by the 17th century writer Evliya Çelebi describes the display put on by the customs officers and the inspector of guilds and markets during a guild procession to mark a royal celebration. Each guild and department demonstrated their goods, skills and duties to the spectators as they passed by, either walking or on floats.

> The superintendent of customs, his chief officer, his deputy, the inspector of markets and all their men are armed, and with the inspector leading, they march holding balances with gilded and silver chains, weighing the goods of the tradesmen. Many hundreds of tradesmen whose goods are found to be below weight are beaten and camel bells and jingles hung around their necks. Around the throats of many hundreds of men are hung wooden cannonballs, and on their heads uncleansed tripes stuck with quills of eagles and crows, and their clothes adorned with fox tails, and their faces smeared with honey, and the officers shout, 'Such is the condition of he who sells short weight.' They make pavilions in the form of pergolas on carts and litters, each so ornately decorated that the cost cannot be less than a thousand kuruş, as if each were a pavilion in the garden of paradise. Within male slaves with countenances as lovely as the moon give one another sherbet and coffee, and joke in diverse dialects. Behind come the superintendent, his chief officer, his deputy and the inspector of markets in their special costume, smothered in arms and armour, and and with pairs of assistants of equal standing right behind them. It is as if these officers are patrolling Istanbul, and when they reach the spot beneath the Alay Köşk [pavilion overlooking the walls of Topkapı Palace from which the sultan watched the procession], they accuse several men, 'Would you sell short weight?', and giving them eighty lashes, pass on with their balances.[33]

EVLIYA ÇELEBI'S ACCOUNT OF THE LAW CODE OF SHEIKH SAFI IN IRAN[34]

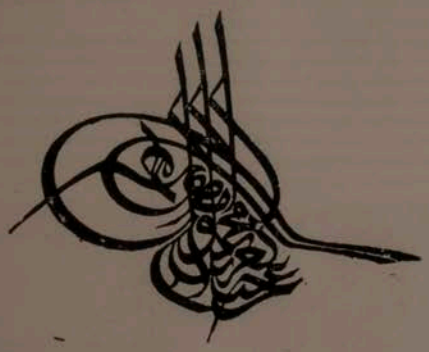
> In all the markets the currency used consists of the bisitî [Iranian coin], abbâsî [coin minted by Shah Abbas], and gold coins. The coins of foreign sultans and kings are not accepted, but only their own. Coins are minted in seven places. First in their former capitals, whose coins are marked 'Minted in Ardabil' and 'Minted in Hamadan', and similarly other coins marked 'Minted in Baghdad', 'Minted in Isfahan', 'Minted in Tblisi', 'Minted in Nihavend' and 'Minted in Tabriz'. On them is inscribed, 'There is no god but God, Muhummed is his prophet, Ali his best beloved servant.'
>
> On one side is the name of each shah, inscribed with the words, 'Fe ağlân-ı Kelb-i Alî Şâh Abbas'. Only on their kazbikî [coins] do they write 'Minted in Tblisi' or 'Minted in Tabriz' on one side, while on the other is the year and decoration. Kazbiki is what they call their copper coins. These are the only coins that are valid.

33 - *Evliyâ Çelebi Seyahatnâmesi, TSM, Bağdat 304 numaralı yazma*, 1, ed. Orhan Şaik Gökyay, Istanbul 1996, p. 260.
34 - *Evliyâ Çelebi Seyahatnâmesi, TSM, Bağdat 304 numaralı yazma*, 2, ed. Zekeriya Kurşun, Yücel Dağlı, Seyit Ali Kahraman, Istanbul 1999, p. 132.



> At the end of all their measuring rods, and on all their measuring containers, as on all their textiles, is written, 'There is no god but God.' Also on their weights and balances the name of God is inscribed. Woe to whosoever should cheat in his transactions over the declaration, 'There is no god but God.' They put out his eyes and set a heated stone upon his head, causing the man to ail. In all the shops of all the bazaars and in the marketplaces hang balances made of brass with chains of brass or iron, and no one ever grasps them in their hand, instead they always hang there.
>
> When someone wishes to buy food, drink, herbs or green vegetables, he chooses the finest and places these in the scale, and when the correct weight is reached, he pays the amount to the owner of the goods. Since his coin is good, he has the right to buy the finest wares. Meat, bread, vegetables, barley, wheat, flour, chickens, pigeons, walnuts, hazelnuts and all the cooked foods in the market, in short every kind of food and drink is sold by weight according to prices set by Sheikh Safi.
>
> Wheat, rice and other cereals are never sold by volume. All are bought and sold by weight. Woe to he who violates the words, 'There is no god but God' inscribed on the weights. They pull his guts out from his armpit, that is the law of Iran. Only cloth is sold by the zirâ'-ı melikî [royal zira, a unit of length]. For livestock and slaves, too, the Law of Safi sets a price.

LAWS AND REGULATIONS CONCERNING THE INTRODUCTION OF THE METRIC SYSTEM IN THE OTTOMAN EMPIRE



(صورت خط همايون)

﴿ موجنجه عمل اولنه ﴾

(مساحات واكيال واوزان جديده يه دائر قانوننامه در)

برنجى ماده ممالك محروسهٔ شاهانه ده مساحات واكيال واوزانك واحد قياسلرينه اساس اولق اوزره دائرهٔ نصف النهارك ربعنك اون ملیون جزئنه برجزئنه مساوى برطول اتخاذ اولنوب (مترو) ياخود (ذراع اعشارى) تسميه قلنمشدر وبونك اقسام واضعما فى دخى اعشاريدر

THE FIRST STATUTE CONCERNING THE INTRODUCTION OF THE METRIC SYSTEM
Copy of the Imperial Edict of Sultan Abdülaziz dated 3 Zilhicce H 1286 and 22 February H 1285.
Cem Mahruki's archive.

٣

ايكنجى ماده معيار اولق اوزره مترويه مساوى پلاتينه دن برذراع اعشارى اعمال ايتديريلوب خزينهٔ همايونده حفظ اولنه جقدر

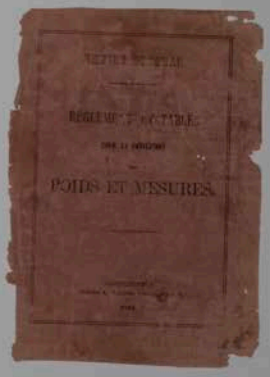
اوچنجى ماده طول ومسافه اولچمك ايچون ذراع اعشارى واحد اتخاذ اولنوب بونك اقسامنه يعنى اون جزئنده برينه عُشر ذراع ياخود دَسِى مترو وبوز جزئنده برينه عَشير ذراع ياخود سانتى مترو وبيك جزئنده برينه مِعشار ذراع ياخود ميللى مترو واضعافندن بيك ذراع طوله ميل اعشارى ياخود كيلو مترو واون بيك ذراع طوله فرسخ اعشارى ياخود ميريامترو دينور

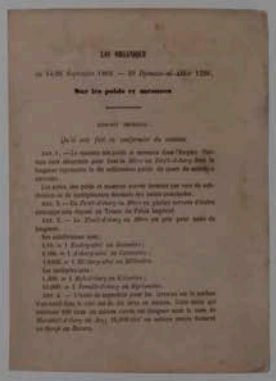
در دنجى ماده اراضى مساحه ايتمك ايچون بهر ضلعى اون ذراع اعشاريدن عبارت برمربعك احاطه ايلدبكى مقدار محل واحد اتخاذ اولنوب بوكا مربع اعشارى ياخود آر واون بيك ذراع مربع محله دخى جريب وياخود هَكتار دينور

بشنجى ماده مايعات وحبوباتى حجماً اولچمك ايچون عشر ذراع مكعب يعنى بر دَسِى مترو مكعب واحد اتخاذ اولنوب اولچك ياخود لِيترُو تسميه اولنور واونده برينه ظرف وياخود دسى ليترو واو يلكك يوز مثلى حجمنه دخى كيل اعشارى وياخود هَكتُو ليترو دينور

The process of introducing the metric system began on 20 Cemaziyelahir H 1286 (1869). Under this statute the metre was accepted as the unit of length, and named the zira-ı a'şarî (decimal zira), to encourage public acceptance by use of the accustomed term zirâ (an alternative term for arşın).

The are (100 square metres) became the unit used for land area; the cubic decimetre, named öşr-i zirâ küp (tenth of a zirâ cubed) and the litre the units of volume; and the dirhem-i a'şarî (decimal dirhem) or gram the unit of weight. Under articles 2 and 7 of the new law a standard zira-i a'şarî rule and a standard kilogram weight were to be manufactured from platinum and kept in the Imperial Treasury. It stated that the provisions of the law were to go into effect for official transactions in March H 1287, but that the general public could continue to use both old and new measures together until March H 1290, when use of the old measures would be prohibited.





THE FIRST STATUTE CONCERNING THE INTRODUCTION OF THE METRIC SYSTEM[1]
This French copy of the statutes concerning the metric system promulgated in H 1286 (1869) during the reign of Sultan Abdülaziz was printed by the Ottoman government in 1870. Garo Kürkman archive.

STATUTE CONCERNING NEW WEIGHTS AND MEASURES
20 Cemâziyelâhir H 1286 / 14 Eylül 1285

Article 1: The metre, which is a length equivalent to one part in 10 million of one quarter of the equator, is to be taken as the fundamental unit for all weights and measures in the Ottoman lands, where it will be known as the zirâ-ı a'şârî. It is divided into tenths.

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 öşr-i zirâ or decimetre, and its hundredth part aşîr zirâ' or centimetre, and the length of 10,000 zirâ the fersâh-ı a'şarî (decimal furlong) or miriametre.

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 kare or are, and 10,000 square zirâ shall be known as a cerib or hectare.

Article 5: For measuring liquids and grain by volume, the unit shall be the cubic öşr-i zirâ or cubic decimetre, also known as the litre. And one tenth of this shall be known as a zarf or decilitre, and a multiple of one hundred of this measure as keyl-i a'şârî or hectolitre.

Article 6: The basic unit of weight shall be the gram, which is equivalent to the weight of a cubic aşîr-i zirâ (tenth of a metre) of distilled water at a temperature of 4 degrees. The parts of the dirhem shall be known as öşr-i dirhem or decigram and aşîr-i dirhem or milligram, and one thousand dirhem as vukiyye-i a'şârî or kilogram. The weight of the kilogram 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 kantar-ı a'şârî or kental, and 1000 kilograms as the tonilato or ton.

Article 7: A standard vukiyye-i a'şâriye weight equivalent to 1 kilogram shall be manufactured from platinum and kept in the Imperial Treasury.[2]

Article 8: Standards to be used for measures of area, length and weight shall be produced in accordance with the measurement 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 1287, government offices 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 1290, 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 1290 shall not include old weights and measures.

Article 11: As of March 1290, 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 new, and the new to old, shall be drawn up and printed.

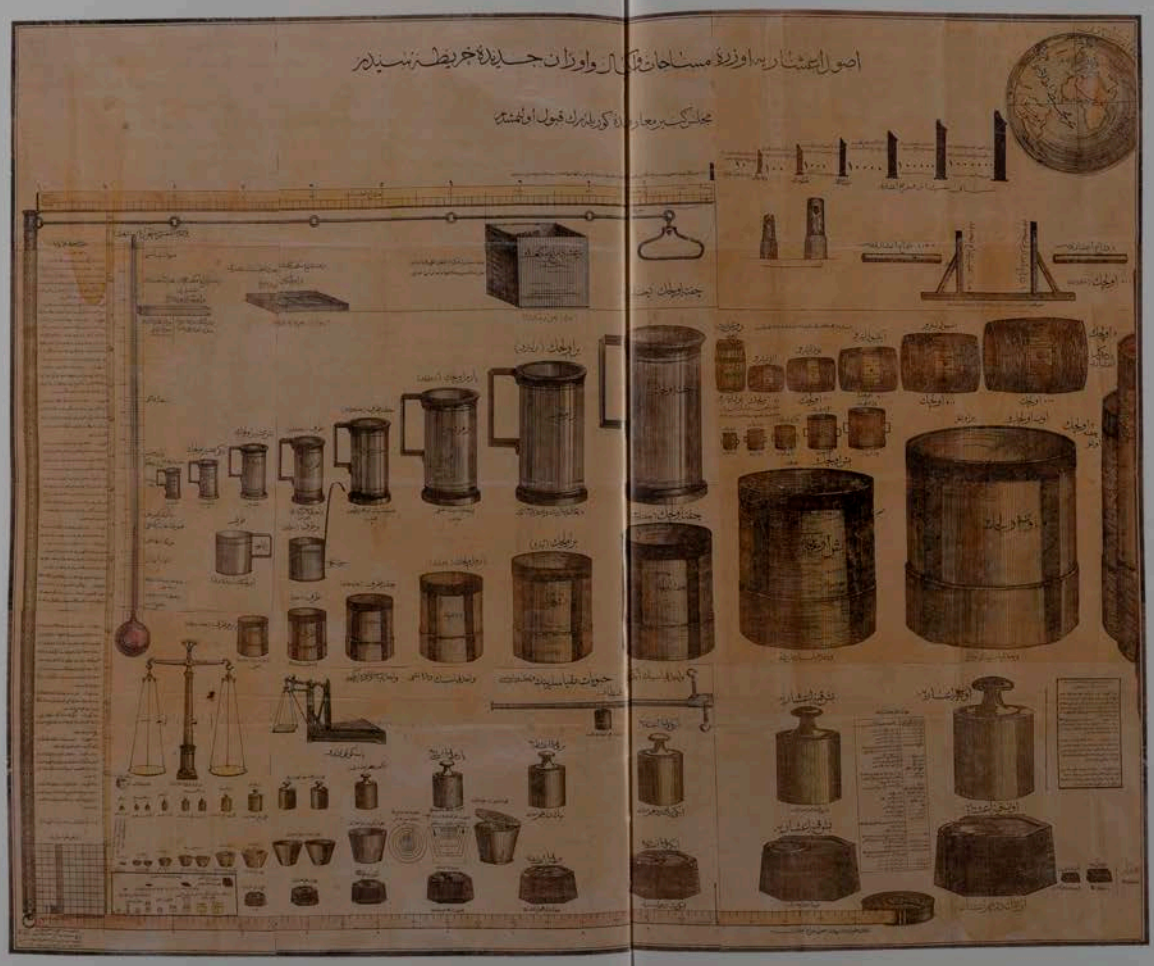
Article 13: These new measures and the metric system shall be taught in all schools.

Article 14: The provisions of this law shall not apply to the weighing and assaying of weights and coins as in force for legal procedures, or to the special weights used for precious gems.

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.[3]

1 - Osman Nuri Ergin, *Mecelle-i Umûr-ı Belediye*, Istanbul 1995, p. 1959

2 - The word vukiyye, a unit of weight traditionally equivalent to 400 dirhems, was corrupted to kıyye or okka in vernacular Turkish. This Arabic word is written as vukiyye in most old Turkish books and statutes.
3 - Eski Düstûr, cilt 1, s. 744.



AN OTTOMAN PUBLICITY POSTER FOR THE NEW MERTRIC WEIGHTS AND MEASURES
1340x1670 mm.
Cem Mahruki archive.

Length, Distance and Their Units of Measurement

Unit	*Quantity*	*Explanation*
Zirâ'-ı a'şârî	1	The zirâ'-ı a'şârî or metre is equivalent to one part in ten million parts of a fourth part of the equator. This is the basis for measures of weight, length and area.
Mil-i a'şârî or kilometre	1.000	A length of 1000 metres.
Fersah-ı a'şârî or miryametre	10.000	A length of 10,000 metres.
Fractional measures		
Öşr-i zirâ' or decimetre	0.5	One tenth part of a metre.
Aşîr-i zirâ' or centimetre	0.01	One hundredth part of a metre.
Mi'şâr-ı zirâ' millimetre	0.001	One thousandth part of a metre.
Kare or are	100	An area of one metre square. Equivalent to a square whose edges are each 10 metres, and is the basis for land measurements.

Land Measurements

Unit	*Quantity*	*Explanation*
Cerîb or hectare	10.000	It is equivalent to a square whose edges are each 100 metres long.

Liquid and Grain Measures

Unit	*Quantity*	*Explanation*
Ölçek or litre	1	This is an öşr-i zirâ or cubic decimetre, and the basic unit used for measuring liquids and grain, equivalent to a container holding one kilogram of water.
Keyl-i a'şârı or hectolitre	100	One hundred cubic decimetres or 100 ölçek.
Fractional measures		
Zarf or decilitre	0.1	One tenth of an ölçek. A container used for measuring.

Weights

Unit	*Quantity*	*Explanation*
Dirhem-i a'şârî or gram	1	Equivalent to the weight of 1 cubic centimetre of distilled water at a temperature of 4 degrees, this is the basis for measuring weight.
Vukiyy-i a'şârı or kilogram	1.000	One thousand kilograms.
Kantar-ı a'şârı or "kental"	100	
Tülâ or ton	1.000	
Fractional measures		
Öşr-i dirhem or decigram	0.1	
Aşîr-i dirhem or centigram	0.01	
Mi'şâr-ı dirhem or milligram	0.001	

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 assay officials, the inspection of transactions using the new measures, penalties, dues payable on assay stamps, and the shapes and specifications of new measuring instruments and weights.

According to the first and second sections of these 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 to every town and district, and the public would not be allowed to use any measures, weights, balances or steelyards 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 treats of penalties for fraudulence relating to weights and measures, those who draw up documents not in accordance with the law, and those using unstamped weights and measuring equipment. Violators of the law were to be penalised under Article 262 of the Criminal Code.

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

The fifth section concerns assay charges payable for stamping. The sums payable according to the types of weights and measuring equipment are each separately specified.

The sixth section concerns the physical characteristics of the new weights and balances and ways of using them.

6 OKKA (VUKIYYE)
Ottoman
Stamped 'Kayseri Municipality 1311'.
7700 g.
140x145x70 mm
KMA 194 (cat. 377)

REGULATIONS CONCERNING THE IMPLEMENTATION AND INSPECTION OF THE NEW MEASURES[4]

Below is the full text of these regulations:

Section 1: Concerning Weights and Measures Inspectors

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 governors to the Ministry of Interior.

Article 2: One inspector of measures shall be appointed for each subprovince, but if necessary assistants 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 inspectors 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 stamp used to mark new measuring equipment shall be different from that used for the annual assaying 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 his 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 procedures carried out at the office, the expenses incurred in the process of patrolling, and expenses for the maintenance and transportation of instruments required in the course of inspection will be paid separately. Patrolling expenses may where necessary be added to the specified salaries. Sample weights and measures shall be kept in a place to be decided upon by the local authorities, and where procedures will be carried out. If 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 Istanbul 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 other 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 assaying 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 assaying, and may not be used for commercial transactions. Only in the case of weights and measures whose size is so small 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 detracted from their accuracy.

Article 13: Tradesmen engaged in the manufacture and sale of measuring equipment cannot put these 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 year.

Article 14: Local authorities must organise 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 so on presented to him so long as they meet the minimum specifications or 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 them who are illiterate and have no seal or have such but avoid signing or setting their seal, shall be recorded in the book and presented with a voucher having a stub.

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 townships or villages may take place in the nearest main town, and the tradesmen from those townships or villages requested to come to the main town for this purpose.

Article 18: Itinerant tradesmen using weights and measures should take these 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 dues laid down, in return for which they will receive an official receipt.

Article 19: Weights and measures used by government offices 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 offices, 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 is the

4 - Osman Nuri Ergin, *Mecelle-i Umûr-i Belediye*, p. 1963

responsibility of the local authority.

Article 22: Municipal offices and gendarmes shall inspect shops, marketplaces, fairs and bazaars several times a year in accordance with their own sphere of duty, to see that the measuring equipment is up to standard, is being used correctly, and bears clearly struck assays stamps; and that since the previous inspection these have not been damaged or exchanged; and that the stamps are not forgeries. 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 inspect the measures used by tradesmen and merchants either 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 statute, 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 should then present to in writing to the local authority.

Article 27: Rusty or mouldy weights and measures likely to have an adverse effect on quality and quantity shall be confiscated by the inspector, who shall deliver them up to the authorities immediately and report the situation.

Article 28: During the time set aside for the process of inspection, shopkeepers and tradesmen are required to be present in their shops.

Article 29: Inspectors are permitted to enter shops that they find open at night for the purpose of inspection.

Article 30: If any tradesmen and shopkeepers attempt to prevent inspectors entering 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 31: 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 32: Anyone who draws up advertisements, bills of exchange, or account books that violate articles 10 or 11 of the Imperial Statute of Weights promulgated on 20 Cemaziyelahir of the year 1286 and 14 September of the year 1285 [1869; lunar and solar dates of the two calendars based on the Hegira], or is found using weights and measures that similarly violate these provisions, shall be penalised according to Article 262 of the Imperial Criminal Code.

Article 33: Until fines payable for violations of the law in the drawing up of advertisements, bills of exchange and account books as mentioned in the previous article have been paid, these documents shall not be valid in a court of law or council.

Article 34: Merchants, tradesmen 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 262 of the Imperial Criminal Code.

Article 35: Forgers of assay stamps for the new measures, anyone found striking these, or using measures that have been struck with such forged stamps shall be penalised in accordance with Article 150 of the Imperial Criminal Code.

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

Article 36: Dues 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 offices shall be charged at the same rate.

Article 38: Dues set and charged in each district shall be delivered to the local finance office together with the special registers, and these registers shall be stamped jointly by the inspectors of weights and collectors of dues.

Article 39: All new measures that pass through customs, whether from foreign countries or from the interior, shall be stamped, 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.

Para	*Kuruş*	*Para*	*Kuruş*	
15	-	30	-	A 1 kilogram single weight made from brass for each additional kilogram
10	-	20	-	For each additional kilogram
10	-	20	-	A 1 kilegram single weight made from iron, and those in excess of this weight
10	-	20	-	Weights of 100, 200 and 500 dirhem (gram), whether made of brass or iron , and each piece of lower denomination
5	-	10	-	Weights of 50 dirhem (gram) or less made of brass or iron
-	7	-	-	Extra large balance beam
30	1	20	3	Extra large pair of balance pans
	5	-	-	Large balance beam
10	1	20	2	Large pair of balance pans
-	3	-	-	Medium balance beam
30	-	20	1	Medium pair of balance pans
-	2	-	-	Small balance beam
20	-	-	1	Small pair of balance pans
1	-	-	-	Every kind of steelyard and weighing machine, first kilogram
-	-	2	-	For each vukiyye (kilogram) above 1 kilogram up to 100 kilograms for steelyards and weighing machines
-	-	1	-	For each vukiyye (kilogram) above 100 kilograms up to 200 kilograms, in addition to the 2 para charged for the first 100 kilograms
-	-			For steelyards and weighing machines in excess of 200 kilograms each piece shall be charged at a flat rate

-		1		For all kinds of metre rules, for each section and multiple
10	-	10	-	For each cereal measuring container equally
15	-	15	-	For each litre volume liquid measuring container
10	-	10	-	For each additional litre volume of liquid measuring containers
10	-	10	-	For each liquid measuring container equivalent to 100, 200 or 500 dirhems (grams) [centilitres]
5	-	5	-	For each liquid measuring container of 50 dirhems (grams) or less

Section 6: Concerning the Form and Specifications of New Weights and Measuring 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.

MEASURING DEVICES FOR LENGTH

Article 43: Measuring devices for length shall be of eight types: the first, 20 zirâ'-ı a'şârî (20 metres), the second 10 zirâ'-ı a'şârî (10 metres), the third 5 zirâ'-ı a'şârî (5 m), the fourth 2 zirâ'-ı a'şârî (2 metres), the fifth 1 zirâ'-ı a'şârî (1 metre), the sixth half a zirâ'-ı a'şârî (half a metre), the seventh 2 öşr-i zirâ (2 decimetres), and the eighth 1 öşr-i zirâ (1 decimetre).

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 in customary local use. For convenience of manufacture and transportation, those devices consisting of several parts shall consist of 2, 5 or 10 parts.

Article 45: Wooden rules measuring 1 zirâ'-ı a'şârî (1 metre), 2 zirâ'-ı a'şârî (2 m) or half a zirâ'-ı a'şârî (half metre) shall be reinforced with metal at each end, and clearly and accurately graduated in aşîr-i zirâ (cm) or mi'şar-ı zirâ' (mm); and the marked with their denominations, and the name or sign of their makers. Measures of 20 zirâ' (20 metres), 10 zirâ' (10 metres) and 5 zirâ' (5 m), as used for measuring streets and land, shall consist of sections linked by rings, each section half a zirâ' (5 decimetres) in length, the sections to consist of from iron rods. The use of tape measures and steel tape measures is allowed.

MEASURING DEVICES FOR GRAIN AND LIQUIDS

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.

Diameters and Heights in Mi'şâr-ı Zirâ' (Millimetres)

Millimetres	
503.1	Keyl-i a'şârî (Hectolitres)
399.3	1/2 Hectolitre
294.2	20 ölçek (2 Decalitres)
233.5	10 Ölçek (1 Decalitre)
185.3	5 Ölçek (1/2 Decalitre)
136.6	2 Ölçek (2 Litres)
108.4	1 Ölçek (Litre)
86.0	1/2 Ölçek (1/2 Litre)
63.4	2 Zarf (2 Decilitres)
50.3	1 Zarf (Decilitre)

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 turning inwards over the wood. But for measuring containers of 10 ölçek (decalitres) 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 walnut, oak, chestnut or beech. The capacity of measuring container must be marked by name.

Article 48: Hectolitre measuring containers may be constructed in the form of boxes for the sake of lightness and convenience. In that case they should be 5 decimetres in length, 5 decimetres in width, and 4 decimetres in height. Or if such containers are constructed as cubes, the inside length of each side should be 464.2 millimetres.

Article 49: Measuring containers for liquids with a capacity ranging from 1 hectolitre down to half a decalitre (5 ölçek) shall have the heights and diameters as shown in the table below, and must be made of well tinned copper, sheet iron or cast-iron. And containers with a capacity ranging from 2 ölçek (2 litres) to a zarf (1 decilitre) 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:

Height (millimetres)	*Diameter (millimetres)*	*Capacity*
216.7	108.4	2 Ölçek (2 Litres)
212.0	86.0	1 Ölçek (1 Litre)
136.6	68.3	1/2 Ölçek (1/2 Litre)
100.6	50.3	2 Zarf (2 Decilitres)
79.9	39.9	Zarf (Decilitre)
63.4	31.7	1/2 zarf (1/2 decilitres)

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.

Capacity	*Diameter and height*
2 Ölçek (2 Litres)	öşr. 136,6 mm
1 Ölçek (1 Litre)	öşr. 108,4 mm
1/2 Ölçek (1/2 Litre)	öşr. 86,0 mm
2 Zarf (2 Decilitres)	öşr. 63,4 mm
1 Zarf (1 Decilitre)	öşr. 50,3 mm
1/2 Zarf (1/2 Decilitre)	öşr. 30,9 mm

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.

50	vukiyye	kilo
20	vukiyye	kilo
10	vukiyye	kilo
5	vukiyye	kilo
2	vukiyye	kilo
1	vukiyye	kilo

Article 53: 50 kilogram weights and 20 kilogram weights should be in the form of truncated 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 cast rivet. And each weight should be clearly marked with the denomination, and the name or sign of the maker should be stamped on the lead of the base.

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 legibly on the upper part of the base or on the summit of the knob. In the case of 2 dirhem (2 gram) and 1 dirhem (1 gram) 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.

20	Vukiyye, kilo	100	Dirhem, gram
10	Vukiyye, kilo	50	Dirhem, gram
5	Vukiyye, kilo	20	Dirhem, gram
2	Vukiyye, kilo	10	Dirhem, gram
1	Vukiyye, kilo	5	Dirhem, gram
500	Vukiyye, kilo	2	Dirhem, gram
200	Vukiyye, kilo	1	Dirhem, gram

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 inside a lidded box, also made of brass, and with space for a balance. Such a set of weights must consist of the following.

Pieces	*Dirhems (Grams)*	
1	500	Weight in the form of a hollow conical container
1	200	"
2	100	"
1	50	"
1	20	"
2	10	"
1	5	"
2	2	"
1	1	"
12	1.000	equivalent to 1 vukiyye-i a'şâriyye (1 kilogram)

Using such a set of 12 weights ranging from 1 dirhem (gram) to 1000 dirhems (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 nine ring weights made of brass and each fitting into the other. Like other weights these must be marked with their denomination and the names or signs of their makers.

Article 57: Fractions of a dirhem (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 their denominations and units ranging from 1 milligram to 1000 milligrams (1 gram), as shown in the table below.

Pieces	*Denomination*		
1	5	sm	öşr-i dirhem means decigram
1	2	sm	
2	1	sm	
1	5	sm	5 öşr-i dirhem means centigram
1	2	sm	
2	1	sm	
1	5	mm	5 mi'şâr-i dirhem means milligram
2	2	mm	
1	1	mm	
12	1	Dirhem (gram)	

Article 58: It is permissible to use combinations of the five types of weight described and defined above.

SPECIFICATIONS OF MEASURING DEVICES

Article 59: Three types of weighing devices are used for weighing goods. The first is the ordinary balance, the second the weighing-machine, and the third the steelyard.

Article 60: It is essential first of all that the beam be strong enough not to bend under the weight of the objects placed in the pans; secondly that the points from which the pans are hung and the balance point of the beam be in line; and thirdly that the two halves of the beam be exactly equal.

Article 61: 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 62: Steelyards should have the same degree of sensitivity as balances, and adjusted to an accuracy of one in 500, while weighing machines should be accurate to within 1 milligram.

Article 63: Since it is impossible that measuring devices should be completely accurate, apart from the measures of 20 and 15 metres in length used for measuring area, short measurement is never accepted, but a slight excess is acceptable. Measuring rods of 20 metres may vary by a maximum of 3 millimetres less or more, and 1.5 millimetres in every 2 or 5 metres for measures of smaller dimensions. And for fractional measures only excess variations are accepted as follows.

Permitted Maximum Excess Amounts		
Length	*Wooden Rules*	*Iron rules*
2 metres	1/2 millimetre	1/5 millimetre
1 metre	1 millimetre	1/5 millimetre
1/2 metre	2/5 millimetre	1/10
2 decimetres	2/5 millimetre	1/10 millimetre

Article 64: The maximum excess variations allowed for capacity measures are 1/500 for metal containers and 1/100 for wooden containers. For example, a hectolitre measure made of wood may have an excess capacity of up to 1 litre, and a kile [25 kilogram] measure made of metal may have an excess capacity of up to 2 decilitres. Metal measuring containers with a capacity of 2 litres or less may have a maximum excess capacity of 1/200.]
Maximum excess variations for weights are shown in the table below:

Iron weights	*Maximum excess variation*	*Copper weights*	*Maximum excess variation*
50 kilograms	20 grams	20 kilograms	150 milligrams
20 kilograms	10 grams	10 kilograms	80 milligrams
10 kilograms	2 grams	5 kilograms	50 milligrams
5 kilograms	4 grams	2 kilograms	25 milligrams
2 kilograms	2 grams	1 kilogram	15 milligrams
1 kilogram	1 gram	500 grams	10 milligrams
-	-	200 grams	5 milligrams
-	-	100 grams	3 milligrams
-	-	50 grams	2 milligrams
-	-	20 grams	1 milligram
-	-	10 grams	4 milligrams
-	-	5 grams	2 milligrams[5]

5 - Although the date of these regulations recorded on page 747 of the Eski Birinci Cilt Düstür is not recorded in the law code, it must have been drawn up after the law code itself, which is dated 14 September H 1285/1869.

However, a memorandum from the office of the grand vezir dated 28 March H 1299 (1883) indicates that the metric system introduced by the statute of 1869 had still not been generally accepted.[6] In this memorandum tradesmen are given three months to procure the new weights and measures, after which using these will become compulsory.

STATUTE CONCERNING NEW WEIGHTS AND MEASURES AND THEIR IMPLEMENTATION[7]

29 Şevval H 1298 and 11 September 1297 (Rumi solar calendar) and 23 September 1881 (AD)

Article 1: The arşın that is a basis of the new measures to be used in the Ottoman lands is equal to that known as the metre.

Article 2: The new arşın is equal to 10 parmak, 1 parmak to 10 hat, and 1 hat to 10 nokta. The distance of 1000 arşın is a mil, and the distance known as a fersah is equivalent to 10,000 arşın or 10 mil. One fersah is approximately the distance that can be covered in 2 hours.

Article 3: The new dönüm is equivalent to an area of 100 square arşın, or a square of which each side measures 10 arşın. The cerîb is the area of a square of which each side measures 100 arşın, that is 10,000 square arşın or 100 dönüm.

Article 4: The new ölçek for water and other liquids, and grains and other dried provisions is a measure whose width, height and depth are one parmak. One new kile is equivalent to 10 ölçek, 1 ölçek is equivalent to 10 kutu, and 1 kutu to 10 zarf.

Article 5: The new okka is 1000 dirhem. And 1 dirhem is equivalent to 10 denk. And 1 denk is 10 buğday and 1 buğday is 10 habbe. The new batman is 10 okka and 1 kantar is 10 batman and 1 çeki is 10 kantar.

Article 6: The new measures are regarded as going into force at the beginning of March of the year 1880 of the Christian era.

Article 7: As of the beginning of March of the aforementioned year, everyone in the Ottoman lands is obliged to use the new measures, and all the old weights and measures such as the old arşın, endaze, kile and so on will be abandoned completely, and their measuring devices destroyed. The new measuring devices will be manufactured in accordance with examples to be sent to every part of the country.

Article 8: Two tables comparing the new and old measures shall be drawn up to show the proportions of one to the other, and added to this statute.

Article 9: This statute, together with the aforementioned definitions and tables, will be sent to the provinces, and disseminated and publicised by the authorities, and every municipal office will have sufficient examples of both old and new weights and measures, for teaching tradesmen the names and method of use of the new weights and measures.
Conclusion: So that these new weights and measures do not give rise to malpractice, every weight and measuring devices shall be stamped with the sultan's tuğra on one side, and the starting date on the other.

6 - Osman Nuri Ergin, *Mecelle-i Umur-i Belediye*, C.VIII, s. 4308-9. O. N. Ergin explains that the new metric weights and measures did not find general acceptance among the general public. Their acceptance by the authorities was the result of expanding trade relations with Europe in the 19th century, and westernisation trends from the middle of that century. He says that every province of the Ottoman Empire had its separate weights and measures, that even those with the same name had different values; that for example, the unit known as the çeki in Istanbul was different when used for stone and wood, and the batman used in Izmir differed from the same measure as used in Sivas, Konya and Diyarbakır.
7 - Osman Nuri Ergin, *Mecelle-i Umûr-i Belediye*, p. 1976

Table of new measurements

Measurements of length, distance and area		*Liquid and dry measures*	
1 new arşın	= 10 parmak	1 new kile	= 10 ölçek
1 parmak	= 10 hat	1 new ölçek	= 10 kutu
1 hat	= 10 nokta	1 newkutu	= 10 zarf
1 mil	= 1000 arşın	1 new okka	= 1000 dirhem
1 fersah	= 10.000 arşın	1 newdirhem	= 10 denk
1 dönüm	= 100 square arşın	1 new denk	= 10 habbe
1 cerîb	= 10.000 square arşın	1 new buğday	= 10 habbe
		1 new batman	= 10 okka
		1 new kantar	= 10 batman
		1 new çeki	= 10 kantar

Table of old units of measurement

Measurements of length, distance and area		*Liquid and dry measures*	
1 bina or mimar arşın	= 24 parmak	1 keyl-i İstanbul	= 4 şinik
1 parmak	= 12 hat	1 şinik	= 2 kutu
1 hat		1 kıyye	= 400 dirhem
1 çarşı arşını or endaze	= 8 rub	1 dirhem	= 16 kırat
1 rub'	= 2 kirah (?)	1 kantar	= 44 kıyye
1 dönüm	= 1.600 bina arşın	1 çeki	= 4 kantar

Conversion table for old units of measurement

Measurements of length, distance and area	
1 bina and architect's arşın	= 0.758 new arşın
1 çarşı arşın	= 0.68 new arşın
1 endaze	= 0.65 new arşın
1 fersah and saat	= 0.5685 new arşın

Measurements of area	
1 square bina arşın	= 0.574564 new square arşın
1 square çarşı arşın	= 0.4624 new square arşın
1 square endaze	= 0.4225 new square arşın
1 old dönüm	= 0.193024 new dönüm

Weights	
1 old okka	= 1.282945 new okka
1 old dirhem	= 3.207363 new dirhem
1 İstanbul kilesi	= 3.7 new kile
1 old çeki	= 0.225798 new çeki
1 old batman	= 0.769767 new batman

Volume	
1 cubic bina arşın	= 0.435560 cubic new arşın

Conversion table for new units of measurement

Measurements of length, distance and area	
1 new arşın	= 1.319261 bina and architect's arşın
1 new arşın	= 1.470588 çarşı arşın
1 new arşın	= 1.538462 endaze
1 new fersah	= 1.759015 old fersah

Measurements of area	
1 new square arşın	= 1.740450 square bina arşın
1 new square arşın	= 2.162629 square çarşı arşın
1 new square arşın	= 2.366865 square endaze
1 new dönüm	= 0.108778 old dönüm

Kile and weights	
1 new okka	= 0.779457 old okka
1 new dirhem	= 0.311783 old dirhem
1 new kile	= 0.270270 old kile
1 new çeki	= 4.428733 old çeki
1 new batman	= 1.296095 old batman

Volume	
1 cubic new arşın	= 2.296107 cubic old arşın

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 measures 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.

First example: If you wish to know the equivalent of 3251 endaze in arşın, look on the table for the equivalent of the endaze, which is 0.65 arşın, and multiply 3251 by 0.65. The result will be 2113.15 new arşın.

Second example: If you wish to find the equivalent of 983 new arşın in çarşı arşın, look on the table for the equivalent of 1 new arşın in çarşı arşın, which is 1.470588 and multiply this by 983, which will give the result of 1445.59 çarşı arşın. When you convert the decimal value to the fractional units of rub' (one quarter of an arşın) and gerah (half a rub), you will obtain 1445 arşın 4 rub' and 1.4 gerah.

Third example: If 1 endaze of cloth costs 27 kuruş, and you wish to find the price of 1 new arşın of the same cloth, multiply 27 by 1.538462, which is the equivalent of the new arşın in endaze, and you will find that 1 new arşın of cloth costs 41.54 kuruş, that is 41 kuruş and 22 para.

Fourth example: If the area of a room is 187 square endaze, and you wish to know the area in new arşın square, multiply 187 by 0.4225, which makes the area of the room in new arşın square to be 79.0075.

If you wish to express the decimal values of the new arşın square in new parmak square and hatt square, divide the numerals after the decimal point into groups of two, and the first two numerals will give the number of square parmak and the second two numerals the number of square hat. For the example here it is therefore evident that the result is 79 square arşın and 75 square hat.

A similar method can be applied to find the equivalent of the decimal numbers in cubic parmak and cubic hat. In this case divide the numerals after the decimal point into groups of three. For example, if the volume of a cellar is 23.71 cubic arşın, it is possible to express this as 23 cubic arşın and 710 cubic parmak. Because 23.71 cubic arşın means 23 cubic arşın and 71 percent of one cubic arşın or 710 parts in a thousand. Since 1 cubic parmak is a thousandth part of 1 cubic arşın, then it is clear that the fraction in question equals 71 cubic parmak.
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 okka contained in 1 ölçek 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 compare the amounts of liquids measured in the old and new units, it is obvious that these two problems needed to be solved.

Performing such conversions easily depends on knowing how to calculate decimal fractions. Nevertheless, separate tables have been drawn up for the purpose of converting old and new measurements from one to the other, up to for example one thousand units, and it is hoped that these will make it fairly simple for these changes to take effect.[8]
7 Zilkade 1298 of the Hegira and 19 September 1297 of the Rumi calendar

CONCERNING THE DECIMAL SYSTEM
BOA, Y.A.RES 13/19, lef 2

By means of the reform of the current units of measurement and adoption of the decimal system, to go into effect as of March next year, samples of the new weights and measures have been prepared and sent to the provinces, while the standards are kept in the Treasury. The names for the new weights and measures have been chosen so that the people will find them easy to use.

Evzân ve ekyâl-i mevcûdenin tanzîm ve tensîki ile usûl-i u'şâriyenin kabûl ve ittihâzı hakkında olan kararın hangi tarihden itibâren mecbûriyyü'l-icrâ olması münâsib olacağının bi'l-müzâkere arz ve istîzâm şeref-sâdır olan irâde-i isâbet âde-i cenâb-ı padişahi iktizâ-yı âlîsinden bulunmakla ol bâbda Şûrâ-yı Devlet'den tanzîm olunan mazbata Meclis-i âcizânemizde mutâla'a ve îcâb edenlerle dahi müzâkere olundu. Arz ve beyândan müstağnî olduğu üzere karâr-ı mezkûrun icrâsı tashîh-i mu'âmelât için pek lüzûm olduğu hâlde mikyâsât-ı cedîde esâmîsinin lisân-ı halkda ötedenberi yerleşmiş olan ta'bîrâta muğâyereti eşkâl [...] sebebiyet vermiş olmasıyla halkın alıştığı yolda tayin-i esâmî edilmesi tesâdüf edilen müşkilâtı tehvîn ve teshîl edeceğinden mikyâsât-ı cedîde için o yolda isimler vaz' ve ta'yîni ile tanzîm edilen pusula leffen ve evrâk-ı sâ'iresiyle me'an arz ve takdîm kılındı. Bu karârın zamân-ı icrâsı ile mikyâsât-ı cedîdenin umûmen ve def'aten veyahut bir kısmının şimdiden ve akşâm-ı sâ'iresinin dahi tedrîcen mevki'-i icrâya konulması bahsine gelince karâr-ı mezkûr bir hayli vakitden beri beyne'l-halk münteşir olmasına ve esâmî-i cedîde dahi hüsn-i telakkîyi müstelzim olacağına binâ'en bir müddet ta'yîniyle i'lân olunarak müddet-i mezkûrenin hulûlünde umûmen mevki'-i icrâya konulması ve târîh-i mîlâdînin sene-i âtiye Mart'ının mebde'-i icrâât ittihâz edilmesi tensîb olunmuş ve mukaddemâ tanzîm ve i'mâl ettirilen mikyâsât-ı cedîde nümûneleri vilâyetlere gönderilip mi'yârı dahi Hazîne-i Hümâyûn'da mahfûz bulunmuş olduğundan bunlar Tophane müşîriyetince bir kere daha tatbîk olunarak sıhhati hâlinde hemen dağıtılması ve muhtâc-ı tashîh ise müddet-i mu'ayyenesi zarfında ıslâh ve ikmâl edilmesi lâzım geleceği muhât-ı ilm-i âlî buyuruldukda ol bâbda ve kâtibe-i ahvâlde emr u fermân hazret-i veliyyü'l-emr efendimizindir.

27 Şevval [12]98 / 9 Eylül [12]97.

Ali Saîb	Ahmed Cevdet	Server	Mehmed Asım	Hasan Hüsnü
Osman Nuri	Mahmud Nedim	AhmedEsad	Sad	Raif
Vehbi	Hasan Fehmi	Ahmed Münir	Kamil	

Aslına mutâbıkdır
Ali Rıza

8 - The tables mentioned here were drawn up and printed as the book. But because most tradesmen and members of the public did not know how to convert decimal fractions, this book was of limited use. When this was realised, the decimal fractions in the tables were converted into fractional units, and those that were insignificant in commercial transactions were abandoned, resulting in a manual that could be conveniently used by everyone. A copy of this manual is given on page 202 of the second appendix of the Eski Düstür. The same tables and the Statute of Weights were translated into Arabic, French, Armenian and Greek. In short, at that time the government attached great importance to the question of weights and measures, yet the desired results were not obtained.

﴿ فی ٢٩ شوال سنه ١٢٩٨ و فی ١١ ایلول سنه ١٢٩٧ ﴾
﴿ تاریخیله شرفمتعلق بیوریلان ارادهٔ سنیهٔ حضرت ﴾
﴿ پادشاهی موجبنجه یکی اولچولرك تنظیم وتطبیقیله ﴾
﴿ صور اجرائیه‌سی حقنده قرارنامه در ﴾

﴿ برنجی ماده ﴾ ممالك عثمانیه‌ده قوللانیله‌جق یکی اولچولره اساس اتخاذ اولنان ارشون (مترو) دنیلان اولچو بیوکلکنده در .

﴿ ایکنجی ماده ﴾ یکی (ارشون) اون کراهدر و بر (کراه) اون پارمقدر و بر (پارمق) اون خطدر و بر (خط) اون (نقطه) در بیك ارشون طولنده اولان مسافه‌یه (میل) و اون بیك ارشون ویاخود اون میل طولنده اولان مسافه‌یه (فرسخ) تعبیر اولنور برفرسخ تقریباً ایکی ساعت عادی مسافه در .

﴿ اوچنجی ماده ﴾ یکی (اولك) هر طرفی اون ارشون بوینده درت کوشه اولمق اوزره یوز ارشون مربع محلدن عبارتدر یکی (دونم) هر طرفی اللیشر ارشون بوینده درت کوشه اولمق اوزره ایکی بیك بشیوز ارشون

(٣)

مربع محلدن عبارتدر و بر (جریب) هر طرفی یوزر ارشون بوینده درت کوشه اولمق اوزره اون بیك ارشون مربع محلدن و بر جریب درت دونمدن عبارتدر .

﴿ دردنجی ماده ﴾ یکی (اولچك) صو واتك کبی شیلرله ارزاق وحبوبات اولچمك ایچون اکی بوبی و دردلکی بر یکی ارشون کراهی بیوکلکندن عبارت براولچودر بر یکی (کیله) اون شینك و بر (شینك) اون اولچك و بر (اولچك) اون قوطی و بر (قوطی) اون (ظرف) در .

﴿ بشنجی ماده ﴾ یکی (اوقه) بیك درهمدر و بر (درهم) اون دنکدر و بر (دنك) اون بغدایدر و بر (بغدای) اون (حبه) در یکی (بطمان) اون اوقه‌در و بر (قنطار) اون بطماندر و بر (چکی) اون قنطاردر .

﴿ آلتنجی ماده ﴾ بیك ایکی یوز طقسان طقوز سنهٔ هجریه‌سنی قمریه‌سی ربیع الآخرینك یکرمی ایکنجی کوننه مصادف بیك ایکی یوز آلتمش سنهٔ هجریهٔ شمسیه و بیك سکز یوز سکسان ایکی سنهٔ میلادیهٔ رومیه‌سنك مارتی ابتداسی مبدأ اجراآت اتخاذ اولنه‌جقدر .

﴿ یدنجی ماده ﴾ مبدأ اتخاذ اولنان سنهٔ مرقومه مارتی ابتداسندن اعتباراً ممالك عثمانیه‌ده هرکس یکی اولچولری قوللانمغه مجبور اولوب اسکی ارشون و اندازه و کیله‌لر و سائر مختلف نسنه‌ده بولنانلر بالجمله مقیاسات و اوزان عتیقه کلیاً ترك وامحا اولنه‌جق و یکی اولچولر هر طرفه کوندریلان نمونه‌لره توفیقاً اعمال ایدیله‌جکدر .

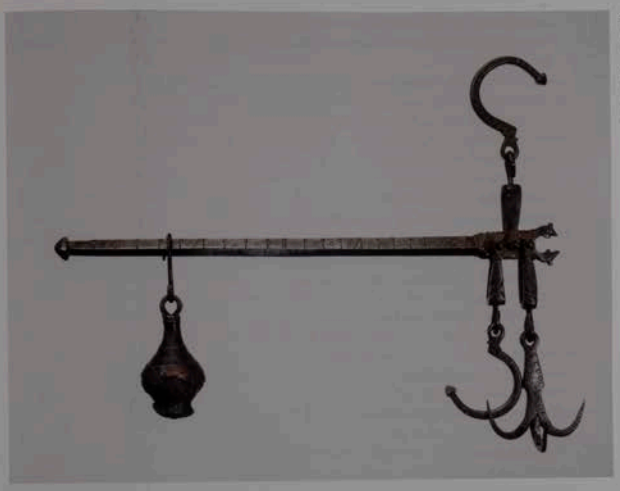
﴿ سکزنجی ماده ﴾ مقیاسات جدیده ایله مقیاسات عتیقه‌یی ارائه ایدر

STATUTE CONCERNING THE METRIC SYSTEM
The Ottoman Turkish statute concerning the metric system dated H 1298 (1880) published at the Imperial Foundry of Tophane in Rebiyülevvel 1299. Garo Kürkman archive.

ASSAY CHARGES FOR OLD WEIGHTS[9]

Assay stamp charge		*Annual inspection stamp charge*		
Para	Kuruş	Para	Kuruş	
-	1	20	1	old brass kıyye (400 dirhem) weight in one piece
20	-	30	-	for each additional old kıyye for weights larger than one old kıyye
30	-	-	1	100 and 200 old dirhem weights made of brass, and 50, 25, 20 and 12.5 dirhem weights made of brass
15	-	20	-	50, 25, 20 and 12.5 old dirhem weights made of brass
5	-	10	-	weights of 10 dirhem and less made of brass
	1	-	1	single piece old kıyye (400 dirhem) weights made of iron and those of heavier denominations
30	-	30	-	100 and 200 dirhem weights made of iron
20	-	20	-	weights of 50 dirhem or less made of iron
30	-	30	-	liquid measuring containers with a capacity of 1 old kıyye (1 ölçek)
20	-	20	-	liquid measuring containers with a capacity of 100 and 200 dirhem (2 kutu and 1/2 ölçek)
10	-	10	-	liquid measuring containers with a capacity of 50 dirhem (1 kutu), half a kutu and two zarf
3	-	-	-	all kinds of other measuring containers per kıyye
-	-	3	-	steelyard, for every kıyye up to 100 kıyye
-	-	2	-	steelyard, for 100 kıyye to 200 kıyye, after charging as above for the first 100 kıyye
-	-	-	10	steelyard, for every kıyye over 200 kıyye
-	1	-	1	for all kinds of measuring rules and rods
10	-	10	-	for every grain measuring container

9 - Osman Nuri Ergin, *Mecelle-i Umûr-i Belediye*, p. 1981; 'Official correspondence concerning the introduction of the new weights and measures, and the abrogation of the old have been given in the first volume. In this respect let me say here that in a memorandum written by the grand vezirs's office and dated 13 Kânûn-ı sânî 1313/1898, it writes: "Although some considerable time has passed since the old weights were replaced by the new, the public house as yet shown no sign of becoming accustomed to them, and particularly since tradesmen and merchants use both the old and the new weights, they put purchasers at the financial disadvantage.' The memorandum goes on to say that until a decision is taken on this matter, since the old weights have been accepted, until the aforementioned resolution has been taken to prevent malpractice as before, for the present tradesmen are forbidden to use the new weights in their possession, and a royal edict has been issued on this subject. Since a definite decision has not yet been reached, both the old and new weights are still being used. For this reason the old weights were taken to the Weights Office to be stamped at charges laid down in this price list, while for the new weights the prices given on page 427 of the Code are being applied.'



STEELYARD
Ottoman,
17th-18th
century
l: 325 mm
KMA 670
(cat. 216)

STEELYARD TAX RECEIPT AND ASSAY CERTIFICATE
Private collection
and Cem Mahruki
archive.

CONCERNING THE ADMINISTRATION OF STEELYARD TAX, ITS COLLECTION, AND THE DUTIES OF OFFICIALS[10]

Article 1: Steelyard 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 steelyard tax has been placed in the hands of the Municipal Tax Office, and for this purpose a chief clerk and sufficient clerks, a cashier and several stamp officials shall be employed. They are responsible for the good management and collection of the tax in question, for organising 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 Steelyard 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 act 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 unmarried and literate, and people whose circumstances and behaviour 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 revenues for the district 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 claim in this respect.

Article 6: All the steelyard officials and clerks and weighmasters must have reliable surety of at least 20,000 kuruş, and the surety documents shall be kept at the accounts office of the Municipality.

Article 7: No steelyard officer, clerk or weighmaster may be employed under any circumstances without surety, and those who have stood surety on their behalf shall be checked under the Surety Regulations every six months to see if their financial situation or standing has diminished, or if they have died. If such should occur, surety must be renewed within a week at most, and if those employed cannot obtain the necessary surety 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 Steelyard Office are absolutely prohibited from consuming any kind of alcoholic drink during the daytime, 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 steelyard officer, 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 main office immediately; and since they will only continue to be employed on this condition, this measure well prevent them resorting to means of postponing their transfer. Any who cause difficulties in this respect shall be immediately dismissed.

10 - Osman Nuri Ergin, *Mecelle-i Umûr-ı Belediye*, p. 1982: 'Since the Steelyard Office has been placed under the auspices of the Weights Office, it has undergone many changes. At first it was contracted out, but later placed under provisional management. After the reforms The Steelyard Office and Directorate were abolished and the steelyard officials divided between the other offices. This state of affairs continued until the year H 1329, when a Steelyard and Slaughter Tax Directorate was set up at the Weights 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 taxes and the carrying out of procedures.

Article 11: All weighmasters at Köprübaşı, Yenikapı and Üsküdar shall commence work one hour before sunrise, and those at other centres and offices a quarter hour before sunrise, and continue on duty until nine o'clock [old 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 when on duty.

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 offices of the centre to which they are attached and by their seniors. 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 Weights Office.

Article 15: Weighmasters are obliged to adjust their steelyards every morning using the stone kept in the office, and for those whose places of work are too distant for this to be possible shall adjust their steelyards every Sunday. These stones must themselves be adjusted at the Weights Office at the beginning of every month.

Article 16: If it be discovered that the weighmasters have hung the counterpoise belonging to the large steelyard onto the small, and that belonging to the small steelyard onto the large, they shall be dismissed immediately, made to pay the damages incurred as a result, and penalised by law.

Article 17: If it be proved that the weighmasters have reported the weight of goods to be less or more than the actual weights, or reached agreement to such effect with the owner of the goods or the customer, they shall be dismissed immediately and penalised 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 annoys 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: Steelyard officials and clerks and weighmasters are absolutely forbidden to engage in trade in all provisions and goods regarded as essential needs of the country, or to be in open or secret partnership with merchants and tradesmen trading in such commodities, and any who do so shall be immediately dismissed and legal proceedings taken against them.

Article 20: The employment of trainees as officials, clerks or weighmasters of any grade in the Steelyard 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

accounts office of the Municipality.

Article 23: 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 Rumi calendar, and shall use these to imprint the back of the official stamps, together with the name of the month.

Article 24: Full records shall be kept of these stamps and revenues at the main office of the Steelyard Authority, and the officials and clerks to whom the stamps are issued every day shall be held to account for them.

Article 25: The officials at the central offices will supply the weighmasters with stamps against signature, and check the number used and the number remaining every evening, and make sure that the clerks working under them record the quantity received and used.

Article 26: 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 27: Every day at eight o'clock [four hours before sunset] 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 supplied to the office, and both revenues and stamps separately recorded in special registers. Following this the same information shall be written in the daily report book, and both registers and book sealed by the officers and clerks, and the first and second grade weighmasters, and that day's takings together with the remaining stamps, registers and daybooks sent to the main office by seven o'clock the following day. At the main office the chief clerk and cashier shall compare the registers and day book with one another, stamp them and tear out that day's page from the day book to keep, returning the registers and stub, 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 marked with the daily takings and signed, then given to the accountant of the Weights Office, who hands over the takings to the cashier.

Article 28: At the end of every month the chief clerk shall draw up two summaries, one for revenues and the other for the unused stamps which have been returned. These shall be submitted to the accountant of the Weights Office who shall compare this with the sheets torn 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 29: 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 a line should merely be drawn through it such that the writing remains legible, and the correct version written beside it. Any employees who fail to comply with this requirement will be held responsible for the consequences.

Article 30: The sum of 5 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]

11 - [original footnote] Instructions to this effect were drawn up by the Council of State in the year H 1310, and after being examined by the Weights Office Board were endorsed and put into effect. The provisions of this document are still in effect and a copy has been included in the Civil 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 reason whatsoever.

Article 32: Every three months the monies paid into and out of the fund shall be calculated by the central office at the municipality 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 revenues, one of the chief collectors of weighing charges, and one of the first grade inspectors. The literate shall be evaluated according to their degree of competence and merit, and employed for the services as laid down in the new table. Those who are illiterate 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 in 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 95.[12]

5 para	40 para	80 para
10 para	50 para	90 para
20 para	60 para	100 para
30 para	70 para	200 para

Steelyard tax receipt for 40 para.
93 x 81 mm.
Some of the legends on the receipt are in Greek.
J. C. Hinrichs archive.

Steelyard tax receipt for 2 kuruş.
96 x 74 mm.
The charge was for weighing 145 kıyye (kg) of pine resin on 1 Teşrin-i Sani [12]97.
J. C. Hinrichs archive.

12 - Eski Düstur, vol. 4, p. 598.

Steelyard tax receipt for 50 para.
94x69 mm
J. C. Hinrichs archive.

Steelyard tax municipal stamp for 5 kuruş.
On it is imprinted the stub number 6 volume 6579.
51x42 mm
J. C. Hinrichs archive.

Steelyard tax stamp for 20 para
(adhesive on the reverse).
38x31 mm
J. C. Hinrichs archive.

Steelyard tax receipt for 20 para
(adhesive on the reverse).
It bears the words 'kantar rüsumatı' (steelyard tax)
in Ottoman, French and Armenian.
21x29 mm.
J. C. Hinrichs archive.

Steelyard tax stamp for 50 para. 43x39 mm.
J. C. Hinrichs archive.

Steelyard tax stamp for 60 para. 61x30 mm.
J. C. Hinrichs archive.

DOCUMENT CONCERNING STEELYARD TAX RATES FOR DIFFERENT COMMODITIES[13]

Article 1: All types of fat, vegetables and fruit, cured meat, pasta, noodles, cheese, caviar, coffee, sugar, rice, candle wax, tobacco, waterpipe tobacco, snuff, all medical items, tea, nuts, rush baskets, silk and similar commodities shall be charged for weighing at the rate of 5 para in total from 1 kıyye up to 6 kıyye 100 dirhem, and at 10 para up to 12.5 kıyye. And up to 18 kıyye 300 dirhem at 15 para, and up to 25 kıyye at 20 para in total. In short for every increase of 6 kıyye 100 dirhem, an additional 5 para is charged, without any proportional increase within each weight bracket.

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

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

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

13 - Osman Nuri Ergin, *Mecelle-i Umûr-i Belediye*, p. 1988

MEMORANDUM CONCERNING THE THREE-MONTH GRACE PERIOD GRANTED TO TRADESMEN WHO HAVE STILL NOT OBTAINED THE NEW WEIGHTS, AND THE OBLIGATION TO USE THE NEW WEIGHTS AND MEASURES IN ISTANBUL AT THE END OF THIS PERIOD[14]

28 March 1299 (1883)

Although municipalities were ordered to stamp new weights as of the year H 1300 (1884), since old weights were meanwhile still being assayed and stamped, it became apparent that if this situation continued it would be 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 ñotified the municipalities accordingly. A memorandum and appendices and a petition on the subject presented by the greengrocers were subsequently sent by the municipality, and debated by the Cabinet of Ministers.

This memorandum stated that it was inadvisable on several counts to prohibit the old weights and measures of a sudden, 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 protect the general public it was proposed 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 foundrymen and scale makers had suffered considerable losses, and that although purchasers in Serbia, Romania and Bulgarian had been found for the old weights and scales that they could now no longer sell at home, these shipments were being delayed by the customs, 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 standardise the different weights and measures in use in the Ottoman lands, and prevent the general public being cheated and defrauded, and thereby ensure that commerce be well regulated, permission should be given for the old weights to be stamped throughout the provinces and partially in Istanbul; that the system which had been resolved upon should not remain without conclusion indefinitely (and so avoid the general public being disadvantaged by measures such as the çeki that they could 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 since this was one of the duties of the municipality, permission should be provisionally given for tradesmen who had not as yet obtained the new weights to use these for a period of three months, after which it would be obligatory for all tradesmen in Istanbul to use the new weights and measures, and if after the specified period old weights should be found in any shops, these should be seized; that obstacles in the way of scale makers and metal founders

14 - Osman Nuri Ergin, *Mecelle-i Umûr-i Belediye*, İstanbul 1995, p. 4308: From the General Municipal Code: 'Since our relations with Europe became closer, and particularly since the Reforms [of 1839], among the many innovations introduced in imitation of the western countries was the metric system of weights and measures, for which laws, regulations, instructions and lists of rates which were drawn up can be found on pages 417 to 444 of the second volume. Like other beneficial institutions, this could not be fully implemented, as evident from correspondence given here, and the continuing use today of all kinds of weights and measures.

For failure to implement these laws and regulations means that in the Ottoman Empire today:

Units of length: Metre, yarda, endaze, mimar arşın, çarşı arşın, kadem (foot), pus, mil-i bahri (nautical mile), mil-i berri (land mile), fersah.

Units of weight: Okka, kilo, batman, kantar, çeki and other diverse units are in current use, as they are for volume and area.

The diversity of weights and measures, the difficulties in converting one to another, and particularly the disadvantages suffered by women and those who do not understand the difference when shopping is evident, and I see no need to say more on this subject here. Indeed, the unit of measurement bearing the same name may have different meanings and quantities from one place to another. For example, the İstanbul çeki varies according to whether the load be stone or firewood, and the kantar and batman have different values in every region. For example, the batman used in İzmir, Sivas, Konya and Diyarbakır all refer to different weights.

One of the reasons for establishing municipalities has been to standardise weights and measures, and so protect the general public from being deceived, but as of yet this has not been achieved. During the Great War the government achieved such reforms as standardising the coinage, introducing the western calendar, and western system of measuring time. It is to be hoped that this reform too will succeed.'

exporting their stocks of old weights and scales to countries outside the Ottoman Empire, such as Serbia, Romania and Bulgaria should be lifted, and the Department of Customs notified accordingly, and that the necessary preparations be made for introducing and manufacturing new weights and measures, so that tradesmen and others could not take advantage of the situation to cause losses to the general public, and that the office of the grand vezir notify the municipality accordingly.

Although an attempt was made to introduce the metric system during the reign of Sultan Abdulaziz [1870], it only proved possible to implement this during the reign of Sultan Abdülhamid [after 1883]. Meanwhile, however, disputes errors and fraudulence arising from sales of commodities by the kilo instead of the okka, resulted in the restoration 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.[15] 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 (H 1313/1896). By the time the Turkish Republic was established [1923] the standardisation of weights and measures had still not been achieved. An act was promulgated on 26 March 1931, and the new system went into force from 1934.

MEMORANDUM CONCERNING THE PROVISIONAL PROHIBITION OF THE NEW WEIGHTS[16]

13 Kânun-ı evvel 1313 (1896)

It was explained that due to the conversion of old to new weights, some women and the general public were disadvantaged, and many complaints were received to the effect 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 than at 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 got 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 unfair advantage. Then it was decided that to prevent such situations, in accordance with commands and decrees issued by the sultan, until Ramazan and the public holiday following were over, the old weights should be regarded as in force, and tradesmen provisionally forbidden from using the new weights so as not to give rise to malpractice. Therefore a government memorandum dated 30 Şaban H 1315 declaring this situation was issued and an imperial command promulgated, and the Ministry of Interior ordered that the necessary steps be taken.

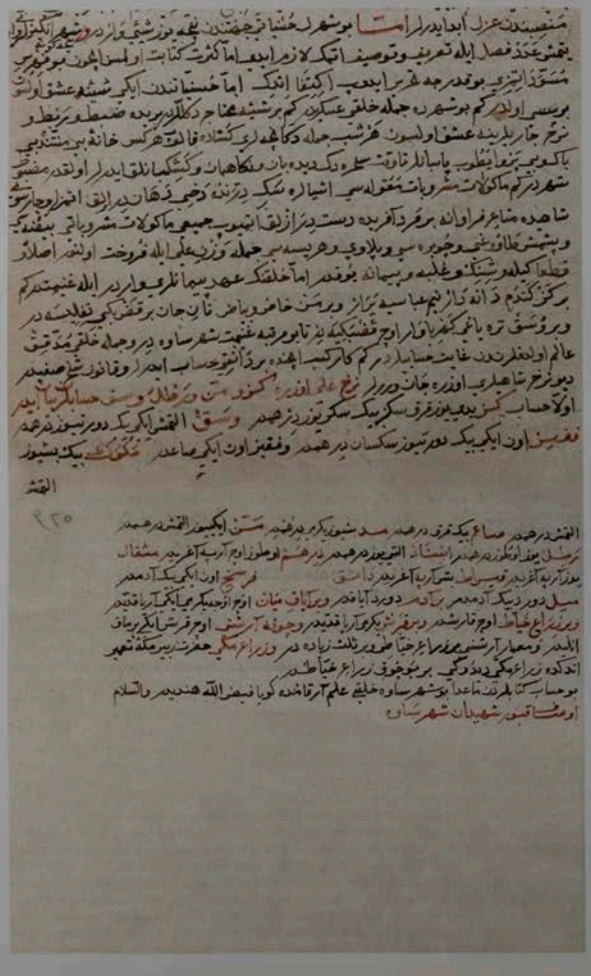
Under the provisional memorandum the dirhem, okka and şinik were reinstated, to the relief of the public and tradesmen. The use of old weights and measures continued for some years after the founding of the Turkish Republic. The law concerning weights and measures was promulgated on 26 March 1931, and under its provisions the metric system was introduced on 1 Kânun-i Sani 1934.[17]

15 - Ergin, *Mecelle-i Umur-i Belediye*, pp. 4310-11.

16 - Osman Nuri Ergin, *Mecelle-i Umur-i Belediye*, p. 4311

17 - [original footnote] 'After the Ramazan bayram, that is one month after this command was issued, the commission was set up in accordance with the sultan's edict, but I have not come across any evidence as to whether any concrete steps were taken regarding the introduction of the metric system, which has failed to make satisfactory progress over the past 28 years. Since today tradesmen use every kind of weight without restriction, it can be concluded that no decision has been taken. In the year 1333 [1915] the Municipal Technical Committee drew up the report on the subject of this confusion and correspondence, and proposed a reform too resolve the situation which was presented to the government, but so far no steps have been taken. Since the year 1285 [1869] no decisions have been taken with respect to reducing high prices, preventing blackmarketeering and thus protecting the public, and this matter is at present one of the most urgently in need of resolution.'

UNITS OF WEIGHT AS DESCRIBED BY EVLIYA ÇELEBI IN THE 17TH CENTURY



Description of the ancient city of Sâvî, which was built for the second time by Nûh Necî and then rebuilt by the great hero Şah Gave, that is the splendid city of Save[18]

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, nightwatchmen keep watch and guard until dawn. This city is so safe that even fierce dogs do not reach out their mouths to food and drink. No one lays hands on the property of another in the great bazaars. All food and drink, eggs, cooked chicken, soup, pilaf and herise is sold by weight. Here the kile, şinik, ulbe [crate, barrel] and peymane [Iranian unit of volume] are never used. The word of the people is trusted. There is such abundance here that one gez of wheat costs half an abbasiye, and one menn of pure white bread costs one Tblisi kazbeki. Since all the people are sharp witted they are extremely thrifty, counting even a dangı in the course of their business and earnings. They would give their lives for their prices fixed by law known as the Law of Sheikh Safi.

The values of the gez, menn, ritl [ratl] and vask according to the regulations:
First of all the gez is 748,800 dirhem.
The vask is 62,400 dirhem.
The kafiz is 12,480 dirhem, or 12 sa'.
The mekkuk is 1560 dirhem.
The sa' is 1040 dirhem.
The müd is 520 dirhem.
The menn is 260 dirhem.
The ritl [ratl] is 130 dirhem.
The istâz is 600 dirhem.
The dirhem is the weight of 33 barley grains.
The miskal is the weight of 100 barley grains.
The kîrât is the weight of 5 barley grains.
The dânk is ... [three words missing].
The fersah is 12,000 strides.
The mîl is 4000 strides.
1 stride is 4 feet.
1 foot is the length of 22 barley grains placed end to end.
1 terzi zira is 3 karış.
1 karış is 20 barley grains lengthwise.
The çuka arşın is 3 karış and 2 parmak.
The mimar arşın is one quarter larger than 1 terzi zira.
The Mecca zira is the length of the rod used by the Lord Zübeyr when repairing Mecca.

All the villages and all the treasury purses and dirhem and danuk and vukiyye and barley weight and wheat weight and miskal of Egypt[19]
Every kise [purse] is 846 kuruş.
The kuruş is 30 para.
Every kise is 28,000 para.
Every para is 1 dank.
1 dank weighs 10 barley grains.
4 dank makes 1 dirhem.
1 dirhem weighs 1 full barley [perhaps an ear is what is meant here].
1 miskal weighs 100 wheat grains.
Accordingly one Egyptian kese weighs ... [missing word] okka.

18 - *Evliyâ Çelebi Seyahatnâmesi, TSM, Bağdat 305 numaralı yazma, 4*, ed. Yücel Dağlı, Seyit Ali Kahraman, İstanbul 2001, p. 232.
19 - *Evliya Çelebi Seyahatnamesi, Mısır, Sudan, Habeş (1672-1680)*, (vol.10), 1944, p. 413.

UNITS OF LENGTH IN EVLIYA ÇELEBI

Egypt's astrology, astronomy and the science of the astrolabe reveal the climes, 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.[20]

First of all, in accordance with the words of the old philosophers, 'Regard the acts 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 into possession of the secrets of the world, and wrote that it is 356 mil 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 6400 mil. Ibnülverdi said in his Cezîre that Ptolemy has ruled the circumference of the earth to be 20,160 mil, or 80,000 fersah.

Every mil is 3000 Mecca zira.

Each of these zira is 3 şibr (karış).

Each şibr is 12 ısba' (parmak).

Each ısba' is the length of 5 barley grains.

And if the width of the nahn [the meaning of nahn is not known] is 7636 mil that is 2545 fersah and one third of a fersah.

The entire world is 132,600 times a thousand and six hundred thousand mil and 288 fersah. However these written opinions are the true conclusions of the rulers Bukrat, Sokrat, and the Philosopher and Feylekus. Since they had learnt all the branches of knowledge and science they wrote with the certainty of knowledge. At that time, without travelling 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 Padra and Kolon [Christopher Columbus] that the world is 87,000 mil.

Each mil is 4000 zirâ-ı esved [54.04 cm].

Each zirâ is 24 parmak.

1 mil is 4000 strides. Walking slowly this makes a distance of ... [missing word] hours.

1 fersah is 12 steps.[21]

These islands and the world in which we are now is 87,000 mil, according to the writings of geometricians and astronomers.

But what they call a mil is 4000 zirâ in zirâ-ı esved.

Every zirâ is 24 parmak.

Every zirâ is 3 şibr.

Every şibr is 12 ısba and 5 şair [barley grains], as they calculate the mil at the land registry of Rhodes, and according to which they calculate all the islands.

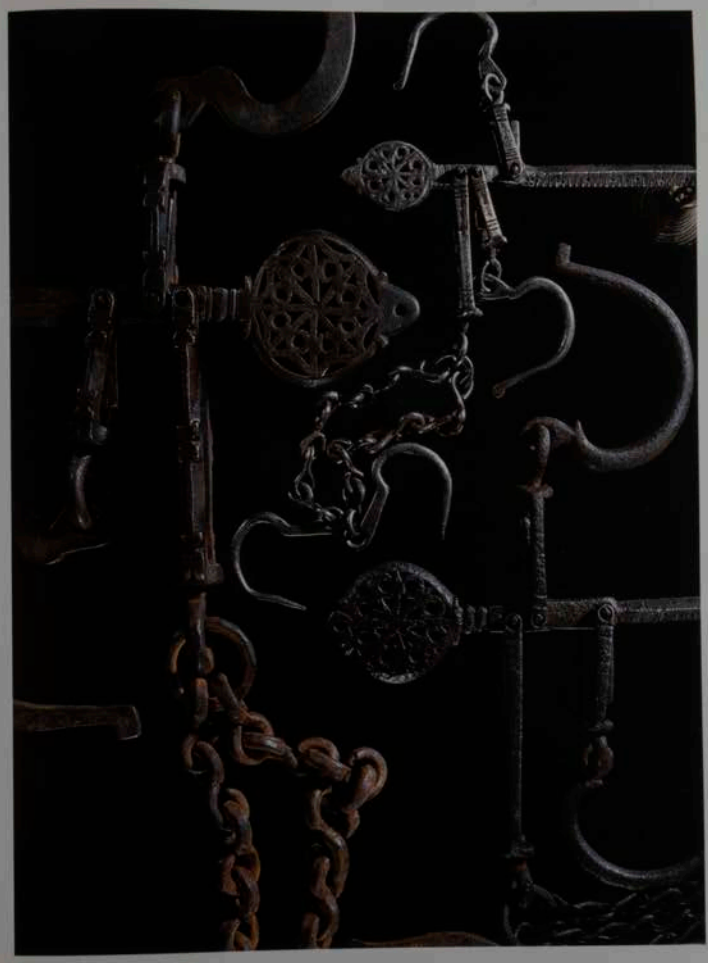
This humble servant [Evliya Çelebi] has travelled the islands, and as far as it is in his power has recorded the calculations in mil according to the records of this land registry.[22]

20 - *Evliya Çelebi Seyahatnamesi, Mısır, Sudan, Habeş (1672-1680)*, p. 535
21 - *Evliya Çelebi Seyahatnamesi, Mısır, Sudan, Habeş (1672-1680)*, p. 538
22 - *Evliya Çelebi Seyahatnamesi*, (vol. 9), p. 1935, p. 256.

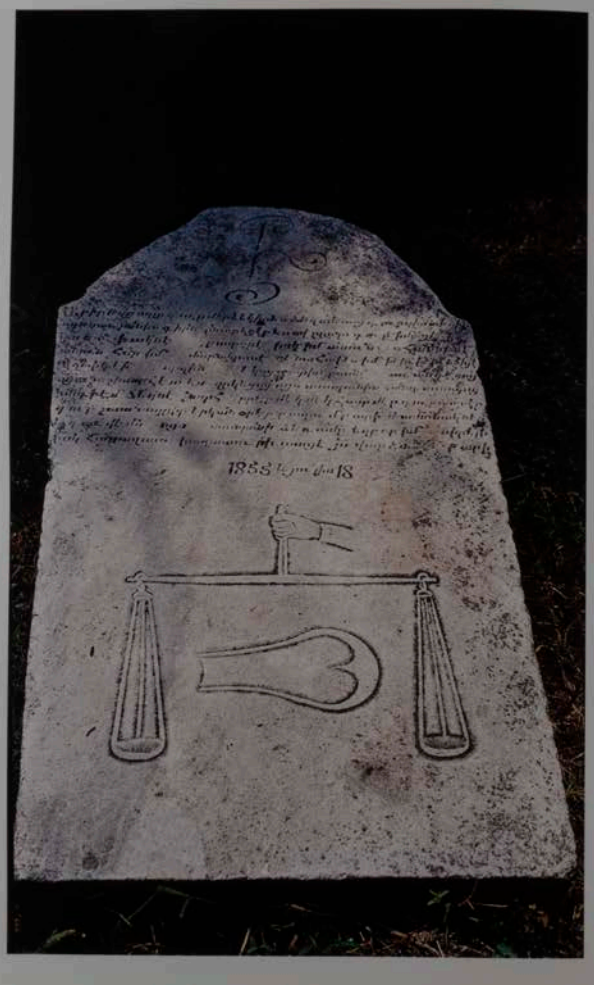
MARKET PLACE AT AN ARMY ENCAMPMENT
A miniature from *Nusretname*
TSM, H 1365, fol. 93r.

10 DIRHEM WEIGHT
Dated [1]927 and
stamped Ankara
Brass, 34,096 gr
2,3x2,3x2,3 mm
h: 10 mm
Private collection.

2 KILOGRAM WEIGHT
Ottoman
Late 19th century
1976 gr. ø top 97,5 mm,
ø bottom 105,5 mm. h: 44 mm
Private collection.



TOMBSTONES IN THE ARMENIAN CEMETERY AT EDİRNEKAPI



Marble tombstone belonging to the tobacco merchant Hovhannes, son of Mardiros of Egin, who died on 18 July 1855.

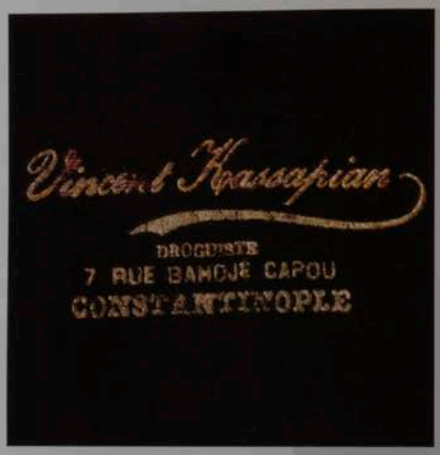
This 18th century marble tombstone is thought to belong to a tailor, because of the shears and endaze rule carved on the stone.

Marble tombstone belonging to Hacı Agop, a muslin maker from Kayseri who died on 3 Rebiyülahir H 1252 (1836). An endaze rule and coin counting board are carved on the stone.

OTTOMAN SULTANS AND THEIR REIGNS

	Sultan	*Dates of birth and death*	*Father's name*	*Reign*		
					Christian era	*Islamic era*
01	Osman	1258 - 1326	Ertuğrul		1299 - 1324	699 - 729
02	Orhan	1288 - 1360	Osman		1324 - 1362	724 - 763
03	Murad I (Hüdavendigar)	1326 - 1389	Orhan		1362 - 1389	763 - 791
04	Bayezid I	1360 - 1403	Murad I		1389 - 1402	791 - 804
	Interregnum				1402 - 1413	804 - 816
05a	Emir Süleyman	1377 - 17.2.1411	Bayezid I		1402 - 1411	805 - 813
05b	Mehmed Çelebi	1387 - 26.5.1421	Bayezid I		1403 - 1413	806 - 816
05c	Musa Çelebi		Bayezid I		1411 - 1413	813 - 816
05d	Mustafa Çelebi		Bayezid I		1419 - 1422	822 - 825
05e	Mustafa		Bayezid I		1423	826
05	Mehmed (Çelebi)	1387 - 26.5.1421	Bayezid I		1413 - 1421	816 - 824
06	Murad II	6.1404 - 3.2.1451	Mehmed	First reign	1421 - 1444	824 - 848
				Second reign	1445 - 1451	849 - 855
07	Mehmed II	30.3.1432 - 9.1446	Murad	First reign	1444 - 1445	848 - 849
				Second reign	1451 - 1481	855 - 886
	Cem Sultan		Mehmed II		28.5 - 19.6.1481	886
08	Bayezid II	1.1448 - 24.4.1512	Mehmed II		1481 - 1512	886 - 918
09	Selim I	1470 - 22.9.1520	Bayezid II		1512 - 1520	918 - 926
10	Süleyman I	6.11.1494 - 7.9.1566	Selim I		1520 - 1566	926 - 974
11	Selim II	30.5.1524 - 15.12.1574	Süleyman I		1566 - 1574	974 - 982
12	Murad III	4.7.1546 - 16.1.1595	Selim II		1574 - 1595	982 - 1003
13	Mehmed III	26.5.1566 - 20.12.1603	Murad III		1595 - 1603	1003 - 1012
14	Ahmed I	18.4.1590 - 22.11.1617	Mehmed III		1603 - 1617	1012 - 1026
15	Mustafa I	1592 - 20.1.1639	Mehmed III	First reign	1617 - 1618	1026 - 1027
				Second reign	1622 - 1623	1031 - 1032
16	Osman II	3.11.1604 - 20.5.1622	Ahmed I		1618 - 1622	1027 - 1031
17	Murad IV	27.7.1612 - 9.2.1640	Ahmed I		1623 - 1640	1032 - 1049
18	İbrahim	4.11.1615 - 18.8.1648	Ahmed I		1640 - 1648	1049 - 1058
19	Mehmed IV	2.1.1642 - 6.1.1693	İbrahim		1648 - 1687	1058 - 1099
20	Süleyman II	15.4.1642 - 22.6.1691	İbrahim		1687 - 1691	1099 - 1102
21	Ahmed II	25.2.1643 - 6.2.1695	İbrahim		1691 - 1695	1102 - 1106
22	Mustafa II	3.6.1664 - 29.12.1703	Mehmed IV		1695 - 1703	1106 - 1115
23	Ahmed III	31.12.1673 - 1.7.1736	Mehmed IV		1703 - 1730	1115 - 1143
24	Mahmud I	2.8.1696 - 13.12.1754	Mustafa II		1730 - 1754	1143 - 1168
25	Osman III	2.1.1699 - 30.10.1757	Mustafa II		1754 - 1757	1168 - 1171
26	Mustafa III	28.1.1717 - 21.1.1774	Ahmed III		1757 - 1774	1171 - 1187
27	Abdülhamid I	20.3.1725 - 7.4.1789	Ahmed III		1774 - 1789	1187 - 1203
28	Selim III	24.12.1761 - 28.7.1808	Mustafa III		1789 - 1807	1203 - 1222
29	Mustafa IV	8.9.1779 - 16.11.1808	Abdülhamid I		1807 - 1808	1222 - 1223
30	Mahmud II	20.7.1785 - 1.7.1839	Abdülhamid I		1808 - 1839	1223 - 1255
31	Abdülmecid	25.4.1823 - 25.6.1861	Mahmud II		1839 - 1861	1255 - 1277
32	Abdülaziz	8.2.1830 - 4.6.1876	Mahmud II		1861 - 1876	1277 - 1293
33	Murad V	21.9.1840 - 29.8.1904	Abdülmecid		30.5 - 31.8.1876	6 Ca - 10 Ş.1293
34	Abdülhamid II	21.9.1842 - 10.2.1918	Abdülmecid		1876 - 1909	1293 - 1327
35	Mehmed V (Reşad)	2.11.1844 - 3.7.1918	Abdülmecid		1909 - 1918	1327 - 1336
36	Mehmed VI (Vahideddin)	2.2.1861 - 16.5.1926	Abdülmecid		1918 - 1922	1336 - 1341

BALANCE MAKERS IN PROCESSION
A miniature from *Surname-i Hümayun* (detail), TSM, H 1344, fol. 275r.

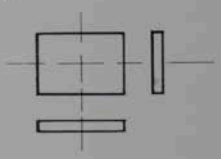


APOTHECARY'S SET OF BALANCE AND WEIGHTS
European, 19th-20th century
KMA 640 (cat. 480)

CATALOGUE

TYPES OF DIRHEM WEIGHTS

TYPE (A)



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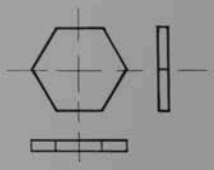

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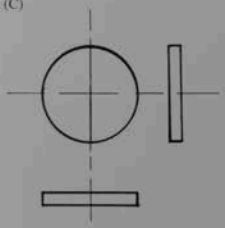

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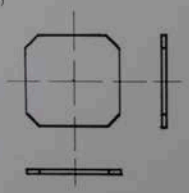

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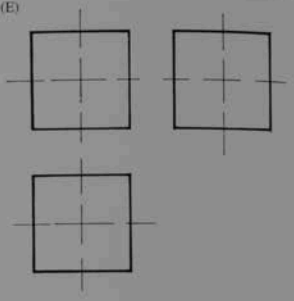

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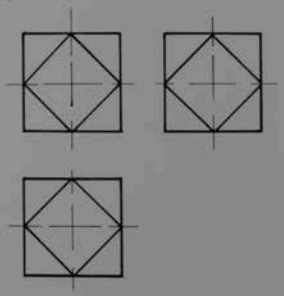

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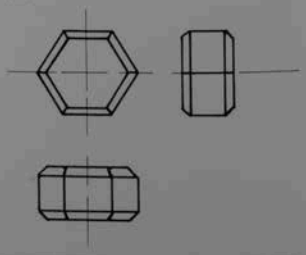

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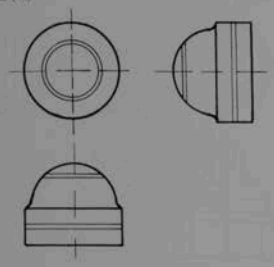

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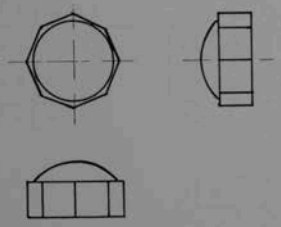

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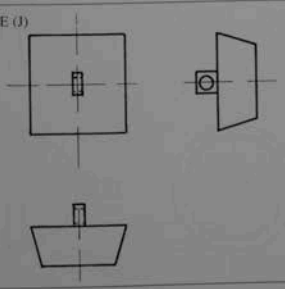

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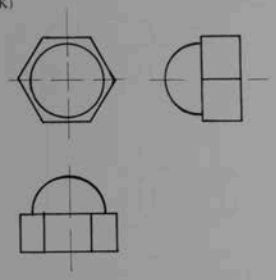

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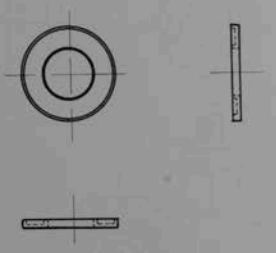

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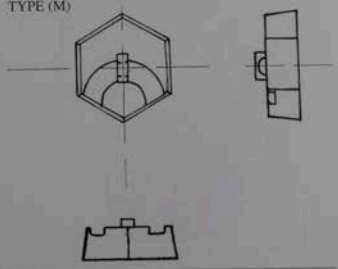

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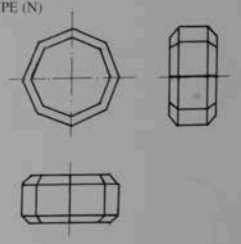

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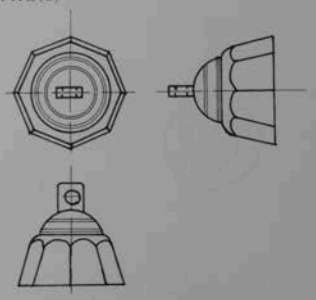

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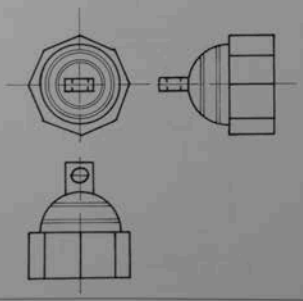

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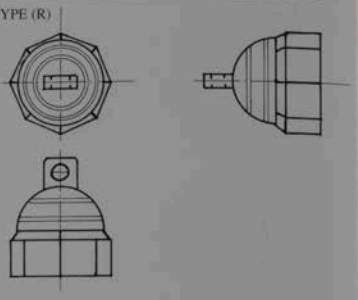

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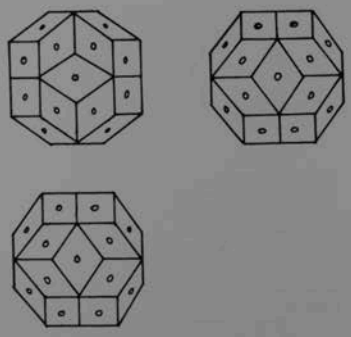

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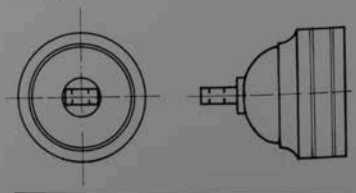

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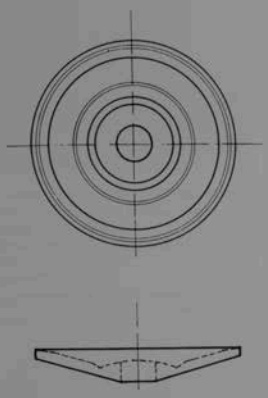

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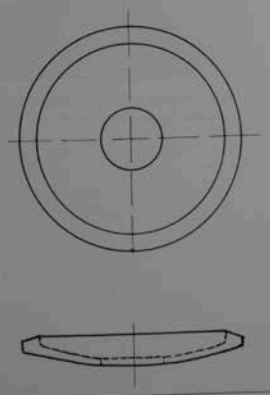

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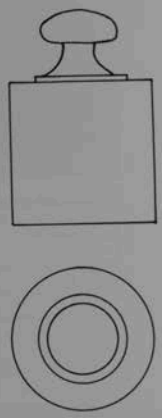

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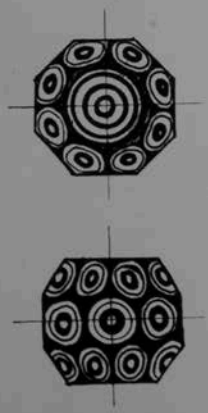


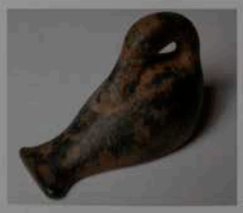
1 - **STEELYARD WEIGHT**
Late archaic - early classical period
5th-4th century BC
Lead
270 g; ø 55.5 mm; h: 80.5 mm
KMA 1286

A woman's head, probably that of a goddess, is carved in profile on both sides of the weight.

2 - **1 DRACHM WEIGHT**
Greek, 5th century BC
Bronze
4.56 g; ø 10 mm
KMA 645

3 - **DUCK SHAPED WEIGHT**
Mesopotamia, 3rd century BC
Bronze
3.33 g; l: 15.3 mm; h: 10 mm
KMA 563

Thought to be a solidi, although it is too worn to weigh accurately.



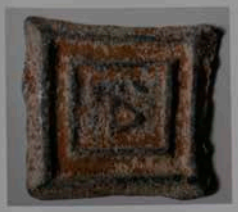
4 - **DUCK SHAPED WEIGHT**
Mesopotamia, 3rd century BC
Bronze
41.20 g; l: 38 mm; h: 25 mm
KMA 562

5 - **1 DRACHM WEIGHT**
Late Hellenistic period, 1 st century BC
Drachm of Indian Standart
Bronze, type D
3.41 g; 10.5x10.5x4.2 mm
KMA 027

The composition represents the power of humans over animals.

6 - **2.5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
10.71 g; 23.2x23.7 mm
KMA 528

The words 'KYZI' and 'HMK' suggest that this weight was used in the region around Erdek.



7 - **2.5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
10.27 g; 28x25.8 mm
KMA 560

Inscribed with the letter delta inside a square cartouche.

8 - **2.5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
11.07 g; 13.2x13x6.7 mm
KMA 587

Bears a relief crown motif.

9 - **2.5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
10.61 g; 24x22 mm
KMA 540

The words 'KYZI' and 'HMI' suggest that this weight was used in the region around Erdek.

11 - **4 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
17.76 g; 25x22 mm
KMA 526

The words 'KYZI' and 'HMI' flanking a fish motif suggest that this weight was used in the region around Erdek.

10 - **3 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Bronze
14.11 g; 20.7x20.7 mm
KMA 1290

There is the bust of Athena with a Corinthian helmet on the 3 drachm weight.
The inscription 'ΤΗΟϹ ΝΕΡΩΝ CEB (ACTOC)' and the christogram '☧' is inscribed at a later period.

12 - **5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
20.21 g; 23x22 mm
KMA 531

The monogram (EX) indicates that this weight is 5 drachm.

13 - **UNCIA WEIGHT**
Greek, 1st - 2nd century BC
Lead
26.72 g; 21.6x21.5 mm
KMA 533

The 16-pointed star shows that this weight was used in Macedonia. On the reverse is an 8-pointed star.

15 - **UNCIA WEIGHT**
Greek ?
Lead
28.31 g; ø 19.4 mm
KMA 543

The star motif is formed by three interconnecting triangles.

14 - **UNCIA WEIGHT**
Greek, 1st - 2nd century BC
Lead
25.61 g; 26x25.5 mm
KMA 534

On the obverse is the word 'OVN' and on the reverse the word 'KIA'. The weight is an uncia or 1/12 litra or libra.

16 - **UNCIA WEIGHT**
Greek, 1st - 2nd century BC
Lead
28.21 gr
KMA 644

The weight bears the letter 'H', but what this stands for is unknown.

17 - **8.5 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
38.99 g; 31x33 mm
KMA 537

The motifs on this weight suggest that it was used by fishermen in the vicinity of Erdek.

19 - **12 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
53.73 g; 42x39 mm
KMA 530

The legends 'KYΣ' and 'ΔICT' suggest that this weight was used in the region around Erdek.

18 - **12 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
45 g; 36.5x34 mm
KMA 527

Between the legends 'KYΠ' and 'ΔIC' is a cypress tree. The weight was probably used by fishermen in the vicinity of Erdek.

20 - **14 DRACHM WEIGHT**
Greek, 1st - 2nd century BC
Lead
61.35 g; 31x32 mm; h: 6.5 mm
KMA 549

Nine flowers with eight petals each are stamped on the obverse. The reverse is plain.

21 - **14 MILIARENSE WEIGHT**
Roman, 4th - 6th century BC
Lead
71.83 g; 36.5x38.9 mm; h: 5.5 mm
KMA 544

The monogram may be read as ΝΕΑΠΟΛΙϹ *(NEAPOLIS).*

23 - **SANJA COIN WEIGHT**
Roman, 2nd - 3rd century
Glass
3.53 g; ø 18.5-20 mm
KMA 646

A female figure can be discerned.

22 - **1 MNA WEIGHT**
Greek, 1st - 2nd century BC
Lead
492.03 g; 75.5x79 mm
KMA 548

24 - **1 SOLIDI WEIGHT**
Byzantine, 5th - 6th century
Brass
3.93 g; 15x15x2.5 mm
KMA 1289

The monogram which may be read as NAPKICOC (NARKISOS), is inlaid in silver on the obverse.

25 - **STEELYARD WEIGHT**
Constantinople, 5th century
Bronze
6 kg; h (weight): 210 mm; h (hook): 180 mm
KMA 605

The cast bronze weight in the form of a bust of an empress is filled with lead. The empress is dressed in a himation and has a diadem on her head. Her right hand holds the edge of the himation and in her left is a scroll. The figure may depict Aelia Eudoxia or Licinia Eudoxia.

Cf. Merichova and Atasev 1965, no. 5; Atasev and Putman 1983, p. 193, C103; Weitzmann 1979, p. 545, no. 528.

26 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
1797 g; ø 63 mm; h (weight): 70 mm;
h (hook): 80 mm; l: 530 mm
KMA 1320

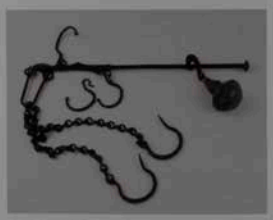
The steelyard is suspended by a hook and the arm is square in cross-section. The double chain with hooks was used for hanging the goods to be weighed. The cylindrical lead weight slides up and down the arm. Graduations are marked on three faces of the arm.

Cf. Waldbaum 1983, p. 81, pl. 28/436.

27 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
1890 g; ø 72 mm; h (weight): 67 mm;
h (hook): 100 mm; l: 530 mm
KMA 627

The steelyard is suspended by a hook and the arm is square in cross-section. The double chain with hooks was used for hanging the goods to be weighed. The cylindrical lead weight slides up and down the arm. Graduations are marked on three faces of the arm, and on the other is the inscription "ΠΑΝΔΡΕΑΤΟΣ ΧΑΡΙCΤΙΟΝ".

Cf. Waldbaum 1983, p. 81, pl. 28/436.



28 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
715 g; ø 54 mm; h (weight): 77 mm;
h (hook): 70 mm; l: 360 mm
KMA 628

The steelyard is suspended by a hook and the arm is square in cross-section. The double chain with hooks was used for hanging the goods to be weighed. The mushroom shaped lead weight slides up and down the arm. Graduations are marked on three faces of the arm.

Cf. Ross 1962, p. 63, no. 73; Waldbaum 1983, p. 81, pl. 28/436.

29 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
1300 g; ø 59 mm; h (weight): 61 mm;
h (hook): 90 mm; l: 455 mm
KMA 629

Identical to cat. 27, but lacks an inscription.

30 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
1029 g; ø 55 mm; h (weight): 59 mm;
h (hook): 70 mm; l: 365 mm
KMA 630

Identical to cat. 29.

31 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
l: 235 mm; h (hook): 55 mm
KMA 631

Identical to cat. 27, but weight is missing.

32 - **STEELYARD**
Early Byzantine, 5th - 7th century
Bronze
l: 260 mm
KMA 1338

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

Cf. Waldbaum 1983, p. 81, pl. 28/436.

33 - **SCALE ARM**
Early Byzantine, 5th - 7th century
Bronze
l: 228 mm; h (handle): 75 mm
KMA 617

The pans of the scales are missing. At either end of the arm are holes through which chains or wires would have passed. At the centre are two remaining fragments of the handle. One side of the arm is fluted for hanging weights.

Cf. Davidson 1952, pl. 98, no. 1675, pl. 99, no. 1672; Waldbaum 1983, p. 84, pl. 29/459.

34 - **1 NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Bronze
4.29 g; 12x12x3.8 mm
KMA 595

The letter 'N' engraved on the weight indicates that it weighed 1 nomisma. The reverse is plain.

Cf. Dürr 1964, p. 77, no. 170, pl. 2; Wodelbauer 1983, pl. 29, no. 470-472.

35 - **1 NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Bronze
4.13 g;13.7x12.7x3.3 mm
KMA 586

Identical to cat. 34, but with the letter 'N' for nomisma engraved on both faces.

36 - **1 NOMISMA WEIGHT**
Late Roman - early Byzantine, 4th - 6th century
Bronze
4.43 g; 13.5x12.2x3.8 mm
KMA 593

Identical to cat. 34. The extremities of the lines forming the letter 'N' are decorated with circles. The reverse is plain.

Cf. Dürr 1964, p. 76, no. 157, pl. 1.

37 - **12 NOMISMATA WEIGHT**
Early Byzantine, 4th - 6th century
Bronze
53.69 g; 29.5x28x8 mm
KMA 525

The letters 'NIB' engraved on this weight indicates a value of 12 nomismata. Above the letter I is a Greek cross. The inscription and cross were originally inlaid, but the inlay material is missing. The reverse is plain.

38 - **3 NOMISMATA WEIGHT**
Early Byzantine, 4th - 6th century
Bronze
12.57 g; 19x19x4.1 mm
KMA 566

The letters 'N I' engraved on the obverse signify 3 nomismata. This legend and the Greek cross above, which are encircled by a wreath, were originally inlaid. The reverse is plain.

39 - **1.5 SOLIDI WEIGHT**
Early Byzantine, 4th - 6th century
Bronze
6.48 g; 14x14x4 mm
KMA 579

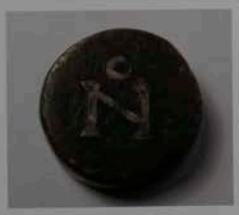
The letter S is inlaid in silver on the obverse. Part of the silver inlay is missing.

Cf. Dürr 1964, p. 78, no. 177, pl. 2; Bendall 1996, pp. 52-54.

40 - **1 NOMISMA WEIGHT**
Early Byzantine, 5th - 6th century (?)
Copper
4.10 g; 14.5x11.2x3.6 mm
KMA 581

A flower motif with six petals inside a medallion is stamped on both faces. The weight is equivalent to 1 nomisma.

Cf. Fleischer, Hjort and Rasmussen 1996, p. 99, no. 77.



41 - **1 NOMISMA WEIGHT**
Byzantine, late 6th century
Bronze
4.35 g; ø 13 mm, h: 3.7 mm
KMA 536

The letter 'N' on the obverse and cruciform monogram (IOVCTINOV) on the reverse are both inlaid in silver.

42 - **1/3 NOMISMA WEIGHT**
Byzantine, late 6th - late 9th century
Bronze
1.26 g; ø 10 mm; h: 2 mm
KMA 624

The letter H is engraved on one side. The weight is equivalent to 1/3 of a nomisma (tremissis).

44 - **1 NOMISMA WEIGHT**
Byzantine, 5th - 6th century
Bronze
3.98 g; ø 17.2 mm; h: 2.5 mm
KMA 577

Six concentric circles are engraved on one side of the weight. The reverse is plain.

43 - **1 NOMISMA WEIGHT**
Byzantine
Bronze
4.07 g; ø 18.6 mm; h: 2 mm
KMA 564

There is no indication of the value of the weight. On one side are three engraved circles, and on the other two crossed lines.

45 - **6 NOMISMATA WEIGHT**
Byzantine, 5th - 6th century
Bronze
25.30 g; ø 28 mm; h: 6.5 mm
KMA 529

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

46 - **4 NOMISMATA WEIGHT**
Byzantine
Bronze
17.69 g; ø 25 mm; h: 5 mm
KMA 547

The weight has a moulded edge and the letters 'N Δ' meaning 4 nomismata worked in dotted lines inside two dotted parallel lines. Below and above the letters are undulating dotted lines, around which are a vine leaf and bunch of grapes worked in dots. There is a boss in the centre.

Cf. Temple 1980, p. 117, no. 98.

48 - **3 NOMISMATA WEIGHT**
Byzantine, after 1189
Copper
13.16 g; 25.4x25x4 mm
KMA 561

A coin dating from the period of the Mosul atabek Izzeddin I Mesud has been clipped into an octagon and turned into a weight. On the obverse is a ruler holding a crescent moon in his arms, with the legend 'el-Musul, sene 585' (Mosul, the year 585). On the reverse is the Islamic declaration of God's unity, and the sultan's name and titulature.

Cf. Artuk and Artuk 1970, p. 409, no. 1254.

47 - **1/3 NOMISMA WEIGHT**
Byzantine, 1092-1118 or later
Copper
1.27 g; 15x14x1 mm
KMA 079

A Byzantine coin has been cut to form a weight. On the obverse is a cross embellished with stones and resting on two steps. Between the arms of the cross are the letters C, Φ, M and Δ. On the reverse is an emperor wearing a loros, holding a sceptre with cross in his right hand, and a sphere with a cross in his left hand. It was struck in Salonica between 1092 and 1118 following the reforms of Alexius I.

Cf. Hendy 1969, pp. 236-237, no. 40a.12.

49 - **1 OUNCE WEIGHT**
Early Byzantine, 5th - 6th century
Bronze
26.57 g; 23x23x7 mm
KMA 532

Inlaid in silver on the square weight are the letters 'Γ.Α' indicating 1 ounce. The reverse is undecorated.

Cf. Ross 1962, no. 77-79.

50 - **1 OUNCE WEIGHT**
Early Byzantine, 4th - 6th century
Bronze
26.39 g; 25.6x25.2x4.9 mm
KMA 539

The letters 'Γ.Α' indicating a value of 1 ounce are inlaid in silver. Above these is a six-petal rosette in the centre of which is set a Christogram, also inlaid in silver. The reverse is undecorated.

51 - **1 OUNCE WEIGHT**
Early Byzantine, 4th - 6th century
Bronze
26.24 g; 24x23.6x6 mm
KMA 542

The weight has a moulded edge, and is inlaid in silver with the letters 'Γ.Α' indicating 1 ounce, and between them a Latin cross. The silver inlay is partially missing. The letters and cross are surrounded by a wreath and set on a relief disk that fills the ground.

52 - **1 OUNCE WEIGHT**
Byzantine, 6th century
Bronze
24.76 g; ø 26.5 mm; h: 6 mm
KMA 1306

The weight is engraved with the letters 'Γ.Α', indicating 1 ounce. Above the letters is a Greek cross. Encircling the letters and the cross is a wreath and a circular cartouche form of semicircles, and small circles on the horizontal and vertical axes at the centre.

Cf. Fleischer, Hjort and Rasmussen 1996, p. 98, no. 74.

53 - **2 OUNCE WEIGHT**
Byzantine, 6th century or later
Bronze
53.83 g; ø 33.1 mm; h: 9 mm
KMA 1304

The weight has a moulded edge and engraved decoration that was formerly inlaid. The letters 'Γ. Β' indicates a value of 2 ounces. Above the letters is a Greek cross. Around the edge are two concentric wreaths.

Cf. Bass and Doorninck 1982, p. 202, no. W4, figs. 10-2.

54 - **1 OUNCE WEIGHT**
Byzantine, 6th - 7th century
Bronze
23.67 g; ø 25 mm; h: 6 mm
KMA 550

The letters 'Γ. Α' indicating 1 ounce, and the Greek cross above them were originally inlaid. They are encircled by a wreath.

Cf. Whiting 1973, p. 64, no. 84; Bass and Doorninck 1982, p. 204, no. W5, fig. 10-2.

55 - **3 OUNCE WEIGHT**
Byzantine, 7th - 9th century
Bronze
81.11 g; ø 39 mm; h: 9.5 mm
KMA 551

The weight has a moulded edge and is engraved in the centre with the letters 'Γ. Γ' indicating 3 ounces and above them a Greek cross. These were formerly inlaid. Encircling the edge are two wreath motifs.

Cf. Dürr 1964, p. 67, no. 14, pl. 3; Fleischer, Hjort and Rasmussen 1996, p. 98, no. 75.

56 - **2 OUNCE WEIGHT**
Byzantine, 5th - 6th century
Bronze
55.07 g; ø 33 mm; h: 7.5 mm
KMA 535

In the centre of the weight are the letters 'Γ. Β' indicating 2 ounces, flanking a Latin cross. These were formerly inlaid. Around the edge are two concentric wreath motifs, the inner one left unfinished.

Cf. Ross 1962, p. 80-81; Dürr 1964, p. 70, no. 60, pl. 7.

57 - **2 OUNCE WEIGHT**
Byzantine, 10th - 13th century
Bronze
52.25 g; ø 32.6 mm; h: 8.1 mm
KMA 545

The weight has a moulded edge, a raised circle around the lettering, and a boss in the centre. The letters 'Γ Β', indicating 2 ounces, are surmounted by a cross. The border is filled with triangles and dots arranged alternately.

Cf. Davidson 1952, no. 1597, pl. 94; Dürr 1964, p. 70, no. 56, pl. 7, 76, no. 146, pl. 12.

58 - **1 OUNCE WEIGHT**
Early Byzantine
Bronze
25.58 g; ø 18 mm; h: 15 mm
KMA 1325

The spherical weight is flattened at top and bottom. On the upper surface are engraved the letters 'γ . A.', indicating 1 ounce.

Cf. Dürr 1964, p. 83, no. 263, pl. 15; Waldbaum 1983, p. 88, pl. 30/475; Bendall 1996, no. 32-34.

60 - **3 OUNCE WEIGHT**
Early Byzantine
Bronze
84.63 g; ø 27.2 mm; h: 22 mm
KMA 620

The spherical weight is flattened at top and bottom. On the upper surface are engraved the letters 'γ . Γ', indicating 3 ounces.

Cf. Bendall 1996, no.23.

59 - **2 OUNCE WEIGHT**
Early Byzantine
Bronze
52.88 g; ø 22.1 mm; h: 19 mm
KMA 619

The spherical weight is flattened at top and bottom, and engraved on the upper surface with the letters 'γ . B', indicating a weight of 2 ounces.

Cf. Bendall 1996, no. 31.

61 - **1/3 NOMISMA COIN WEIGHT**
Early Byzantine
Glass
1.23 g; ø 16 mm; h: 3 mm
KMA 515

There is no indication of the value of this coin weight, but it weighs 1/3 of a nomisma (tremissis). In the concave surface are two slanting lines in relief. Colour of the glass is purple.

Cf. Davidson 1952, no. 2872, pl. 136.

62 - **COIN WEIGHT**
Byzantine, 6th century
Glass
3.41 g; ø 22 mm; h: 4-6 mm
KMA 520

The monogram in relief on the intaglio ground is damaged and partially illegible. As was usual with glass weights, this monogram probably belongs to a prefect.

Cf. Fleischer, Hjort and Rasmussen 1996, p. 100, no. 78.

64 - **SANJA COIN WEIGHT**
Fatimid, 1020-1036 AD
Glass
1.48 g; ø 15-16 mm
KMA 516

This coin weight bears the inscription 'al-Imam az-Zahir', showing that it was struck by the Fatimid caliph Abu al-Hasan 'Ali az-Zahir li-i'zaz din Billah (H. 411-427).

63 - **1/4 SANJA COIN WEIGHT**
Fatimid, 1036-1094 AD
Glass
0.75 g; ø 15 mm
KMA 514

The coin weight is stamped with the words 'al-Imam Ma'add', showing that it dates from the reign of the Fatimid caliph Abu Tamim Ma'add al-Mustansir Billah (H. 427-487).

65 - **SANJA COIN WEIGHT**
Umayyad or Abbasid, 7th - 9th century
Glass
3.89 g; ø 22.5-28 mm
KMA 521

This coin weight thought to date from the Umayyad or Abbasid period is inscribed with the words 'Seid Muammer'.

66 - **SANJA COIN WEIGHT**
Ayyubid, 11th - 12th century
Glass
2.95 g; ø 21 mm
KMA 518

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

67 - **SANJA COIN WEIGHT**
Ayyubid, 5th - 12th century
Glass
2.21 g; ø 18.5-21 mm
KMA 517

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

68 - **SANJA COIN WEIGHT**
Fatimid-Ayyubid, 5th - 12th century
Glass
6.06 g; ø 25.5-30 mm
KMA 524

The inscription is indecipherable.

69 - **SANJA COIN WEIGHT**
Fatimid-Ayyubid, 5th - 12th century
Glass
5.72 g; ø 25.5 mm
KMA 523

The inscription is indecipherable.

70 - **SANJA COIN WEIGHT**
Ayyubid ?, 13th - 14th century ?
Glass
5.66 g; ø 26.5-27 mm
KMA 522

This coin weight has a rose motif.

71 - **1/2 DIRHEM WEIGHT**
Ayyubid, circa 700 AD
Bronze, type A
1.46 g; 10x9.2x2 mm
KMA 1288

Thought to date from the Ayyubid period. The inscription reads 'Lillahi Muayyer Vaf'.

72 - **1/4 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
0.91 g; 10.5x10.5 mm
KMA 074

Since the kufi inscription is incomplete, it is indecipherable. The words 'Muayyer Vaf' in the centre mean that the weight complies with the standard.

73 - **1/3 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.38 g; 10x10 mm
KMA 042

The inscription is indecipherable.

74 - **1/2 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.44 g; 9.6x9.2 mm
KMA 138

The inscriptions are indecipherable.

75 - **1/2 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.43 g; 9.5x9.5 mm
KMA 140

The first word of the kufi inscription, Ahmed, is decipherable, and is thought to refer to one of the Ayyubid sultans.

76 - **1/2 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.43 g; 9.5x8.5 mm
KMA 077

The inscriptions are indecipherable.

77 - **1/2 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.41 g; 9.2x8.2 mm
KMA 083

The inscriptions are indecipherable.

78 - **1/2 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
1.41 g; 9x7.5x2.8 mm
KMA 078

The inscriptions are indecipherable.

79 - **1 DIRHEM WEIGHT**
Ayyubid, 11th - 12th century
Bronze, type A
2.76 g; 11.8x10.5x4 mm
KMA 133

The inscriptions are indecipherable.

80 - **MONEYCHANGER'S POCKET BALANCE**
Islamic, 11th - 13th century
Bronze
l: 68 mm
KMA 724

81 - **MONEYCHANGER'S POCKET BALANCE**
Islamic, 11th - 13th century
Bronze
l: 69.5 mm
KMA 725

82 - **MONEYCHANGER'S POCKET BALANCE**
Byzantine or Seljuk, 11th - 14th century
Bronze
l: 73 mm
KMA 711

The adjustable balance was used for weighing coins. It bears no stamp.

83 - **MONEYCHANGER'S POCKET BALANCE**
Byzantine or Seljuk, 11th - 14th century
Bronze
l: 74 mm
KMA 712

The adjustable balance was used for weighing coins. It bears no stamp.

84 - **1 DIRHEM WEIGHT**
Seljuk, 13th - 16th century
Bronze, type N
3.35 g; ø 15-16 mm
KMA 121

The Seal of Solomon on the weight is worn.

86 - **1 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
2.89 g; 10x9x4.8 mm
KMA 084

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

85 - **1 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
2.90 g; 10.5x10x4 mm
KMA 497

The name Muhammed is inscribed in kufi script inside a circle.

87 - **1 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
2.84 g; 10.5x10x4 mm
KMA 498

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

88 - **2 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
5.77 g; ø 11.5 mm
KMA 113

Polyhedral weight with bird's eye motifs.

90 - **2 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
5.67 g; 12x12.7x5 mm
KMA 598

The two bird's eye motifs on this weight indicate that it weighs 2 dirhems.

89 - **2 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
5.70 g; 12x12.5x5 mm
KMA 499

The two bird's eye motifs on this weight indicate that it weighs 2 dirhems.

91 - **2 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
5.85 g; 11.5x11.5 mm
KMA 081

The two bird's eye motifs on this weight indicate that it weighs 2 dirhems.

92 - **2 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type A
5.79 g; 12x13x4.5 mm
KMA 076

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

93 - **5 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
14.25 g; ø 15 mm
KMA 112

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

94 - **5 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type E
14.71 g; 12x12x12 mm
KMA 107

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

95 - **5 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type F
15.77 g; 13.5x14x13.8 mm
KMA 098

There is a Seal of Solomon motif on each face of this polyhedral weight.

96 - **6 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
20.30 g; ø 18 mm
KMA 111

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

97 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
28.90 g; ø 20 mm; h: 15.4 mm
KMA 360

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

98 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
29.18 g; ø 20 mm
KMA 110

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

99 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type E
29.13 g; 15.5x15.5x15.5 mm
KMA 106

100 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Iron (?), type F
28.79 g; 16.5x16.5x16.5 mm
KMA 097

There is a Seal of Solomon motif on each face of this polyhedral weight.

101 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
29.46 g; ø 20 mm; h: 15.4 mm
KMA 504

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

102 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
28.73 g; 15.3x19 mm
KMA 1282

There are bird's eye motifs on each face of this polyhedral weight. On the upper face is the word Muhammed in kufi script set in a circle.

103 - **10 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type F
30.60 g; 17x16.6x16 mm
KMA 1281

On one face of this polyhedral weight are stamped two flowers with five petals. This type of weight first appears during the Seljuk period, and continued to be used until the 19th century.

104 - **12.5 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type C
37.62 g; ø 29 mm
KMA 116

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

105 - **15 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type E
51.42 g; 18.5x18.5x18.5 mm
KMA 105

No markings are stamped on this cubic weight.

106 - **20 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type Z
59.16 g; ø 25 mm
KMA 109

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

107 - **20 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type F
60.81 g; 22.4x22x22 mm
KMA 1323

Geometric motifs are stamped on the faces of this polyhedral weight.

108 - **50 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze
145.34 g; ø 32.5 mm
KMA 108

The weight has many bird's eye motifs.

109 - **10 DIRHEM WEIGHT**
Memluk, 14th - 16th century
Bronze
28.80 g; ø 19 mm; h: 16.4 mm
KMA 502

110 - **50 DIRHEM WEIGHT**
Seljuk, 12th - 13th century
Bronze, type L
124.65 g; ø 105 mm
KMA 512

No other weight of this type has been found with similar decoration. Brass has been riveted to the weight in order to bring the weight up to standard.

111 - **NUGI (200 DIRHEM) WEIGHT**
Seljuk, 12th - 13th century
Iron and brass (handle), type F
660 g; 49.5x49.5 mm; h: 72 mm
KMA 102

Nugi is the name given in Anatolia to 200 dirhems. This polyhedral iron weight has cruciform motifs and dots on each face. The handle is made of brass.

112 - **10 DIRHEM WEIGHT**
Memluk, 14th - 16th century
Bronze
29.07 g; ø 19 mm; h: 14.5 mm
KMA 503

113 - **15 DIRHEM WEIGHT**
Memluk, 14th - 15th century
Bronze
56.96 g; ø 24 mm; h: 19.2 mm
KMA 347

The stamp on this barrel shaped weight is indecipherable.

114 - **20 DIRHEM WEIGHT**
Memluk, 11th - 14th century
Bronze
60.01 g; ø 25.2 mm; h: 19 mm
KMA 352

The stamp on this barrel shaped weight could not be deciphered.

115 - **1 DIRHEM WEIGHT**
Seljuk/Ottoman, 13th - 17th century
Copper, type C
3.10 g; ø 20 mm
KMA 082

This weight has been made from an earlier Seljuk coin. The tuğra or monogram could not be deciphered.

116 - **BALANCE PAN**
Turkish Emirates, 14th - 15th century
Bronze
ø 307 mm
KMA 744

The tuğra stamped in reverse contains the word Isfendiyar.

118 - **10 DIRHEM WEIGHT**
Ottoman, 15th - 16th century
Bronze, type F
30.24 g; 17x17x15.5 mm
KMA 095

بايزيد بن محمد خان المظفر دائماً

This weight was assayed between the years H 886 and 918, and stamped with the tuğra of Sultan Bayezid II. The tuğra reads, 'Bayezid b. Mehmed Han, May He Always Be Victorious.'

117 - **100 DIRHEM WEIGHT**
Ottoman, 15th century
Bronze, type F
299.46 g; 34x35.5x35 mm
KMA 037

محمد بن مراد خان المظفر دائماً

This weight was assayed between the years H 869-886, and the tuğra of Sultan Mehmed II stamped on it. The tuğra reads 'Mehmed b. Murad Han, May He Always Be Victorious.' The other stamps on the weight are similar to those used by apothecaries.

119 - **20 DIRHEM WEIGHT**
Ottoman, 15th - 16th century
Copper, type F
58.37 g; 20.5x22x21 mm
KMA 090

بايزيد بن محمد خان المظفر دائماً

This weight was assayed between the years H 886 and 918, and stamped with the tuğra of Sultan Bayezid II. The tuğra reads, 'Bayezid b. Mehmed Han, May He Always Be Victorious.'

120 - **200 DIRHEM WEIGHT**
Ottoman, 14th - 17th century
Bronze, type L
516 g; ø 145.5 mm
KMA 1279

The weight is stamped with the word 'Ayarjad', indicating that it has been assayed. The holes bored in it showed that make-weights were added that have since being lost.

122 - **GEZ (MEASURING ROPE)**
Ottoman, 15th - 16th century
Brass
l: 290 mm
KMA 625

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

121 - **200 DIRHEM WEIGHT**
Ottoman, 13th - 16th century
Bronze, type L
556 g; ø 150 mm
KMA 1280

123 - **1 DIRHEM WEIGHT**
Ottoman, 16th century
Copper, type B
2.83 g; 14x15 mm
KMA 069

سلم شاه بن سليمان شاه خان المظفر دائماً

The weight was assayed between the years H 974-982 and stamped with the tuğra of Sultan Selim II, reading 'Selim Şah b. Süleyman Şah Han, May He Ever Be Victorious.'

124 - **1 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Brass, type B
3.19 g; ø 14.5 mm
KMA 070

سليمان بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.'

126 - **1 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Copper, type C
3.3 g; ø 14.7 mm
KMA 062

[سلیما]ن بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading '[Süleyma]n b. Selim Şah Han, May He Ever Be Victorious.'

125 - **1 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Bronze, type B
3.07 g; ø 14.5 mm
KMA 075

سليمان بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.'

127 - **1 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Copper, type N
3.30 g; ø 13.8 mm
KMA 088

سليمان بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.'

128 - **2 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Copper, type A
5.90 g; 15x16.4 mm
KMA 068

سليمان بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.'

130 - **200 DIRHEM WEIGHT**
Ottoman, dated H [10]84
Bronze, type L
530 g; ø 134 mm
KMA 003

سليمان بن سلم شاه خان المظفر دائماً
محمد بن ابراهم خان المظفر دائماً

The weight was assayed between the years H 926-1099, and stamped with the tuğras of Sultan Süleyman I and Mehmed IV. The first tuğra reads, 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.' The second tuğra, which is slightly worn, reads 'Mehmed b. Ibrahim Han, May He Ever Be Victorious.' There is also an assay mark, 'Ayarşad 84' showing that it was assayed in the year H 1084. The weight had evidently become worn, since holes were made for the addition of make-weights, which have since being lost.

129 - **2 DIRHEM WEIGHT**
Ottoman, first half of 16th century
Copper, type A
6.08 g; 16.5x13x3.5 mm
KMA 072

سليمان بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 926-974, and stamped with the tuğra of Sultan Süleyman I, reading 'Süleyman b. Selim Şah Han, May He Ever Be Victorious.'

131 - **50 DIRHEM WEIGHT**
Ottoman, 16th century
Bronze, type F
153.79 g; 30x27.5x28 mm
KMA 323

The weight bears a worn tuğra of Selim II.

132 - **1 DIRHEM WEIGHT**
Ottoman, late 16th century
Bronze, type B
3.39 g; 15x15 mm
KMA 063

مراد بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 982-1003 and stamped with the tuğra of Murad III, reading 'Murad b. Selim Şah Han, May He Ever Be Victorious.'

133 - **1 DIRHEM WEIGHT**
Ottoman, 15th - 16th century
Copper, type C
3.14 g; ø 15.5 mm
KMA 073

محمد بن مراد خان المظفر دائماً

مراد بن سلم شاه خان المظفر دائماً

This dirhem was originally made during the reign of Sultan Mehmed II, and assayed between the years H 869-1003, when it was stamped with the tuğra of Sultan Murad III, reading 'Murad b. Selim Şah Han, May He Ever Be Victorious.' On the reverse is the earlier tuğra of Sultan Mehmed II, reading 'Mehmed b. Murad Han, May He Ever Be Victorious.'

134 - **1 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type B
3.38 g; ø 15 mm
KMA 071

احمد بن محمد خان المظفردائمًا

The weight was assayed between the years H 1012-1026, and stamped with the tuğra of Sultan Ahmed I, reading 'Ahmed b. Mehmed Han May, He Ever Be Victorious.'

135 - **100 DIRHEM WEIGHT**
Ottoman, dated H [10]84
Bronze, type L
314 g; ø 112 mm
KMA 001

مراد بن سلم شاه خان المظفر دائماً

The weight was assayed between the years H 982-1003, and stamped with the tuğra of Sultan Murad III, reading 'Murad b. Selim Şah Han, May He Ever Be Victorious.' In the year H 1084 it was assayed again, as shown by the assay mark 'Ayarşud 84'. Since the weight had become worn iron and lead make-weights were added.

136 - **1 DIRHEM WEIGHT**
Ottoman, 16th century
Bronze, type B
3.37 g; ø 14 mm
KMA 135

Since the tuğra is incomplete, it could not be deciphered, but it is similar to those used around H 1000.

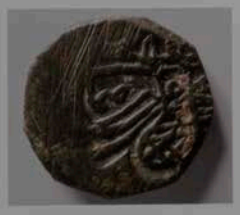
137 - **5 DIRHEM WEIGHT**
Ottoman, 16th century
Bronze, type F
15.06 g; 13x13x13 mm
KMA 091

The tuğra on this polyhedral weight is worn and could not be deciphered, but the form is reminiscent of 16th century tuğras.

138 - **1 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type C
3.26 g; ø 14.5 mm
KMA 122

[احمد بن محمد]خان المظفردائمًا

Although the tuğra is worn, comparison with others indicates that it belongs to Sultan Ahmed I.



139 - **100 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type B
3.39 g; ø 14.5 mm
KMA 080

[احمد بن محمد]خان المظفردائمًا

Comparison with other examples shows that this worn tuğra belongs to Sultan Ahmed I, and was therefore assayed between the years H 1012 and 1026.

140 - **1 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type B
3.37 g; ø 14 mm
KMA 067

احمد بن محمد خان المظفر ادائمًا

The weight was assayed between the years H 1012 and 1026, and stamped with the tuğra of Sultan Ahmed I. Although the tuğra is not complete, it was identified by comparison with other tuğras of the same sultan.

141 - **5 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type F
15.22 g; 12x13.5x13 mm
KMA 040

[احمد]بن[محمد]خان المظفردائمًا

The tuğra on this polyhedral weight is worn, but comparison with other examples shows it to belong to Sultan Ahmed I. The 5 circles stamped on one face are thought to indicate 5 dirhems.

142 - **10 DIRHEM WEIGHT**
Ottoman, 17th - 18th century
Bronze
31 g; 17x16.5x17 mm
KMA 092

احمد بن محمد خان [المظفر] دائماً

The weight was assayed between the years H 1012 and 1143, and stamped with the tuğras of Ahmed I and Ahmed III. Since the father of both the sultans was named Mehmed, both tuğras read, 'S. Ahmed b. Mehmed Han, Ever [Victorious].'

143 - **10 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type F
29.02 g; 16.5x16.5x17 mm
KMA 327

Since the tuğra is worn and incomplete, it is indecipherable.

144 - **25 DIRHEM WEIGHT**
Ottoman, 15th - 16th century
Bronze, type L
63 g; ø 77 mm
KMA 263

The tuğras on this weight are worn and indecipherable, but resemble those used between H 1000 and 1143. The cruciform motifs suggest that it may have belonged to an Armenian or Greek monastery or church in Anatolia.

145 - **50 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type S
158.53 g; ø 32.5 mm
KMA 101

سلطان احمد

The weight was assayed between the years H 1012 and 1026, and stamped with the tuğra of Sultan Ahmed I. The tuğra is unusual in form, and only the sultan's name Ahmed has been inscribed within the loop.

146 - **100 DIRHEM WEIGHT**
Ottoman, dated H [10]35
Bronze, type L
310 g; ø 109 mm
KMA 015

The weight was assayed twice, first between H 1026 and 1027, and a few years later between H 1031 and 1032. The tuğra might belong to Sultan Mustafa I?, reading A worn oval stamp contains the date [10]35. Lead has been added to the weight as a make-weight.

147 - **100 DIRHEM WEIGHT**
Ottoman, first quarter of 17th century
Bronze, type L
319.07 g; ø 114 mm
KMA 005

مصطفي شاه بن محمد خان المظفر دائماً

The weight was assayed between H 1106 and 1115, and stamped with the tuğra of Sultan Mustafa I, reading 'Mustafa Şah b. Mehmed Han, May He Ever Be Victorious.' A brass nail has been hammered into the weight to make it up to standard.

148 - **STEELYARD**
Osmanlı, 16th - 18th century
Iron
l: 193 mm
KMA 693

The terminal of the arm is in the form of a double-headed eagle.

149 - **STEELYARD**
Ottoman, 16th - 18th century
Iron
l: 252 mm
KMA 694

The terminal of the arm is in the form of a double-headed eagle.

150 - **1 DIRHEM WEIGHT**
Ottoman, 17th century
Copper, type C
3.30 g; ø 14.5 mm
KMA 064

سلطان مراد خان بن سلطان[احمد]خان

The weight was assayed between the years H 1032 and 1049, and stamped with the tuğra of Sultan Murad IV, reading 'Sultan Murad Han b. Sultan [Ahmed Han].'

152 - **200 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type L
582 g; ø 124 mm
KMA 004

سلطان مراد خان بن سلطان احمد خان

The weight was assayed between the years H 1032 and 1049, and stamped with the tuğra of Sultan Murad IV, reading 'Sultan Murad Han b. Sultan Ahmed Han.'

151 - **1 DIRHEM WEIGHT**
Ottoman, late 16th century
Copper, type B
3.50 g; ø 14.5 mm
KMA 065

[سلطان]مراد[خان بن سلطان احمد خان]

The weight was assayed between the years H 1032 and 1049, and stamped with the tuğra of Sultan Murad IV, reading '[Sultan] Murad [Han b. Sultan Ahmed Han].'

153 - **2 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type L
5.93 g; ø 26 mm
KMA 099

The weight is stamped with bird's eye motifs.

154 - **1/4 DIRHEM WEIGHT**
Ottoman, circa H 1080
Copper, type D
0.70 g; 13.5x13 mm
KMA 043

[محمد بن ابراهم خان] المظفر دائمًا ٨٠

Since the lower part of the tuğra has worn away, the name of the sultan is illegible. However, this type of tuğra was used between the years H 1000 and 1100, so the number 80 between the two loops must refer to the year H 1080, therefore dating the weight to the reign of Sultan Mehmed IV.

155 - **1/2 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type D
1.32 g; 18.5x19 mm
KMA 046

محمد بن ابراهم خان المظفر دائمًا

The weight was assayed between the years H 1058 and 1099, and stamped with the tuğra of Sultan Mehmed IV, reading 'Mehmed Han b. Ibrahim, May He Ever Be Victorious.'

156 - **1 DIRHEM WEIGHT**
Ottoman, dated H [11]71
Copper
3.25 g; ø 14.5 mm
KMA 087

محمد بن ابراهم خان المظفر دائمًا ٧١

The weight was assayed between the years H 1058 and 1099, and stamped with the tuğra of Sultan Mehmed IV, reading 'Mehmed Han b. Ibrahim, May He Ever Be Victorious 71.' The number 71 shows that it was assayed in the year H 1171.

157 - **1 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type B
3.41 g; ø 15 mm
KMA 061

محمد بن ابراهم خان المظفر دائمًا

The weight was assayed between the years H 1058 and 1099, and stamped with the tuğra of Sultan Mehmed IV, reading 'Mehmed Han b. Ibrahim, May He Ever Be Victorious.'

158 - **1 DIRHEM WEIGHT**
Ottoman, dated H [105]8
Bronze, type B
3.36 g; 13.4 mm
KMA 115

[محمد]بن ابراهم خان المظفر دائمًا ٨(٥)

The weight was assayed between the years H 1058 and 1099, and stamped with the tuğra of Sultan Mehmed IV, reading 'Mehmed Han b. Ibrahim, May He Ever Be Victorious 8.' The number 8 shows that the weight was assayed in the year H 1058.

160 - **2 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type D
5.69 g; 29x23 mm
KMA 142

The tuğra is worn, but resembled those used during the years H 1058 and 1100. On the reverse are two flowers indicating a denomination of 2 dirhems.

159 - **2 DIRHEM WEIGHT**
Ottoman, 17th century
Brass, type D
5.90 g; 35x31.5 mm
KMA 052

محمد بن ابراهم خان المظفر دائمًا

The weight was assayed between the years H 1058 and 1099, and stamped with the tuğra of Sultan Mehmed IV, reading 'Mehmed Han b. Ibrahim, May He Ever Be Victorious.'

161 - **200 DIRHEM WEIGHT**
Ottoman, 17th century
Bronze, type L
571.35 g; ø 119 mm
KMA 002

محمد بن ابراهم خان المظفر دائمًا

The weight was assayed between the years H 1058 and 1099, and stamped on the reverse with the tuğra of Sultan Mehmed IV reading, 'Sultan Mehmed Han b. Sultan Ibrahim, May He Ever Be Victorious.' The holes in the weight indicate that when it became worn, make-weights were added.

162 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, 17th - 19th century
Wood
74x41 mm
KMA 722

The balance has three arms used for checking the weight of three different denominations of coins. It is carved with bird's eye motifs.

164 - **12.5 DIRHEM WEIGHT**
Ottoman, 17th - 19th century
Bronze, type L
39.16 g; ø 57.5 mm
KMA 270

The circular cavities must have been made to adjust the weight to standard.

163 - **12.5 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, type L
40.57 g; ø 51.5 mm
KMA 282

The weight has openwork decoration. The circular cavities were made to adjust the weight to standard.

165 - **1/4 DIRHEM WEIGHT**
Ottoman, first quarter of 18th century
Copper, type D
0.72 g; 16x16 mm
KMA 066

احمد بن محمد خان [المظفر] دائماً

The weight was assayed between the years H 1115 and 1143, and stamped with the tuğra of Sultan Ahmed III, reading 'Ahmed b. Mehmed Han, Ever [Victorious].'

166 - **1/4 DIRHEM WEIGHT**
Ottoman, 16th - 17th century
Bronze, type F
14.97 g; 13x13x12.7 mm
KMA 356

The tuğra is worn and could not be deciphered.

168 - **200 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type L
596 g; ø 121 mm
KMA 1278

مصطفى بن احمد المظفر دائماً

احمد بن محمد خان المظفردائماً

The weight bears two tuğra, the first belonging to Sultan Mustafa III, reading 'Mustafa b. Ahmed, May He Ever Be Victorious,' and the second belonging to Sultan Ahmed III, reading 'Ahmed b. Mehmed Han, May He Ever Be Victorious.' An iron nail has been hammered into the weight as a make-weight.

167 - **100 DIRHEM WEIGHT**
Ottoman, first quarter of 18th century
Bronze, type L
303.96 g; ø 115 mm
KMA 010

احمد بن محمد خان [المظفر] دائماً

The weight was assayed between the years H 1115 and 1143, and stamped twice with the tuğra of Sultan Ahmed III, reading 'S. Ahmed b. Mehmed Han, Ever [Victorious].'

169 - **1 DIRHEM WEIGHT**
Ottoman, dated H 1143
Bronze, type D
3.21 g; 36.5x37 mm
KMA 045

محمود خان بن مصطفى المظفر دائماً ١١٤٣

The weight was assayed between the years H 1143 and 1168, and stamped with the tuğra of Sultan Mahmud I, reading 'Mahmud Han b. Mustafa, May He Ever Be Victorious 1143.' The date indicates that the weight was assayed in H 1143.

170 - **2 DIRHEM WEIGHT**
Ottoman, second quarter of 18th century
Bronze, type N
6.29 g; ø 15 mm
KMA 085

[محمو]د حان بن مصطفى المظفر دائماً

The weight was assayed between the years H 1143 and 1168, and stamped with the tuğra of Sultan Mahmud I, reading '[Mahmud Han] b. Mustafa, May He Ever Be Victorious.' The date indicates that the weight was assayed in H 1143.

171 - **2 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type L
6.95 g; ø 36 mm
KMA 353

172 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1143
Bronze, type L
73.96 g; ø 81.5 mm
KMA 1303

محمود حان بن مصطفى المظفر دائماً ١١٤٣

The weight was assayed between the years H 1143 and 1168, and stamped with the tuğra of Sultan Mahmud I reading, 'Mahmud Han b. Mustafa, May He Ever Be Victorious 1143.'

173 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1168
Bronze, type F
31.52 g; 17x17x16 mm
KMA 089

عثمان حان بن مصطفي المظفر دائماً ١١٦٨

The weight was assayed between the years H 1168 and 1171, and stamped with the tuğra of Osman III reading, 'Osman Han b. Mustafa, May He Ever Be Victorious 1168.' The date shows when the weight was assayed.

174 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]68 and 1171
Bronze, type L
302 g; ø 110 mm
KMA 011

عثمان حان بن مصطفي المظفر دائماً ١١٦٨

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1168 and 1187, and stamped with the tuğras of Osman III and Mustafa III reading, 'Osman Han b. Mustafa ... Ever [11]68,' and 'Mustafa b. Ahmed Han, May He Ever [Be Victorious] 1171.' Four nails of various sizes have been hammered into the weight to make it up to standard.

175 - **1 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type D
2.99 g; 28x29 mm
KMA 038

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.'

176 - **5 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type F
15.82 g; 13x13x12.6 mm
KMA 093

مصطفي حان بن احمد المظفر دائماً

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.'

177 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type F
30.50 g; 18x15.5x17 mm
KMA 039

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III, reading 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.'

178 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type J
31.19 g; top: 15x15 mm; bottom: 21x20.5 mm; h:10.6 mm
KMA 086

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.' The number 10 in Roman numerals shows the denomination of the weight, and the date 1171 that it was assayed in that year.

179 - **10 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type N
15.69 g; ø 18.2 mm; h: 9 mm
KMA 449

مصطفي حان بن احمد المظفر دائماً

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious.'

180 - **25 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type L
77.40 g; ø 79 mm
KMA 178

مصطفي حان بن احمد المظفر دائماً

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious.'

181 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type U
161.83 g; ø 104 mm
KMA 266

مصطفي حان بن احمد المظفر دائماً ١١٧١

It was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.' The weight also bears the stamp of Osmaniye Municipality. An iron nail has been hammered into the weight to bring it up to standard.

182 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type U
319.72 g; ø 136.5 mm
KMA 409

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.'

183 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1171
Bronze, type U
612.66 g; ø 130 mm
KMA 170

مصطفي حان بن احمد المظفر دائماً ١١٧١

The weight was assayed between the years H 1171 and 1187, and stamped with the tuğra of Mustafa III reading, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171.'

184 - **400 DIRHEM WEIGHT**
Ottoman, dated H 1171 and 1187
Bronze, type U
1278.45 g; ø 155 mm
KMA 298

مصطفي بن احمد حان المظفر دائماً ١١٧١

حان عبدالحميد بن احمد المظفر دائماً ١١٨٧

The weight was assayed between the years H 1171 and 1203, and stamped with eight tuğras, six belonging to the sultans Mustafa III and two to Abdülhamid I. They read, 'Mustafa Han b. Ahmed, May He Ever Be Victorious 1171,' and 'Abdülhamid bin Ahmed, May He Ever Be Victorious 1187' respectively. Pieces of iron have been riveted to the weight to bring it up to standard.

185 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1187, [11]95, [11]97 and 1222
Bronze, type L
39.83 g; ø 58.5 mm
KMA 259

عبدالحميد حان بن احمد المظفر دائماً ١١٨٧

مصطفي حان بن عبدالحميد المظفر دائماً ١٢٢٢

The weight was stamped twice with the tuğra of Abdülhamid I reading, 'Abdülhamid Han b. Ahmed, May He Ever Be Victorious 1187,' and once with the tuğra of Mustafa IV, reading 'Mustafa Han b. Abdülhamid [May He Ever Be Victorious] 1222.' The weight was assayed on H 1187, 1195, 1197 and 1222.

186 - **25 DIRHEM WEIGHT**
Ottoman, dated H [118]7
Bronze, type L
75.45 g; ø 80 mm
KMA 1302

عبدالحميد حان بن احمد المظفر دائماً ١١٨٧

The weight bears the tuğra of Abdülhamid I reading, 'Abdülhamid Han bin Ahmed, May He Ever Be Victorious.' Between the two loops of the tuğra is a worn assay date, [118]7. A stamp in the form of a bud containing the numeral 1 is thought to belong to the assay official.

187 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1187
Bronze, type U
156.43 g; ø 101 mm
KMA 201

حان عبدالحميد بن احمد المظفر دائماً ١١٨٧

The weight was assayed between the years H 1171 and 1203, and stamped with the tuğra of Abdülhamid I reading, 'Abdülhamid bin Ahmed, May He Ever Be Victorious 1187.' Below the tuğra is a stamp in the form of a flower with six petals.

188 - **50 DIRHEM WEIGHT**
Ottoman, H [1]224, [1]235 and [1]248
Bronze, type U
159.21 g; ø 95 mm
KMA 262

عبدالحميد حان بن احمد ٠٠٠دائماً

محمود حان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1187 and 1255, and stamped once with the tuğra of Abdülhamid I reading, 'Abdülhamid Han b. Ahmed [...] 7' and twice with that of Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' The weight is also stamped 'Ayarşud [1]224' and 'Ayarşud [1]235', and with the date [1]248. The other stamps are illegible. Two iron nails of different sizes have been hammered into the weight to bring it up to standard.

189 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1187, [1]199 and 1202
Bronze, type L
73.40 g; ø 85 mm
KMA 174

عبدالحميد حان بن احمد المظفر دائماً ١١٨٧

The weight was assayed between the years H 1187 and 1203, and stamped with the tuğra of Sultan Abdülhamid I reading, 'Abdülhamid Han bin Ahmed, May He Ever Be Victorious 1187.' The weight was assayed in [1]199 and 1202. Another stamp is illegible.

190 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1187, 1238 and [1]312
Bronze, type U
316.04 g; ø 117 mm
KMA 287

حان عبدالحميد بن احمد المظفر دائماً ١١٨٧

The weight is stamped with the tuğra of Sultan Abdülhamid I reading, 'Abdülhamid Han b. Ahmed. May He Ever Be Victorious 1187.' Two other assay stamps are legible, one consisting of the date 1238 and the other a worn stamp of Sandıklı Municipality with the date [1]312. The other two stamps are illegible. A semispherical addition has been made to the weight to bring it up to standard.

191 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1187
Bronze, type U
311.51 g; ø 117.3 mm
KMA 422

حان عبدالحميد بن احمد المظفر دائماً ١١٨٧

The weight was assayed between the years H 1187 and 1203, and stamped twice with the tuğra of Sultan Abdülhamid I reading, 'Abdülhamid Han bin Ahmed, May He Ever Be Victorious 1187.' Two other stamps are illegible. The nail has been hammered into the weight to bring it up to standard.

192 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1187
Bronze, type U
607.29 g; ø 139 mm
KMA 180

عبدالحميد حان بن احمد المظفر دائماً ١١٨٧

The weight was assayed between the years H 1187 and 1203, and stamped twice with the tuğra of Sultan Abdülhamid I reading, 'Abdülhamid Han bin Ahmed, May He Ever Be Victorious 1187.' Another worn stamp shows that the weight was assayed once more after H 1187.

193 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1187, 1202, [12]20, [12]25 and [12]41
Bronze, type U
618.91 g; ø 136 mm
KMA 462

حان عبدالحميد بن احمد المظفر دائماً ١١٨٧

The weight is stamped with two tuğras of Sultan Abdülhamid I reading, 'Abdülhamid Han bin Ahmed, May He Ever Be Victorious 1187.' Additionally there is a stamp in the form of a tree, and assay stamps for the years H 1202, [12]20, [12]25 and [12]41. Four more worn stamps on the weight could not be deciphered.

194 - **STEELYARD**
Ottoman, 16th - 18th century
l: 374 mm
KMA 671

The terminal of the steelyard is in the form of a double-headed eagle.

195 - **GUNPOWDER MEASURE**
Ottoman, 18th - 19th century
Brass
53.33 g; ø 18 mm; l: 107 mm
KMA 616

This gunpowder measure was used for muzzle loading firearms.

196 - **5 DIRHEM WEIGHT**
Ottoman, dated H [1]206
Bronze, type F
15.93 g; 13x13x13.5 mm
KMA 096

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There is also an assay mark with the date [1]206.

197 - **5 DIRHEM WEIGHT**
Ottoman, dated H [1]206
Brass, type J
15.96 g; bottom: 12.5x12.5 mm; top: 16.5x16.5 mm; h: 11 mm.
KMA 119

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There is also an assay mark with the date [1]206.

199 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1203 and [1]219
Bronze, type L
39.11 g; ø 59 mm
KMA 176

سلم حان بن مصطفي المظفر دائماً ١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious 1203.' Another stamp with the date [1]219 shows that it was assayed again a few years later.

198 - **10 DIRHEM WEIGHT**
Ottoman, late 18th century
Brass, type J
31.79 g; bottom: 15.5x15 mm; top: 20.5x21 mm; h: 12 mm
KMA 349

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' The number 10 in Latin numerals indicates the denomination of the weight.

200 - **20 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type N
63.86 g; 28x28.5 mm; h: 12 mm
KMA 031

سلم حان بن مصطفي المظفر دائماً
محمود حان بن عبدالحميد المظفر دائماً

The weight was assayed between the years H 1203 and 1255, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' On the reverse is the tuğra of Sultan Mahmud II, with the date 1223.

201 - **20 DIRHEM WEIGHT**
Ottoman, dated H 1203 and [1]206
Brass, type J
63.95 g; bottom: 17.5x17.5 mm; top: 26x26 mm; h: 16 mm
KMA 117

سلم[حان بن مصطفي المظفر دائما]١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim [Han b. Mustafa, May He Ever Be Victorious].' The date stamp [1]206 shows that it was assayed on this date. The number 20 in Roman numerals indicates the denomination of the weight.

202 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1203 and 1208
Bronze, type L
78.18 g; ø 83.5 mm
KMA 216

سلم حان بن مصطفي المظفر دائماً ١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious 1203.' A stamp with the date 1208 shows that it was assayed again a few years later.

203 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]206
Brass, type L
152.18 g; ø 97 mm
KMA 166

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There is also an assay stamp dated [1]206.

204 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]211, [1]212 and [1]216
Bronze, type U
153.45 g; ø 97 mm
KMA 014

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped three times with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There are three assay stamps with the dates H [1]211, [1]212 and [1]216. Make-weights added to the weight are missing.

205 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]211, [1]215, [1]218, 1220 and 1222
Bronze, type U
157.29 g; ø 91 mm
KMA 254

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped six times with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' Date stamps read H [1]211, [1]215, [1]218, 1220 and 1222.

206 - **50 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Brass, type U
161.15 g; ø 92 mm
KMA 396

The stamp reading 'First Office' has been struck twice, and two others read 'First 1304' and 'First 1302'. There are further stamps bearing the numerals 1, 2 and 4 that are probably assay stamps.

207 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]215
Bronze, type N
158 g; ø 44 mm; h: 13.5 mm
KMA 427

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' An assay stamp consists of the date H [1]205.

208 - **50 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type N
159.76 g; ø 39.5 mm; h:16.5 mm
KMA 428

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.'

209 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]211, [1]212 and [1]213
Brass, type U
313.61 g; ø 117 mm
KMA 391

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped five times with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' Between the loops of the tuğras are the dates H [1]211, [1]212 and [1]213. A fragment of iron has been hammered into the weight to bring it up to standard.

211 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1203
Bronze, type U
308.52 g; ø 117 mm
KMA 183

سلم حان بن مصطفي المظفر دائماً ١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious 1203.' The date H 1203 stamped between the two loops of the tuğra is the assay date.

210 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1220
Bronze, type U
313.20 g; ø 116 mm
KMA 255

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' Two assay stamps have the date H 1220.

212 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]208
Bronze, type U
313.15 g; ø 116 mm
KMA 407

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There is a stamped assay date H [1]208. Lead has been poured over part of the weight to make it up to standard.

213 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]206
Bronze, type U
307.44 g; ø 116.8 mm
KMA 405

سلم حان بن مصطفي المظفر دائماً

The weight was assayed between the years H 1203 and 1223, and stamped with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious.' There is a stamped assay date H [1]206.

215 - **400 DIRHEM WEIGHT**
Ottoman, dated H 1203 and [1]211
Brass, type U
1240.60 g; ø 167 mm
KMA 179

سلم حان بن مصطفي المظفر دائماً ١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped six times with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious 1203.' As well as the date 1203 between the two loops of the tuğras, there is an assay stamp with the date H [1]211. Two other assay stamps are illegible.

214 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1203
Bronze, type U
618.71 g; ø 137.7 mm
KMA 401

سلم حان بن مصطفي المظفر دائماً ١٢٠٣

The weight was assayed between the years H 1203 and 1223, and stamped six times with the tuğra of Selim III reading, 'Selim Han b. Mustafa, May He Ever Be Victorious 1203.' As well as the date 1203 between the two loops of the tuğras, there is an assay stamp with the date H [1]211. Two other assay stamps are illegible.

216 - **STEELYARD**
Ottoman, 17th - 18th century
Iron
l: 325 mm
KMA 670

217 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1222
Bronze, type U
309.61 g; ø 110 mm
KMA 257

مصطفى خان بن عبدالحميد ... داتماً ١٢٢٢

The weight was assayed twice between H 1222 and 1223, and stamped with the tuğra of Sultan Mustafa IV reading, 'Mustafa Han b. Abdülhamid [May He Ever Be Victorious] 1222.' Another stamp is illegible.

218 - **1/2 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1228
Brass, type D
1.60 g; 25x27 mm
KMA 056

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp gives the date H 1228.

219 - **2 DIRHEM WEIGHT**
Ottoman, early 19th century
Bronze, type A
6.25 g; 13x16 mm; h: 4.5 mm
KMA 041

محمود خان بن عبدالحميد المظفر دائماً

The weight was assayed between H 1223 and 1255, and stamped three times with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious.' Two small circles stamped on the weight indicate 2 dirhem.

220 - **6 DIRHEM WEIGHT**
Ottoman, dated H [12]49
Bronze, type L
19.02 g; ø 35 mm
KMA 016

There is a stamp bearing the name of Muhammed Ali, khedive of Egypt, and the date H [12]49. The meaning of the star shaped stamp is unknown.

221 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1224
Bronze, type G
31.72 g; ø 24 mm; h: 9.4 mm
KMA 060

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' A stamp with the date 1224 shows that the weight was assayed again the following year.

223 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1239
Bronze, type N
16.54 g; ø 18.3 mm; h: 8 mm
KMA 450

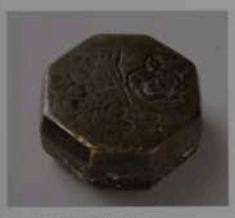
محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp has the date H [12]37.

222 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1239
Bronze, type N
31.34 g; ø 23.5 mm; h: 9.5 mm
KMA 446

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp has the date 1239.



224 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1223 and [1]226
Bronze, type N
31.99 g; ø 23.5 mm; h: 10 mm
KMA 434

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp has the date [1]226.

225 - **10 DIRHEM WEIGHT**
Ottoman, dated H 1223 and [1]225
Bronze, type N
31.70 g; ø 26 mm; h: 9 mm
KMA 430

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp has the date [1]225.

227 - **12.5 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, type C
33.09 g; ø 53 mm
KMA 274

This is a rare example of a dirhem weight in the form of a disk without a hole in the centre.

226 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1250
Bronze, type L
37.51 g; ø 46.7 mm
KMA 017

A lobed stamp contains the name Mehmed Ali, khedive of Egypt, and the date 1250. The meaning of the star shaped stamp is not known.

228 - **12.5 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, type L
41.25 g; ø 46 mm
KMA 281

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

229 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1230 and 1232
Bronze, type L
38.07 g; ø 57.2 mm
KMA 292

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' The weight bears two further assay stamps with the dates 1230 and 1232.

231 - **20 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type N
63.93 g; ø 28.8 mm; h: 11.7 mm
KMA 429

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another worn stamp is probably an assay mark.

230 - **12.5 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, type L
42.49 g; ø 44 mm
KMA 293

This weight has unusual decoration. Circular cavities have been made to adjust the weight, and flower motifs stamped between them.

232 - **20 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type N
62.42 g; ø 28.5 mm; h: 12.5 mm
KMA 438

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are other worn assay stamps on the weight.

233 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1235
Bronze, type L
77.79 g; ø 79 mm
KMA 214

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp has the date 1235.

235 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1247 and 1248
Bronze, type L
78.62 g; ø 78 mm
KMA 290

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Other assay stamps have the dates [1]247 and [1]248.

234 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1227, 1228, 1229, 1230, 1234 and 1235
Bronze, type L
75.24 g; ø 81 mm
KMA 213

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped six times with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Five assay stamps are dated 1227, 1228, 1229, 1230, 1234 and 1235.

236 - **25 DIRHEM WEIGHT**
Ottoman, dated H 1223, [1]248 and [1]249
Bronze, type U
79.09 g; ø 74.5 mm
KMA 383

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Other assay stamps have the dates [1]248 and [1]249.

237 - **50 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type I
158.90 g; ø 40.5 mm
KMA 032

This type of octagonal weight has no stamps.

239 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1239, [1]241, [1]242 and [1]243
Bronze, type U
157.62 g; ø 101 mm
KMA 172

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are assay stamps dated H 1239, [1]241, [1]242 and [1]243.

238 - **50 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type F
159.16 g; 28.5x28.5 mm
KMA 125

Lead has been poured on one side of the polyhedral weight, and two bosses riveted to it to bring the weight up to standard.

240 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type L
76.25 g; ø 85 mm
KMA 175

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Two worn assay stamps show that the weight was checked again after H 1223.

241 - **50 DIRHEM WEIGHT**
Ottoman, 18th century
Bronze, type L
168.61 g; ø 91 mm
KMA 189

Numerous bird's eye motifs are stamped around the weight.

243 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1235 and 1238
Bronze, type L
81.34 g; ø 82 mm
KMA 284

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are assay stamps dated H 1235 and 1238. Lead has been poured on to the weight to bring it up to standard.

242 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1230 and 1232
Bronze, type L
74.15 g; ø 76.5 mm
KMA 230

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are assay stamps dated H 1230 and 1232.

244 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1230
Bronze, type I
160.18 g; ø 37 mm; h: 23 mm
KMA 342

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There is another assay stamp with the date 1230.

245 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1224
Bronze, type U
155.60 g; ø 96 mm
KMA 367

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' An assay stamp is dated 1224.

247 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1241
Bronze, type U
156.20 g; ø 100 mm
KMA 403

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There is an assay stamp dated H [1]241.

246 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type L
77.60 g; ø 77.7 mm
KMA 386

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

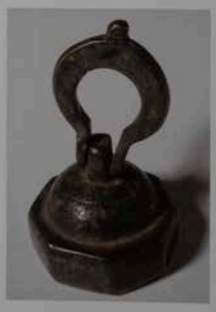
The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are other assay stamps but these are illegible.

248 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]277
Bronze, type F
161.46 g; 25x27x27 mm; h: 70 mm
KMA 508

The weight is of the type with handles that began to be used from the reign of Sultan Mahmud II. The assay stamp is dated H [1]277.

249 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze
160.84 g; ø 44 mm, h: 65 mm
KMA 511

The weight is of the type with handles that began to be used from the reign of Sultan Mahmud II. There is no assay stamp.



250 - **100 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type K
approx. 310 g; ø 48.5 mm
KMA 026

The octagonal weight is of the type with handles that began to be used from the reign of Sultan Mahmud II. There is no assay stamp.

251 - **100 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type H
318.02 g; ø 44 mm; h: 32 mm
KMA 025

252 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1223, [1]241, 1332, 1338, and 1339
Bronze, type U
314.77 g; ø 110 mm
KMA 278

محمود حان بن عبدالحميد المظفر دائماً ١٢٢٣
محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are also assay stamps with the dates H [1]241, 1332, 1338 and 1339. Lead has been poured on the weight to bring it up to standard.

253 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1223
Bronze, type U
281.45 g; ø 115 mm
KMA 379

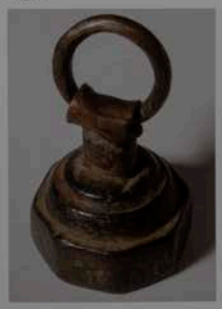
محمود حان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are traces of other date stamps, showing that the weight was assayed subsequently, but these are illegible. Two hands of bird's eye motifs encircle the weight.

255 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1239 and 1261
Bronze, type U
622.55 g; ø 133 mm
KMA 169

محمود حان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Date stamps show that it was assayed in 1239 and 1261.



254 - **100 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type R
approx. 320 g; ø 47 mm; h: 70 mm
KMA 510

Weights with handles of this type began to be used from the reign of Sultan Mahmud II. It is not marked with any stamps.

256 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223, 1250 and 1252
Bronze, type U
638.66 g; ø 127 mm
KMA 187

محمود حان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Date stamps show that it was assayed in 1250 and 1252. Another two stamps are illegible.

257 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223
Brass, type U
632.27 g; ø 134 mm
KMA 301

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are four assay date stamps but these are illegible.

259 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223, [1]253, [1]254, [1]258
Bronze, type U
634.84 g; ø 126.3 mm
KMA 400

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped three times with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Three assay stamps give the dates H [1]253, [1]254 and [1]258.

258 - **200 DIRHEM WEIGHT**
Ottoman, dated H [12]39
Bronze, type F
632.71 g; 41x41.5x91 mm
KMA 321

Weights with handles began to be used from the reign of Sultan Mahmud II. An assay stamp gives the date [12]39.

260 - **200 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, similar to type U
641.69 g; ø 111 mm
KMA 470

There is one illegible stamp.

261 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223 and [1]241, and [1]928 and [1]929 AD
Brass, type U
626.54 g; ø 131 mm
KMA 478

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There are three assay date stamps for H [1]241 and [1]928 AD and [1]929 AD, and a stamp of which the only legible word is 'municipality'.

263 - **200 DIRHEM WEIGHT**
Ottoman, 20th century
Bronze, type P
645 g; ø 37 mm; h: 60 mm
KMA 509

Weights with handles began to be used from the reign of Sultan Mahmud II. This example has no marks.

262 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1223 and [1]246
Bronze, type F
approx. 600 g; 41x41.5 mm; h: 58 mm
KMA 506

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' There is another assay stamp with the date [1]246.

264 - **400 DIRHEM WEIGHT**
Ottoman, dated H 1223 and 1224
Bronze, type U
125.19 g; ø 164 mm
KMA 243

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped twice with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' The date 1224 stamped between the two tuğras shows that it was assayed for a second time. There are two more illegible assay marks.

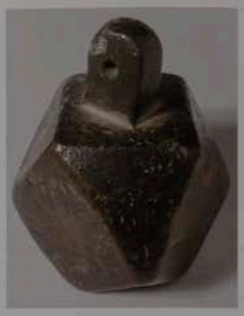
265 - **400 DIRHEM WEIGHT**
Ottoman, dated H 1223 and [1]226
Bronze, type U
1261.55 g; ø 166 mm
KMA 299

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight was assayed between the years H 1223 and 1255, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223.' Another assay stamp is dated [1]226.

266 - **1 OKKA WEIGHT**
Ottoman, early 19th century
Bronze, type F
1250 g; 54x56x115 mm
KMA 322

From H 1223 onwards handles were sometimes attached to weights of this polyhedral type. There are no stamps.



267 - **1 OKKA WEIGHT**
Ottoman, 19th century
Bronze, type F
approx. 1200 g; 54x55x65 mm
KMA 507

The handle of this polyhedral weight is missing.

268 - **BOX FOR A MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Wood and brass
Box: 139x86x26 mm
KMA 600

The box must have originally contained a scale and weights, probably belonging to a moneychanger. There is brass decoration on the lid.

269 - **MONEYCHANGER'S BALANCE AND WEIGHTS**
Ottoman, 18th - 19th century
Wood and brass
Box: 268x150x55 mm
KMA 632

The balance and weights are in their original box, which is stamped with the maker's name Hazin. The characteristics of the box show that it must have been made by an Iranian craftsman. The weights weigh 230.20 g, 138.00 g, 92.01 g, 47.00 g, 22.94 g, 13.82 g, 18.40 g and 3.34 g. Two weights are missing, the 3 miskal and 1 dirhem. The weights are graduated in multiples of the miskal, which was the unit used by the Ottomans for weighing gold, and Anatolian moneychangers used this type of balance.

270 - **MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Bronze and iron
l: 123 mm
KMA 649

271 - **MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Bronze and iron
l: 124 mm
KMA 650

272 - **MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Bronze and iron
l: 138 mm
KMA 652

273 - **SMALL STEELYARD**
Ottoman, 17th - 19th century
Bronze
l: 173 mm
KMA 654

275 - **MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Bronze and iron
l: 208 mm
KMA 657

274 - **MONEYCHANGER'S BALANCE**
Ottoman, 18th - 19th century
Bronze (beam) and tortoiseshell (pans)
l: 172 mm
KMA 655

276 - **BALANCE**
Ottoman, 18th - 19th century
Iron and brass (pans)
l: 404 mm
KMA 673

277 - **BALANCE**
Ottoman, 18th - 19th century
Iron and brass (pans)
l: 565 mm
KMA 680

279 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and bronze (pan)
l: 595 mm
KMA 681

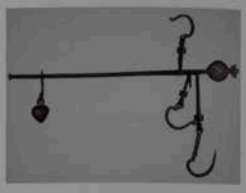
278 - **BALANCE**
Ottoman, 18th - 19th century
Iron and brass (pans)
l: 590 mm
KMA 682

280 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass
l: 280 mm
KMA 663

281 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 305 mm
KMA 668

282 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 310 mm
KMA 669

283 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 400 mm
KMA 674



284 - **STEELYARD**
Ottoman, 18th - 19th century
Iron
l: 405 mm
KMA 675

285 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (pan)
l: 410 mm
KMA 677

286 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 435 mm
KMA 678

287 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 555 mm
KMA 679

288 - **STEELYARD**
Ottoman, 18th - 19th century
Iron
l: 635 mm
KMA 683

289 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 645 mm
KMA 685

290 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 740 mm
KMA 686

291 - **STEELYARD**
Ottoman, 18th - 19th century
Iron and brass (weight)
l: 775 mm
KMA 687

292 - **ARŞIN RULE**
Ottoman, 18th - 19th century
Iron
l: 513 mm
KMA 698

293 - **ARŞIN RULE**
Ottoman, 18th - 19th century
Iron
l: 624 mm
KMA 699

294 - **ARŞIN RULE**
Ottoman, dated H 1252
Iron and brass
380.32 g; l: 679.5 mm
KMA 706

On the brass plaques at either end of the rule is the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious.' An oval assay stamp gives the date H 1252.

295 - **BALANCE PAN**
Ottoman, 1223, [1]241, 1253, [1]254, [1]255, [1]258, [1]261, 1262, [1]263 and [1]264
Brass
ø 90 mm
KMA 743

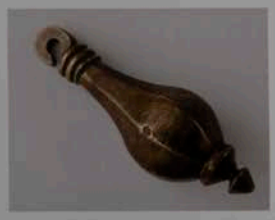
The weight was assayed between the years H 1223 and 1264, and stamped with the tuğra of Sultan Mahmud II reading, 'Mahmud Han b. Abdülhamid, May He Ever Be Victorious 1223,' and that of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There are also assay stamps with the dates H [1]241, 1253, [1]254, [1]255, [1]258, [1]261, 1262, [1]263 and [1]264.

296 - **PLUMB**
Ottoman, 18th - 19th century
Bronze
l: 181 mm
KMA 611

297 - **PLUMB**
Ottoman, 18th - 19th century
Bronze
l: 203 mm
KMA 612

298 - **PLUMB**
Ottoman, 18th - 19th century
Bronze
l: 144 mm
KMA 615

299 - **PLUMB**
Ottoman, 18th - 19th century
Bronze
l: 196 mm
KMA 1296



300 - **QUADRANT PLUMB**
Osmanlı, 18th century
Brass
ø 16 mm; l: 47 mm
KMA 618

This plumb belongs to a quadrant, an instrument used to calculate the latitude of ships by taking measurements of the sun above the horizon.

301 - **PLUMB LEVEL**
Ottoman, 18th - 19th century
Bronze
92x110 mm
KMA 626

303 - **1 DIRHEM WEIGHT**
Ottoman, dated H [1]273
Brass, type D
3.20 g; 29x29 mm
KMA 053

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date H [1]273.

302 - **1 DIRHEM WEIGHT**
Ottoman, dated H [1]267
Brass, type D
3.10 g; 25x27 mm
KMA 151

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is an assay stamp with the date H [1]267.

304 - **1 DIRHEM WEIGHT**
Ottoman, dated H [1]263
Copper, type D
3.15 g; 49x42 mm
KMA 411

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is an assay stamp with the date H [1]263.

305 - **2 DIRHEM WEIGHT**
Ottoman, dated H [1]257
Brass, type D
6.30 g; 49x69 mm
KMA 048

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date H [1]257.

307 - **2 DIRHEM WEIGHT**
Ottoman, dated H [1]257
Brass
6.34 g; 62x59 mm
KMA 050

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [1]257.

306 - **2 DIRHEM WEIGHT**
Ottoman, dated H [12]75
Brass, type D
3.18 g; 50x55.5 mm
KMA 051

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [12]75.

308 - **2 DIRHEM WEIGHT**
Ottoman, dated H [1]271
Brass, type D
6.36 g; 37x28 mm
KMA 147

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [1]271, and the tuğra of Sultan Abdülhamid II.

309 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H [1]277
Bronze, type L
39.26 g; ø 61 mm
KMA 018

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [1]277.

310 - **20 DIRHEM WEIGHT**
Ottoman, dated H [1]256
Bronze, type N
63.73 g; ø 30 mm; h: 12 mm
KMA 440

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [1]256.

311 - **20 DIRHEM WEIGHT**
Ottoman, dated H [1]273
Brass, type N
64.20 g; ø 31 mm; h:12.5 mm
KMA 491

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' There is also an assay stamp with the date [1]273.

312 - **25 DIRHEM WEIGHT**
Ottoman, 18th - 19th century
Bronze, type L
79.13 g; ø 76.5 mm
KMA 273

313 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]279 and [1]280
Brass, type U
318.06 g; ø 103 mm
KMA 285

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' Stamps show that the weight was also assayed in H 1279 and 1280, during the reign of Sultan Abdulaziz.

314 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]275, [1]279, [1]280, [1]281
Bronze, type U
318.83 g; ø 103 mm
KMA 404

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' The weight also bears assay stamps dated H [1]275, [1]279, [1]280 and [1]281.

315 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]275 and [1]316
Brass, type U
316.14 g; ø 106 mm
KMA 210

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' Stamps reading [1]275 and 'Ayarşud [1]316' indicate that the weight was assayed on these dates.

316 - **100 DIRHEM WEIGHT**
Ottoman, dated H [12]75
Brass, type U
311.78 g; ø 102 mm
KMA 156

عبدالمجيد حان بن محمود المظفر دائماً

The weight was assayed between the years H 1255 and 1277, and stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.' And assay stamp gives the date H 1275.

317 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1269
Bronze, type U
641.89 g; ø 135 mm
KMA 114

An assay stamp reading 'Bring 1269' shows that the weight is made of brass and was assayed in the year H 1269.

319 - **MONEYCHANGER'S BALANCE**
Ottoman, first half of 19th century
Bronze and iron
l: 105 mm
KMA 648

The balance is stamped with the tuğra of Sultan Abdülmecid reading, 'Abdülmecid Han b. Mahmud, May He Ever Be Victorious.'

318 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1271 and [1]312
Bronze, type U
641 g; ø 126 mm
KMA 007

There is an assay stamp with the date 1271 and the stamp of Sandıklı Municipality dated [1]312. The other stamps on the weight are illegible.

320 - **1 DIRHEM WEIGHT**
Ottoman, dated H [1]281
Copper, type D
3.07 g; 25x26 mm
KMA 047

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' An assay stamp is dated [1]281.

321 - **1 DIRHEM WEIGHT**
Ottoman, 19th century
Copper, type D
3.21 g; 25x26 mm
KMA 055

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' A stamp in the form of a ring indicates the denomination of 1 dirhem, while the Arabic numeral 9 must indicate the assayer.

323 - **1 DIRHEM WEIGHT**
Ottoman, 19th century
Copper, type D
3.18 g; 31x26.4 mm
KMA 490

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' There are also stamps bearing the numerals 4, 5 and 6, which are thought to identify the assayers, and a worn stamp.

322 - **1 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type D
3.18 g; 30x23 mm
KMA 058

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' The Arabic numeral 4 must belong to the assayer. The ring stamp in one corner indicates the denomination of 1 dirhem.

324 - **2 DIRHEM WEIGHT**
Ottoman, dated H [12]86
Brass, type D
6.40 g; 41.5x35 mm
KMA 149

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' An assay stamp gives the date [12]86.

325 - **2 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type D
6.33 g; 37x37.4 mm
KMA 123

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' The other stamp is illegible.

327 - **12.5 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type L
38.78 g; ø 59.1 mm
KMA 233

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' Two other stamps are illegible.

326 - **10 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type N
31.56 g; ø 24.7 mm; h: 9.7 mm
KMA 447

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' The Arabic numeral 5 stamped on the weight must belong to the assayer. There are two other stamps which are illegible.

328 - **20 DIRHEM WEIGHT**
Ottoman, dated H [12]88 and [12]89
Bronze, type N
64.11 g; ø 30 mm; h: 13.4 mm
KMA 441

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' On the same face are three worn stamps. On the reverse are assay stamps with the dates [12]88 and [12]89, a faint illegible stamp, and the Arabic numeral 5 which must indicate the assayer.

329 - **20 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type N
64.33 g; 26x26x15 mm
KMA 034

The weight bears a stamp indicating the denomination of 20 dirhem, and the stamped name of the assayer 'Mustafa'. Research into the archive records reveals that there was an official named Mustafa Efendi employed at the assay office.

331 - **25 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type H
64.11 g; ø 26.5 mm
KMA 344

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.'

330 - **20 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type H
64.53 g; ø 27.5 mm; h: 17.3 mm
KMA 030

There is a maker's stamp on this weight reading 'Foundryman Hatib'.

332 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type N
160.69 g; ø 38.5 mm; h: 20 mm
KMA 331

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, ' Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' An assay stamp is illegible.

333 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]279 and [1]280
Brass, type U
158.92 g; ø 93 mm
KMA 311

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' There are also assay stamps dated H [1]279 and [1]280.

335 - **50 DIRHEM WEIGHT**
Ottoman, dated H [12]87 and [1]318
Bronze, type L
164.23 g; ø 91 mm
KMA 021

The weight bears two 'Ayarşud' stamps indicating that it has been checked for true weight, dated H [12]87 and [1]318 respectively.

334 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type U
161.19 g; ø 88 mm
KMA 022

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' There are also two stamps reading 'Tatai Municipality' and a maker's mark reading 'Foundryman Hatib'.

336 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type U
158.77 g; ø 91 mm
KMA 226

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' An assay stamp is dated [1]281. There are two other illegible stamps.

337 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]274, [1]275, [1]276, [1]278, [1]280, [1]281 and [1]282
Brass, type U
158.17 g; ø 92.5 mm
KMA 215

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped five times with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' Assay stamps are dated [1]274, [1]275, [1]276, [1]278, [1]280, [1]281 and [1]282.

339 - **100 DIRHEM WEIGHT**
Ottoman, dated H [12]71, [12]76, [1]277, [1]278, [1]282
Brass, type U
309.77 g; ø 109 mm
KMA 237

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' There are also ten assay stamps dated H [12]71, [12]76, [1]277, [1]278, and [1]282.

338 - **50 GRAM WEIGHT**
Ottoman, 19th century
Bronze
49.89 g; ø 19.5 mm; h: 28.5 mm
KMA 104

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.'

340 - **100 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type U
314.20 g; ø 105 mm
KMA 457

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1277 and 1293, and stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.' Four other stamps on the weight are illegible.

341 - **MONEYCHANGER'S BALANCE**
Ottoman, 19th century
Bronze and iron
l: 146 mm
KMA 653

عبد العزيزخان بن محمود المظفر دائماً

Stamped on the iron beam of the balance is the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.'

342 - **POSTAL BALANCE**
Ottoman, 19th century
Brass and wood
1919.94 g; l: 340 mm; h: 160 mm
KMA 639

عبد العزيزخان بن محمود المظفر دائماً

This balance used at a post office is stamped with the tuğra of Sultan Abdulaziz reading, 'Abdülaziz Han b. Mahmud, May He Ever Be Victorious.'

343 - **1/2 DIRHEM WEIGHT**
Ottoman, dated H [1]323
Copper
1.64 g; 17.8x18 mm
KMA 044

The stamp is partially illegible and reads '...İbrahim 323'. It may belong to the owner of the weight or to an assayer.

344 - **1 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Brass, type D
3.21 g; 27x28.2 mm
KMA 144

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1299, and stamped with the tuğra of Sultan Abdülhamid reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' To the right of the tuğra is the title 'el-Gazi'.

345 - **10 DIRHEM WEIGHT**
Ottoman, dated H [1]295 and [1]297
Bronze, type L
39.46 g; ø 44.5 mm
KMA 103

One of the stamps reads 'Kayseri Municipality [1]295', and two read 'Kayseri Municipality [1]297', indicating the years when the weight was assayed.

347 - **12.5 DIRHEM WEIGHT**
Ottoman, [1]308 and [13]28
Bronze, type L
39.40 g; ø 61 mm
KMA 019

As well as a stamp indicating the denomination of 12.5 dirhems, there are two assay stamps, one consisting of the date [13]28 and the other with the name of the city and date, 'Akşehir [1]308'.

346 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1304
Bronze, type L
39.55 g; ø 62 mm
KMA 203

One of the stamps reads 'First 1304' and two read 'First', an abbreviation for First Office, which was presumably a department of the city authority.

348 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H 1320
Bronze, type L
39.37 g; ø 61 mm
KMA 268

As well as a stamp indicating the denomination of 12.5 dirhems, there is a maker's stamp reading 'Foundryman Hatib', a partially legible assay stamp reading 'Tarakli...' and the assay date stamp [1]320. A stamped tuğra and two other stamps are too faint to be legible.

349 - **25 DIRHEM WEIGHT**
Ottoman, dated H [1]319
Bronze, type L
80.67 g; ø 73 mm
KMA 260

The weight has a municipal stamp reading 'Yenişehir' and an assay date stamp for [1]319.

350 - **50 DIRHEM WEIGHT**
Ottoman, dated 1880, 1885, 1888 and 1890
Brass, type U
155.10 g; ø 88 mm
KMA 204

The weight has been stamped in countries neighbouring on the Ottoman Empire, and as well as the date stamps 1880, 1885, 1888 and 1890s, bears numerous stamps struck one on top of the other, most of which are illegible.

351 - **50 DIRHEM WEIGHT**
Ottoman, dated H 1304, 1305, 1307, 1308 and 1311
Bronze, type U
153.76 g; ø 90 mm
KMA 380

The weight bears several municipal assay stamps reading 'First 1304', 'First 1305', '[municipality] 1305', 'municipality 1307', '[municipality] 1308', '[municipality] 1311' and 'First Office'. In addition a maker's stamp reading, 'Made by Foti' has been struck three times. There are two further illegible stamps.

352 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]311, [1]321, [1]322, and [1]325
Bronze, type L
156.29 g; ø 86 mm
KMA 308

Assay date stamps read [1]311, [1]321, [1]322, and [1]325. Another three stamps are illegible.

353 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]20
Brass, type U
160.57 g; ø 87 mm
KMA 309

عبدالحميد خان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a maker's stamp, 'Osman', a stamp indicating the denomination reading '50 dirhem', and a date stamp reading '20 mim', indicating that it was assayed in the month of Muharrem 1320.

354 - **50 DIRHEM WEIGHT**
Ottoman, dated H [1]325
Bronze, type U
160.80 g; ø 95 mm
KMA 384

محمود خان بن عبدالحميد المظفر دائماً ١٢٢٣

The weight bears the stamp 'Ayarıyud', meaning that it has been found to be accurate, a stamp reading 'AYAR', meaning standard, dating from the period of the Turkish Republic, and the tuğra of Sultan Mahmud II. An assay date stamp reads [1]325. Lead has been poured onto the weight to bring it up to standard, but the stamp on this is illegible.

355 - **50 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Brass, type U
160.37 g; ø 87.7 mm
KMA 421

عبدالحميد خان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' A stamp bears the name Arif, probably that of the assay official, and another stamp specifies the denomination of 50 dirhem. Another faint stamp is illegible.

356 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]17, [13]18, [13]19, [13]20, [13]21, [13]22, [13]23, [13]26 and [13]27
Brass, type U
156.55 g; ø 87 mm
KMA 279

عبدالحميد خان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading,'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' As well as assay date stamps, there is another stamp with the name Mustafa, who was probably an assay official.

357 - **50 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Brass, type U
158.63 g; ø 87 mm
KMA 247

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There are two stamps reading 'Full Standard', and another stamp with the name Mustafa, belonging to the assayer.

358 - **66 DIRHEM WEIGHT**
Ottoman, dated H [13]23
Bronze, type U
213.74 g; ø 79 mm
KMA 417

A stamp reading Sivas shows that this weight was manufactured in or around the city of Sivas, and there is an assay date stamp reading [13]23.

359 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]299
Brass, type U
317.56 g; ø 105 mm
KMA 181

The stamp 'Ayarşud 299' shows that it was assayed in the year 1299.

360 - **100 DIRHEM WEIGHT**
Ottoman, 1306, 1307, 1308, 1309, 1311, [1]313, [1]314, [1]315, [1]316, [1]320, [1]322, [1]323, [1]324, [1]335
Bronze, type L
316.60 g; ø 102 mm
KMA 408

The weight bears numerous assay date stamps reading 'First 1306', 'Municipality 1307', 'Municipality 1308', 'Municipality 1309', 'Municipality 1311', 'Municipality [1]313' stamped twice, 'Municipality [1]314' stamped twice, 'Municipality [1]315', 'Municipality [1]316', 'Municipality [1]320', 'Municipality [1]322', 'Municipality [1]323', 'Municipality [1]324' and 'Municipality [1]335'. Another stamp reads 'Brass'. Two other stamps are illegible.

361 - **100 DIRHEM WEIGHT**
Ottoman, dated H 1309 and [19]40 AD
Brass
321.94 g; ø 106 mm
KMA 223

One stamp reads 'Municipality 1309', and a hexagonal stamp reads 'Second [19]40', probably referring to a municipal department. Two other faint stamps are illegible..

362 - **100 DIRHEM WEIGHT**
Ottoman, dated H [1]312
Bronze, type U
324 g; ø 104 mm
KMA 013

There is an assay stamp with the date [1]312, and a municipal stamp with the name of the town Sandıklı.

363 - **100 DIRHEM WEIGHT**
Ottoman, dated H [13]15, [13]16, [13]17, [13]18, [13]19, [13]20, [13]21, [13]22, [13]23 and [13]24
Brass, type U
317.84 g; ø 102 mm
KMA 157

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There are assay stamps with the dates H [13]15, [13]16, [13]17, [13]18, [13]19, [13]20, [13]21, [13]22, [13]23 and [13]24. One stamp consists of the name Emin, which probably refers to the assayer.

364 - **100 DIRHEM WEIGHT**
Ottoman, dated H [13]26, [13]27, [13]28 and [13]41
Brass, type U
321.68 g; ø 103 mm
KMA 455

One stamp reads 'hak' meaning 'right' indicating full weight. Assay stamps give the dates H [13]26, [13]27, [13]28 and [13]41.

365 - **100 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type U
313.18 g; ø 104 mm
KMA 202

There are 20 stamps on the weight, those which are legible giving the dates 1308, [1]309, [1]315, [1]318, 1319, [1]320, [1]321, [1]322, [1]323, [1]324, [1]325, [1]326, [1]329, [1]330, [1]331, [1]332 and [1]333.

367 - **100 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Brass, type U
320.90 g; ø 101.5 mm
KMA 372

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a stamp indicating the denomination reading '100 dirhems', and two faint stamps which are illegible.

366 - **100 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Bronze, type U
316 g; ø 125 mm
KMA 008

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There are seven stamps belonging to İzmit Municipality, and stamps bearing the numerals 7, 9, 11 and 12 must refer to assay officials.

368 - **100 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Bronze, type U
320.05 g; ø 100 mm
KMA 454

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a stamp indicating the denomination reading '100 dirhems', and an assay date stamp reading 'the year 15' for the year H 1315. Three more faint stamps are illegible.

369 - **200 DIRHEM WEIGHT**
Ottoman, 18th century?
Bronze, type U
634.41 g; ø 125 mm
KMA 244

The weight is stamped with the words 'full standard', and beneath this the number 11, indicating either that the weight was assayed in H 1211 or 1311.

371 - **200 DIRHEM WEIGHT**
Ottoman, dated H [1]312
Bronze, type U
643.80 g; ø 116.4 mm
KMA 399

The weight is stamped with the name of the town Sandıklı and the assay date [1]312. In addition there is an illegible municipal stamp with a tuğra form. Lead has been poured around the hole in the centre to make it up to weight.

370 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1304
Brass, type U
645.75 g; ø 131 mm
KMA 300

The weight bears the assay stamps 'Ayarşud', 'Municipality 1304' and 'First Office' stamped twice. Beneath the second stamp is an illegible date.

372 - **200 DIRHEM WEIGHT**
Ottoman, dated H 1304 , 1305 and [1]312
Bronze , type U
635.47 g; ø 132 mm
KMA 459

Stamps on the weight read 'Municipality [1]312', 'First 1304', 'First 1305', and 'First Office' stamped twice. There are two stamps with the numerals 2 and 9, thought to indicate the assay officials, and another illegible stamp.

373 - **200 DIRHEM WEIGHT**
Ottoman, dated [19]24, [19]26, [19]27, [19]28 and [19]30
Bronze, type U
624 g; ø 123 mm
KMA 006

عبد العزيزخان بن محمود المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' The weight was later assayed after the establishment of the Turkish Republic in [19]24, [19]26, [19]27, [19]28 and [19]30. There are also stamps bearing the names of the towns of İzmit and Bahçecik.

374 - **200 DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Brass, type U
629.64 g; ø 120 mm
KMA 461

عبدالحميد خان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There are also assay dates stamps reading '15 mim', '16 mim', '25 mim', '26 mim', '27 mim', '29 mim', '30 mim' and '31 mim', mim indicating the month of Muharrem. Four other stamps are too faint to be legible.

375 - **400 DIRHEM WEIGHT**
Ottoman, dated H [1]297
Bronze, type U
1265.25 g; ø 140 mm
KMA 241

There is the municipal stamp of the city of Kayseri, and an assay date stamp reading [1]297. Another six faint stamps are illegible.

376 - **400 DIRHEM WEIGHT**
Ottoman, dated H 1304
Brass, type U
1298.15 g; ø 166 mm
KMA 460

One stamp reads 'First 1304', and there are a further four faint stamps.

377 - **6 OKKA WEIGHT**
Ottoman, dated H 1311
Iron
7700 g; 140x145x70 mm
KMA 194

Two identical stamps read 'Kayseri Municipality 1311'.

379 - **50 NEW DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Bronze, type V
50.05 g; ø 55.5 mm
KMA 222

عبدالحميد خان بن عبدالمجيد المظفر دائماً

This is a weight manufactured after the introduction of the metric system in H 1299 (1882-83). The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' A stamp gives the domination of the weight as '50 new dirhems'. A partially illegible stamp reads 'Mustafa...', the maker's stamp reads 'Foundryman Hatib', and another stamp is illegible.

378 - **50 NEW DIRHEM WEIGHT**
Ottoman, late 19th - early 20th century
Bronze, type V
50.05 g; ø 54.5 mm
KMA 220

This is a weight manufactured after the introduction of the metric system in the year H 1299 (1882-83). The gram was denoted 'new dirhem', and a stamp gives the domination of the weight as '50 new dirhems'. There is also a maker's stamp, 'Hatib Kapusu', and a stamp with the numeral 6, that is thought to belong to the assayer.

380 - **20 GRAM WEIGHT**
Ottoman, [13]10 and [13]15
Brass, type V
20.02 g; ø 38 mm
KMA 295

The weight was manufactured after the introduction of the metric system in H 1299 (1882-83). The maker's stamp reads 'Foundryman Hatib', and two assay stamps consist of '10 mim' and '15 mim' for the dates Muharrem [13]10 and Muharrem [13]15.

381 - **SET OF WEIGHTS**
Ottoman, 19th century
Brass, type V
1995.96 g; ø 25-128.4 mm
KMA 390

عبدالحميد حان بن عبدالمجيد المظفر دائماً

This set of weights was manufactured at Tophane, the imperial foundry in Istanbul, after H 1299. The tuğra of Sultan Abdülhamid II reads, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' This set consists of graduated weights ranging from 1 kıyye (1 kilogram) down to 10 grams. The 20 gram weight is missing.

382 - **100 NEW DIRHEM WEIGHT (100 GRAMS)**
Ottoman, dated H 1299
Brass
99.75 g; ø 25 mm, h: 35 mm
KMA 127

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight bears a stamp reading 'Tophane', and an assay date stamp for the year 1299. At the edges are assay stamps consisting of the numbers 5, 7, 8, 9 b, 15 and 16, and below our stamps with the numbers 2, 3 and 5.

383 - **200 NEW DIRHEM WEIGHT (200 GRAMS)**
Ottoman, dated H [1]303 and 1305
Brass, type U
645.29 g; ø 125 mm
KMA 458

The marks 'Second 1305' and 'Second Office [1]303' are both stamped twice. Another faint stamp is illegible.

384 - **100 NEW DIRHEM WEIGHT (100 GRAMS)**
Ottoman, dated H [13]15 and [13]16
Brass, type V
99.99 g; ø 67.5 mm
KMA 171

عبدالحميد حان بن عبدالمجيد المظفر دائماً

It was manufactured after the introduction of the metric system in H 1299 (1882-83), assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II. Stamps give the maker's name 'Foundryman Hatib', and the denomination '100 new dirhems'. A stamp with the numeral 1 is thought to indicate the assayer, and assay dates stamps read '15 mim', 'the year 15 mim' and '16...', for Muharrem 1315 and the year 1316.

385 - **100 NEW DIRHEM WEIGHT (100 GRAMS)**
Ottoman, late 19th - early 20th century
Brass, type V
98.47 g; ø 65 mm
KMA 224

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was manufactured after the introduction of the metric system in H 1299 (1882-83). It was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a stamp reading '100 new dirhems', the maker's mark 'Hatib Kapusu', and a mark reading 'Brass'. There are also stamps with the numbers 6, 7, 8, 9, 10 and 11, probably identifying the assay officials.

386 - **100 NEW DIRHEM WEIGHT (100 GRAMS)**
Ottoman, late 19th - early 20th century
Brass, type V
99.17 g; ø 75 mm
KMA 276

عبدالحميد حان بن عبدالمجيد المظفر دائماً

The weight was manufactured after the introduction of the metric system in H 1299 (1882-83). It was struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a stamp reading '100 new dirhems', the maker's mark 'Hatib Kapusu', and a mark reading 'Brass'. There is also a stamp with the number 5, probably identifying the assay official.

387 - **200 NEW DIRHEM WEIGHT (200 GRAMS)**
Ottoman, dated H 1299
Brass, type V
198.87 g; ø 91 mm
KMA 313

The weight was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' There is a stamp reading 'Tophane' for the place of manufacture, and the date 1299. A stamp reading 'Izmid' indicates the town where it was used.

388 - **500 NEW DIRHEM WEIGHT (500 GRAMS)**
Ottoman, late 19th - early 20th century
Brass
500.83 g; ø 42 mm; h: 62 mm
KMA 296

The weight was manufactured after the introduction of the metric system in H 1299 (1882-83), when grams were called 'new dirhems'. There is a maker's mark ' Foundryman Hatib', and a mark reading 'Ahmed 4' probably referring to the assay official.

389 - **1 KILOGRAM WEIGHT**
Ottoman, 20th century
Brass
1000 g; ø 123 mm
KMA 1284

The weight was manufactured after the introduction of the metric system in the year H 1299 (1882-83). A municipal stamp reads 'Malgara', and the number 1000 stamped at the edge gives the denomination of 1000 grams.

390 - **SET OF WEIGHTS**
Ottoman, 19th - 20th century
Brass
2012.05 g; ø 125 mm
KMA 610

The weight was manufactured after the introduction of the metric system in the year H 1299 (1882-83). There are no assay marks, however, suggesting that these weights may have been used illegally.

391 - **1/2 MEASURE (1/2 LITRE)**
Ottoman, dated H 1299
Iron
286.25 g; ø 90 mm; h: 94 mm
KMA 604

A stamp reading 'Tophane' on the rim shows that this measuring cup was manufactured at the imperial foundry. Lead seals have been struck on the joins. At the top is the tuğra of Sultan Abdülhamid II, and at the edge a date stamp reading 'the year 1299'.

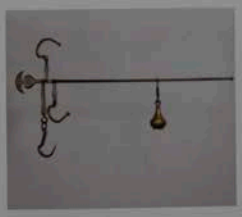
392 - **BUTCHER'S BALANCE**
Ottoman, late 19th - early 20th century
Iron (beam) and brass (pans)
l: 770 mm
KMA 688

On both of the pans is the stamped name Osman, the faint tuğra of Sultan Abdülhamid II, and the word 'Brass'. One of the pans also has 23 assay marks.

393 - **STEELYARD**
Ottoman, late 19th - early 20th century
Iron and brass
l: 285 mm
KMA 662

عبدالحميد خان بن عبدالمجيد المظفر دائماً

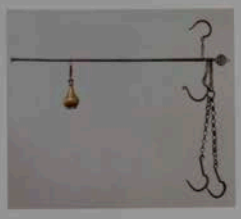
The steelyard was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.'



394 - **STEELYARD**
Ottoman, late 19th - early 20th century
Iron
l: 1083 mm
KMA 1341

عبدالحميد خان بن عبدالمجيد المظفر دائماً

The steelyard was assayed between the years H 1293 and 1327 and struck with the tuğra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Ever Be Victorious.' The number numeral 8 inside a triangle may indicate the assayer.



395 - **STEELYARD**
Ottoman, dated H 1324, 1325, 1326 and [13]31
Iron
l: 1042 mm
KMA 1340

The date 1324 is stamped on one side of the terminal, and the number 6 has been stamped over the number 4, indicating that it was assayed in the year H 1326. On the other side is the date 1325 and a stamp reading '... Municipality [13]31'.

396 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Ebony
l: 110 mm
KMA 721

On one side of the balance in Latin script is a stamp reading 'Servet Tarakçılar' and on the other in Ottoman script the word 'Tarakçılar'. The balance is marked for measuring full value gold coins on one side and half value gold coins on the other. The full values are marked as '88, full French', '100, full Ottoman', and '110, full English'; and the half values as '44, half French', '50, half Ottoman' and '55, half English'.

397 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 109 mm
KMA 726

In two places on the balance are stamps reading 'Ömer Lütfi Tarakçılar' in Latin and Ottoman script respectively. The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

399 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 110 mm
KMA 728

On one side of the balance in Latin and Ottoman script are stamps reading 'Mustafa Zeki'. The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

398 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Ebony
l: 112 mm
KMA 727

The 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 illegible.

400 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Bone
l: 110 mm
KMA 713

The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

401 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 110 mm
KMA 714

Two stamps on the balance read 'Ömer Lütfi Tarakçılar' in both Latin and Ottoman script respectively. Ömer Lütfi is thought to be the name of the maker, and Tarakçılar his place of business. The balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

403 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 98 mm
KMA 716

The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

402 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 109 mm
KMA 715

Two stamps on the balance read 'Mustafa Boruci' in both Latin and Ottoman script. A stamp with the number 107 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.

404 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Wood
l: 109 mm
KMA 729

A stamp on the top of the balance reads '[Mustafa] Boruci'. A stamp with the number 107 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.

405 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Bone
l: 106 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.

407 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Metal
l: 97 mm
KMA 718

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 what it signifies is unknown.

406 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman, late 19th century
Bone
l: 91 mm
KMA 733

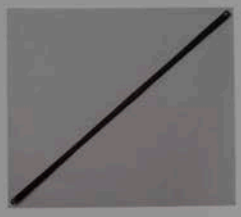
The pocket balance is marked for measuring full value gold coins on one side and half value gold coins on the other.

408 - **MONEYCHANGER'S POCKET BALANCE**
Ottoman?, late 19th century
Metal
l: 101 mm
KMA 719

The three stamps on the balance read 'BREVETES G.D.G. no: 1005', 'Babrat Ali N., K. Y. 1005' in Ottoman Turkish, and 'Iskender Arabyan, CONS/PLE'. The last stamp is thought to refer to the importer.

409 - **MONEYCHANGER'S POCKET BALANCE AND CASE**
Ottoman, late 19th century
Metal and wood (case)
l: 113 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, 'BREVETE no: 1031, M.G. Hatcadourian'.



411 - **METRE RULE**
Ottoman, dated H 1312 and [1]933 AD
Iron
673.29 g; l: 999.2 mm
KMA 707

At one end of the rule is the maker's mark, 'Manuk 1312', and at the other a municipal assay stamp reading, 'Ayvaci[k] [1]933'.

410 - **METRE RULE**
Ottoman, dated H 1299
Iron
1000x22x44 mm
KMA 704

This metre rule was manufactured at the imperial foundry after the introduction of the metric system during the reign of Sultan Abdulaziz II. At one end are date inscriptions reading, 'Year of the Hegira 1299 lunar', 'solar 1260', and '1883 AD'. At the other end is the tughra of Sultan Abdülhamid II reading, 'Abdülhamid Han b. Abdülmecid, May He Be Ever Victorious.' The rule is marked on one face in Arabic numerals and on the reverse with Latin numerals.

412 - **1/2 DIRHEM WEIGHT**
Ottoman, 19th century
Brass, type D
1.63 g; 27x29 mm
KMA 057

The word 'half' in Ottoman Turkish is worked in repoussé.

413 - **2 DIRHEM WEIGHT**
Ottoman, dated H [13]26, [13]38, [13]39, [13]41
Brass, type D
659 g; 33.4x34.5 mm
KMA 059

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' Assay dates stamps read '[13]26 mim', '[13]38 mim', '[13]39 -7', and '[13]41 çe'. Mim stands for the month Muharrem and çe for the month cemaziyelahir. The numeral 7 on the third stamp must signify the assay official.

414 - **2 DIRHEM WEIGHT**
Ottoman, dated H [13]36
Brass, type D
6.27 g; 33x34 mm
KMA 049

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' The word 'Hak' stamped on the weight means that it is true to standard. There is also an assay date stamp reading '36 mim', signifying the month of Muharrem H 1336.

415 - **3 DIRHEM WEIGHT**
Ottoman, 19th century
Copper, type D
8.38 g; 32x35 mm
KMA 054

The name Mustafa stamped on the weight must refer to the assay official. Three stamped circles indicate the denomination of 3 dirhems, and were probably struck by the owner.

416 - **5 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type D
16.17 g; ø 18 mm
KMA 036

Since the stamps have been struck one on top of the other, they are illegible apart from the number 32 and 'mim' for Muharrem. The form of the weight suggests that it must date from the year H 1332.

417 - **10 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type I
31.81 g; 22x22 mm; h: 12 mm
KMA 035

The weight is octagonal. On the domed upper surface is an illegible stamp.

419 - **12.5 DIRHEM WEIGHT**
Ottoman, late 19th - mid-20th century
Bronze, type L
40.87 g; ø 53.5 mm
KMA 182

Among the many stamps on this weight, 'Bahçecik Municipality' is repeated several times. The numerous date stamps allow us to date the weight between the years H 1327 and 1366. There are also numerous stamps belonging to assay officials.

418 - **12.5 DIRHEM WEIGHT**
Ottoman, dated H [13]28
Bronze, type H
63.49 g; ø 28.5 mm; h: 16 mm
KMA 028

In view of the form, which was used in the 19th century, the stamped number 28 probably indicates the date H 1328. The number 9 probably refers to the assayer.

420 - **20 DIRHEM WEIGHT**
Ottoman, dated H [13]32
Brass, type U
66.13 g; ø 66 mm
KMA 251

Weight of this type, domed in the centre and with small holes, were only used in Sivas, every example bearing the stamps of Sivas Municipality.

421 - **25 DIRHEM WEIGHT**
Ottoman, dated H [13]30
Brass, type L
80.29 g; ø 73 mm
KMA 217

There is a stamp indicating the denomination of 25 dirhems, and an assay date stamp reading '30 mim', signifying the month of Muharrem H 1330.

422 - **25 DIRHEM WEIGHT**
Ottoman, dated H [1]331 and [1]340
Bronze, type L
79.62 g; ø 70 mm
KMA 267

The stamped number 25 indicates the denomination, and there is also an assay date stamp for [1]340. Another partially legible stamp reads, '... [1]331'. Two other stamps are illegible.

423 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]29
Brass, type U
160.93 g; ø 87.5 mm
KMA 258

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' The stamped number 50 indicates the denomination, and there is an assay date stamp reading '29 mim', indicating the month of Muharrem 1329. A third stamp is illegible.

424 - **50 DIRHEM WEIGHT**
Ottoman, early 19th century
Bronze, type I
161 g; ø 40.5 mm; h: 23.2 mm
KMA 343

425 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]27, [13]28 and [13]29
Brass, type L
159.68 g; ø 87.5 mm
KMA 385

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' There are assay date stamps for the years H [13]27, [13]28 and [13]29. There is also the stamp of the maker Osman.

426 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type H
159.72 g; ø 36.5 mm; h: 24.5 mm
KMA 029

On the top of the weight is a faint illegible stamp.

427 - **100 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type U
319.81 g; ø 103 mm
KMA 414

There is a maker's stamp, 'Osman Küçük', and five faint stamps.

428 - **100 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type U
320.54 g; ø 102.9 mm
KMA 416

There is the assay stamp 'Ayaryud' and a later assay stamp reading 'AYAR' from after the establishment of the Turkish Republic.

429 - **100 DIRHEM WEIGHT**
Ottoman, dated H [13]32
Bronze, type U
321.61 g; ø 97 mm
KMA 306

The number 100 is stamped both in Arabic and Latin numerals. There is also an assay stamp for Sivas Municipality with the date [13]32. Another stamp is too faint to be legible.

431 - **100 DIRHEM WEIGHT**
Ottoman, dated H [13]32, [13]35, [13]36 and [13]37
Brass, type U
319.38 g; ø 100 mm
KMA 208

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' There are assay date stamps for the years H [13]32, Muharrem [13]35, [13]36 twice, and [13]37. Two other faint stamps are indecipherable.

430 - **100 DIRHEM WEIGHT**
Ottoman, dated H [13]29 and [13]40
Brass, type U
318.35 g; ø 103 mm
KMA 250

The weight is stamped with the denomination '100 dirhems', with the name of the maker 'Ali', the material 'Brass', and the place name 'Kerkuk'. There are assay date stamps for Muharrem [13]29 and [13]40.

432 - **200 DIRHEM WEIGHT**
Ottoman, dated H [13]35
Bronze, type L
640 g; ø 124 mm
KMA 012

The weight is stamped 'Balıkesir Municipality' with the year [13]35.

433 - **200 DIRHEM WEIGHT**
Ottoman, dated H [13]27, [13]28 and [13]32
Brass, type U
641.51 g; ø 119 mm
KMA 168

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' There are assay date stamps for the years H [13]27, [13]28 and [13]32. Another nine stamps are indecipherable.

435 - **200 DIRHEM WEIGHT**
Ottoman, 20th century
Brass, type U
639.96 g; ø 121 mm
KMA 191

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' There is also a stamp with the name 'Ahmed Sırrı', which is thought to belong to the assay official.

434 - **200 DIRHEM WEIGHT**
Ottoman, dated H [13]26, [13]29 and [13]38
Brass, type U
641.58 g; ø 117 mm
KMA 185

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' One stamp denotes the denomination of 200 dirhems. There are assay date stamps for the years H [13]28, [13]29 and [13]38.

436 - **200 DIRHEM WEIGHT**
Ottoman, dated H [1]302, [1]331 and [13]32
Bronze, type U
630.45 g; ø 123 mm
KMA 302

There is the stamp of the maker 'Foundryman Hatib', assay date stamps reading 'ayarlı [1]331' and 'ayarlı [13]33', the stamp of 'Kayseri Municipality' stamped twice, and the date [1]302. There are three other illegible stamps.

437 - **200 DIRHEM WEIGHT**
Ottoman, dated H [13]30, [13]31, [13]32, [13]33, [13]35, [13]36 and [13]38
Brass, type U
638.10 g; ø 121 mm
KMA 466

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' The weight is marked '200 dirhems', and there are assay date stamps for the years H [13]30, [13]31, [13]32, [13]33, [13]35, [13]36 and [13]38. A further four stamps are decipherable.

438 - **200 DIRHEM WEIGHT**
Ottoman, dated H [13]30, [13]36, [13]37, [13]38 and [13]39
Brass, type U
640.55 g; ø 120 mm
KMA 472

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' The weight has assay date stamps for the years H [13]30, [13]36, [13]37, [13]38 and [13]39. The stamp with the name Osman probably belongs to the assay official.

439 - **200 DIRHEM WEIGHT**
Ottoman, dated [1]926 AD, H [1]331 and [13]40
Bronze, type U
639.45 g; ø 124.5 mm
KMA 476

There are assay date stamps for the years [1]926 AD, H [1]331 and [13]40. The date 1926 shows that this weight continued to be used after the establishment of the Turkish Republic. Numerous other stamps are superimposed and indecipherable.

440 - **200 DIRHEM WEIGHT**
Ottoman, dated [1]927, [1]928, [1]929 and [1]930
Brass, type U
1283.67 g; ø 157 mm
KMA 269

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.' The weight has assay date stamps for the years [1]927, [1]928, [1]929 and [1]930 AD. There are three other indecipherable stamps.

441 - **1 KIYYE WEIGHT (400 DIRHEMS)**
Ottoman, dated H [13]30
Brass, type T
1287 g; ø 68 mm; total h: 125 mm
KMA 607

The weight is marked 'I kiyye', a unit equivalent to 1 okka or 400 dirhems. A stamp reading 'Mehmed 3' belongs to the assayer, and there is a faint tuğra which may belong to Sultan Mehmed V. There is an assay date stamp '[13]30 mim' for Muharrem H 1330.

442 - **5 OKKA WEIGHT**
Ottoman, early 20th century
Iron, type M
6417.87 g; bottom ø 143 mm; top ø 130 mm; h: 80 mm
KMA 193

محمد حان بن عبدالمجيد المظفر دائماً

The weight was assayed between the years H 1327 and 1336, and stamped with the tuğra of Sultan Mehmed V reading, 'Mehmed Han b. Abdülmecid, May He Ever Be Victorious.'

443 - **25 DIRHEM WEIGHT**
Ottoman, dated H [1]337
Bronze, type L
79.98 g; ø 72.5 mm
KMA 280

The weight is marked with the denomination '25 dirhems', an assay date stamp '[1]337', and a stamp with the name Mustafa, who was probably the assayer. Other stamps, 'P.B. 933' and 'P.B.', suggest that this weight was used in neighbouring countries.

444 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]36
Bronze, type L
162 g; ø 90 mm
KMA 020

The weight is stamped 'Ayarşud 36' for the year 1336, and there are two stamps reading 'Seventh 87' whose significance is unknown.

445 - **50 DIRHEM WEIGHT**
Ottoman, dated H [13]39, [13]40 and [13]41
Bronze
159.67 g; ø 27 mm; h: 51 mm
KMA 297

This weight manufactured by a local craftsman has assay date stamps for the years H [13]39, [13]40 and [13]41.

447 - **12.5 DIRHEM WEIGHT**
Ottoman, dated [19]24, [19]25 and [19]26
Bronze
37.31 g; ø 19 mm; h: 22.8 mm
KMA 452

The weight is stamped with its denomination of 12.5 dirhems, and has assay date stamps for [19]24, [19]25 and [19]26.

446 - **10 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type N
32.93 g; ø 20 mm; h:13.3 mm
KMA 448

The stamp is indecipherable.

448 - **20 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type N
63.72 g; 28x28.5x12 mm
KMA 033

The weight bears the stamp of Tokat Municipality.

449 - **25 DIRHEM WEIGHT**
Ottoman, early 20th century
Bronze, type L
80.11 g; ø 74 mm
KMA 246

The weight is stamped 'Ankara Municipality', and the numeral 9 is thought to signify the assayer. Another two stamps are indecipherable.

451 - **50 DIRHEM WEIGHT**
Turkish Republic, dated [1]928
Bronze, type U
162.91 g; ø 85.4 mm
KMA 376

The weight has an assay stamp with the date [1]928. Two other stamps are indecipherable.

450 - **50 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type L
318 g; ø 106 mm
KMA 009

The weight is marked 'Kula Municipality'. The name of the owner, composed in the form of a tuğra, is indecipherable.

452 - **50 DIRHEM WEIGHT**
Ottoman, 19th century
Bronze, type U
161.27 g; ø 74.4 mm
KMA 381

There are two indecipherable stamps.

453 - **100 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Bronze, type U
312 g; ø 104 mm
KMA 023

The weight bears the municipal stamp 'Mihalıç'.

455 - **100 DIRHEM WEIGHT**
Ottoman, 19th - 20th century
Brass, type U
319.99 g; ø 106 mm
KMA 261

The weight is marked 'Karaman Municipality'.

454 - **100 DIRHEM WEIGHT**
Turkish Republic, dated [19]26
Bronze, type U
321.15 g; ø 101 mm
KMA 245

The weight is marked 'Merzifon Municipality', and the assay date [19]26.

456 - **200 DIRHEM WEIGHT**
Turkish Republic, dated 1926 and [1]940
Brass, type U
636.95 g; ø 127 mm
KMA 242

The maker's mark 'Made by Foti' is stamped twice, and it bears the assay date marks 1926 and [1]940. Two other faint stamps are indecipherable.

457 - **200 DIRHEM WEIGHT**
Turkish Republic, dated [19]23, [19]24, [19]25, 1926, 1927, [19]28, [19]29, [19]30, [19]31 and [19]35
Brass, type U
622.19 g; ø 120 mm
KMA 249

Two of the assay stamps give the place as well as date: 'Adana 1926' and 'Adana 1927'. The others give the dates [19]23, [19]24, [19]25, [19]28, [19]29, [19]30, [19]31 and [19]35. Other stamps are indecipherable.

459 - **1 OKKA WEIGHT (400 DIRHEMS)**
Turkish Republic, dated [19]31, [19]32 and [19]33
Iron and lead
1281.16 g; top ø 7.2 cm; bottom ø 8.3 cm
KMA 197

The hollow cast iron weight is filled with lead, which bears the assay date stamps [19]31, [19]32 and [19]33.

458 - **200 DIRHEM WEIGHT**
Ottoman, early 20th century
Bronze, type U
638.02 g; ø 120 mm
KMA 253

There are two assay stamps for the city of Kütahya reading, 'Kütahya assay stamp' and 'Genuine Kütahya stamp.'

460 - **1 OKKA WEIGHT (400 DIRHEMS)**
European, early 20th century
Iron, type M
1260 g; bottom ø 87 mm; top ø 72 mm
KMA 198

The weight is denominated in Latin script as 'I oke', so must have been manufactured in Europe.

461 - **1 OKKA WEIGHT (400 DIRHEMS)**
Ottoman, 19th - 20th century
Bronze, type L
1264 g; ø 139 mm
KMA 1275

The weight bears the stamp of Karaman Municipality.

463 - **10 GRAM WEIGHT**
Turkish Republic, 20th century
Brass
9.99 g; ø 20 mm; h: 8 mm
KMA 134

The weight is marked with the maker's stamp 'EYD', and the denomination of 10 g. There are also two stamps reading 'TC 66'.

462 - **2 OKKA WEIGHT (800 DIRHEMS)**
European, late 19th century
Iron
2561 g; ø 108 mm; h: 57 mm
KMA 195

The weight is marked '2 okes', meaning '2 okkas', and must have been produced in Europe. The cavity in the base of the weight has been filled with lead, which is stamped with an assay mark.

464 - **50 GRAM WEIGHT**
Turkish Republic, dated [19]34
Brass, type V
50 g; ø 55 mm
KMA 100

The weight is marked 'g 50', indicating the domination. There is an assay stamp with the date [19]34. A makeweight copper rivet is stamped '718', but the significance of this number is unknown.

465 - **100 GRAM WEIGHT**
Ottoman, 19th - 20th century
Brass, type V
101.26 g; ø 65 mm
KMA 248

The weight is marked 'Genuine Stamp of Kütahya'.

467 - **2 HECTOGRAM (200 GRAMS)**
Ottoman, early 20th century
Iron, type M
155.09 g; ø 48 mm; h: 23 mm
KMA 200

Lead has been poured inside the weight to bring it up to standard. It is stamped with the denomination '2 HECTOG.'

466 - **100 GRAM WEIGHT**
Turkish Republic, dated [19]26
Brass, type V
99.24 g; ø 75.5 mm
KMA 271

The weight is stamped with the star and crescent motif that was introduced after the establishment of the Turkish Republic, and the denomination, '100 grams'. There is also an assay date stamp reading '[19]26 mim', for the month of Muharrem 1926.

468 - **500 NEW DIRHEM WEIGHT (500 GRAM)**
Ottoman, early 20th century
Iron, type M
497.87 g; ø 66 mm
KMA 199

The weight is filled with lead. It is stamped with the denomination '500 dirhems,' which according to its weight must be new dirhems, ie grams. The stamps are blurred and indecipherable.

469 - **1 KIYYE WEIGHT (1000 GRAMS)**
Turkish Republic, [19]29 and [1]934
Brass, type V
999.44 g; ø 126 mm
KMA 265

The denomination of this metric weight is given as '1 kıyye'. There is also an assay stamp reading 'Conducted by the municipality', and assay date stamps for [19]34 and [1]929.

470 - **5 KILOGRAM WEIGHT**
Ottoman, early 20th century
Iron, type M
5000 g; ø 140 mm; h: 67 mm
KMA 196

On the weight is stamped the denomination '5 kilograms' in Ottoman script. The weight is filled with lead, and marked with an assay stamp.

471 - **SET OF METRIC WEIGHTS**
Turkish Republic, 20th century
Brass
Box: 170x86x22 mm
KMA 505

500 g: *ø 4 cm, h: 6 cm, 498.44 g. Marked with assay stamps 'TC [19]60' and '62', two indecipherable stamps, and 'Y.M.'*

200 g: *ø 4 cm, h: 15 cm, h: 2.7 cm, 200.14 g. Faint stamp post-1923.*

100 g: *ø 3.3 cm, h: 2.4 cm, 99.17 g. Marked with an assay stamp, 'TC [19]87'.*

100 g: *ø 3.3 cm, h: 2.3 cm, 100.04 g. Marked with an assay stamp, 'TC [19]83'.*

50 g: *ø 2.3 cm, h: 1.6 cm, 49.85 g. The stamps are too faint to decipher.*

20 g: *ø 2.15 cm, h: 0.95 cm, 19.89 g. Marked with an assay stamp, 'TC [19]78', and an indecipherable stamp.*

20 g: *ø 2.15 cm, h: 1.1 cm, 20.04 g. Marked with an assay stamp, 'TC [19]42', and 'Y.M.'.*

10 g: *ø 1.9 cm, h: 0.55 cm, 9.88 g. Marked with an assay stamp, 'TC [19]65,' and 'Y.M.'.*

472 - **1 LITRE MEASURE**
Turkish Republic, dated [19]50 and [19]51
Iron
610.08 g; ø 130 mm; h: 98 mm
KMA 603

Marked with the assay date stamps [19]50 and [19]51.

473 - **POSTAL BALANCE**
Ottoman, early 20th century
Iron and brass
109x74 mm
KMA 695

Used for weighing letters up to 50 g.

474 - **BALANCE**
Turkish Republic, [19]43, [19]45, [19]47, [19]49 and [19]51
Brass
l: 410 mm
KMA 676

On the beam of the balance is stamped '1 kg', the assay mark 'TC' (acronym for Turkish Republic), the assay date marks [19]43, [19]45, [19]47, [19]49 and [19]51, and numbers indicating assay officials.

475 - **MONEYCHANGER'S BALANCE**
Ottoman ?, 19th-20th century
Wood and brass
Box: 228x134x340 mm
KMA 635

The word 'BONBAY' stamped on the balance suggests that it may have been manufactured in Bombay.

476 - **PHARMACIST'S BALANCE**
British, 19th - 20th century
Wood, brass and glass (pans)
230x120x335 mm
KMA 634

Some of the weights have the inscription 'Apothecaries weight'. In the centre of the face bearing the inscription is a crown motif. The weights are divided into three groups.

Group 1:
1) 7.91 g. Marked 'two drams', with '3ij' in the centre.
2) 2.73 g. Marked 'two scruples', with 'eij' in the centre.
3) 1.98 g. Marked 'half dram', with '3fs' in the centre.
4) 1.35 g. Marked 'one scruple', with 'ej' in the centre.
5) 0.71 g. Marked 'half scruple', with 'efs' in the centre.

Group 2:
1) 7.79 g. Marked 'two drachms' on both sides, with '3ij' in the centre, and below 'J.L.B'.
2) 2.67 g. Marked 'two scruples' on both sides, with 'eij' in the centre, and below 'J.L.B'.
3) 1.96 g. Marked '1/2 drachm' on both sides, with 'efs' in the centre, and below 'J.L.B'.

Group 3:
1) 0.40 g. Stamped with the number 6 on one side.
2) 0.28 g. Stamped with the number 4 on one side.
3) 0.19 g. Stamped with the number 2 on one side.

477 - **MONEYCHANGER'S BALANCE AND WEIGHTS**
British, 19th century
Mahogany, iron, bronze
Box: 135x63x23 mm
KMA 651

On the box is an Armenian inscription meaning 'Istanbul and its environs'. From the printed list of weights pasted inside the lid, it is evident that this balance was used for weighing gemstones. The partially illegible heading reads, 'A Table... which may .... Calculate...e Value of any Weight of Dia...'. Below are the words, '...rts of Scales & Weights ... Diamonds etc made ... sold ... Graye & Son Scale Makers Corner St. Ann's Andert. London.'

478 - **MONEYCHANGER'S BALANCE AND WEIGHTS**
Ottoman, 19th century
Wood and brass
Box: 197x113x40 mm
KMA 601

On the lid is stamped the name 'Haşim'. The weights weigh 91.83 g, 45.46 g, 22.91 g, 18.36 g and 13.87 g. The set is incomplete. The box must have been made by an Iranian craftsman. The weights are in miskals and multiples of the same unit. The miskal was the unit used for weighing gold by the Ottomans, and sets of this kind were used by moneychangers in Anatolia.

479 - **MONEYCHANGER'S BALANCE AND WEIGHTS**
Ottoman, 19th century
Wood and brass
Box: 154x95x37 mm
KMA 599

The weights are stamped with the name 'Nur Ali'. The weights weigh 45.73 g, 22.91 g, 18.51 g, 13.57 g, 9.26 g and 4.93 g. The box is typical of Iranian craftsmanship. The weights are in miskals and its multiples. The miskal was the unit used for weighing gold by the Ottomans, and sets of this kind were used by moneychangers in Anatolia.

480 - **PHARMACIST'S BALANCE**
European, 19th - 20th century
Wood, brass and glass
Box: 295x230x250 mm
KMA 640

On the box is the name and address of the maker, 'Vincent Kassapian Droguiste, 7 rue Bahdje Capou Constantinople'. Two of the weights are inscribed '10 g', two '2 g', one '1 g', two '5v desi.', two '2 desi.', four '1 desi.', and three 'cent.'

481 - **POSTAL BALANCE**
French, 19th - 20th century
Brass and iron
ø 76 mm; l: 11 mm; h: 190 mm
KMA 636

On the pan is inscribed, "Tarif d'affranchissement des lettres pour la France la Corse l'Algerie et la Tunisie. Lettres affranchies lettres changées, lettres recommendées 15 c par 15 gr.es, 15 c par 15 gr.es, 15 c par 15 gr.es 25 c, droit fixe, 25 c, droit fixe. Avis les lettres insuffisamment affranchies, sont frappées en sus d'une taxe egale au double del'insuffisance de l'affranchissement Affranchissement des lettres pour les pays etrangers 25 c par la grammes droit fixee pour les lettres chargées ou recommandées 25c."

482 - **BALANCE**
American, 19th century
Opaline and iron
ø 154 mm, l: 350 mm
KMA 633

The balance can weigh up to 2 kilograms. The word 'OHAHUS' is probably the name of the manufacturer.

483 - **BALANCE**
Ottoman, 19th-20th century
Iron and brass (pans)
l: 283 mm
KMA 666

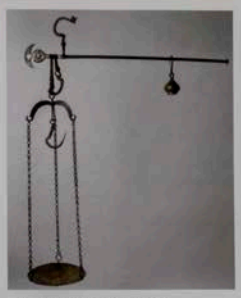
485 - **STEELYARD WITH PAN**
Ottoman, 19th-20th century
Iron and brass (weight)
l: 875 mm
KMA 689

484 - **STEELYARD WITH PAN**
Ottoman, 19th century
Iron and brass
l: 990 mm
KMA 690

The weight is filled with lead.

486 - **STEELYARD**
Ottoman, 19th - 20th century
Iron
l: 630 mm
KMA 684

The steelyard has two weights, and is thought to have been used for weighing sacks of coffee.



487 - **STEELYARD WITH PAN**
Ottoman, 19th century
Iron and brass (pan)
l: 950 mm
KMA 1319

489 - **BISMAR**
Ottoman, 19th century
Wood
l: 340 mm
KMA 1339

Simple steelyards of this type are known in English as bismar or besom. They were made by local craftsman in Anatolia. The weight is not movable but attached to the beam, and by attaching the strings of the pan to one of the series of notches on the beam, the weights can be calculated .

488 - **WOODEN BALANCE**
Ottoman, 19th - 20th century
Wood
l: 445 mm
KMA 1337

This balance is made by a local craftsman and both beam and pans are carved from wood.

490 - **STEELYARD FOR SALT**
Ottoman, 19th - 20th century
Wood
l: 883 mm
KMA 1342

The fact that the pan is made of wood suggests that this may have been used for weighing salt.

491 - **SPRING BALANCE**
European, 19th - 20th century
Iron and brass
h: 400 mm
KMA 672

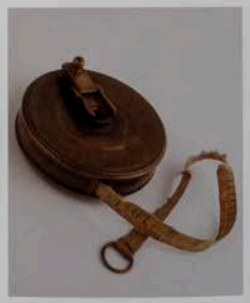
On the balance is written, 'SALTER'S SPRING BALANCE'.

492 - **ARŞIN MEASURING ROD**
Ottoman, late 19th century
Iron
l: 663 mm
KMA 701

The rule can be folded in two at the centre. At either end is the partially legible mark of the maker reading, 'Artin ... damgası'. One end is broken.

493 - **FOLDING METRE RULE**
European, late 19th - early 20th century
Wood
l: 1000 mm
KMA 697

The rule is marked with the word Metre.



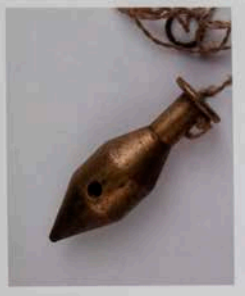
494 - **TAPE MEASURE**
Ottoman, 19th - 20th century
Brass and fabric
ø 52 mm
KMA 1297

495 - **TAPE MEASURE**
Ottoman, late 19th century
Brass
ø 50 mm
KMA 734

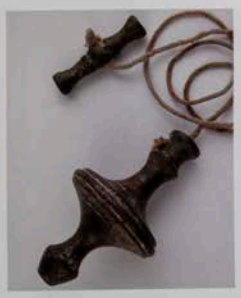
The case is made of brass. The tape itself is missing.

496 - **INCH AND ARŞIN FOLDING RULE**
British, 19th - 20th century
Wood and bronze
l: 610 mm
KMA 700

The rule is marked in inches on one side, and as fractions of an arşın on the other.



497 - **PLUMB**
Ottoman, late 19th century
Brass
l: 76 mm
KMA 735



498 - **PLUMB**
Ottoman, 20th century
Bronze
l: 80 mm
KMA 736

499 - **PLUMB**
Ottoman, 19th century
Iron
l: 81 mm
KMA 737

501 - **60 DEGREE SET SQUARE**
Ottoman, 19th century
Steel
400-200 mm
KMA 1292

The letters 'kaf' and 'ye' stamped on the set square are thought to be the initials of the owner.

500 - **ADJUSTABLE SET SQUARE**
Ottoman, 19th century
Steel
l: 350 mm
KMA 1291

The letters 'kaf' and 'ye' stamped on the set square are thought to be the initials of the owner.

502 - **CALIPERS**
Ottoman, 19th century
Iron
184x104 mm
KMA 1293

503 - **CALIPERS**
Ottoman, 19th century
Iron
158x88 mm
KMA 1294

505 - **1 ŞİNİK MEASURE**
Ottoman, 19th - 20th century
Iron
ø 245 mm; h: 220 mm
KMA 1334

An iron rod riveted across the top of the measuring container serves both as a handle and to prevent the iron band around the rim from bending.

504 - **KUTU MEASURE**
Ottoman, 19th - 20th century
Wood
ø 120 mm, h: 800 mm
KMA 1336

506 - **KUTU MEASURE**
Ottoman, 19th - 20th century
Wood
ø 125 mm; h: 175 mm
KMA 1335

The canister has been carved from wood. A zigzag pattern of lozenges has been incised around the rim to give a grip to the hand.

507 - **1 ŞİNİK MEASURE**
Ottoman, 19th - 20th century
Wood
ø 220 mm; h: 260 mm
KMA 1333

The carved wooden measure was used for grain. The ring attached below the rim on one side was probably for putting the finger through, so speeding up the measuring process.

508 - **1 ŞİNİK MEASURE**
Ottoman, 19th - 20th century
Wood and iron
ø 175 mm; h: 385 mm
KMA 1332

The carved wooden measure has been reinforced with a band of iron around the rim. The upper part of the measure has been incised with crisscrossing lines to give a grip to the hand.

509 - **1/2 KILE MEASURE**
Ottoman, 19th - 20th century
Iron
ø 340 mm; h: 255 mm
KMA 1331

The measure is made from sheet iron, and the rim is reinforced. An iron rod riveted across the top of the measuring container serves both as a handle and to prevent the iron band around the rim from bending.

510 - **1/2 KILE MEASURE**
Ottoman, 19th - 20th century
Wood
ø 330 mm; h: 260 mm
KMA 1330

The measure is made from wood, and reinforced with slender wooden rods.

511 - **1/2 KILE MEASURE**
Ottoman, 19th - 20th century
Wood
ø 325 mm; h: 300 mm
KMA 1329

The measure is made from wood, and reinforced with slender wooden rods.

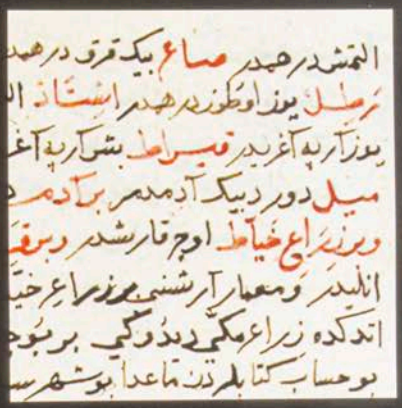
512 - **1/2 KILE MEASURE**
Ottoman, 19th-20th century
Wood and iron
ø 325 mm; h: 295 mm
KMA 1328

The measure is made from wood, reinforced with an iron band.

513 - **1/2 KILE MEASURE**
Ottoman, 19th - 20th century
Wood and iron
ø 335 mm; h: 260 mm
KMA 1327

The measure is made from wood, and reinforced with an iron band. An illegible mark is scorched onto the wood.

GLOSSARY OF LOCAL AND FOREIGN TERMS OF MEASUREMENT AND MEASURING INSTRUMENTS USED IN THE OTTOMAN EMPIRE



Compiled by Dr Yücel Dağlı and Garo Kürkman

FOREWORD TO THE GLOSSARY

Many 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 earliest in 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 use has been made of the writings of scholars like Halil İnalcık and Walter Hinz, who have spent years researching the subject, and of Mehmet Zeki Pakalın's extensive glossary of Ottoman historical 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 compared. Orhan Şaik Gökyay's article on colloquial units of measurement has also been of extensive use. The 11th century dictionary of Turkish dialects, *Divanü Lugat-it Türk*, has been scanned for explanations of measures in use among the Turks at that period. Information given in the tables in the earlier chapters of this book has also been included in the glossary.

Evliya Çelebi's *Book of Travels*, which is one of the most important works of travel literature in Turkey and the world, gives lists of units of measurement used in different regions, sometimes with their equivalents, and his definitions and uses of terms have been included in the form of quotations. Words occurring in the first eight volumes of this ten-volume work have been given with reference to the folio numbers of the manuscripts in Topkapı Palace Library, and those in the last two volumes with reference to the page numbers of the edition printed by the Ministry of Education. Words missing in the original manuscript are marked with dashes in brackets.

Ottoman dictionaries on the internet 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 all in 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 to this. Where alternative spellings of the same word exist, these are cross-referenced to the most common versions.

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.

Abis (ML) Sea depth of over 900 metres.

Abra (TDK) Makeweight, such as a stone, nail or other piece of metal used to correct an inaccurate balance.

Adam boyu (TDK) The height of a man.

(EÇ) 7/177b 'It is suspended from the centre of the great dome, the height of four men from the ground'

Adım (TDK) Stride.

1. Each forward movement of the feet in the process of walking.

2. The distance covered in one stride (taken to be 75 cm when used as a unit of measurement)

(OŞG) Distance equal to a stride: Ballıbadra. The circumference of the moat is 1500 hatve (adım).

(ML) 1. Placing one foot before, behind or to one side of the other when walking, running or changing position.

2. A unit of length approximately equal to a mimar arşın= 75.711 cm.

(EÇ) 1/15b From there following the edge of the ditch it is 1000 adım to Yedikalle Gate. Then 2010 adım to Silivri Gate, 2900 adım to Top Gate, 1000 adım to Edirne Gate, and 900 adım to Eğri Gate. And all these six gates face westwards in the direction of Edirne. From here it is 1000 adım to Ayvansaray Gate, 700 adım to Balat Gate, 900 adım to Fânûs Gate, 600 adım to Petre Gate, 100 adım to Yeni Gate, 300 adım to Ayâ Gate, 400 adım to Unkapanı Gate, 400 adım to Ayazma Gate, and 400 hatve to Odun Gate. From there it is 300 adım to Zindan Gate, 400 adım to Balık Bazârı Gate, and 300 adım to Yenicâmi Gate.

(EÇ) 4/325a A fersah is 12.000 adım. A mil is 4000 adım. One adım is four ayak. And one ayak-ı meyân is 22 grains of barley lying end-to-end.

Adımlamak (ML) To measure a distance by strides.

Adîla (WH) A unit of weight equivalent to 1/2 himl and varying between 125 kilograms and 150 kg used in Jiddah in the 14th century.

Agruk (DLT) Weight, load.

Ağaç (OŞG) 1. Unit of distance approximately equal to a kilometre.

2. Distance covered in one hour.

3. Measurement for cloth of 68 cm.

(MLT) Old Turkish unit of distance= 6 km.

Ağır (TDK) Heavy.

Ağırlık (TDK) Weight.

1. The amount that a thing weighs.

2. An object of a particular known weight placed in one scale of a balance when weighing articles.

Ağız (TDK) 1. Mouth.

2. A single object or occasion.

Aime (MLT) Liquid measure formerly used by the Turks. = 130 litres.

Alama (ZK) Stone small enough to pick up in the hand and throw.

Ambar (TDK) 1. Storehouse, usually for grain.

2. Cube-shaped measure of which each side is 75 cm used for measuring building materials such as sand and gravel.

(ML) Cube-shaped measure of which each side is 75 cm used for measuring building materials such as sand and gravel.

Amphora (HRD) 19.44 litres

Ar Are.

(AT) Metric unit of area equivalent to 100 sq m, used for measuring land. Invented in 1793.

(ML) Unit of area used for agricultural land. One are is 100 square metres.

Araş (WH) 1. Unit of length used in Iran equivalent to approximately 64 cm.

2. The forearm between elbow and wrist, and the length equivalent to this.

3. Length of the forearm from elbow to the fingertips.

4. Length equivalent to 12 karış.

5. Length equivalent to 40 cm.

Ardabb See İrdabb

Arış See Arşın

Arpa Barley grain.

(OŞG) Goldsmith's measurement of weight equivalent to 0.048 g, based on a medium-sized barley grain without husk and with both ends clipped.

(MLT) Unit of length used formerly by the Turks. = 2.16 mm.

(EÇ) 'The dirhem is the weight of 33 arpa. The miskal is equivalent to 100 arpa.'

Arşın (ML) Measurement of length, approximately 68 cm, equivalent to the distance from the elbow to the fingertips. This measurement of length was used until recent times in Turkey. There are three types of arşın: the çarşı arşını was 68 cm and used for measuring cloth. One eighth of this was called *urub*, and sixteenth a *kerah*. Subsequently a slightly shorter measure of 65 cm was introduced for expensive silks, so that the price would seem lower, and known as endaze (see endaze).

Bina arşını or mimar arşını: Although the standard length of this unit was taken to be 75.8 cm, due to variations in practical use, an ebony arşın standard was made during the reign of Sultan Selim III. A half arşın was regarded as equivalent to the European foot, and referred to in Turkish as kadem, a measurement that was used particularly in excavations. In 1869 the new arşın was taken to be equivalent to the metre, and so by this means resolved the confusion of the various different arşın measures and foreign units of length towards the middle of the 19th century. The metric system was introduced by Act 1782 on 26 March 1931, and its use became compulsory as of 1 January 1933.

(MZP) Name of a measuring device used until the official acceptance of the metre. The alternative term zirâ was also used. At that time the metre was known as the zirâ-ı âşârî.

Burhan-i Kaati gives the following definition for the word areş: 'In the Ethiopian system of measurement this is what we call kulaç. It is equivalent to the

distance between the tips of the fingers of either hand when the arms are stretched out to either side of the body like wings. Some people regard it as the distance between the tip of the middle finger and the elbow, and this is the real meaning. It is what in Turkey they call an arşın, and in Arabia a zirâ.'

Kamus-ı Türki: 'An arm's length measured from the tips of the fingers to the shoulder, zirâ.'

Celâl Esat Arseven, in his *Sanat Kamusu*: 'Although it is often assumed that this word derives from the Persian arış meaning arm combined with the word în, it is clear that it comes from the Turkish verb arşımak, meaning to stride.'

Two types of arşın were used. The çarşı arşını and mimar arşını.

Çarşı arşını: Used in shops and markets to measure printed cotton, woollen and similar fabrics and cloths. Its subdivisions were as follows: 1 arşın equals 8 rubu, and 1 rubu equals 2 kerah.

Since silk fabrics were expensive, a slightly shorter measurement of length known as the endaze was used to make the price seemed cheaper.

Mimar arşını: Also called the zirâ-ı mimari. Used as a measurement of length by builders and architects. It was divided into 24 parmak, each parmak into 12 hat, and each hat into 12 nokta. The mimar arşını was 758 parts in 1000 of a metre.

According to *Kamus-ı Riyaziyat* the basis of the mimar arşını is the zirâ used by the Islamic peoples, such that one arşın is 24 parmak, and 1 parmak equivalent to 6 barley grains laid side by side widthwise.

It is unknown when the mimar arşını originated, but the standard zirâ-ı mimari used today was specially made of ebony by Selim III and is kept in the School of Engineering.

The parts and multiples of the mimar arşını are as follows: 1 kadem equals 12 parmak, 1 kulaç equals 5 kadem, 1 zirâ-ı mimari equals 2 kadem. These divisions are written in the work entitled *Hediyetü'l-Mühendisîn* translated from French and German by the engineer Osman Efendi, interpreter to the Council of State in Belgrade in 1779 (H 1193).

The term arşın is employed in the following terms:

Arşını büyük: large strides taken by a man with long legs. Arşınları açmak: to walk with open strides, to walk fast. Arşınlamak: to measure with strides, to proceed quickly with broad strides.

Arşınlık: something sold by the arşın.

Nureddin Rüştü Büngül, in his *Eski Eserler Ansiklopedisi*, says that arşın rules are made of iron, steel and wood, and gives the following information about antique arşın rules: 'During the war one of these came to the Bedesten [section of the bazaar in Istanbul were antiques were sold]. It was inscribed with the name Mehmed Akkoyunlu, and here and there carved with coarse decoration. It was purchased for 22 lira at auction and sold to a Jewish antique dealer from Paris for 200 lira. In Ankara Museum there is an ivory arşın rule dating from the reign of Sultan Abdülmecid.'

(HI) Duvarcı or mimar arşunu = 0.758 m

For fabrics see endaze

Çarşı arşunu = 8 rub' = 16 gireh = 0.680 m or 68.579 cm.

(IAG) Former measurement of length of 68 cm.

(NS) An old measurement of length derived from the division of arşın measurements into a specific number of parts. In the section on measurements in RM, it writes that the zirâ-i benâ was divided into 68 = parts called engüşt (= parmak) until the year H 994. Here it explains that the length described as a parmak is 'the width on the nail side of the thumb when held out sideways,' and the length known as boğumis the length 'from the tip of the thumb to the knuckle.'

If any change has been made in the total length of the arşın, since there is no information regarding this, calculations according to the values given are based on the engüşt, which is mentioned in all 16th century sources and is equivalent to 1.263 cm (making the arşın 75 8/6 cm). In the same source a regulation issued in H 994/1585 AD to facilitate calculations of measurement divided the zirâ-i benâ into 24 units called parmak. In other words, while the engüşt was originally 1.263 cm, after the introduction of the fractional division known as parmak equivalent to the meaning of the word as finger, it began to have a value of 3.15 cm. Again, when in RM its says 'a boğum was the thickness of 2 old parmak', we can deduce that the zirâ-ı benna was divided into 30 boğum. However, entries in building registers showed that the boğum was not used, and that particularly in 16th century architecture the engüşt was always the unit used. The new arşın is divided into parmaks, each of which is divided into 12 hat, and each hat into 12 nokta. The Ottomans used arşın of various length, divided into varying numbers of parmak. For example the çarşı arşını was divided into 22 parmak, the endaze into 21, the Aleppo arşın into 22 and the zirâ-i mimârî into 24. A study undertaken by the French for the Ottoman government in 1841 gives the length of some units as follows:

1 arşın: 757.628 mm

1 parmak: 31.572 mm

1 urub/rûb: 85 mm

1 bat: 1.631 mm

1 nokta: 0.219 mm

(OŞG) The length from the elbow to the tip of the middle finger. The length of the arşın is not absolute, but varies according to the different types.

çarşı arşını: 68 cm.

melik arşını (gez-i melik or gez-i şâhi): 95 cm

mimar arşını: approximately 75 cm.

terzi arşını: a measurement used for carpets, silks and fine fabrics, generally known as the Aleppo arşın, and equivalent to 68 cm.

Çarşı arşını: a measurement for woollen cloth. It is divided into eight parts known as urup, and into 16 parts known as kırat (colloquially as kırak).

kumaş arşını: equals 22 parmak, and divided into 8 urup and 16 kirah.

(PGI) Used to measure linen goods, broadcloth, brocade and so on. It is equivalent to three large karış, or the distance from the tip of a man's middle finger to his shoulder.

One arşın is divided into 8 rubu, and 1 rubu into 2 kerah. Although an endaze is similarly divided, this is smaller than the arşın. When measuring linen cloth, they refer to 2 arşın as 1 arşın.

The Mosul arşın is 5 parmak larger than the Istanbul arşın.

100 Basra arşın are equivalent to 142.5 Istanbul arşın.

As well as this arşın used for the measurement of fabric, there is the mimar arşını [architect's arşın] and the gemi arşını [ship arşın]. Although both of these consist of 24 parmak, the mimar arşını used by builders is smaller than that used by shipbuilders. The mimar arşını must be divided into 17 parts, and two of these added to make one gemi arşını. While the fractional measurement used by architects is the parmak, in the vernacular three small measurements are used known as çırpı payı, teneke payı and cam payı. These are equivalent to a specific value. For example, 2 cam payı make 1 parmak.

(Old Testament) = 2 spans = 0.45 m

(T.2) = 10 parmak = 1.319261 bina and mimar arşını = 1.470588 çarşı arşını = 1.538463 endaze.

arşın square = 1.740450 bina arşını square = 2.162629 çarşı arşını square = 2.366865 endâze square

arşın cube = 2.296107 old arşın cube

bina arşını = 0.758 new arşın = 24 parmak

bina arşını square = 0.574564 new arşın square

bina arşını cube = 0.435 560 new arşın cube

çarşı arşını = 0.68 new arşın = 8 rub

çarşı arşını square = 0.4624 new arşın square

(EÇ) 1/15a As the King of Vezendon built, he constructed what was to be the keep, but when the late Bayram Paşa set about repairing it, and decreed that the lords and notables of Istanbul, Eyüp, Galata and Üsküdar and the guild of palace craftsmen should repair and rebuild the walls of Istanbul in each district, decreeing in terms of mi'mâr arşın that the perimeter around the towers on the outside of the wall was in all 87,000 arşın, based on the zirâ'-i bennâ of Istanbul.

(EÇ) 1/16a I speak truly, so be it, and in mi'mâr arşını, the walls of Constantinople are 87,000 arşın.

(EÇ) 1/75a An imperial decree commanding that there be a useful baştarda [bastard, small wall galley] in each dock of the Imperial Naval Arsenal, and that in many other places 20 mavna [galleass] each 80 carpenter's arşın in length be constructed...

(EÇ) 1/128b As the side of the wall was painted with white lime, the perimeter of the wall was measured in mi'mâr arşını, together with all its towers and ramparts, and found to come to 18,000 mi'mâr arşını.

(EÇ) 1/162b These also, fully armed, pass by measuring cloth and making sails for small ships carried upon carts.

(EÇ) 1/177a The commander of the stores was there with all the officers of the 162 janissary chambers together with their private soldiers, passing company by company, and regiment by regiment, and in accordance with the law of the sultan every one received 10 arşın of broadcloth, and one length of turban cloth, and one shirt of the same stuff, and in three days and three nights it was completed and they spoke prayers of blessing upon the sultan.

(EÇ) 2/243a And in these mountains they cut bürdinar [a kind of tree] masts and anchor posts each 50 arşın in height, and the masts of Rumelia and the Balkans are renowned.

(EÇ) 2/260a Because galleys and şayka [a kind of boat used in the Black Sea] cannot enter at this place called Balsura because they each draw five arşın of water, and here the sea is shallow with a depth of two or three arşın.

(EÇ) 2/298a But in order to seize the country of Azerbaijan by conquest, around Şâh Heybân in the centre of the city of Tabriz they built a strong castle worthy of Ferhad constructed of stone, square in shape, whose circumference was 12,700 mi'mâr-i melikî arşın, fortified with towers and ramparts, and this invincible castle of Özdemirzâde was like a new barrier.

(EÇ) 4/325a And the çuka arşını is three karış and two parmak wide. And the mi'mâr arşını is a zirâ'-i hayyâti and one third in addition. And the zirâ of Mecca is a rod used by the Lord Zübeyr when repairing Mecca.

(EÇ) 6/180b And all around the wall is a quay 50 ayak wide and a strong filled grassy rampart. And both sides of this wall, both within and without, are oak and valonia oak trees with trunks the size of a man, each 15 mi'mâr arşını in height, and the extremities of these thick trees are artfully woven together by master builders and the inside of this quay like a porcupine they have filled with a grassy mound, so that even if you were to bombard it many times with 100,000 cannon, the cannon balls would enter through the timber columns and be embedded in the earth, as if in Mount Elburz.

(EÇ) 7/86a The castle wall above the moat is a structure taller than that built by Şeddâdî, 40 mi'mâr arşını high and 10 arşın wide, and above the 20 arşın wall earth is heaped like the mountain of Demâvend.

(EÇ) 8/311a Particularly inside the moats on top of the aforementioned high bastion are prepared with 100,000 kinds of turning wheels and cross-timbers and prison traps and snares, and it encircles the castle being 80 mi'mâr arşını deep and 80 arşın wide.

Artıg (DLT) A bale of a load being carried

Aruzza (WH) A unit of weight equivalent to 1/240 dinar or miskal, or 25 mustard grains.

As (Roman) = 325.45 g

Assarion (Byzantine) = 2 barley grains = 0.09 or 4/9 of a gram.

Aşba (WH) This measure is a finger's width, generally taken to be 1/24 of an arşın. For this reason it is changeable. In Islamic metrology two types of this measure are commonly used:

şer'î arşın aşba, 49.875:24 = 2.078 cm

kara arşın aşba, 54.04:24 = 2.252 cm

In Egypt today the aşba is officially set at 3.125 cm.

In India at the end of the sixteenth century Aqbar divided the arşın into 41 angoşt, each 2.032 cm. This

measurement, equivalent to a finger's width, was readjusted to 40 angoşt per old royal arşın in 1647.

Aşîr (ISAM) A unit of both volume and area. In both cases it is one tenth of a kafîz.

a) As a unit of area 1 aşîr = 13.66 m

b) As a unit of volume its value depends on whether the kafîz is calculated at 66 litres or 33 litres

If 1 kafîz = 66 litres, 1 aşîr = 6.6 litres

If 1 kafîz = 33 litres, 1 aşîr = 3.3 litres

One aşîr as a measurement of area was equivalent to a kasaba square or six large Hashimid arşın square. Since we know for certain that a kasba was 399 cm, we can calculate 1 aşîr to be 15.92 square metres. It is used as a measure of both volume and area. As a measure of volume 1 aşîr = 1/10 kafîz = 1/600 kurr, or approximately 6 litres.

Aşl (WH) The aşl is a chain or rope 60 Hashimid arşın in length, or approximately 39.9 metres.

Atım (OŞG) Distance, stage. Bullet range. The distance that a bullet can be fired. The distance that an arrow can be shot.

Avuç (TDK) Handful. Palm.

(Old Testament) = 4 fingers = 0.07 metres.

(EÇ) 1/69a When they summoned him they made a gift of two handfuls of gold.

(EÇ) 1/70b Then he congratulated me and wishing me prosperity made a gift of one handful of gold.

(EÇ) 1/115b In delight Kara Mustafa Paşa presented a handful of money to the madman and ordered that his mother be liberated, and instructed his steward that she be given in marriage.

(EÇ) 1/170b If our house be without vinegar there can be no abundance there. It is a wonderful things that vinegar is first grape juice that is prohibited by holy law, then becomes vinegar which is permitted, and finally becomes wine which is again prohibited, yet if a handful of salt be dropped into that wine, it becomes vinegar and again permitted, such that it be a wondrous creation of God.

(EÇ) 4/233a When he was just about to descend to the ground, he attached the glove string in his hand firmly, and with his body upon the wall, hanging by the string in his hand, he somersaulted to the ground, and in the presence of the paşa kissed the soil that had the fragrance of pure ambergris, and the paşa scattered two handfuls of gold over the head of the wrestler.

(EÇ) 5/150a At once the Lord Mevlânâ, before the eyes of our envoys, stretched out his hand with the word Bismillâhi, pointing in the direction of the west with the right sleeve of his green robe, and in the twinkling of an eye poured a handful of Venetian gold coins upon the tambourine of the singers and musicians and minstrels, at which the gold coins like red hot embers burnt through the leather of the tambourine and fell to the ground. Our envoys were amazed at this sight and wrote of this circumstance, its time and hour, and its degree.

(EÇ) 5/186a Saying 'In the end good deeds are wasted on the House of Osman,' and other such reluctant words mingled with taunts, he scattered handfuls of gold over the corpse of Seydî Paşa and declared, 'Bury this inoffensive vezir and read the Koran according to your faith.' Then he got into his coach and went to Serdar Alî Paşa.

(EÇ) 8/290a And in all 300 of their naval commanders and in all 4000 heads were taken, and the grand vezir gave generously to each soldier according to his station handfuls of gold and increases of wages, and to the wounded he granted retirement and pensions, and to encourage the army of the one God to fight, with his own hands he placed silver wreaths on the heads of many who had fought.

Avurt The pouch of the cheeks.

(TDK) That part of the cheek on a level with the mouth

(EÇ) 7/149b The language of the Circassians is one composed of unpronable sonorous letters that are like the bellow of cattle and come from the throat, the pouch of the cheeks and beneath the tongue in a way that can only be heard and not written.

Ayak Foot.

(TDK) 1. The part of the leg below the ankle which rests on the ground

2. A measurement of half an arşın or 30.5 cm. Same as kadem.

3. English measurement of length equivalent to 30.4 cm.

(ML) The length of the foot, used as a measurement of length in many languages (English foot)

(OŞG) 1. The length of a human foot

2. The Ottoman kadem, consisting of 12 parmak, equivalent to half an arşın

3. Brief time.

(MZP) Ayak; divided into 12 parmak, and each parmak into 12 hat, and each hat into 6 kerte.

(ML) 1. The part of the body of human beings and animals upon which the body stands and serves for walking.

2. The extremity of the body, linked to leg by the ankle.

3. A measurement equivalent to half an arşın (30.5 cm) used in Turkey until the introduction of the metric system.

4. The capacity of refrigerators is calculated in cubic feet, an English unit of measurement.

5. Measurement used for measuring the area of fine leather. 1 square foot: 0.929 square decimetres. Recently abandoned in favour of the square decimetre.

(HRD) 0.296 metres

(MLT) Foot 30.4 cm

ayak kare: measurement of area = 929.0341 square metres

(EÇ) 1/39b The distance from the qible door to the prayer niche is (—) ayak and the width is (—) ayak.

(EÇ) 1/41b Then the aforementioned tabhanes were added to the mosque, extending it in two directions. From the qible door to the prayer niche is (—) ayak in goldsmith's ayak and the width from the right to left is (—) ayak. The width is more than the length, because these chambers in which they recite litanies in praise of God were added.

Ayar Adjustment, standard, fineness (of precious metals)

(ML) 1. Principles of measurement regarding the precision and accuracy of measuring instruments.

2. The proportion of a precious metal in an alloy.

3. The process of adjusting and correcting a measuring instrument so that it measures correctly.

4. Determining the relationship between the indicator of a measuring instrument and the values it is meant to measure.

5. The size of a measurement serving to define the unit of measurement.

(AT) A grain measure.

(ZK) A grain measure, half an ölçek.

Azâla (WH) One azâla was 100 times 1 terazi arşın (1 terazi arşın = 145.63 cm) and 145.63 square metres.

Bâ

Bâ (WH) A bâ is what the Arabs call kâme and the same as kulaç = 4 şer'î arşın, that is 184.8 cm, or one thousandth of a mile. In modern Egypt the bâ' = 4 carpenter's arşın = 3 metres.

Baar See Bahar.

Bâb (WH) A bâb (rod) was a unit of length = 1/10 aşl = 3.99 metres.

Badron (AT) A measure for gunpowder

Baer See Bahar

Baş Bunch, bundle, link, something which binds.

(TDK) 1. Something which can be knotted such as rope, string, ribbon or wire used to tie one thing to another or several objects together.

2. A bunch of things of the same sort bound together.

(OŞG) A bunch of hemp weighing approximately 100-150 kg.

(AT) Five hanks of cotton bound together.

Bahar (ISAM) A unit of weight used in medieval Europe spelt variously as bar, bhar, baar and baer. 1 bahar = 243.75 kg, or 270.562 kg.

(WH) A bahâr was a unit of weight used in medieval Europe spelt variously as bar, bhar, baar, baer and bahar in different sources, and theoretically was equivalent to 300 menn.

According to a source concerning Arabia, if it weighed 300 rtl, then this must have been the Meccan rtl of 260 dirhem, which would make it twice as much, and thus the weight of a bahâr would have been 243.75 kg.

According to Ibn Hurdaẕbih, on the other hand, one bahâr was theoretically 333 menn. By this must be meant the Baghdad menn of 260 dirhem, which would make the weight of one bahâr 270.562 kg. The bahâr was important in the international spice trade in the countries of the Indian Ocean and around the Gulf of Basra. Extraordinary differences in equivalents given for the weight of the bahâr can be explained by the traditional addition of quantities varying from region to region to the main weight in accordance with the type and price of the commodity. Known in Portuguese as picotâ, this makeweight was to compensate the purchaser. The most detailed combination of bahâr weights can be found in *Lyvro dos pesos da Ymdia* written in 1554 by the Portuguese finance officer Antonio Nunez.

The value of the bahâr used in the Lar region of southern Iran in the 16th century was 3 kental 2 arroba and 27 arratel, which is equivalent to 218 kg.

Bahr (WH) An Iranian unit of length, equivalent to an arşın (zâr) of 104 cm.

Bakila (WH) The Egyptian bakila (bakla) is equivalent to 4 sâmûna or 12 kırat. Since 1 kırat has been calculated at 0.195 g, the bakila was 2.34 g.

Bakraç (TDK) 1. Small bucket, usually made of copper.

2. The quantity contained by a bakraç.

(OŞG) A vessel made of sheet metal containing up to 2700 kilograms of coal, and used for loading coal from boats onto steamships by winch.

(EÇ) 1/172a The company of hot pâlûde makers. In entirety they consist of 800 tradesmen, who never have their own shops but from the hot pâlûde shops described above purchase many thousands of bakrac of pâlûde, and arrange them attractively over horses containing fire.

Balla (HI) (silk, Genoa) = 300 libbra = 90 kg

Balya Bale.

(TDK) Commercial goods tied by bands and wire.

(ML) A bundle of commercial goods wrapped in linen cloth or similar material, and secured with bands.

(MLT) A unit of weight formerly used by the Turks. = 205 kg

(silk, Genoa) = 300 libbra = 90 kg

Bar (ML) Load

(Albania) = 120 okka = 153.936 kg

(WH) see Bahar

Bardak Cup, drinking glass.

(TDK) 1. Vessel usually made of glass used for drinking water and similar beverages.

2. The amount contained in a bardak.

3. In some regions a pottery jar.

(OŞG) 1. Pottery water vessel with a handle and lip.

2. Drinking cup or mug with a handle, and sometimes having a lid and saucer.

3. A drinking glass in the present sense.

(ML) 1. A vessel, usually made of glass, for drinking liquids.

2. The quantity contained in a bardak. A water glass usually contains approximately 250 g.

(HI) A bardak of butter or oil = 10 men = 8.3 kg.

Barîl See Varil

Barley grain (Byzantine) = 1/4 carat = 0.04 g.

Barre (HI) 6 İstanbul kile = 153.953 kg.

Bart (DLT) Cup for drinking water; measure for wine and similar liquids.

Barut hakkı (ML) The quantity of gunpowder used to attain the necessary pressure of gunpowder gas in order to project a bullet for the desired distance.

Barut kertesi (OŞG) Measures showing how much gunpowder should be placed in a bullet or shell.

Barut ölçeği (ML) Small metal measure with a handle for measuring the gunpowder or small shot to be placed in a hunting cartridge.

Basen (TDK) Section of the spine between the waist and hip.

(AT) Waist measurement.

(ML) Measurement taken around the hip, 20 cm below the waist.

Basil (MLT) Unit of weight formerly used by the Turks. = 119 kg

Baskül (TDK) Weighing-machine.

1. Device generally used for weighing an object by means of another object with a much smaller mass.

2. A lever whose two arms rise and descend by turns, resting on a fixed point in the centre or nearer one of the two ends.

(ML) A device used for weighing a car, wagon, goods etc.

(OS) A device consisting of several levers so put together as to make it possible to weigh large weights by means of small weights.

Baş Head. Single item.

(OŞG) 1. Piece or item (used when counting people, animals and some objects).

2. The part that exceeds the estimate when weighing.

Bat (Old Testament) = 6 hin = 37 litres

Batman (ML) Unit of weight formerly used in the Near East in particular which varied in value from region to region and depending on the materials being weighed from 2 okka to 8 okka or 2.5 kg to 10 kg. The 1280 miskal batman was equivalent to 5.888 kg, and the 640 miskal batman to 2.944 kg.

The unit used by the Turks and related peoples also varied from country to country and depending on the material being weighed. The batman used in pharmacy in the 16th and 17th centuries was equivalent to 266 dirhem, that used in Turkish commerce to 6 okka, that used in Iran to 2.9 kg and that used in the Crimea to 425 kg. This wide variation causes problems for researchers. According to historical sources meat, cotton, millet, wheat, flour, wine, water, dry provisions and bread were measured by the batman. Among some Turkic peoples today grain and liquids are still measured by this unit. From time to time governments and local authorities endeavoured to set its value to avoid confusion. For example, in one Uighur-Chinese dictionary 1 batman was set at 1 ketti (the unit used by the Chinese and Japanese). In later periods in Turkistan 1 batman = 8 sir (1 sir = 4.097 kg). In Bukhara 1 batman = 45.093 kg, and in Turkey 1 batman = 6 okka. A Russian encyclopaedia explains that the value of this unit was standardised by the state in the 17th century, but does not say what this value was. Various dictionaries reveal that it varied from place to place. As a measurement of land the batman was used to express the amount of seed sown and the proportion of yield to land area. In other words the amount of land needed to sow 1 batman of seed, or to yield 1 batman of grain. This use is found in the Volga basin and Azerbaijan. Later it was used in a metaphorical sense in idioms.

Unit of weight formerly used by the Turks. = 5.888 kg

The name of a unit of weight varying between 2 okka and 6 okka depending on the place and goods being weighed.

In the *Kamus-ı Osmani* dictionary, which gives it as an Arabic word, the following explanation is given: 'It is known to derive from the word *man* meaning measurement, from *men*, meaning measure, originating from Greek, and pronounced with an extended vowel, the letter alif. Since *bat* means 'definite', the word *batman* means definite measure. One *men* varies from 8 kıyye to 2 kıyye depending on place and the commodity. In the vernacular it has been corrupted to batman...

The use of the batman as a measurement of land must derive from its use as a specific ratio to land in Turkistan and Iran. In Uighur documents concerning land transactions the size of the land is usually recorded as well as its boundaries. Although it was used as a measurement of land in Iran the value of this measure is unknown.

In Russian, patmannık meant a rope used to measure a batman, or tarred rope the thickness of a little finger used by fisherman of the Caspian Sea for their nets.

Like much commercial terminology, the batman must be a foreign word. F. W. K. Müller says merely that it derives from the Middle Persian batman. For the ancient Persian batimana, pehl batman, batman and later payman and paymana meaning measure, see *Grund d. iranischen philologie* (Part 1 and Part 2 p. 37), and from these forms payman, paymana and ça (Rald. IV. 1126).

The definition of a small measure for grain must have passed into these dialects at a later stage. If this is true, the batman (for the seemingly related bezmen, bizmen see these entries), although a very early borrowing in Turkic regions, in terms of its pronunciation cannot have undergone the stages of evolution that would have been expected. The word must have been introduced to the Slavic peoples at an early stage by the Turks. The fact that some dictionaries define the word as 'the name of an ancient Russian unit of measurement' shows that it was not regarded as a foreign word in some quarters in Russia.

(HI) In modern times the batman was equivalent to a Chinese ketti, or 604.79 g. In Bukhara it was equivalent to 45.0 93 kg.

1 batman = 4 undser = 80 ara

(standard) = 72 lidre = 7200 dirhem = 23.095 kg

(Asia Minor, 19th century) 7.694 kg

(Adana, 19th century) = 4.848 kg

(silk, Mosul) = 9.236 kg

(Urfa, 19th century) = 2.309 kg

(Bursa, 15th century) 15-16 okka = 19.245-20.528 kg

(Erzincan) 12 nügi = 1920 dirhem = 6.158 kg

(OS) A former unit of weight varying from 2 okka to 8 okka from place to place. (ZK) Generally it is 6 okka. The Egyptian batman is 900 dirhem.

Large pottery jar. The quantity contained in such a jar.

(T.2) (old batman) = 6 okka = 0.769 767 new batman

(T.2) (new batman) = 10 okka = 1.296095 old batman

EÇ 2/288b In this fine city goods are so cheap that one somar of the finest camel tooth wheat is (---) batman. Five somar cost 1 kuruş.

(EÇ) 3/50a As if it had just been plucked from the township of Rûm in Baghdad, a bunch of hıstâvî dates weighing 40 Ottoman batman was given to the head of the Arab attendants of the caravan.

(EÇ) 4/346a And by the command of God, there are both male and female date palms. The male tree never bears fruit, and if wood from a male tree is inserted into the bark of a female tree, the female has as much pleasure as if having sexual intercourse, and produces twenty or thirty bunches of dates, and each bunch weights forty or fifty batman.

Batta (ISAM) Egyptian unit of volume for flour = 22.5 litres

Beka (Old Testament) = 10 gera = 7.50 g

Berid (ISAM) This word derives from the Latin veredus. = 4 fersah = 22.176 km

(MLT) Unit of length formerly used by the Turks. = 22.774 km

Bes (Roman) = 8 unciae = 218.30 g

Binlik (OŞG) Large bottle containing one thousand dirhem of liquid such as wine or olive oil.

Binter (MLT) Unit of weight formerly used by the Turks. = 1950 kg

Birim Unit.

(ML) Unchanging part used to measure the whole of something of the same type. *The metre is a unit for measuring length.*

Birşâla (WH) Unit of volume equivalent to 12.5 rtl = 2000 dirhem = approximately 8.5 litres, used as a measurement of grain in Tilemsan (Tlemcen).

Bitemi (AT) A measurement of length equivalent to the arşın.

Boğça See Bohça

Boğum Knuckle, node, knop.

(ML) 1. The bulbous part of a finger, or of the stems of plants such as reeds and bamboo.

(OŞG) (In charcuterie) A pair of sausages.

(MZP) The solid portions in the centre of reeds that were used for writing before the invention of iron pens. Reed pens were classified according to the number of nodes as a 'two-node' or 'three-node' pen.

The name of a measurement equivalent to the distance between the two knuckles of the thumb. This was also equivalent to 1 part in 24 of the arşın. After the year H 994, this term was replaced by parmak.

(EÇ) 1/161b And their male slaves pass by holding Basra javelins with seventeen nodes each as well as lances.

(EÇ) 3/31b Some held fans, and had tobacco pouches at their waists and six-node marbled citrus pipes from Diyarbakır.

(EÇ) 8/273a And they place cloth sufficient for one shirt inside a single segment of reed and send them as gifts to the sultans, vezirs and ministers.

Bohça (TDK) A square of fabric used for wrapping underclothing, garments and similar things.

(OŞG) 1. A measure used by the Ottomans equivalent to 4 batman of 1580 dirhem each. = 20.268 kg.

2. Bale or package of tobacco weighing approximately 7 kg.

(EÇ) 3/77b Then when Bayezid Han was honoured as shah, Shah Tahmasb scattered jewellery on the head of Bayezid, and in the year 967 granted Bayezid Han the khanate of Shirvan, but he did not accept, and then he presented rations and coins without limit and compare, and 200 boğça, and drowning the great palace with gold-on-gold decoration, stayed there for social conversation with the shah and friendly discourse during hunting expeditions.

Boru (TDK) Pipe.

A long narrow hollow cylinder with open ends used for transmitting liquids or gases from place to place.

(PGI) A measurement of water = 4 masura.

Botte (HI) Large barrel, Genoa = 500 libbra = approximately 159 kg.

Buğday Wheat.

(MZP) Name of an old measure, one of the fractional divisions of the dirhem. One dirhem was divided into four parts known as denk, and each denk into four parts known as kırat, each kırat into four parts known as buğday, each buğday into four parts known as fitil, each fitil into two parts known as nakir, each nakir into two parts known as kıtmir, and each kıtmir into two parts known as zerre. One and a half dirhem was a miskal, 44 okka a kantar, and 4 kantar a çeki.

(ML) An old unit of weight approximately equivalent to one-fifth of a gram.

(T.2) = 10 habbe.

Butta (WH) The butta is a measure used for flour in Egypt, and equivalent to 50 rtl, 24 kadeh, or 1.5 vaiba. This is compatible with an estimate of 22.5 litres for the butta, equalling approximately 17.5 kg of flour. In Medina the fark was a measure of volume equivalent to 3 şa', or 12.617 litres. In Iraq and Mesopotamia 1 fark of wheat was equivalent to 36 Baghdad rtl, each equivalent to 406.25 g, that is 14.625 kg, which is equivalent to a volume of 19 litres.

Cam payı (PGI) While for architects the parmak was the unit of length used for small quantities, ordinary people used three terms for tiny quantities: çırpı payı, lenske payı and cam payı. These were equivalent to specific amounts. For example, two cam payı made one parmak.

Caretello (HI) (Genoa) = 2 or 2.5 barrels = around 300 litres

Barut kertesi (OŞG) Measures showing how much gunpowder should be placed in a bullet or shell.

Barut ölçeği (ML) Small metal measure with a handle for measuring the gunpowder or small shot to be placed in a hunting cartridge.

Basen (TDK) Section of the spine between the waist and hip.

(AT) Waist measurement.

(ML) Measurement taken around the hip, 20 cm below the waist.

Basil (MLT) Unit of weight formerly used by the Turks. = 119 kg.

Baskül (TDK) Weighing-machine.

1. Device generally used for weighing an object by means of another object with a much smaller mass.

2. A lever whose two arms rise and descend by turns, resting on a fixed point in the centre or nearer one of the two ends.

(ML) A device used for weighing a car, wagon, goods etc.

(OS) A device consisting of several levers so put together as to make it possible to weigh large weights by means of small weights.

Baş Head. Single item.

(OŞG) 1. Piece or item (used when counting people, animals and some objects).

2. The part that exceeds the estimate when weighing.

Bat (Old Testament) = 6 hin = 37 litres

Batman (ML) Unit of weight formerly used in the Near East in particular which varied in value from region to region and depending on the materials being weighed from 2 okka to 8 okka or 2.5 kg to 10 kg. The 1280 miskal batman was equivalent to 5.888 kg, and the 640 miskal batman to 2.944 kg.

The unit used by the Turks and related peoples also varied from country to country and depending on the material being weighed. The batman used in pharmacy in the 16th and 17th centuries was equivalent to 266 dirhem, that used in Turkish commerce to 6 okka, that used in Iran to 2.9 kg and that used in the Crimea to 425 kg. This wide variation causes problems for researchers. According to historical sources meat, cotton, millet, wheat, flour, wine, water, dry provisions and bread were measured by the batman. Among some Turkic peoples today grain and liquids are still measured by this unit. From time to time governments and local authorities endeavoured to set its value to avoid confusion. For example, in one Uighur-Chinese dictionary 1 batman was set at 1 ketti (the unit used by the Chinese and Japanese). In later periods in Turkistan 1 batman = 8 sir (1 sir = 4.097 kg). In Bukhara 1 batman = 45.093 kg, and in Turkey 1 batman = 6 okka. A Russian encyclopaedia explains that the value of this unit was standardised by the state in the 17th century, but does not say what this value was. Various dictionaries reveal that it varied from place to place. As a measurement of land the batman was used to express the amount of seed sown and the proportion of yield to land area. In other words the amount of land needed to sow 1 batman of seed, or to yield 1 batman of grain. This use is found in the Volga basin and Azerbaijan. Later it was used in a metaphorical sense in idioms.

Unit of weight formerly used by the Turks. = 5.888 kg

The name of a unit of weight varying between 2 okka and 6 okka depending on the place and goods being weighed.

In the *Kamus-ı Osmani* dictionary, which gives it as an Arabic word, the following explanation is given: 'It is known to derive from the word *man* meaning measurement, from *men*, meaning measure, originating from Greek, and pronounced with an extended vowel, the letter alif. Since *bat* means 'definite', the word *batman* means definite measure. One *men* varies from 8 kiyye to 2 kiyye depending on place and the commodity. In the vernacular it has been corrupted to batman...

The use of the batman as a measurement of land must derive from its use as a specific ratio to land in Turkistan and Iran. In Uighur documents concerning land transactions the size of the land is usually recorded as well as its boundaries. Although it was used as a measurement of land in Iran the value of this measure is unknown.

In Russian, patmannik meant a rope used to measure a batman, or tarred rope the thickness of a little finger used by fisherman of the Caspian Sea for their nets.

Like much commercial terminology, the batman must be a foreign word. F. W. K. Müller says merely that it derives from the Middle Persian batman. For the ancient Persian batimana, pehi batman, batman and later payman and paymana meaning measure, see *Grund d. iranischen philologie* (Part 1 and Part 2 p 37), and from these forms payman, paymana and ça (Rald. IV. 1126).

The definition of a small measure for grain must have passed into these dialects at a later stage. If this is true, the batman (for the seemingly related bezmen, bizmen see these entries), although a very early borrowing in Turkic regions, in terms of its pronunciation cannot have undergone the stages of evolution that would have been expected. The word must have been introduced to the Slavic peoples at an early stage by the Turks. The fact that some dictionaries define the word as 'the name of an ancient Russian unit of measurement' shows that it was not regarded as a foreign word in some quarters in Russia.

(HI) In modern times the batman was equivalent to a Chinese ketti, or 604.79 g. In Bukhara it was equivalent to 45.0 93 kg.

1 batman = 4 undser = 80 ara

(standard) = 72 lidre = 7200 dirhem = 23.095 kg

(Asia Minor, 19th century) 7.694 kg

(Adana, 19th century) = 4.848 kg

(silk, Mosul) = 9.236 kg

(Urfa, 19th century) = 2.309 kg

(Bursa, 15th century) 15-16 okka = 19.245-20.528 kg

(Erzincan) 12 nügi = 1920 dirhem = 6.158 kg

(OS) A former unit of weight varying from 2 okka to 8 okka from place to place. (ZK) Generally it is 6 okka. The Egyptian batman is 900 dirhem.

Large pottery jar. The quantity contained in such a jar.

(T.2) (old batman) = 6 okka = 0.769 767 new batman

(T.2) (new batman) = 10 okka = 1.296095 old batman

EÇ 2/288b In this fine city goods are so cheap that one somar of the finest camel tooth wheat is (—) batman. Five somar cost 1 kuruş.

(EÇ) 3/50a As if it had just been plucked from the township of Rüm in Baghdad, a bunch of histâvî dates weighing 40 Ottoman batman was given to the head of the Arab attendants of the caravan.

(EÇ) 4/346a And by the command of God, there are both male and female date palms. The male tree never bears fruit, and if wood from a male tree is inserted into the bark of a female tree, the female has as much pleasure as if having sexual intercourse, and produces twenty or thirty bunches of dates, and each bunch weighs forty or fifty batman.

Batta (ISAM) Egyptian unit of volume for flour = 22.5 litres

Beka (Old Testament) = 10 gera = 7.50 g

Berid (ISAM) This word derives from the Latin veredus. = 4 fersah = 22.176 km

(MLT) Unit of length formerly used by the Turks. = 22.774 km

Bes (Roman) = 8 unciae = 218.30 g

Binlik (OŞG) Large bottle containing one thousand dirhem of liquid such as wine or olive oil.

Binter (MLT) Unit of weight formerly used by the Turks. = 1950 kg

Birim Unit.

(ML) Unchanging part used to measure the whole of something of the same type. *The metre is a unit for measuring length.*

Birşâla (WH) Unit of volume equivalent to 12.5 ritl = 2000 dirhem = approximately 8.5 litres, used as a measurement of grain in Tilemsan (Tlemcen).

Bitemi (AT) A measurement of length equivalent to the arşın.

Boğça See Bohça

Boğum Knuckle, node, knop.

(ML) 1. The bulbous part of a finger, or of the stems of plants such as reeds and bamboo.

(OŞG) (In charcuterie) A pair of sausages.

(MZP) The solid portions in the centre of reeds that were used for writing before the invention of iron pens. Reed pens were classified according to the number of nodes as a 'two-node' or 'three-node' pen.

The name of a measurement equivalent to the distance between the two knuckles of the thumb. This was also equivalent to 1 part in 24 of the arşın. After the year H 994, this term was replaced by parmak.

(EÇ) 1/161b And their male slaves pass by holding Bas javelins with seventeen nodes each as well as lances.

(EÇ) 3/31b Some held fans, and had tobacco pouches at the waists and six-node marbled citrus pipes from Diyarbakır.

(EÇ) 8/273a And they place cloth sufficient for one shi inside a single segment of reed and send them as gifts to th sultans, vezirs and ministers.

Bohça (TDK) A square of fabric used for wrappin underclothing, garments and similar things.

(OŞG) 1. A measure used by the Ottoma equivalent to 4 batman of 1580 dirhem each. 20.268 kg.

2. Bale or package of tobacco weighin approximately 7 kg.

(EÇ) 3/77b Then when Bayezid Han was honoured as sha Shah Tahmasb scattered jewellery on the head of Bayezid, and the year 967 granted Bayezid Han the khanate of Shirvan, but h did not accept, and then he presented rations and coins witho limit and compare, and 200 boğça, and drowning the great palac with gold-on-gold decoration, stayed there for social conversatio with the shah and friendly discourse during hunting expeditions.

Boru (TDK) Pipe.

A long narrow hollow cylinder with open ends use for transmitting liquids or gases from place to place.

(PGI) A measurement of water = 4 masura.

Botte (HI) Large barrel, Genoa = 500 libbra approximately 159 kg.

Buğday Wheat.

(MZP) Name of an old measure, one of th fractional divisions of the dirhem. One dirhem wa divided into four parts known as denk, and eac denk into four parts known as kirat, each kirat in four parts known as buğday, each buğday into fou parts known as fitil, each fitil into two parts know as nakir, each nakir into two parts known as kıtmi and each kıtmir into two parts known as zerre. Ou and a half dirhem was a miskal, 44 okka a kanta and 4 kantar a çeki.

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Cam payı (PGI) While for architects the parmak was the unit length used for small quantities, ordinary people us three terms for tiny quantities: çarpı payı, teneke pa and cam payı. These were equivalent to specif amounts. For example, two cam payı made one parma

Caretello (HI) (Genoa) = 2 or 2.5 barrels = around 300 litres

Carro (HI) (wheat) = 20 hectolitres

Cartousto (HI) (Prevesa) = 150 dirhem = 481 g.

Cendum (WH) Unit of weight used in Iran. This was a wheat grain and equivalent to the cev'le. (barley grain). = 0.048 g.

Cere (PGI) Unit of weight used for measuring fat.

Cerîb (AT) 1. Unit of volume used in the Arab countries and approximately equivalent to 216 litres.

2. An old unit used in the Arab provinces equivalent to a land area measuring 60 arşın wide and 60 arşın long.

(ML) 1. A measurement of land used in Arabia during Ottoman times. (In different sources it is defined as 1000 square arşın, 60 square kadem, or a square with sides measuring 60 arşın.)

2. Unit of volume equivalent to the amount of wheat yielded from one cerîb of land. It varied from country to country (for example 1 şirar cerîb made 10 kafiz, which made 16 ratl. 1 ratl is 130 dirhem.)

(MLT) Unit of area formerly used by the Turks. = 10,000 square metres.

(ISAM) Unit of both area and volume. It had different values at different periods and in different regions.

1. As a unit of area it was equivalent to a square the sides each measured 10 kasba, and equivalent to 1366.0416 square metres.

2. As a unit of volume, 1 cerîb = 4 kafiz. Since the kafiz could be equal to 33 litres or 66 litres, it was therefore either 132 or 264 litres.

(T.2) = 10,000 square metres (the area of a square whose sides each measured 100 metres).

(WH) As a measurement of volume 1 cerîb was 7 kafiz in Medina in the 7th century during the time of the Caliph Omar.

In the later period 1 kafiz was defined as 1 şâ' or 51/3 rtl (as a unit of weight for grain).

We have calculated the şâ' to be 4.2125 litres or 3.245 kg of wheat, and in the early period of Islam the cerîb as a measurement of volume has been calculated at 29.5 litres or 22.715 kg of wheat.

In Iran 1 cerîb was always equal to 10 kafiz, although the values given for the kafiz are contradictory to a large extent.

In eastern Iran in the 10th century kafiz equivalent to 2.5 and 1.5 menn were used, and there were also cerîb equivalent to 26 litres and 16 litres.

Arab geographers tell us that the following values were used for the cerîb in the region of Fars:

Shiraz cerîb = 10 kafiz (each 16 rtl) = approximately 65 kg or 83 litres

Beyza cerîb = 13/20 of a Shiraz cerîb = approximately 74.75 kg or 95 litres

Arracan cerîb = 5/4 of a Shiraz cerîb = approximately 81.25 kg or 105 litres

Kazerun cerîb = 5/3 Shiraz cerîb = approximately 108.3 kg or 138 litres

Fesâ cerîb = 9/10 Shiraz cerîb = approximately 58.5 kg or 75 litres

İstahr cerîb = 1/2 Shiraz cerîb = approximately 32.5 kg or 42 litres

In 14th century Iran 1 cerîb = 120 Tabriz menn (equivalent to 260 dirhem, 1 dirhem being 3.2 g). After the standardisation by Gazan Han 1 cerîb was taken to be equivalent to 100 kg of wheat or a volume of 130 litres.

In the middle ages 1 cerîb as a measurement of land was equivalent to 100 square kasaba, or 1592 square metres (since 1 kasaba = 399 cm). This cerîb was known in Persia as the small cerîb, equivalent to 60 x 60 royal arşın (zirau'l-melik). The large cerîb was 3 2/3 of the small cerîb, or 5837 1/3 square metres. In the late middle ages the cerîb was equivalent to a square whose sides measured 32 1/3 gez, that is 1066 square gez. Since the gez was equal to 94.745 cm, we can calculate that in the 17th century 1 cerîb = 30.95 x 30.95 metres = 958 square metres. It has not yet been determined when the cerîb was reduced from 1600 square metres to 960 square metres in the sphere of Iranian cultural influence. Certain indicators which we do not want to mention here since it would involve going into unnecessary detail, show that this change made itself felt in the 15th century. Today the official value of 1 cerîb in Iran is 1 hectare, but many local variations on this measure are still in use, varying between 400 and 1450 square metres. The cerîb-işah is 1200 square metres, and the cerîb-i resm is 760 square metres.

(MZP) The cirib is equivalent to a square whose sides measure 60 zirâ, or 3600 square zira. Each zirâ is 7 kabza and each kabza is 4 parmak.

The name of a unit of area. In *Kamus* it is defined as 'a unit of land area with various values.' Hüseyin Kâzım Bey in his *Büyük Lugat* defines it as 'a measurement of area equivalent to a square whose sides measure 60 kadem, and equivalent to 1000 square arşın.' In *Sonar Kamusu*, it is spelt cirib and defined as follows: 'A measurement of area of a square whose sides are 60 arşın. It was formerly used to measure land. It is a measure used for grain.' In *İslam Ansiklopedisi* we find this definition: 'This term is used to mean an area of land which can be sown with a cerib of seed, and is thus used as a measure of area. The value of this measure varies according to time and place.'

Cev (AT) A very small unit of weight.

(WH) The weight of the Iranian 'barley grain' was 1/4 tesû or 1/16 dâng or 1/96 miskal. Thus until the 14th century it was equivalent to 0.045 g (since the miskal is calculated to be 4.3 g), but from then until the present day it was equivalent to 0.048 g (based on a miskal of 4.6 g).

Cevze (WH) The 'ceviz' weighed 7 miskal/darahmi or 14 large Şâmûne, while the royal cevze was 6 miskal/darahmi. According to my calculation 1 atiki drahme = 4.25 g, the first being 29.75 g, and the second 25.5 g. H. Sauvaire calculates it to be 23.1735 g and 19.863 g respectively.

Chalkous (Hult) 0.091 g.

Cılga (ZK) 1. A small evlek [furrow or quarter dönüm], an area of a few steps.

2. A row of beads threaded on a string.

Cımbıt (OŞG) 1. A bunch of grapes.

2. Small bunches comprising a bunch of grapes.

Cimbiş See Cimcik.

Cimcik (ZK) Pinch. The amount that can be taken up between two fingers.

Cirib See Cerîb

Colla (HI) 2.5 kantar = 141. 122 kg; also see çuval.

Cuv = 0.045 g. See Fatîl.

Çahm

(MLT) Unit of area formerly used by the Turks. Fractional part of a dönüm.

Çamçak (TDK) Water mug with handles carved from wood, çapçak.

(OŞG) 1. Glass vessel for water. A larger version is known as mastala.

2. Wooden ladle.

3. Wooden water vessel or bowl.

(ML) Çamçaks with lids are known as sebzelik [vegetable containers] on account of the used to which they are put today.

Çanak (OŞG) 1. A grain measure equivalent to 3 okka.

2. All kinds of pottery cooking vessels used in the oven; pottery dish; shallow vessel; casserole, bowl, dish.

(ML) Small, round shallow dish made of pottery.

(EÇ) 5/146a While all of them were eating food and drinking wine, our God made us a gift of this food and this wine. When a dish of wine was offered to me, I declared, 'I do not drink, warriors, and nor did my fathers and ancestors smoke tobacco or even drink coffee, that I might drink wine.'

(EÇ) 7/186a The shrine of the Dervish Cook and near to it the shrine of the Dervish Sheep's Head Cook and the Dervish Yogurt Maker: All three of these reverend men were brothers. They were at the siege of this fortress under Gedik Ahmed Paşa, and every day provided the soldiers of Islam with one sheep's head and one dish [çanak] of mastaba aşı and one dish [çanak] of ayran made with yogurt, satisfying their hunger. It is said their dishes never became empty.

(EÇ) 8/321b A priest brought twelve çanak of honey as a gift to the grand vezir. The honey in one çanak was so white that the chief secretary who was İshak Çelebi took the end of his turban and they rubbed it with honey.

Çap Diameter, width.

(AT) 1. Generally the width or diameter of objects.

2. The width of the barrel of a cannon or rifle; the measurement of a cart wheel.

3. Measurement of land.

4. A grain measure equivalent to 5 teneke, and 1 çap to 80 kg.

(ML) 1. Generally the width of objects.

2. The greatest distance between two points on the circumference of a circle.

3. The interior measurement of the barrel of a firearm.

çapölçer: A foldable sliding wooden rule used for measuring the width of timber.

(HI) (Van) = 36-45 okka = 46-57 kg

(Malatya) = 12 standard kile = 307.680 kg.

Çapuk (AT) 1. Open basket for carrying in the hand.

2. Grain measure.

Çarek (AT) An Iranian measure equivalent approximately one-fourth of the large menn, a today and equivalent to 750 g.

Çaryek (ML) One fourth part, one quarter.

(HI) 0.25 arşın = 17 cm

(iron) = 0.25 metres

(silk) = 0.25 lidre

(Bursa, in 1500) = 22.5 lidre = 8.661 kg

Çatala see Çetele

Çatan (DS) Large basket or pannier for carrying straw.

Çatana (HI2) see Çeten

Çatım (OŞG) Sufficient firewood for a single lighting of stove. *The weather is cold, let us light the stove o çatım.*

Çekem (AT) The amount of water drawn from a well at o time.

Çeki (MZP) Unit of weight formerly used for firewoo stone and similar materials. A çeki was also a ki of balance consisting of a pole suspended from t centre of a tripod. At one end of the pole was hung latticework pan on which the thing to be weigh was placed, and at the other a stone weighing kantar (195 okka, 250 kg).

çeki taşı: A stone weighing 4 kantar (195 okka, 2 kg) hung on one side of a çeki balance used f weighing wood, stone and other materials.

(OŞG) 1. A large balance or scales used f weighing heavy items like firewood, lime and ston

2. A unit of weight equivalent to 4 kantar or 1 okka.

3. A unit of weight equivalent to 200 kg.

4. A horse-load of firewood or other fuel.

(PGI) Unit of weight equivalent to 250 kg used f weighing heavy goods like firewood. When used f firewood it was equivalent to 4 kantar or 176 okka.

A çeki of stone was equivalent to 2 kantar or okka.

A çeki of lime was equivalent to 1 kantar or okka.

A çeki of mohair or camel hair as used by merchan was equivalent to 2 okka.

A çeki of coral was equivalent to 100 dirhem.

A çeki of opium was equivalent to 250 dirhem.

A çeki of silver was equivalent to 100 dirhem.

(AT) 1. A unit of weight equivalent to 250 formerly used to weigh firewood and other hea materials. Formerly one çeki was 4 kantar, and o kantar was 40 okka.

2. A unit of weight equivalent to 300 g used weighing silk and similar materials.

3. A weighing device.

(AT) Unit of weight for firewood (today 250 kg)

(HI) (standard) = 4 kantar = 225.798 kg

(firewood) = 195 okka = 250 kg

(Ayvalık, 19th century) = 100 okka = 128.29 kg

(Salonica, 19th century) = 135-140 okka = 173-179 kg

(İzmir, 19th century) = 180 okka = 230.896 kg

(camlet, 19th century) = 4.564 kg

(opium, 19th century) = 763 g

(gold and silver) = 100 dirhem = 320 g; syn. lidre

(Crimea, 18th century) = 150 dirhem = 480 g

(T.1) = 4 kantar = 225.798 kg

(T.2) (formerly) = 0.225798 new çeki

(new) = 10 kantar = 4.428733 old çeki

Çekirdek Seed, kernel, carat.

(OŞG) Unit of weight equivalent to 5 centigrams used by jewellers.

(PGI) Weight of 4 wheat grains [buğday]. Known in Italian as karato or in the vernacular as kirat. It is used for measuring gold. Pure gold is 24 kırat, and there are 24 kırat of gold in every 24 kırat of metal.

(EÇ) 10/621 'O Muslims, the whole say that I have shown you such a spectacle. Let all the great men and notables make a gift of one Egyptian piece each to my wrestler. Then I will step down and show you many skills,' he declared. 'Now we desire one çekirdek of silver from you enthusiasts.' And so saying he collected the sum of ten thousand pieces from all the noblemen.

Çekül Plumb.

(ML) Device consisting of a weight tied to the end of a length of string used for determining the vertical.

Çelik (MLT) Unit of weight formerly used by the Turks. = 116 kg

Çepik See Çapuk

Çepük See Çapuk

Çerik (AT) A grain measure. A vessel is used for storing and measuring wine, olive oil etc.

Çetele Tally stick.

(OŞG) Stick used by shopkeepers for calculations. It is divided into two sections, one half being kept by the customer. Every time the customer does shopping, the two sticks are placed together and a notch made across both simultaneously; forked twig (as used in the game of tipcat).

EÇ 7/168a When we gave the letters from the sultan of Daghestan and the papers known as pulir from the commander of Terek Castle, the Circassian lord who was held hostage gave his wooden çetele [tally stick] and seal and showed the letter of the Austrian emperor.

Çeten (HI) This word is pronounced in various ways as çatana, çeken, çiten, çetene etc. It is a unit used for loads of straw.

Çetvirnik (HI) 0.25 kabal

Çıg (DLT) A Turkish arşın, two-thirds of the Arabic arşın, used by nomads for measuring cloth.

Çıglamak (DLT) To measure with a Turkish arşın.

Çıkın (OŞG) 1. A small bundle created by knotting the four ends of a wrapper together.

2. A small bundle containing a gift or money.

Çırpı payı (PGI) While for architects the parmak was the unit of length used for small quantities, ordinary people used three terms for tiny quantities: çırpı payı, teneke payı and cam payı. These were equivalent to specific amounts. For example, two cam payı made one parmak.

Çift (HI) Pair, double.

Çiftlik Farm, smallholding.

(HI) Land varying between 60 and 150 dönüm allocated to a single household in a village.

(Bursa) = 12 mud of land

Land required for sowing 2, 3 or 4 müdd of seed.

Çiğnem (OŞG) 1. Piece or amount which can be chewed at one time.

2. Morsel.

(EÇ) 4/405a It is like a mine of God Eternal that for one thousand years has been carried in many thousand camel and mule loads without a çiğnem [morsel] of mastic diminishing.

(EÇ) 9/114 They are villages belonging to the Treasury where all the mastic on the face of the earth is grown, and nowhere else. If anyone is found in possession of a çiğnem [morsel] or one drop of raw mastic, they execute them.

Çile (OŞG) 1. A hank of thread, skein.

2. A ball of twisted silk or cotton thread.

3. A hank of silk, forty stems; seven hanks of cotton make a piece.

4. Woven ball; small coil, ball of thread, hank, skein of silk, roll of paper.

(AT) 1. Measure of cloth or fabric.

2. Height of the heald on a weaving loom.

(HI) Hank of wool, hank of silk; a group of ten in a bolt of cloth.

(EÇ) 1/200b They passed by on floats measuring out many thousands of bolts of stuff, sâya and londirine and vüzentin and karkaşovna and nime and pâris and marlîye and ankona and londura and iskerled and seventy rolls of broadcloth, saying 'The finest for 1000 or 2000 kuruş.

Çimdik Pinch.

(OŞG) The amount that can be held between the thumb and index finger.

Çiplik (MLT) Distance between the thumb and index finger when they are held apart.

Çit (HI) Large fruit basket.

Çitmik (OŞG) 1. Each of the small stalks forming a bunch of grapes; tiny bunches. Cımbıt.

2. Pinch of a substance held between two fingertips.

Çokal (OŞG) Coarsely and thickly glazed pottery jar.

Çömlek (OŞG) Pottery jar made from clay that has been precipitated and filtered; unglazed pot, small jar; earthenware cooking pot.

Çubuk Stick, rod.

(MZP) 1. Long, narrow and hard object in the form of a rod.

2. A fraction of a dönüm equivalent to 3.5 zirâ. One dönüm equalled 100 square çubuk, each çubuk being 12.5 arşın. 10 çubuk were called a nişan.

(MLT) Unit of length formerly used by the Turks. = 2.38 m

See Dönüm

(EÇ) 4/325a And a mi'mâr arşını is one zirâ-ı hayyâti plus one third, and the Meccan zirâ is what the Lord Zübeyr called zirâ'-ı Mekkî when he repaired Mecca, equivalent to one çubuk zirâ-ı hayyâti.

Çuval Sack.

(OŞG) 1. A bag or sack made of haircloth.

2. A measure of quantity: one sack of coal; five sacks of flour.

(HI) 2 kantar = 112.898 kg

(one sack of hazelnuts) = 2.5 kile = 74 cubic decimetres

(one sack of rice) = 18 kile = 46.184 kg

(EÇ) 1/175b And from the ports of the towns called Erdek and Mihalıç ten men lift each çuval that they call seklem weighing seven or eight Ottoman kantars and place it on the back of one man who puts it onto the steelyard. As he puts it down the axles of the steelyard resound, then he lifts it on his back again and they take it where they wish, but strong porters come to his aid, grasping it, one on either side.

(EÇ) 1/178b And in all there are 200 strong porters, whose power of lifting çuval of henna and linen weighing forty and fifty kantar each is astounding.

(EÇ) 5/88a Each year they bring to Istanbul forty or fifty thousand seklem, that is çuval, of white refined and finely ground flour, and this wheat flour is a strong and delicious flour more sought-after than that of Damascus and Havran.

Çuvaldız (MZP) Formerly the name of a measure of water. Used of a stick for picking the teeth and ears pointed at one end and in the form of a spade at the other, the thickness of round umbrella wire, and previously used as a measure of water pouring in the thickness of a hilâl. Assuming that two hilâl together would make the thickness of a çuvaldız [thick curved needle] used for sewing sacks, awnings and sailcloth, this was taken as one of the measurements. The hilâl measure was rarely used, water flow generally being measured in the larger masura unit. Four çuvaldız made one masura.

(MLT) Water measure formerly used by the Turks. = 340.80 cc.

2 hilâl.

(OŞG) 1. Water measure.

2. Tap.

(EÇ) 7/153a Indeed, around this tree for the height of a man no cracks even as large as a needle or a çuvaldız remains, and men upon camels rise to a standing position and seek a space the size of a peg.

Dağar See Tağar.

Dahekan (Byzantine) = 24 carats = 4.53 g

Dâm (WH) India in unit of weight, originally equal to the weight of copper coin. It was instated during th time of the Babur ruler Aqbar (late 16th century According to W. H. Moreland it was equivalent 323.5 grains or 20.963 g.

Damacana Demijohn.

(TDK) Large bottle with a globular body and narro neck used for carrying water or other liquids ar generally contained in wickerwork or a basket.

Damla Drop.

(TDK) A very small amount of water in a globul shape.

(EÇ) 9/114 They are villages belonging to the Treasury whe all the mastic on the face of the earth is grown, and nowhere els If anyone is found in possession of a çiğnem [morsel] or one dro of raw mastic, they execute them.

Dang (WH) Egyptian unit of weight, money and area.

It is equivalent to one sixth of a dirhem and tw kırât (each kırat weighs 5 barley grains). Th Persian denk had the same value. The plural of th Arabic word is devanik, and the Arabicised form dânik.

a) As a unit of weight = 0.495 g

b) As a monetary unit = 1/6 silver dirhem

c) As an Egyptian unit of area = 1/6 kırat = 29.17 square metres

(T.1) = 4 kırat = 0.801840 g

(OS) Unit of weight one-quarter of a dirher Mangır.

(EÇ) 10/413 And one danık [dang] is the weight of ten barl grains. And four danık is one dirhem. And one dirhem is t weight of forty plump barley grains. And one miskal is the weig of one hundred hınta.

Danık See Dang.

Dara Tare.

(TDK) 1. The weight of the container in which substance is weighed.

2. A weight placed in the other scale of a balance compensate for the weight of the container.

(ML) Dara almak means to deduct the weight of th packaging when weighing packaged goods, and find the net weight.

Darahmi (drachm) (WH) The name of the Greek drachme in medic terminology. According to H. Sauvaire this w 3.3105 g, and according to Decourdemanche it w 4.25 g. The latter is more probable.

Debbe See Debe

Debe (OŞG) 1. A kind of bucket with a rounded ba which can rock but cannot tip over; pot for honey fat; mercury cup.

2. Vessel for storing fat with a narrow mouth a broad base.

3. Circular vessel with a broad base used for liquid

(EÇ) 1/194b They too decorate their shops with many kinds debbe and bodoç [vessel with a handle and spout] and yağ [skins of clarified butter?] and oil holders made of camel skin a proceed past.

(EÇ) 7/24b I piled two pairs of Indian sofa covers and three kilims and one empty debbe on the ground, set fire to them and went.

Değirmen Mill.

(OŞG) A machine or apparatus for grinding. A hand mill for grinding coffee, pepper etc.

(EÇ) 10/667 All of them eat this/gasul [a plant that grows in Egypt] like watercress. And they dry it in bunches and grind it in a hand mill producing a paste from which they make bread.

Dekametre Decametre.

(OS) Length of 10 m.

Dekar Decare.

(AT) Measurement of land equivalent to 11,000 square metres.

Demet Bunch, bouquet, sprig.

(OŞG) Several objects of the same type tied together.

(EÇ) 2/329b He gave them no respite at that time, saying 'Do not leave off, brothers, the endeavour is yours. Labour for the sake of faith. May God be the protector of you and me'. Thus in the Circassian tongue Koca Gâzî Seydî Paşa encouraged all his men to fight with gracious promises, upon which by God's greatness on every side the mountains and rocks and vineyards and fields near and far were transformed into a sea of soldiers that surged forward in billows, in everyone's hands a bunch of branches and a pat of dried dung and a bunch of Laz millet and bunches of wild plum branches and millet straw, and as they came and heaped their bunches on all four sides of the castle, some were killed and some wounded, and in this attack seventy men died, joining the ranks of those who have given their lives for their faith in battle.

Denk (ML) 1. Each of the loads hung to the right and left side of pack animals.

2. One fourth part of a miskal used as a unit of weight among the Ottomans. (One fourth of the denk was called a kırat, one-fourth of a kırat a buğday, one fourth of a buğday a fitil, half a fitil a nekir, half a nekir a kıtmir, and half a kıtmir a zerre.)

(MLT) Unit of weight formerly used by the Turks. = 0.8019 grams

(OŞG) 1. Bale or load of commercial goods.

2. Each of the loads hung to the right and left of pack animals.

3. Unit of weight equal to one quarter of a miskal or 6 çekirdek.

(HI) 50 top = 20 çile = 2 pastav; one horseload.

(T.2) = 10 habbe

(EÇ) 4/215b three thousand muskets the colour of gems and three hundred bales of silk of diverse colours and many hundreds of bales of black gunpowder and three hundred mules

(EÇ) 8/263b And many hundred bales of sekerled [a kind of fabric] and coarse white broadcloth brought in loads from the land of the Franks [Europe]

(EÇ) 10/901 Ten loads of sindora [*Sindora supa and Sindora* ssp, a tree that grows in the Philippines, Malaysia and Borneo] wood and two loads of gold nuggets and one bale of civet, and one bale of zimran [an aromatic plant] and one box of musk and sixty pastilles perfumed with ambergris.

Derahim See Dirhem

Desigram (T.2) Decigram. = 10 g

Desilitre (T.2) Decilitre. = 0.1 litre

Desimetre Decimetre.

Deste Bunch, packet, pile, heap.

(TDK) Several things of the same or similar type bound together.

(AT) 1. Handful

2. Bouquet

3. Stack of several sheets of paper one on top of the other

4. Heap of a reaped crop in a field.

(OŞG) 1. Bunch, bouquet, handful.

2. Packet or bunch of goods for sale.

3. Packet of 24 sheets of paper; dozen.

(HI) Group of 10 or 12.

(EÇ) 1/167b The manufacturers of candle was ornament their stalls set on floats with many bunches of decorated candles and fight candles in many decorated lanterns, and affix oil candles on many tall poles

(EÇ) 6/68a Around the semahane [hall where Mevlevi dervishes perform their whirling dance] they place bunches of diverse roses and hyacinths and sweet basil and lilies and violets and redbud in jugs

(EÇ) 10/482 And they make piles of leaves from the sarcan tree that grows in this orchard and send them as gifts to one another

Deunx (Roman) = 11 unciae = 300 .160 g

Devanik (OS) One fourth of a dirhem.

Devasa (AT) Enormous, gigantic.

Deve yükü Camel load.

(HI) 200-300 kg

(WH) In Iraq this measure known as huml was theoretically equivalent to 300 menn or 600 rıtl, each rıtl being 130 dirhem; which was equivalent to 243.75 kg.

A similar conclusion can be drawn from the proportions of customs duties in eastern Anatolia in 1518. For example, in Urfa a mule load was two-thirds of a camel load. Since the former is known to be equivalent to 162 kg, that makes one camel load 243 kg.

O. Blau reports that in the 19th century a camel load averaged 180 Turkish okka (approximately 230 kg).

According to J. B. Tavernier in the 17th century, a camel load in the mountainous regions of Anatolia was 800 livres (approximately 390 kg); while in low-lying regions this load was 15 kental (approximately 735 kg).

In the Egyptian trade 1 huml (300 rıtl) of flour = 135 kg, for polish and pepper 500 rıtl = 225 kg, for combed cotton 553 and one third rıtl = 249 kg, and for linen and brazilwood 600 rıtl = 270 kg. From this information we can calculate 1 huml to be approximately 250 kg.

(EÇ) 1/30b From beneath the floor of that place in a week they dug out many thousand camel loads of goods as abundant as the ocean and carried them to the king's treasury and to the garden of the naval dockyard

(EÇ) 1/35a They filled a kunkuma [large bodied bottle with a narrow neck] with Zemzem water and loaded seventy camel loads of soil of Holy Mecca, and laid a further seventy camel loads of skins filled with Zemzem water and came to Istanbul at high speed. Here they urgently set about repairing and restoring the dome of Haghia Sophia, mixing the lime with seventy camel loads of Zemzem water and soil of Mecca, completing the construction work with the help of God so that it was entirely strong.

Dextans (Roman) = 10 unciae = 272.880 g

Dırazî (OS) Length.

Didrachmon (Greek) = 8.73 g

Dilim Slice, segment, lobe.

(OŞG) 1. Thin piece cut from an object.

2. Each of the pieces into which some fruits are naturally divided.

(EÇ) 1/22a And another division of Muslims was trapped in the fortress as large as a segment of a cowhide built by Hârûnu'r-Reşîd in the district of Kocamustafâpaşa near Yedikule. They fought with determination for three days and three nights until finally they were all killed.

(EÇ) 4/228b Furthermore they make arrows from 150 segments of reed that are hollow right up to the arrowhead.

(EÇ) 10/508 In Egypt they sow melons three times a year. First there is a kind of spherical lobed green melon that they call dümeyrî.

Dimidia sextula (Roman) = 2 scripula = 4 oboli = 2.274 g

Dinar (WH) Derived from the Latin denarius. From the early periods of Islam it was the name for a gold coin. As a unit of weight it is equal to 1 miskal, and in terms of minting gold weighs 4.233 g.

The average weight of a dinar is 2.97 g or 45.833 habbe.

The weight of the classical gold dinar is 4.233 g.

The weight of the Ayyubid and Muvahhid gold dinar was 4.722 g.

Dirhem (ML) A former a unit of weight, one part in 400 of the okka. The dirhem weighed 3.148 g, although this varied from region to region. When Cairo was occupied by the French in 1799 the weight of the dirhem was 3.0884 g, but in 1845 a board of inspectors found it to be 3.0898 g. In Istanbul one dirhem was regarded as 3.07 g.

(MLT) Unit of weight formerly used by the Turks. = 2.97 g

(OS) Unit of weight and money

1. Former unit of weight equivalent to 3 g.

2. 1/400 part of the old unit of weight known as okka, and equivalent to 3.207 g.

3. In canonical law the weight of seventy medium-sized barley grains. The miskal was 7/10 of the dirhem, but in practice this was taken to be 2/3.

4. Old silver coin that was worth five kuruş. Akça.

5. 4 denk or 16 çekirdek. The Mosul dirhem was 2 buğday [weight grains] less than the Istanbul dirhem.

(HI) (Ottoman standard) = 16 kırat = 64 dang = 3.207 g

(Byzantine and early Islam) = 3.125 g

(canonical law) = 3.125 g

(copper, Cairo) = 3.0898 g

(Damascus) = 3.086 g

(coins, Tabriz until 1700) = 3.072 g

(T.1) = 4 dang = 10 denk = 16 kırat = 0.311783 ok

dirhem = 3.07363 g

(T.2) **Dirhem-i a'şârî** [metric dirhem] = 1 gra

(based on the weight of 1 cc of distilled water at

temperature of 4 degrees)

(T.2) **Aşîr-i dirhem** [metric dirhem] = 1 gram

(MZP) In the Arab monetary system the dirhem wa

the name of a silver coin, and later passed to th

Ottomans. The word was used in antiquity

originating in the Persian direm. The Arabs forme

the plural derahim from this word. The Arabs als

use the form dirham.

It is generally assumed that the dirhem cou

weighing 2.97 g was first struck by the Lord Oma

The oldest Islamic dirhem coins, with the exceptio

of some doubtful examples, date from the year 75

(694 AD).

Dirhem weights were originally in the shape of da

seeds. Both these and those that were spherical i

shape were at first plain. Then in the time

Abdullah ibn-i Zübeyr the word 'minallah' wa

inscribed on one side and 'bilbereke' on the othe

Haccac replaced this with the İhlas Sura or the wor

'bismihi'.

There is disagreement about the weight and quantit

of the dirhem. The most accurate claim is that te

dirhem made five miskal. In the time of Omar th

was changed to seven. That is ten dirhem wer

equivalent to seven miskal. Accordingly seve

miskal were 14 kırat, and each kırat was seventy arp

[barley grains]. That is the weight which applies fo

alms, and so it writes in *Kitab-üz-zekât* by Camiu

Rumuz. The same author says in the chapter o

Tathirü'l-encas in his *Kitâb-ût tahare* that the dirhe

here is different from the dirhem applying to alm

Because what is meant by the dirhem here is o

miskal, which is a handful. In *En-nevadir* by th

Imam Muhammed the dirhem is a handful. *Kitabü'*

selât writes on the other hand that it is the weight

a miskal. Ebu Cafer brings these two assertions in

agreement by saying that what is meant by the si

of the palm is not a large one. Whereas what

meant by the miskal is a large one. The generality

sheikhs preferred this, and said that this was the tr

definition... Kirmani says that the dirhem

estimated size is always larger than the coin existi

in the hands of men. Because this is large

Keşşafü'l-ustılahat says: In short, in coinage dirhe

is the name of a circular object struck from silver.

the context of canonical alms it is whatever

struck... The dirhem is half a miskal and one fifth

a miskal. It has also been called six denk. In Ir

they say dank. This last is a term used

accountants. In *Müstehap* it is said that the canonic

dirhem is also called the dirhem-i değali, because t

man who minted that coin was named Resûl Beğ

That dirhem is the size of the palm of the hand.

The Ottomans used to use this term for silver coins, but later abandoned it.

E. V. Zambaur says (in the entry on Dirhem in the *İslâm Ansiklopedisi*): Establishing the official weight of the dirhem is harder than calculating that of the dinar, because dirhems were never struck with great accuracy and precision. Definitions of the official rate of the dirhem as given by different chroniclers are inconsistent, agreeing only on the point that the ratio between the weights of the dirhem and miskal is 7/10. But since the word miskal has several different meanings, this is only meaningful when the miskal is defined in terms of the dinar (the Meccan miskal is 4.25 g). The most likely weight for the dirhem is 2.97 g. This complies both with existing coins and glass weights, and with the weights of coins dating from the Elmuktedir period found in Fayyum by E. T. Rogers, where 295.320 = 908.932.

In the early centuries of Islam multiples and fractions of the dirhem are hardly ever encountered. The most frequently used fraction was 1/6, and the most widely used was the 1/2 dirhem.

The dirhem is one part in 400 of an okka, which is the same as the kıyye, and was the name for a weight of 3.148 g. In canonical law it was equivalent to seventy medium-sized barley grains. During the reign of Sultan Orhan it was decided that it should be one quarter of the canonical dirhem. Each of its four parts was known as denk, and each denk divided into four parts known as kırat, which were each divided into four parts known as buğday, each buğday into four parts known as fitil, each fitil into two parts known as nakir, each nakir into two parts known as kıtmir, and each kıtmir into two parts known as zerre. One and a half dirhem was known as miskal, 400 dirhem as okka, 44 okka as kantar, and 4 kantar as çeki.

With certain variations from place to place, the dirhem and its fractions were used for weighing precious metals until modern times.

Dirhem-i şer'î: Used to mean 14 kırat of silver. It was a weight equivalent to seventy medium-sized barley grains. It was this dirhem that was used for calculating alms, blood money and the value of stolen goods. In the time of Muhammed there were three types of dirhem weighing 20, 12 and 10 kırat. During the time of the Caliph Omar these were joined to form a dirhem of average 14 kırat. It is said that during the era of the Prophet the following four types of dirhem were used:

1. Dirhem-i bagalî 8 danık
2. Dirhem-i tabarî 4 danık
3. Dirhem-i mağribî 3 danık
4. Dirhem-i yemenî 1 danık

The Lord Omar combined the two dirhem that were most commonly used, and decreed that they should be equivalent to 6 danık.

Dirhem-i örfî: This term is used of silver weighing 16 kırat. According to some theologians, the örfî dirhem was valid for alms, blood money and other circumstances. This means that this dirhem could not be less than the dirhem-i şer'î, and if it was then the latter was applicable.

(IAG) 1. Former unit of weight. One quarter of an okka, that is 31 decigrams.

(WH) In 1924 the Egyptian government officially adopted this measure, which was set at 3.12 grams. However, the values found by V. Queipo average 3.125 grams. Thus the standard dirhem weight of 3.125 grams (48.225 habbe) was to be valid. Based on this value we can calculate the miskal weight (at the ratio 7:10) to be 4.464 grams (68.888 habbe). However, this miskal was less commonly used than the particular weights that were widespread in different countries.

Dirhemü'l-keyl: in 1854 an Egyptian commission set up by Khedive Mehmed Ali set the value for the dirhemü'l-keyl at 3.0898 grams. H. Sauvaire, who has gathered the most detailed information about Islamic weights and measures, used this value for his calculations. J. A. Decourdemanche asserts this value set by the Egyptian commission to be erroneous, and calculates the dirhemü'l-keyl at 3.148 grams.

(EÇ) 1/30b And they called one of their idols Peyrev, and placed it in a northerly direction from which they shot arrows from the south. They still call that kind of arrow peyrev for this reason. An arrow weighing five dirhem goes a distance of 800 kez.

(EÇ) 1/46b But during the time of Süleyman Han one akçe was one dânk and four made one dirhem, which was the accepted standard for pure silver, and 100 gold coins came to 118 dirhem. According to this God knows the expense of this act of charity.

(EÇ) 1/63b But Murad Han did not collect a single dirhem from the wives of one fellow creature.

(EÇ) 114a Some children who were addicted to taking snuff which they called nose herb, and placing the dust in their palms sniffed it up their nose, and 100 dirhem a day was not considered excessive.

(EÇ) 1/140a They call it Çubuklu Park. By the grace of God the cornelian cherries which grow here are unsurpassed anywhere. Each one weighs five dirhem, as much as a red date of Medina.

(EÇ) 1/162a The Muslim ships took the ships of the infidels in tow, throwing away the muskets of the soldiers that weighed 40 and 50 dirhems each.

(EÇ) 1/165b They place Tarabefsûn linen and cloth and shirts inside reed stems, and one bodtâvî shirt weighs 20 dirhem.

(EÇ) 1/211b And Mukallid Cîlve Çavuş was regimental sergeant to Vezir Kara Murad Paşa, and had a rosary of 33 beads, each weighing 50 dirhem

(EÇ) 2/229b This place has very large chestnuts, all growing on grafted trees, some weighing 40 dirhem

(EÇ) 2/252b And carnations whose heads each weigh five or six dirhem grow here.

Dirsek Elbow.

(HRD) 1.5 ayak, 0.444 metres

Diş Tooth, clove (of garlic).

(OŞG) Objects resembling a tooth.

(EÇ) 1/172a It is a plant resembling the testicles of a fox or like a diş [clove] of garlic

(EÇ) 10/360 Salep sherbet. In the Arabic language it is called hussatü'l-sa'leb, that is the testicles of a fox. It grows abundantly in Bursa on Mount Ruhban. It is a white plant like garlic diş [cloves].

Dizi Row, string, series.

(EÇ) 1/171a Onion sellers: These have seventy shops and 300 tradesmen. Their patron saint is unknown. They carry thousands of strings [dizi dizi] of onions on their shoulders

(EÇ) 1/147 Galleon columns like swallows' wings are mounted one upon the other in rows [dizi dizi] on either side

Dodrans (Roman) = 9 unciae = 245.590 grams

Dokurcun see Tokurcun

Doruklama (OŞG) To fill a vessel so that the contents form a peak and spill over the rim.

Doz Dose.

(AT) The amount of a medicine that is prescribed.

(OS) 1. The specific amount of a substance to be contained in a mixture.

2. The amount of something that is recommended.

3. The amount of medicine prescribed to a patient at one time or in one day.

Dozaj (AT) Adjusting the dose of a medicine.

Dölüm see Dönüm

Dönüm (OŞG) 1. A square, each of whose sides measures 40 ordinary steps.

2. Four evlek.

3. The area of land which can be ploughed in one day.

4. The size of a field which can be sown with ten tins (10 put) of seed.

Âsarî dönüm: a square area each of whose sides is 100 steps.

Yeni dönüm: 1 hectare; 100 sq m.

(ML) An area measuring 40 arşın in length and width (1000 sq m). At first the dönüm was calculated at 40x40 = 1600 adım, and then the mimar arşını (approximately 75.58 cm) replace the adım, and this is known as the atik (ancient) dönüm (918.672 sq m, later 919. 302 sq m). The new dönüm according to the metric system introduced in 1881 was calculated at 50 x 50 = 2500 sq m. The Weights and Measures Act of 1931 did not include the dönüm. Today the dönüm is calculated at 1000 sq m.

(MLT) **Dönüm (atik)**: Measurement of area formerly used by the Turks. ≈ 918.672 sq m

Dönüm (büyük): Measurement of area formerly used by the Turks. = 2720 sq m

Dönüm (cedit): Measurement of area formerly used by the Turks. = 2500 sq m

(HI) (Standard) 4 evlek = 10 nişan = 100 çubuk = 1600 sqare arşın = 919.30 sq m.

(Turkish Republic period) = 1000 sq m

(PGI) Measurement of land equivalent to a square whose sides measures 40 zirâ, that is 1600 square arşın

(T.2) = 100 square arşın = 1600 bina arşını

(old) = 0.193024 new dönüm

(new) = 0.108778 old dönüm

(MZP) The name of an area, each of whose sides measures 40 arşın, making 1600 square mima arşını. Formerly the dönüm used in and around Istanbul was a square each of whose sides measured 35 zira-ı mimari. Each side of this square measured 10 çubuk and each çubuk was 3.5 zira. One in ten parts of this was called a nişan. Thus 1 dönüm was a square measuring 100 çubuk square, and each çubuk measured 12.25 arşın square. In places far from Istanbul one dönüm was a square whose sides measured 45 zira, and in Samarkand, Bukhara, Egypt, Baghdad and Basra the sides of this square measured 60 zira. In recent times the dönüm was divided into 40 parts, each known as evlek. According to the last Land Act, one dönüm was set at 1000 square metres.

(EÇ) 1/170b In the vineyards of Ketehorya the chief vinegar maker holds one thousand dönüm of misket [muscatel] grapevines.

(EÇ) 5/153b And in all 5000 gardens and vineyards pay the dönüm tithe, and 41,000 people pay hereditary land tenure tax.

Drachma (Byzantine) = 17 carats = 3.4 g

(Hult) = 6 obols = 4.366 g

(Roman) = 3 scripula = 6 oboli = 18 siliquae = 3.41 grams

(Greek) = 4.37 g

Dram (Byzantine) = 1/18 litre = 4.08 g

Efa

(Old Testament) = 10 omer = 37.00 litres

Egin (DLT) A piece of cloth one and a half karış wid and four arşın long.

Ekyâl (OS) Plural of keyl and kile. Grain measures.

Elpeze (OŞG) Pile, bunch.

Emyal (OS) Plural of mil [mile].

Endaze (OS) 1. Name of one of the units of length use along with the arşın until the introduction of th metric system.

2. Equivalent to four kabza, the width of four finger side by side.

3. A measurement of 65 cm used for measurin cloth.

(OŞG) 1. Measure.

2. A measurement of approximately 65 cm used fo cloth.

(MLT) Unit of length formerly used by the Turks. 60 cm

(PGI) 8 rubu. Used for measuring fabrics such a şali, kutnu and astar.

(MZP) Name of one of the units of length used togeth with the arşın until the introduction of the metr system. It was equivalent to four kabza, the width

four fingers side by side. In metric terms it was 60 cm.

Kamus-ı Osmani gives the following explanation: 'This measurement is 60 cm. Although some people have assumed that the original word was hendese or hendize, in fact research has shown that endaz comes from the root endahten, to which a suffix is added, to mean a kind of small arşın. Metaphorically it was used to mean estimate.'

Kamus-ı Riyaziyat explains under the entry for Arşın: 'Some tradesmen invented another measure called the endaze that was shorter than the çarşı arşını, probably to make precious fabrics such as silks seem cheaper.'

(ZK) A measurement of length equivalent to 65 cm used for measuring fabrics.

0.650 m.

(T.2) = 0.65 new arşın = 8 rub

(T.2) = 0.4225 new arşın square

(EÇ) 1/200b The broadcloth weavers number 107 and have 100 shops. Their patron saint is Ebü'l-Hüdâyî Halebî who was Selmânî. His tomb is in Mecca. They pass by on floats measuring out many thousands of bolts of stuff, sâya and londrine and vüreznin and karkaşovna and nime and pârsı and marliye and ankona and londura and iskerled and seventy rolls of broadcloth, saying 'The finest for 1000 or 2000 kuruş.

(EÇ) 2/302b At the tips of all their endazes and on all their weights and on all their sumptuous rugs are inscribed the words 'There is no god but God.'

Erdeb see İrdabb

Erdib see İrdabb

Erim (OŞG) 1. The distance that something can reach.

Eriş (OS) The name of a measurement of length equivalent to the length of the forearm from the tip of the middle finger to the beginning of the elbow.

Unit of length formerly used by the Turks. = 68 cm

Erlik (HI) The amount of land that can be cultivated by one person, used particularly for vineyards, rice paddies and vegetable gardens; or the amount of land needed to sow 50 okka of rice, or the equivalent of 2.5 dönüm.

Eşel (OS) Unit of length equivalent to 60 Hashimîd zirâ. Approximately 39.96 m.

Etalon (TDK) Standard of weights and measures.

Evlek (OŞG) 1. One quarter of a dönüm.

2. Four deep furrows made with a plough on a dönüm of land.

3. Each of the strips of land separated by furrows for sowing seed in a field.

4. Each of the strips into which a garden is separated for planting vegetables and other plants.

5. A grain measure of 10 kilos.

(DS) In İçel a grain measure of 10 kilos.

(MZP) The name of one quarter of a dönüm equivalent to 1600 arşın square or 900 m square. It is equivalent to 400 arşın square. The section of a field or vegetable garden divided into four by a deep furrow is known as evlek.

(ML) An evlek is a unit of area equivalent to 225 square metres. Every fourth part of a dönüm field divided into by ploughing deeply is known as an evlek.

(MLT) Unit of measurement formerly used by the Turks. = 229.669 square metres

(HI) Area of a field that can be ploughed by oxen in one day

(grain) = 10 kile = 12.829 kg

As a measure of vineyards or gardens = 0.25 dönüm (400 square arşın or 254.8 square metres)

Evran (OS) Measurement, quantity, amount, estimate, form, size.

Exagia (ODB) A unit of weight equivalent to 1/72 of a Roman or Byzantine litra. Approximately 4.44 g. *Olan exagia* was used to check gold coins.

Ezâle (OS) Unit of area = 145.63 square metres

Fadak

Fadak (DS) Measurement used in the province of Uşak to mean two handfuls.

Farâsîla (WH) According to European and documents this was spelt frassola or ferasilah and was equivalent to one twentieth of the bahâr.

Fardello (HI) Unit of measurement used for silk in Genoa. = 252 libbra = 79.821 kg; also see Yük.

Fark (ISAM) Unit of volume that varies from region to region. It is equivalent to 12.617 litres in Medina and approximately 19 litres in Iraq.

Fathom (ML) Anglo-Saxon unit of length equivalent to 6 feet or 2 yards, that is approximately 1.828 metres.

Kulaç. 1.828 metres.

see Kulaç.

Fatîl (WH) An extremely minuscule unit of weight equivalent to one part in 432 of a cuv.

Feddân (WH) An Egyptian measurement of area, which according to al-Kalkaşandî was equivalent to 400 kasaba square. Since we calculated the kasaba at 399 cm, we may take the value of 1 feddân in the middle ages to have been 6368 square metres. In the 19th century until 1830 1 feddan was only 333 1/3 square kasaba, or 5306 2/3 square metres. After 1830 the kasaba was reduced to 355 cm; and from that date onwards 1 feddân in Egypt was 4200.833 square metres.

(ISAM) Unit of length used in Egypt. = 5929 square metres

(MZP) A term used for units of measurement. This Arabic word was derived from Aramaic and originally meant a pair of oxen ploughing a field. In Egypt it was a measurement of land area whose value has changed several times. According to Lane, a short time prior to his own residence in Egypt (1833-1835) 1 feddan = approximately 1.1 acre (1 acre being approximately 4 dönüm). One feddan = 333 1/3 square kasaba, which was divided into 24 kırat. While one kasaba was originally 24 kabza, this later became 22 kabza. At the time of the French invasion there were three types of feddan: around the Nile = 1.336 arpent, in places remote from the Nile = 2.375 arpent, at Dimyat = 2.012 arpent. In addition different feddan measurements were used in Upper Egypt (1.670 arpent) and among the Copts (= 5.25 square metres).

According to M. Decourdemanch equivalent to 400 hâkim (the kasaba accepted by Hâkim bi-emrillâh), each 6 zirâ (1 zirâ = approximately 0.5 m) long, or the old feddan or Babylonian kasaba = 5883.5 square metres and 333.5 kasaba for the new feddan = 4200.8333 square metres.

In Syria the word feddan means a single ox. Or as a unit of measure = 333 kasaba.

(EÇ) 10/127 At the time of writing the goods collected from them was in proportion to the amount of land in feddân or dönüm which had been endowed to the vakıf

(EÇ) 10/160 Husta is the wheat ration, kamh again wheat, and alîk the barley ration; cirâye is a wheat ration; yer-i cirâye means a place to sow crops. That is a field. A feddân place means a pasture.

(EÇ) 10/635 Around the city are mud flats extending for seven thousand feddân. The farmers plant two thousand feddân, that is dönüm, of land, and harvest crops equivalent to 50 Egyptian purses. Their other feddâns are neglected.

Fels (ISAM) Comes from the Latin follis. A unit of weight and money.

1. As a unit of weight it is equivalent to half a habbe. = 0.03 g.

2. As a unit of money it referred to copper coins used as small change.

Ferade (PGI) A heap of gold of no specific weight. Mint weights.

Ferak (OS) Large measure.

Ferde (PGI) 1. Small pile, bolt, 3 kantar, that is 132 okka, used for weighing coffee. The ferde was not a standard measure, but referred to sacks of coffee weighing 100, 120 or 125 okka and equivalent to half a camel load.

(EÇ) 1/166b These coffee sellers, fully armed, weighed out their sacks [ferde] of coffee beans with kile weights upon liners, and as they passed by cried 'Take a thousand kuruş, give a hundred kuruş.'

(EÇ) 1/197a The coffee merchants number 500 and have 300 shops and warehouses. They are great merchants, each of whom has property worth 1000 purses in Egypt and Yemen and Kum Fsta and Samtân and Aden. Upon their floats they load many hundred ferde of coffee, throwing them on to the steelyards and crying, 'Take a thousand kuruş, give two thousand kuruş' as they pass.

Fersah Furlong.

(OS) Unit of length. There are two types: the nautical fersah of 5555 metres and the land fersah of 4444 metres.

(TDK) A unit of length of approximately five kilometres.

(WH) The fersah is equivalent to 3 miles, and every mile is equivalent to 4 şer'î arşın or 1000 kulaç (bâ'), that is approximately 6 kilometres.

(ML) A measurement of distance (approximately 3 miles or 5 kilometres). Formerly it was a distance equivalent to 3 nautical miles (5570 metres).

One hour's fersah is a fersah of 4872 metres.

A nautical fersah is one twentieth of a degree measured on the meridian, that is 3 miles or approximately 5556 metres.

An English furlong is 5569 metres.

A Portuguese furlong is 3898 metres.

A Prussian furlong is 7407 metres.

A unit of length formally used by the Turks = 5.685 kilometres.

The name of a measurement of distance. It derives from the Persian fersenk, borrowed into Arabic as fersah, and defined in *Kamus-ı Osmani* as a measurement of distance equivalent to 3 mil (the distance between Üsküdar and Kadıköy is one fersah). It is used both literally and metaphorically, usually being repeated twice when used metaphorically. For example 'Such and such a picture has surpassed the master by furlongs'. Cl. Huart (*İslâm Ansiklopedisi* Fersah) gives the following explanation of this term: 'It has passed into Arabic from one of the forms in the dialects of northern Iran, such as fars, frasang, pehl and farsang. Herodotus and Xenophon mention it as a measure of distance used in Iran which is approximately equivalent to the distance back can be covered on horseback in one hour. It is equivalent to 6000 zirâ or 6232.2 metres. The Arabic fersah = 3 mi or 12,000 zürrâ = 5762.8 metres.

(HI) 7500 arşın = 5685 metres

(T.2) (new) = 1.759015 old fersah = 10,000 arşın

= 0.5685 new arşın

Fersah-ı a'şârî: 10,000 metres.

(EÇ) 1/36a And its great dome was surmounted by a enormous finial, measuring 50 zirâ in height and gilded wit 50,000 pieces of pure gold. This finial was a religious symbo visible two fersah away by land,and a hundred miles away by sea and Sultan Murad III had two kingly jars of white marble brough from the island of Marmara to adorn the mosque, such jars the neither Jem nor Jemshid nor Darius had ever possessed.

(EÇ) 2/223a This is a large place just beyond the mountai known as Keşiş Dağı. It stretches from east to west, being exactl one fersah in length and half a fersah in width, and the perimete surrounds three sides of the castle, whose total circumference five thousand steps.

(EÇ) 2/230a From there the mountain of Kumar is twent fersah inland to the north in a straight line in the land of Egyp and the beginning of the holy Nile which flows to Egypt.

Fersenk see Fersah.

Fetîl see Fitil.

Fetr (WH) A unit of weight used in Iran in the middl ages and equivalent to one tenth of a donkey loa (harvâr), such that 10 menn = 8.33 kilograms. In th time of the Buveyhids Adududdevle (949-82 AD recorded that the fitr'i was 12 menn (10 kg), an that a donkey load was 120 menn (= 100 kg).

Feyhec (OS) Cup for measuring alcoholic drinks.

Fıçı Barrel, cask.

(TDK) 1. A vessel with a convex body made o narrow planks held together with bands, and flat the top and bottom.

2. The quantity held by a fıçı.

(ML) A vessel with a convex body of narrow strips of wood held together by bands, flat at the top and bottom.

An oil barrel is a cylindrical vessel made of sheep steel for holding petroleum products, having a capacity of 50 to 250 litres, and holes closed by screw stoppers.

(OŞG) A container made from long pieces of wood and enclosed by wooden or iron bands.

(HI) (standard in Akkerman in 1500) = 52 medre = 225.798 kg

(wine, honey etc) = 40 medre = 89.810 kg = 2 karatil = 4 baril

(EÇ) 1/130b Right at the top of this roof on all four sides are many hundreds of barrels of honey

(EÇ) 1/179b These merchants buy honey from those countries, and more from Wallachia and Moldavia carrying many thousands of barrels of honey to the Honey Warehouse in Emmönü, and there the barrels are in such abundance that they block the roads.

(EÇ) 3/41b Description of how a galleon was launched: First of all many hundreds of barrels were gathered in the city, and a rope tied to each barrel, and the other end tied to another barrel, so that 100 barrels were at one side of the galleon and 100 at another, and the strong rope remained beneath the ship. Then all the barrels were placed at the edge of the water and submerged in the sea. Then an infidel pump was placed on each barrel, and as the pumps emptied the water from the barrels, the ship was lifted by the empty barrels, and they hauled the anchor at the stern and easily released the ship.

(EÇ) 3/121a And when Koca Ken'ân Paşa was governor 87,000 barrels of honey were poured into the muddy stream of the Danube, as written in the court records.

(EÇ) 3/140b Another agreeable custom among the people of Sofia: In this city when any individual, man or woman, dies, at that moment the pious foundation provides that the water carriers of every neighbourhood lift up the honey barrels that they call çile on poles, and filling those çile with the hot water of life created by Providence in the saline baths, they wash all the dead bodies with that powerful heat and bury them.

Fincan Tea cup, coffee cup.

(TDK) 1. Small cup generally used for drinking hot beverages like tea and coffee.

2. The quantity contained by a fincan.

(EÇ) 1/172a Whoever wishes for pâlûde [a soft pudding made with fruit juice and starch] purchases two fincan for one akçe, sprinkles ginger and cinnamon on top, and then sprinkles rose water from a sprinkler

(EÇ) 1/179b And one fincan of honey is sufficient for forty fincan of water to make a delicious pâlûde.

Fiske Pinch. Flick, slap.

(TDK) The amount that can be held between two fingertips.

Fişek Cartridge.

(OŞG) A packet of tobacco in the form of a cartridge weighing 25 g.

Fitil (ISAM) A very small unit of weight equivalent to 1/6 fels, approximately the weight of a grain of barley = 5 mg.

(MZP) Name of one of the fractions of the dirhem used as a unit of weight in the past. One quarter of a dirhem was known as a denk, one quarter of a denk as a karat, and one quarter of a kirat as a fitil.

Fitre (OS) Alms given in the month of Ramazan whose amount depends on the means of the giver.

(ZK) 1. The name of a measure of wheat of approximately 2 kg. In the villages of Ulubey (Hasköy), Çamdere, Eşme (Kayalı) and Dervişli the name formerly given to the day before the eve of Ramazan was buldey, bulday or buğday. This name must have been used because alms were given in the month of Ramazan (*Uşak Halk Takvimi*, p. 123)

2. Half a şinik.

Foot (MLT) Ayak, 0.304 m.

Fuçu see Fıçı

Funt (MZP) The name formerly used to describe the weights of the gunpowder rings indicating the size of cannon. This unit is equivalent to 1.2357 libre in Germany and 1.0311 libre in Austria.

Futa (OŞG) Barrel open at both ends used for carrying grapes to market; grape barrel.

Fülüs see Fels.

Gabari (OS) The height of loads on land transportation vehicles.

Galbur see Kalbur

Galon Gallon.

(ML) Former unit of volume. As used by the Ottomans it was equivalent to 4.5 litres.

US gallon: 3.785 litres

British gallon: 5.545 litres

Garar see Girar

Gasa (OS) Length.

Gaz see Gez

Gazivi (PGI) Small or large container or basket containing rice from Egypt.

Gera (Old Testament) = 0.75 g.

Gerdel (OŞG) Wooden bucket used for milk and similar substances, and to feed animals.

(EÇ) 1/154a All of them were fully armed with and their great honey barrels embellished with bright green leaves carried on poles resting on their shoulders, and in their hands picks and shovels and street brushes and gerdels, and calling 'Aşa aşa' they swept the roads in places and filled their gerdels and barrels.

(EÇ) 1/202a Barrel makers: They number 105 and have 80 shops. Their patron saint is unknown. I have never seen barrel makers in Futuwa. Upon litters they make barrels and gerdels of juniper and cypress and pine wood as they pass dressed in disguise

Gereh (WH) Iranian unit of length = 1/16 zar (zar = 104 cm) = 2 bahr = 6.5 cm.

Gez (OŞG) 1. Knotted measuring rope, arşın rope.

2. An arm's length.

3. The rope of a plumbline used by builders.

4. A measurement of length which varied over place and time, today equivalent to 104 cm or 65 cm.

5. The notch in an arrow,

6. Short arrow for practice shooting.

(ML) A knotted rope formerly used for measuring length. A plumbline used for building construction.

A former unit of length used in Iran. The ordinary gez was 0.63 metres, and that used in Tehran 1.40 metres.

(OS) 1. White tamarisk tree.

2. Short practice arrow made from tamarisk wood.

3. Endâze, measuring rope.

(HI) 68.58 cm

Gez-i şahî: 95 cm

(PGI) 1.5 halebî, that is an arşın. Used in the south of Armenia. Derived from the Persian word gez that means arşın in Turkish.

(WH) Term used to mean arşın in Iran. In this country the words zar and zirâ are also frequently used for arşın, although determining their values is difficult.

According to Chardin in the 17th century 1 gez-i şahî was '3 pieds moins un pouce' = 94.945 cm, and according to J. Fryer it was 39.5 inches = 95.15 cm, or an average of 95 cm.

In Basra in the 19th century 1 gez = 94 cm.

As well as the gez-i şâhî there was the gez-i mükesser, or 'shortened arşın' used for measuring carpets, silks and other fine fabrics. According to Chardin this arşın was two-thirds of the gez-i şâhî or (according to his calculation) 63.12 cm. According to Fryer 27 inches = 68.58 cm. This latter piece of information shows that the arşın in question was probably the Aleppo fabric arşın which was widely used, and which we earlier estimated to be 68 cm. In Iran today there is only one gez, which is 104 cm.

(EÇ) 4/324b The values of the gez and men and ratl and sak as set by the Price Regulations of Ali: First of all the value of the gez is 748,800 dirhem.

Girbal see Kalbur

Girar Same as harâr.

(OS) 1. The dictionary meaning of the word is sack, a grain measure equivalent to 12 kile or 72 mut.

2. Large basket or pannier.

3. A large sack for storing mattresses, quilts and similar items.

(HI) 50 okka = 64.150 kg.

(EÇ) 1/63b No tableware made of silver and gold was found, but six purses of money and one garar of coral and one chest of porcelain cups

(EÇ) 1/154a with picks in their hands and some holding sweeping brushes and shovels, and with zenbil [a kind of basket] and garars and baskets for rubbish and sweepings on their shoulders, they marched along in procession with shouts and cries.

(EÇ) 3/35a And all the French and Arab wise men and all the chemists go into these mountains in the spring season and collect many hundreds of thousands of medicinal plants and herbs without end and many thousands of garar loads of wood for curing diseases and carry them to many lands.

(EÇ) 4/192b When by the grace of God I decided to climb the minaret of the mosque, I found a sack of barley and a garar of straw, so that my horses were feasted.

(EÇ) 4/279a 'They are a regiment of seasoned warriors. So they do not know its value. Take possession of their harars [haircloth sacks] and give them their liberty,' he said, and courteously delivered four garar loads of aloe wood from the fire of the Kurds and burnt it with the fire of the vezirs.

(EÇ) 6/138a but men who had galloped and trotted far, suffering troubles and adversities, and labouring much arranged all their garars and heavy loads on all four sides, and pitching their tents tied their tent ropes to sacks, many hundreds of tents were erected

(EÇ) 1/161a The biscuit makers: The superintendent of the biscuit makers is an important officer during campaigns. They number 1000 and have 105 bakeries. Their workplaces are in Galata and Kuruçeşme and Yeniköy. These too were fully armed and baked pure and white biscuits in their ovens on floats, their stalls decorated with leaves and fruit. As they proceeded along they gave generously of their many sacks of biscuits to the crowd.

(EÇ) 1/164a They [navlunçu – freighters, shippers] make their living from the mariners. Constructing stalls upon pack horses they measure out wheat and barley from the sacks and toss barley and wheat over the crowd, crying out 'God who provides abundance' as they pass by fully armed.

(EÇ) 6/138b and many thousands of thieves had slashed their tents and taken away many hundreds of harar loads

(EÇ) 8/282a And they place many thousands of empty harar and baskets and chests in the forests.

Girâra (ISAM) A measure of volume for grain used in Damascus. Although it varies from region to region it is approximately 265 litres.

(WH) A measure of volume used for grain in Damascus. The meaning of the word is sack and it is equivalent to 12 keyl or 72 Damascus müdd.

According to el-Ömerî 1 girâra + 1.5 müdd was approximately equivalent to 3 Egyptian irdabb. The value of the irdebb was approximately 69.6 kg (for wheat) or as a measure of volume to 90 litres, and we calculated the value of the girara to be approximately 204.5 kg (of wheat) or 265 litres.

In Gazze in the late Middle Ages the girara was equivalent to 1.5 Damascus girara (that is approximately 306.75 kg of wheat or 395.5 litres).

In Jerusalem 1 girara = 3 Damascus girara = approximately 613.5 kg of wheat or 795 litres.

Girbal see Kalburi

Girih (OŞG) A word meaning knot, or a unit of length approximately equivalent to 6.5 cm.

(EÇ) 1/43b After a year according to the direction of the prayer niche set by Sultan Bayezid, friend of God, the prayer niche was placed, and when ropes on all four sides reached to the knots [girih] of the dome they completed it in three years, raising

the great dome upon four strong and massive pillars.

(EÇ) 1/192b These silk manufacturers build shops upon packhorses and floats, and decorate them with jewellery and splendid fabrics and pure girih and teybend sashes and diverse gold embroidery and lamps, so adorning their workshops that it might be Gelincik Çarşısı in Bursa.

(EÇ) 8/313a Over these great gates are decorative plaques of wood covered with lead, but on the marble arches of the qibla Gate beneath the leaded dome the mouldings and girihs and eslemi [a kind of decoration] and layer upon layer of intricately worked and artistically fashioned European style fanciful marble carving display such skill that there is nothing to match it on the face of the earth.

God see Kot

Gödek (MLT) Unit of weight formerly used by the Turks. = 6.25 kg

Göynük (OŞG) Small vessel; bag into which camels are milked, skin bag for milk, hair cloth bag for yogurt, barley bag

Göz Eye, compartment.

(OŞG) 1. Room.

2. Compartment in a cupboard, drawer.

3. Arched span of a bridge.

4. Scale pan of a balance.

Gram (T.2) 1 gram = 0.001 kg (based on the weight of 1 cc of distilled water at a temperature of 4 degrees)

Grammarion (Byzantine) = 6 carats = 1.13 grams

Gulve (ISAM) A unit of length equivalent to 400 şer'î zirâ. = 184.8 m

Guraf (OS) Large measure.

Guvr (OS) A unit of measure equivalent to 12 senc, the senc being 24 batman.

Güğüm (OŞG) 1. Copper jug.

2. Copper ewer for water.

(EÇ) 1/32b To this day all the sultans drink this pure water brought every day by three men each provided by the chief cellarer and the chief water carrier. They fill silver güğüms each weighing 20 vakiyye to the brim and load them onto three pack horses each. In the presence of the Superintendent of Water trusted men of the chief cellarer seal the mouths of the güğüms with red beeswax and bring them to the sultan whenever he desires.

(EÇ) 1/62b When it was completed they washed the inside of the mosque with 100 güğüm of rosewater.

(EÇ) 4/202a When Melek Ahmed Paşa was governor of Amid [Diyarbakır] the aforementioned ağa arrived with the royal decree, and the aforementioned Paşa declared 'Whatever you may command', and made güğüms of pure silver weighing ten vukiyye each, and filled six güğüms with lead and six güğüms with zinc oxide and six pine jugs that they call senek with the water of Hamrevât, sealed them all in the presence of the law, and presenting ten purses as a gift to the Chief Doorkeeper and paying sixteen purses more as the cost of the güğüms sent this water of Hamrevât at a gallop to İbrahim Han.

Güvlek see Külek

Habbe

(OS) 1. Cereal grain, seed.

2. Piece.

3. 1/48 of a dirhem.

(ISAM) Unit of area and weight.

1. As a unit of weight it is equivalent to half of a tasuc. Approximately 0.06 grams.

2. As a unit of area, it is equivalent to 59.345 square metres in Egypt today.

(ML) Grain or seed of cereals and similar plants.

Unit of weight used for measuring valuable objects.

Most Arab writers define the habbe as 1/10 of the danak which is 1/60 of the general unit of weight. Some of them define it as varying between 1/48 and 1/72. The proportion varies according to the unit the habbe is defined in terms of. Different habbes are used for different precious metals like silver and gold. The miskal habbesi, dirhem habbesi and so on have various ratios. The oldest unit used for measuring precious metals by the Arabs was the miskal which weighed 4.25 grams. The first Arabic habbe weighed 70-71 mg. This was equal to the granum used by European apothecaries (1/5760 libre). In ancient times the Arabs sometimes calculated the habbe at 2 barley or rice grains or 100 mustard grains. One kırat was sometimes equal to 3 and sometimes to 4 habbe. Formerly in Istanbul the habbe was one quarter of a kırat, and used for weighing precious stones. This was 50.04 mg. The dirhem, which was equivalent to 64 habbe was 3.2025 grams. When the habbe was used as a measure for coins, it was a little heavier, at 50.11 mg. A coin dirhem was 3.207 grams. In Cairo the habbe has the same value in all the systems of weight measurement: 1/3 kırat, 64.3417 mg; while the dirhem is 3.0884 grams. On the basis of these facts it is evident that the habbe was sometimes calculated according to the value of the metals in question. The finest unit of weight used in pharmacies today is evidently derived from the development over time of the unit based on the ratio of the habbe in former times. In the Ottoman system of weights, the habbe was used for a long time by jewellers in particular. Today, the development of jewellery and more accurate weighing devices has necessitated a modification of the habbe according to the new ratio.

(WH) A measurement of area in Egypt, 1/3 kırat = 1/72 feddan, today 58.345 square metres.

According to Ibn Muaz (*Journal Asiatique*, 8 III 1884, p. 414), in Iraq 1 miskal of gold was equivalent to 20 kırat (1 kırat = 3 habbe), 1 miskal of silver was equivalent to 12 kırat (1 kırat = 4 habbe). Therefore, since 1 miskal was 4.233 grams, the following values were used in Iraq: 1 gold kırat = 0.212 grams; 1 silver kirat = 0.247 grams, 1 gold habbe = 0.0706 grams and 1 silver habbe = 0.062 grams. These values are also valid for Iran. In Arabia, Egypt and Syria their values were as follows: 1 kırat in these countries was always equivalent to either 1/24 miskal or 1/16 dirhem, so that 1 gold kırat = 0.176 grams, 1 silver kırat = 0.186 grams, 1 silver habbe = 1/60 dirhem = 0.495 grams. In the Maghrib, since 1 miskal was 4.722 grams, 1 habbe equalled 0.0787 grams.

It is the weight of the Arabic 'barley grain'. The information given by writers about this weight are contradictory. H. Sauvaire in *Journal Asiatique* (8, IV, 1884, p. 296-7) gives a list of the various habbe weights, based on a very low value of 3.0898 grams (which correctly should be 3.125 grams) for the dirhem. Accordingly these appear to be the main factors:

1) According to canonical tradition 1 habbe = 1/100 miskal or 0.0446 grams. This is only an approximate value in practice.

2) In principle the habbe is largely a coinage weight, not used for weighing goods.

3) As a measure of weight for goods 1 habbe is always equivalent to 1/96 miskal, varying according to the local value of the miskal. If the Egyptian miskal of 4.68 grams is taken as a basis, 1 habbe is equivalent to 0.048 grams.

In theory one dirhem is composed of varying numbers of habbe, sometimes 48 and sometimes 60, but whether the dirhem in question refers to a coinage weight or goods weight is usually unclear. Two documents in particular serve to throw light on this question: according to el-Mukaddesî in Syria and el-Makrizî in Egypt in the middle ages 1 dirhem was 60 habbe. For the silver dirhem of 2.97 grams, 1 habbe was 0.0 495 grams, and for the dirhem of 3.125 grams, it was 0.0521 grams. On the basis of a remark by Mukaddesî a dinar of 24 kırat (4.233 grams) was 84 habbe, which would make the habbe 0.0504 grams. So long as there were not varying coinage weights, for all practical purposes we can take the habbe to be a round value of 0.05 grams. But it must be taken into account that in the 19th century in Egypt the habbe was taken to be 1/48 dirhem. According to E. W. Lane this was 127/128 grains = 0.064 grams, and the same as the silver habbe used in medieval Iraq. Even today the official value of the habbe in Egypt is 0.065 grams.

(EÇ) 1/44b In the place where he found Süleyman Han, the mosque was being constructed by great numbers of labourers and masons like unto the sea, and Süleyman Han became like a fiery ember at the meaning of the letter and in the presence of the envoy presented a thousand purses of gold to the Jews of Istanbul, that there was not one habbe left.

(EÇ) 1/63a But in the era of the Prophet rebellion and sedition were daily occurrences, and all the soldiers became mutinous and plundered many noble families so that those who had not a robe to their name became possessors of a thousand purses, while householders were left without a single habbe.

(EÇ) 3/93b Thanks be to God by the high grace of my Sultan not a habbe of mine was lost and he gave me a purse of money and to my male slaves eight chiefs gave weapons and purebred Arab horses, and I took my revenge by having eight of those who had attacked me and taken my property, put to the sword and cut to pieces.

(EÇ) 3/130a The trees were so thick in that land of forests and avenues of trees that not a ray of sun the size of a broadbean grain [habbe] fell on the ground

(EÇ) 4/209a He came into the presence of the sultan making a very low obeisance and after many long words, as he had seen Ma'noghlu, that deceitful woman's father do, he lit a fire of Nimrod and placed in it a kantar of pure copper and a dank of great elixir, and immediately it took on a yellow hue and became such pure gold that it was as soft as a yellow candle, and the good man took a few habbe of that and consumed it. Murad Han ate three habbe and that day and night Murad Han never wished for food but was full-bellied.

(EÇ) 5/20a In Arabia, there is a habbe [grain] by the name of türmüs, which in the Arabic language they call dokat, like the broad bean, which they grind to flour and use like soap to wash their hands. It removes dirt from food, and they call it dokat.

(EÇ) 5/133b They related that the deceased possessed knowledge of chemistry and would eat and drink nothing in 24 hours but swallow ten grains [habbe] of gold the size of chickpeas, never eating bread or water. Therefore since he died of perfect asceticism his reverend corpse did not rot.

(EÇ) 7/81a They took not one habbe but gave him two infidel slaves, a large horse and two Hungarian muskets.

Habl (WH) A length of rope used for measuring land. In western Andalusia it was equivalent to 40 Reyşâşî arşın, each equivalent to 54.04 cm, making 21.616 m.

Hadb (OS) Length.

Halebi (MLT) Unit of length formerly used by the Turks. = 1.30 m

Harar see Girar

Hardal Mustard

(TDK) A plant of the *Cruciferae* family that grows to a height of 100-150 cm, has yellow flowers, and whose seeds are used in medicine.

(WH) The weight of a single mustard grain is 1/70 habbe, and 60 of these are equivalent to a silver dirhem (2.97 grams), that is the weight of a mustard grain is 0.000707 grams.

(EÇ) 1/25b And again by day and night from every quarter provisions came to the aid of the Islamic forces, but not even one mustard grain came to the infidels, because in former times castles had been built on the Mediterranean and Black Sea straits so preventing entry to these waterways.

(EÇ) 1/56b Indeed our master Melek Ahmed Paşa had in the year 1060 during the reign of Mehmed Han IV served as grand vezir and issued a royal ferman recording those servants of the sultan throughout the seven climes who were paid even a mustard grain or a single akçe in wages, and the total was calculated at five times 166,000.

(EÇ) 2/350a And they too declared, 'Our own lives are more important than the rest of the world.' The Paşa said 'O sons, you may stay here if you wish, but in these merciless times there is not a grain of mustard or wheat or any other kind of food or drink. How is it possible then to halt here.' He spoke much in this vein.

(EÇ) 4/214b Early in the morning all the Muslim soldiery invaded the vineyards on Mount Sincâr and pillaged and plundered the 300 villages, but found not a needle, a thread, a chicken or a vine stake, of food and drink not even a mustard grain, or a nail. Then at the command of the Paşa all the houses were set alight and destroyed and devastated, and the black smoke from the houses covered with straw matting rose to the

summit of the sky.

(EÇ) 4/240b They take not a mustard seed from anyone, and neither eat nor dress unlawfully.

(EÇ) 4/270b 'Illustrious vezir! The han has seized our taxes from Muş and our tribute from the enemy infidels in the city for the past seven years, and given us not even a mustard grain. We are still in possession of our legal title deeds and our sacred documents showing that so much property is in his hands, and all the provisions in this strong fortress.

(EÇ) 4/334a Immediately SüleymanHan charged the governor of Rumelia with defending the city of Tabriz that not one creature should plundered Tabriz nor seize even a grain of mustard from the tribute paying and the free.

(EÇ) 5/36b the River Turla flowed through the moat, so cleaning it, as was recorded, and the town criers broadcast warnings and corroboration to the effect that he who dropped even a mustard seed into the moat would be punished.

(EÇ) 6/91b In that place, when the conqueror of Yemen Sinan Paşa was serving as grand vezir for the second time, an Islamic army as abundant as the waters of the sea came upon the infidels beneath Estergon like a flash of lightning from on high and began to decimate them at the dawn hour, and until sunset not one of the soldiers ate even a mustard seed but slaughtered the miserable infidels, forcing them into the Danube and taking 43,000 prisoners in chains.

(EÇ) 7/6b Then all the warriors gathered in one place with our companions to sell all our spoils, placing them in the bazaar of friendship, and nothing made even a mustard seed.

(EÇ) 7/24b But for the horses there was not a particle of barley the size of a mustard seed, but only grass and pasture and the water of life in abundance. Alas there was no remedy but to place trust in God.

(EÇ) 7/106a Immediately, with 87,000 soldiers of the illustrious han from the Crimea, that noble decree was executed, and engaging in battle with the Nogay tribe beneath Akkerman the Nogay were routed and plundered and pillaged in a fearsome battle, and the long and short of it is that by the wisdom of God we fought in this battle, but God on high knows that I did not take possession of even a grain of mustard belonging to this Nogay tribe.

(EÇ) 8/317a but we did not find even a grain of mustard remaining from the time of the infidels.

Harman (OŞG) 1. Heap of threshed grain.

2. Heap of grain that has been threshed but not yet winnowed.

3. Circle of things spread out for the purpose of blending or drying.

4. To take a certain amount of various constituents and combine in a mixture.

Harman kilesi: Large measure, large grain kile.

(EÇ) 1/174b Cast net fishermen: They number 300 and by night and day wander along the seashore, and if they see a shoal of fish close to the shore they spread out their nets and capture all the fish in a place the size of a threshing pile [harman] with wonderful skill.

(EÇ) 2/351a By the grace of God the River Kızılırmak undulated like the Red Sea and seething and boiling, lumps of ice the size of a threshing pile [harman] began to flow past.

(EÇ) 3/111a It is a grassy area the size of a threshing pile [harman] of pure scented dust boiling in the cauldron of Muhammed of Bukhara near the aforementioned Pirevadi in the Kızan Mountains.

(EÇ) 6/161a And in the place where this pure water emerges, in front of the aforementioned cave is a great pool the size of two threshing piles [harman] the extent of whose depth is unknown to local people, and which no diver has been able to discover.

(EÇ) 8/371a And on the south side of the castle beyond the road is a way through reedbeds five threshing floors [harman] in extent, but they say it is of considerable depth.

Harrûba (WH) 1. Unit of volume used in Egypt, whose value was 1/16 kadeh. In medieval times it was approximately 0.06 litres, and today is officially 0.129 litres.

2. The weight of 1 carob seed is equal to 1 kirat, that is 1/24 miskal or 0.195 g.

Harvâr (WH) According to Iranian administrative records in the middle ages 1 harvâr was equivalent to one horse, cattle, mule or donkey load. Very rarely a distinction was made between mule and camel loads (see hml).

According to Adududdevle (942-82 AD) in the Buveyhid state the harvâr was equal to 10 fitr (each of which was 12 menn). Since the menn of that time was equivalent to 5/6 kg, then a mule load was exactly 100 kilograms.

When Gazan Han standardised the system of weights and measures of the Ilkhanid state in the 1300s, a mule load (which as a grain measure was known as tağar) was set at 100 menn, or 83.3 kg. This was actually a donkey load.

In 1440 in Persia one harvâr = 200 menn-i şer'î, or as we have already seen, exactly double that, or 166.67 kg. This unit for an animal load was equivalent to a horse load or mule load.

According to documents referring to Eastern Anatolia in 1518 this did indeed come to twice a donkey load.

In the time of Uzun Hasan a normal load for a horse or mule in Eastern Anatolia was 8 boğça, which was equivalent to 162.144 kg.

But in Iran from the middle of the 14th century onwards one harvâr was set at 100 menn, which was 288 kg.

This harvâr continued to be used in Iran until the present day, but in the 19th century was adjusted to 300 kilograms according to the metric system.

However, O. Blau puts a horse or mule load in Iran in the 19th century at 120 okka, which is 154 kg, which shows that the 300 kg harvâr was not always equivalent to a real load. A smaller harvâr of 83.3 kg continued to be used in Turkistan for longer than in Iran.

At the time of Uluğ Bey (1409–49) 4 harvâr of grain was harvested from 1 cerîb (958 sq m) of land, which is only possible if calculated at the old harvâr. In 16th century Kandehar 1 harvâr was 40 local menn or ten Indian menn, which was probably equivalent to 251.25 kg.

In the case of silk, the load used in Iran in the 15th century was only half of the large harvâr, that is 150 kg. G. Barbaro wrote on this subject: 'due some di seta che sono al modo nostro libre mille di peso = 301.23 kg.'

Hat (MZP) The name of a fraction of the ayak used until the introduction of the metric system. 12 hat = 1 parmak, 12 parmak = 1 ayak.

(ML) The unit of length used in the Ottoman period. = 0.218 cm.

(ÖNB) 12 nokta = 0.263 cm.

(T.2) = 10 nokta

(MLT) Liquid measure formerly used by the Turks. = 340.80 cc.

(MLT) Unit of length formerly used by the Turks. = 18 mm

Havz-ı kebir (OS) A pool of stagnant water with a surface area of 45-50 sq m.

Hektar Hectare.

(T.2) = 10,000 sq m.

Hektemorion (Greek) = 72.77 g

Hektolitre Hectolitre.

(T.2) = 100 litres (100 square decimetres)

Hektometre Hectometre.

(OS) Unit of length of 100 m.

Hekur (OS) Long.

Hem-Seng (OS) The same length, the same weight.

Hemisyhemitetarton (Greek) = 54.57 g

Hemisyhemitriton (Greek) = 72.77 g

Hemitetarton (Greek) = 109.15 g

Hemitriton (Greek) = 145.53 g

Hepçe (PGI) 15 terazû or 7500 dirhem

Heybe (OŞG) 1. Large double bag for holding clothing.

2. Saddlebag with two pouches hung over a horse's saddle.

3. Large leather sack or bag used by travellers to carry their possessions.

(EÇ) 2/241b I saw him immediately, unto a saddlebag [heybe] burç my father placed one *Kitâb-ı Kâfiye* and one *Kitâb-ı Şâfiye* and one *Monla Câmî* and one *Kudûrî* and one *Mültekâ* and one *Kitâb-ı Kuhistânî* and one *Hidâye* and one *Gencîne-i Rûz*.

Hezir (MZP) The name of a measurement of area. Three hezir made one dönüm.

Hîk (WH) This measure meaning hortum (hosepipe) in Persian was used for measuring wine. In the 1300s Gazan Han defined the hîk as follows: When delivering wine to the palace or presenting it as a gift to important people, the hortum was to be calculated at 10 Tabrîz menn = 5 peymana = 50 menn (each 260 dirhem) = approximately 41.7 litres. When providing wine for banquets the hîk was calculated at 4 peymana = 40 menn = approximately 33.4 litres.

Hilâl (MZP) Name of a measure of water flow. It was based on [a stream of water] the thickness of a type of toothpick of this name, one end pointed and the other in the form of a spade, that in the past was widely used by everyone, and whose thickness was that of umbrella wire.

Two hilâl made a çuvaldız, four çuvaldız made a masura.

The hilâl measure was rarely used, water flow generally being measured in the larger masura unit.

(ML) A unit of water flow. One 64th part of a lûle.

Himyan (OS) The scale and arch on which weights were placed.

(EÇ) 5/81a And at this halting place the janissary corps were given fragrant jonquils by the himyân and by royal command instructed to decorate their weapons and all equipment in accordance with the ancient law of the sultans.

Hin (Old Testament) = 12 log = 6.15 litres

Hiyaşa (HI) large hiyaşa = 24 kabal, small hiyaşa = 12 kabal

Hokka see Okka

Homer (Old Testament) = 1 kor = 10 efa = 370 litres

Hurç (OŞG) Large saddlebag made of leather or canvas.

(EÇ) 2/241b I saw him immediately, unto a saddlebag [heybe] burç my father placed one *Kitâb-ı Kâfiye* and one *Kitâb-ı Şâfiye* and one *Monla Câmî* and one *Kudûrî* and one *Mültekâ* and one *Kitâb-ı Kuhistânî* and one *Hidâye* and one *Gencîne-i Rûz*.

(EÇ) 7/144a the treasury was opened to reveal that when I had taken a load of one hundred hurç a few nights previously I had left small but valuable things behind

Hükümdar arşını Royal arşın. see Zirâ'u'l-Melik

Hürmüz Hormuz.

(WH) One bahâr was 20 farâsıla, each consisting of 10 menn. The basic small Hormuz tara weight for the farâsıla was 10.37 kg, so the bahâr was 207.4 kg.

İktiyâl (OS) To measure with weights or rules, to be measured.

Ilgıdır (MZP) A measuring instrument about a metre long made of wood with nails set a span away from each end. A hank of thread was attached to it, with the other end on a bobbin, and by moving the stick up and down the thread was measured as it was wound into a hank.

Isbu' see Usbu'

İbrail Kilesi Kile of Brailow.

(MZP) Name of a grain measure attributed to the Romanian city of Brailow. It was equivalent to a kile of Istanbul or approximately 100 kg.

İçim Sip.

(OŞG) The amount that can be drunk at one time. = sip.

İdl (HI) Unit of weight used for silk in Bursa in the 15th century. = 176 lidre = 68 kg.

İhtisab Resmi (MZP) General term used for municipal income in the form of various stamp, weighing, fair and market taxes, and fines collected from tradesmen.

İlig (MLT) Unit of length formerly used by the Turks. = 1.296 cm.

İnç Inch.

(MLT) Parmak. = 25.4 mm

İrdabb (MZP) Also spelt erdib or erdeb. This measure was also used in the Arabic countries in the form erdib. The name of a unit of weight equivalent to 9 old Istanbul kiles.

(OS) Unit of weight used in Egypt and equivalent to 9 Istanbul kiles.

(HI) Grain measure used in Egypt whose value varied from 90 to 198 litres.

(WH) Unit of volume used in Egypt to measure grain.

An irdabb was equivalent to 6 vayba, each equivalent to 8 large or 16 small kadeh. Calculating it precisely is difficult. According to El-Mukaddesî each vayba was equivalent to 15 menn (of grain).

If we calculate 1 menn at 260 dirhem, and the dirhem at 3.125 g, then the irdabb was 73.125 kg.

Much more reliable is the information given in the 14th century by el-Ömerî, which was confirmed by el-Kalkaşandî in the 15th century. According to this, in Cairo 1 irdabb = 6 vayba = 24 rub = 96 small kadeh, 1 kadeh being equal to 232 dirhem of wheat grains. Consequently 1 irdabb was = 269.6 kg of wheat or 50 6 kg of barley, or as a unit of volume, 90 litres. Although the evidence in some sources leads to different results, I believe this calculation to be the most reliable. The most serious discrepancy is found in the report made by A. Gonsales in 1665. He writes that each ardeb made 6 vibbe, themselves each 8 cadde. This cadde (the author is referring to the large kadeh here) was equivalent to exactly 3 rıtl (pondt, 1 rıtl being 160 dirhem) of rice. That would make a weight of 1.5 kg. Since 1 litre of rice comes to 960 g, the large kadeh would be 1.50 6 litres, making the irdabb equivalent to 75 litres. In the 18th and 19th centuries we find that the value of the irdabb has doubled to 180 litres. 1 irdabb of 96 kadeh, each equivalent to 442 6/7 dirhem, making a weight for wheat of 133.7 kg. Thus 1 irdabb is equivalent to 182 litres. This corresponds with the information given by Lane, who says (in 1836) that 1 irdabb was exactly 5 bushels = 181.735 litres. Today in Egypt 1 irdabb = 198 litres, which is equivalent to 150 kg of wheat, 120 kg of barley, 140 kg of maize, 155 kg of broad beans and 157 kg of lentils. In Feyyum in the middle ages 1 irdabb was equivalent to 9 vayba, rather than 6 vayba as in Cairo, which makes approximately 135 litres (104.4 kg of wheat).

(EÇ) 8/324b When the farmers sow one kile of wheat the yield in some places is 100 kile of pure wheat grains. They call this kile the mahsar. In Egypt they call this erdeb. In Diyarbakır and Erzurum they call this somar, in Baghdad sa'ir and in Anatolia kile.

(EÇ) 9/584 And they came to the aid of the Paşa with two thousand erdeb of barley and 50 sacks of flour and 50 sacks of biscuit.

İshi' see Usbu'

İsbu' see Usbu'

İstanbul kilesi (MLT) Liquid measure formerly used by the Turks. = 37 litres

(T.2) = 3.7 new kile.

İstar (WH) 1. Unit of weight deriving from the Greek stater, equivalent to 4.5 miskal (4.46 g), one twentieth of a rıtl, and 6.5 dirhem, that is 20 g.

İzra' (OS) To measure in arşın.

Kab

(Old Testament) = 4 log = 2.05 litres

Kabak (MLT) Unit of weight formerly used by the Turks. = 31.200 kg

Kabal (HI) Unit of weight used for grain in Serbia. = 65.664 kg

Unit of weight used for grain in Serbia. = 140 or 144 okka = 180-185 kg.

Unit of weight used for metal in Serbia. = 19 okka 135 dirhem = 24.894 kg .

Kabb (WH) Unit of volume used in Jerusalem in particular. The word derives from the Greek kabos. = 1/6 kafiz = 19.47 kg of wheat = 25 litres.

Kabbân see Kapan

Kabda (WH) A kabda was the width of a fist or 4 aşba (finger's width), and in the middle ages was equivalent to 1/6 arşın, although the value of an arşın varied. In the case of the ordinary (kara) arşın the kabda was 9 cm, whereas for the şer'î arşın it was 8.31 cm. In Egypt in the 19th century the kabda was approximately 6.25 inches = approximately 15.875 cm.

Kabran (HI) Unit of measure for rice. = 10 kile = 128.294 kg.

Kabza (ISAM) Unit of length equivalent to 1/6 of the old Egyptian zirâ. = 7.7 cm.

Kadeh Cup, drinkng glass.

(WH) Egyptian unit of volume having two different values.

16 small kadeh made 1 vayba and 96 of these made 1 iddabb, while 8 large kadeh made 1 vayba and 48 made 1 irdabb.

Among the conflicting information about the size of the kadeh, the most reliable is a reference by al-Kalkaşandî, according to which the small kadeh was 232 dirhem of grain = 716.83 g (wheat). Based on this information and our calculation for the irdabb, 1 small kadeh is approximately 0.94 litres and the large kadeh 1.88 litres.

Today 1 kadeh is officially equal to 2.062 litres. Only this single value for this unit is used.

(HI) (Standard) 0.25 kile.

(EÇ) 8/252a And this mosque has a south door three times the size. Between the outer gate and the central gate, on the left as you enter the mosque is a kadeh [cup] built of white figured marble, large enough for five men to fit inside. In former times the contractor would give the labourers working on the mosque one of that kadeh full of shameless wine each. They would drink the wine at a single gulp. Today that kadeh holds two horseloads of water. This shows what an extraordinary size the men of those times were, that they could drink that kadeh of wine at a single swallow. Now marble carvers have chiselled and cut that kadeh to make a tap for ablutions where people can renew their ablutions.

Kadem (ML) Foot. Step. Unit of length around one third of a metre, half an arşın, an average foot length. In the past the name of a measure equivalent to 12 parmak. One kadem is approximately 37.5 cm.

(MZP) The name of the unit of length equivalent to half an arşın or 12 parmak. Equivalent approximately 237.5 cm. In Turkish this is called ayak.

(OŞG) A unit of length equivalent to the length of a human foot. Today this is a unit of length with the value of 30 cm.

(EÇ) 3/152a From this qible door as far as the prayer niche, the length of the inside of the mosque is 100 kadem. And the width is 250 ayak.

(EÇ) 5/114a And this humble servant climbed the 105 kadem to the minaret of the mosque of Süleyman Han in the Upper Castle, and looked out over this great city, where 65 tall masonry minarets and 77 lead roofed imarets were visible.

(EÇ) 10/168 the circumference of this castle is six hundred steps, and in all it is 2060 kadem.

Kadh see Kadeh

Kadûs (WH) Unit of volume used in the Maghrib. In Tenes it was 3 müdd, that is 3.159 litres.

Kaffan (OS) Large balance.

Kafiz (ISAM) Measurement of area and volume.

1. As a measurement of area it is equivalent to one tenth of a cerîb. = 136.6 sq m.

2. As a unit of volume it is equivalent to 8 mekkuk. 1 kafiz can be either 33 or 66 litres.

(ML) Used to measure dried granular substances (flour, rice, beans etc). But since the same volume of different substances can have different weights, and owing to the fact that when the quantities are large the weight of the substance on top compresses that beneath, it is no longer used today. Only in some western Mediterranean countries is the kafiz still used. For example in Sicily the cafiso is a measure of olive oil equivalent approximately to 11-20 kg, and in Spain the cahiz is used as a measure of grain equivalent to 6.6 hectolitres.

(WH) As a measure of land it is equivalent to 1/10 cerîb or 360 sq arşın, which makes 159.2 sq m. As a measure of volume, the kafiz was equal to the şâ', or 4.2125 litres.

Kalah (OS) The length of a turban cloth.

Kalbur (OS) Sieve with widely spaced wires and large holes used for cereals and other large grained substances. Galbur, gırbal.

(HI) One sixteenth of a kile. = 1.604 kg.

(EÇ) 10/359 In Egypt there are 2060 vineyards, and vegetable gardens and pleasure gardens. The patron saint of gardeners is the Lord Ismail, and in all there are 9300 of them. Farmers and public measurers, girbâl [kalbur] makers and gardeners, all with axes and picks and hoes and spades and digging forks in their hands.

(EÇ) 1/161a The makers of sieves [galbur]: They number 300 and have 200 shops. They make sieves from horsehide. They are assistants to the bakers. They passed by in workshops upon floats making sieves.

(EÇ) 5/60a All the soldiers cried out the affirmation that God is most great, and rained such bullets upon the infidels that all of them were in holes like a gunpowder maker's sieve [kalbur] and flew head downwards from the castle.

Kamçı Whip, goad.

(MZP) Although this is a measure of distance, the value is unclear. It is also an instrument for striking animals consisting of a rope etc tied to a handle. "Above the shoulders of the constellation of Gemini, behind three stars like a tripod, are two stars in the Milky Way and another five stars, the distance between them being the length of a whip [kamçı].

Kâme see Bâ

Kamış Reed.

(MZP) The name of a measure of flowing water. Two masura made one kamış. This term was employed by the water engineers.

(OS) 1. The name of a measure of flowing water. Two masura made one kamış.

2. General name for plants of the grass family which grow in damp marshy places, and have hard stems with nodes.

Kanata (OS) 1. Waterjug with a wide mouth.

2. Vessel for liquids.

3. Also used as a unit of measurement.

(ML) 1. Vessel or bowl for liquids.

2. Water vessel or jar with a broad mouth.

Kanatir (OS) Steelyards.

Kandil (OŞG) Term used for pine and fir planks 6-7 cm thick and 5-6 arşın long.

Kane (MZP) Unit of length equivalent to 1/24 of the tersane zira. Since the tersane zira is 3 parmak longer than the mimarî zira, the kane is slightly longer than the parmak which is equivalent to 1/24 of the mimarî zira.

Kangal Coil.

(TDK) Long flexible objects such as wire, yarn or lead piping wound into rings. A large hank of thread wound and gathered together.

Kantar Steelyard.

(TDK) 1. A weighing device whose beam is horizontal when there is no weight suspended from it, and having an indicator attached at a right angle to the beam which shows the weight.

2. A kind of weighing device in which the object to be weighed is attached to a hook below, and with an arrow attached to a spring that shows the weight of the object.

(ML) A weighing device with an indicator attached at a right angle to a lever which is in a horizontal position at zero weight.

A unit of weight and capacity used in the countries of the east Mediterranean. This unit varied considerably from country to country, from 23 to 43 kg.

The kantar weight used in Turkey was 44 okka = 56.452 kg.

Kantar ledresi: Each of the measuring notches on a steelyard beam.

Kantar parası or kantar resmi: Weighing fee.

Kantar topu: Steelyard weight, counterpoise. Metal sphere that can be moved along the steelyard arm when weighing objects to maintain balance.

El kantarı: Hand steelyard. A weighing device attached to a ring held in the hand and consisting of an asymmetric beam balanced on a knife.

Yayh kantar: Spring balance. A device which measures weight by measuring the deformation caused to a spring by the pull of gravity.

(MLT) Unit of weight formerly used by the Turks. = 64 kg.

(HI) (Ottoman standard) = 100 lodra = 17,600 dirhem = 44 okka = 56.449 kg.

(Arab countries) = 100 ratl = 45 kg.

(Anatolia, 19th century) = 180 okka = 230.922 kg.

(Syria, 19th century) = 200 okka = 242.400 kg.

(Mardin, 19th century) = 240 okka = 307.896 kg.

(Aleppo, 19th century) = 250 okka = 320.725 kg.

(Genoa) = 100 rottolo = 47.600 kg.

(T.1) = 44 okka or kıyye = 10 batman = 100 lodra = 56.4 496 kg.

(WH) In principle 1 kintar = 100 rtl. It could also be 100 menn.

In the case of large amounts of gold 1 kintar = 10,000 dinar = 42.33 kg. The kantar used by the Anatolian Seljuks and the Ottomans was equivalent to 100 lodra, each of 176 dirhem, and as of the present day this is equivalent to 56.443 kg.

(MZP) 1. The name of a device used to weigh heavy objects. It consists of a long arm with a counterpoise attached to it such that it can be moved backwards and forwards, and chains with a hook on the end to which the object to be weighed is attached. It may either be suspended somewhere or attached to a pole and lifted by two people. There are several types.

2. The kantar is a unit of weight consisting of 44 old okka (56.41 kg). The value could vary in some places. There was another kantar of 45 okka used by merchants for weighing certain goods.

Kantar Ledresi: Unit of weight consisting of 100 dirhem (320 g). Since a kantar consisted of 44 okka and one okka of 4 ledre, one kantar was equivalent to 176 ledre.

(T.2) **Kantar-ı a'şâri**: = 100 kg

(EÇ) 1/39b In the leads of Hagbia Sophia are many thousands of kantar of gold.

(EÇ) 1/60a And on both sides are white camphor candles each weighing 20 kantar in candlesticks the height of a man, and the mosque is decorated with lamps and censers.

(EÇ) 1/131a No other stone could withstand that fire of Nimrod. It is a green stone found only on that island. Beneath the furnace is an empty space, and above it is domed. Inside each of these domes they place forty or fifty thousand kantar of copper and into it mix the fragments of broken cannon built in former times and outside the domes at some distance they prepare many thousand kantar of tin. The clerks keep a record of how much copper and how much tin are in stock.

(EÇ) 1/145b In this workshop are 100 bronze mortars, each weighing 10 kantar.

(EÇ) 1/159b And on litters and floats and runners they carry loaves of pure white bread as large as a hamam [public bath] dome sprinkled with black cumin seeds and sesame, and each weighs 50 kantar.

(EÇ) 1/175b and from the ports of the towns called Erdek and Mihalıç ten men lift each çuval that they call seklem weighing seven or eight Ottoman kantars and place it on the back of one man who puts it onto the steelyard. As he puts it down the axles of the steelyard groan, then he lifts it on his back again and they take it where they wish, but strong porters come to his aid, grasping it, one on either side. It is dangerous work beyond the human capacity and impossible for the mind to grasp.

(EÇ) 1/178b And on floats weighmasters place loads onto the steelyards, declaring 'A full 40 kantar and 5 lodra of linen belonging to Halil Çelebi.' And so they weigh the goods of the merchants as they pass in the procession.

(EÇ) 2/242b But again if the House of Osman wished, and linked Lake Sabanca to the Gulf of Izmit, one kantar of timber would cost five akçe and one plank two akçe and all the Izmit ships could go right to the market of Düzce, moor there, and that place would become an emporium and trading port.

(EÇ) 2/245a Since this city is famous for its biscuit, we purchased 500 kantar of biscuit and grain and ten boatloads of copper ore.

(EÇ) 2/277b The city of Bolu would be close to the quay and all the ships of Istnabul would be able to approach nearly to Bolu, and then in Istanbul one plank would cost 3 akçe and one kantar of firewood would cost 5 akçe, which would be an act of great philanthropy.

(EÇ) 2/340a The cannon of Süleyman Han are as wide, large and long. They hurl stone cannon balls weighing three kantar, and these commander cannon have iron hoops measuring 27 karış [span] each.

(EÇ) 4/233b And each year many thousand kantar of angora yarn is exported to Europe.

(EÇ) 10/1059 And it records all the villages of Egypt and the number of treasury purses and the weight of the dirhem and dank vakiyyesi and the weight of barley and wheat, and the value of the miskal and kantar, and all expenses.

Kantariyye (MZP) Weighing fee. Used of the charge made for weighing goods that arrive in the customs. Before the invention of weighing machines, these goods were weighed with a device known as a steelyard [kantar], and hence the name for the charge. Like ihtisap and baç, kantariyye was a domestic tax. Customs duty was known as âmediyye, reftiyye, mastariyye or müruriyye. In later times this tax was collected by the municipalities.

Kap Vessel, container.

(OŞG) The general name for all kinds of vessels and containers, with or without lids, and with or without handles used for solid or liquid substances of any kind, or as a measure.

Kapa (HI) One sixty-fourth of a kabal.

Kapan (OŞG) A large çeki balance; a large balance; a steelyard for weighing heavy loads; a balance consisting of a leather drum used for weighing flour; a place where honey, grain, flour and similar commodities were weighed and sold.

(OS) From the Arabic kepân. Large balance, steelyard. The term kapan as used in 'un kapanı' and 'yağ kapanı' is the corruption of this.

Kara (ISAM) A unit of volume once used in Iraq in particular. = 2 kafiz or 16 mekkuk.

(WH) According to el-Ömerî 1 kâra of wheat = 240 rtl = 97.5 kg, or 120 litres.

For barley, chickpeas and lentils this measure was 200 rtl = 81.25 kg, and for rice 300 rtl = 121.875 kg.

Since the average value for the kafîz used in Iraq is found to be 60 litres, we may calculate the kâra to be 120 litres.

In Basra the kara = 2000 okka of dates = 2565.9 kg.

Karataş (HI) (Erzurum) = 1 okka and 100 dirhem = 1.603 kg.

Karatil (HI) Barrel with a capacity of 20-40 medre.

= 18 Genoese libra.

Kare (T.2) = 100 sq m.

Karı (DLT) Span, measure, arşın used for measuring cloth.

Karılamak (DLT) To take the measure of something by length.

Karış Span.

(OŞG) The distance between the tip of the thumb and the tip of the little finger used as a measurement.

(ML) 1. The space between the thumb and little finger when the hand is opened and stretched out.

2. Unit of length equivalent to a hand's span used to make approximate measurements of small distances.

(Old Testament) = 3 palms = 0.22 m

(EÇ) 4/325a And one karış is the length of 20 barley grains.

(EÇ) 1/72a On one occasion he penetrated an Albanian shield made of nine layers of fig root by two karış with the head of a jereed lance at a single blow, and they sent the tip to the council of state in Egypt.

(EÇ) 1/132a The cannon of Bâyezîd Hân consist of cannon with three muzzles, and cannon with six compartments, and rifled cannon and French cannon and cannon with hoops of 40 karış

(EÇ) 2/300 But the headdress of the ulema is taller than 2 karış

Karşag (DLT) Piece of a gown the length of a karış.

Karşamak (DLT) To measure in karış.

Karşatmak (DLT) To cause to be measured in karış.

Karta (HI) (Albania) = 80 okka = 102.640 kg

Karuça (OŞG) 1. The part of the arm from the elbow to shoulder.

2. arşın, kolaç, mimar arşını.

Kasaba (WH) 1 kasaba = 6 Hashimid arşın or = 5 carpenter's arşın or = 8 hand arşın or = 6 2/3 fabric arşın or 7 1/7 kara arşın. From all these sources we can obtain an average value for the kasaba of 3.99 metres until the year 1830. From then on the kasaba became 22 instead of 24 kabda, and therefore equivalent to 3.55 metres, as it is today. In Egypt today there is another completely different kasaba, which is a unit of length equivalent to 1/6 carpenter's arşın, or officially 12.5 cm.

Kasba see Kasaba

Kâse Bowl.

(OŞG) A wide vessel made of glass, porcelain or crystal, with or without a lid, and with or without handles.

(EÇ) 1/18b From the lake between the town of Eyyûb Sultân and the town of Hâskôy divers collect a type of black mud which is used to make diverse mugs and bowls and dishes and plates.

(EÇ) 1/45 But some stones have been damaged by the force of heat and snow and rain and their light destroyed, but between the south door and the courtyard arch is a Nishapur turquoise that is the size of a round bowl [kâse].

(EÇ) 1/60a over the royal gallery are six emerald lamps sent as gifts by the vezir of Ethiopia Ca'fer Paşa that have been made into a chandelier with jewelled gold chains over a seal of Solomon, and each lamp weighs six vakiyye and is the size of a circular bowl, and in each are green lamps enamelled in gold and with jewelled gold feet.

(EÇ) 1/123a Selim II gulped wine from this keşkül [type of bowl]. In truth, it holds not the quantity contained in a bowl for one person, but more wine than a bowl for five people.

(EÇ) 3/146a But he achieved such a degree of ascetic endeavour that he ate one almond and one olive and drank one bowl of milk every 40 days.

(EÇ) 4/230b Also there were fifty glowing and handsome young males slaves magnificently dressed and holding in their hands fifty splendid bowls containing no less than fifty types of fruit cooked with the hanevi cane sugar of Damascus, such that words do not suffice to describe them.

Kasr (ISAM) Unit of length equivalent to 16 fersah of 48 miles. = 88,704 km.

Kaşık Spoon, spoonful.

(OŞG) 1. Utensil with a handle for carrying liquid or small grained foods to the mouth.

2. Share of flour taken by a miller as remuneration for grinding grain.

3. A measure for small quantities. A spoonful of water.

Soup spoon: A spoon larger than a dessert spoon used for eating or for measuring.

Coffee spoon: Small spoon used for adding dry coffee or stirring in sugar when making coffee, or as a measure.

Dessert spoon: A spoon smaller than a soup spoon also used as a measure.

(TDK) Utensil with a handle for carrying liquid or small grained foods to the mouth.

Tea spoon: The amount contained by a small spoon used when making coffee or to put granulated sugar into tea.

(EÇ) 8/379a they make fine spoons inlaid with a hundred pieces of mother of pearl and zerdeste [a kind of dervish staff] and bowls and alms cups and spoons carved from furze, olive and boxwood root, and backscratchers and many thousand sorts of things fashioned with dervish skill that are marvellous and magical inventions, and make gifts of these skilful artefacts to the gentlemen and great men among the travellers who come and go and with the presents and rewards they receive from all, procure the wants of life and the cost of clothing.

(EÇ) 10/732 Some habitual drunkards for whom wine

precious and who are weary of their lives make a small hole in these blue watermelons while they are yet attached to the root in the garden and place a spoonful of honey inside.

Kat (OŞG) 1. A cylindrical grain measure made of wood containing six okka of grain.

2. An entire outfit of clothes. A suit [kat] of clothes, two sets [kat] of underwear.

3. Degree, amount.

4. Multiple.

5. Fold, ply.

6. Degree.

7. Layer, strata.

Katır yükü Mule load.

(HI) 60-80 kg.

(EÇ) 1/80b Appointing him commander-in-chief over Van he presented him with a royal sword and five purses of gold as travel expenses and one hundred trains of pack camels and one hundred trains of pack mules and a royal pavilion, and presented him with a magnificent sable robe.

(EÇ) 2/276a Into the hands of the Paşa of high lineage they placed the decree of the glorious sultan, and gave him five purses of gold as travel expenses, and fifty pack trains of mules and fifty trains of pack camels and one shining pavilion tent, and two magnificent sable robes.

(EÇ) 2/284a Ahmed Ağa made a great feast here and presented the paşa with a stable of purebred Arab horses, and to his followers gave 20 horses and 3000 sheep and seven trains of pack mules and seven trains of breeding camels and 10 purses of gold coins, and it was a feast worthy of a sultan of the house of Osman.

(EÇ) 2/293b and when we left him and arrived at our tents below, the lord of the castle sent after us fifty sheep and a thousand loaves of white bread and seven or eight mule loads of diverse fruit and sherbets of avşula [probably a kind of fruit].

(EÇ) 2/351a But before the pieces of ice came and the River Kızılırmak became an ocean the weights which had passed before were delivered, but of those who passed afterwards many lives and many horse and mule loads without number were lost and many camels were saved and a few drowned.

(EÇ) 3/62a This caesar Cimcime was possessed of such splendour that 70 mule loads of salt were expended each day in his kitchen.

(EÇ) 4/216a We will give Mustafa Paşa 10 red mule loads of silk, but nought else. They sent 10 mules loaded with silk, and to their brave men who accompanied us they gave five vukiyye each of silk.

(EÇ) 4/216b Many of them knew this humble servant and gave one red mule load of silk and one mule load of grapes and figs, and much else besides, and that night I stayed as his guest and watched from dawn till sunset.

(EÇ) 4/279a And 20 mule loads of chests lined with felt containing in all 800 bowls and diverse priceless dishes of Chinese porcelain and Celadon ware.

Katule (HRD) 0.27 litres

Kavd Height.

Kaz see Gez

Kazevi (OŞG) Large baskets are woven from reeds or date palm fibres for storing or carrying rice etc.

Kefe Scale, pan.

(OŞG) Each of the trays of a scale.

(MZP) One of the two pans of a scale. The wooden tray of a large balance.

(EÇ) 1/166b The dancers of the generous butchers, with cleavers in their hands cut up [the meat] in half and then quarters and weigh it in the balances with pans of brass

(EÇ) 1/183b They pass in procession upon floats decorated with diverse weights and balances with pans of brass

Kelep (TDK) 1. Large ball of string.

2. Bunch.

Keleter (ZK) A kind of basket that is filled with finished goods and used to carry them. It was also used as a unit of measurement. In Balıkesir this is a large basket used as a measurement. (*Anadolu Diyalektolojisi Üzerine Malzeme*, I, p 185.

Kelle (OŞG) 1. Head, block.

2. A single block of some types of cheese, sugar and similar things. A loaf [kelle] of sugar. A kelle of cheese.

Kemha (WH) This Egyptian unit of weight known as a 'wheat grain' was equivalent to 1/64 dirhem or 1/4 kırat (today 0.0488 g). It took the place of the habbe used in the middle ages.

Kental (ML) 1. Formerly a weight of 100 libre.

2. A unit of weight used in most countries, but varying in value from one country to another.

3. A weight of 100 kg.

(HI) (Standard) = 80 okka = 102.616 kg

(European goods) = 78 okka = 100.066 kg

(English goods) = 39 okka = 50.033 kg

(T.2) = 100 kg

Kentenarion (Byzantine) = 100 litres = 32 kg and 640 g

Kentiarion (Greek) see Kantar

Kepçe Ladle, skimmer.

(OŞG) 1. Large spoon or ladle made of wood, copper or iron used for skimming.

2. A deep-bowled utensil such as a çamçak.

3. The amount that a kepçe can hold.

Kerah (PGI) 1/16 of an arşın or half a rub.

Keration (Byzantine) = 4 barley grains = 0.18 or 8/9 g

Kerte The name of a fraction of an ayak. 6 kerte equal 1 hat, 12 hat equal 1 parmak, 12 parmak equal 1 ayak.

Kewçi (DLT) A grain measure of 10 rtl used from Kashgaristan to the lands of the Uighurs.

Keyl (OS) 1. To measure, to transfer grain by means of a measuring container.

2. To measure in kile.

3. A former unit of volume varying from 0.5-2 litres or kg.

Kile. A measure of grain. A unit of measure. (Also see Kile).

In Damascus 1 keyl = 1/12 girâra = 17 kg (wheat) = approximately 22.08 litres.

In Aleppo 1 keyl = 1/22 mekkuk = approximately 6.56 litres.

In the Diyar-ı Rabi region 1 keyl = 1/16 local mekkuk = 469 cm.

Keyl-i a'şâr: = 100 litres (100 cubic dc)

Keylçe see Kile

Keyle (WH) In Egypt this unit of volume equalled 8 kadeh or approximately 7,5 m.

Today the official value of this measure is 16.5 litres.

In the 16th century in the semi-independent state of Lâr the quela (the Portuguese spelling of keyle) equalled 1/8 alqueira (13.566 litres). Thus 1 keyle equalled 1.7 litres.

Keylece (WH) A unit of volume which was probably first used in Iran.

In the 10th century in Iraq this equalled 1/3 mekkuk = 600 dirhem of wheat = 1875 g or 2.5 litres.

The information given by El-Mukaddesî is vaguer. According to this writer the Iraqi keylece was equivalent to 2 menn (625 g).

Razî is more specific, however, setting the keylece at 1/3 mekkuk or 5 rtl (2031.25 g).

According to Cevherî who died in Nishapur in 1003, in eastern Iran 1 keylece equalled mekkuk = 1 7/8 menn = 1523.4 g (of wheat) or exactly 2 litres. This definition accords with that given in *Tacu'l-Arus*, which puts 1 keylece at 1/2 şa'. We calculated 1 şa at 4.2057 litres. El-Mukaddesî valued the keylece in Meraga (Azerbaijan) at 1/6 kâfiz = 1 2/3 menn = 1352 g (of wheat) or approximately 1.75 litres. In the late middle ages the Iranian keylece as used in the wheat trade was usually equal to 1/6 kafiz, and for barley 1/5 kafiz. This kafiz was equal to 1/10 cerîb or to 12 menn, each equal to 260 dirhem. Thus the value of the keylece for wheat was approximately 1.67 kg, and for barley approximately 2 kg or approximately 2.2 litres. El-Mukaddesî tells us that in Palestine (in er-Remle and Amman) a keylece was used that was approximately equivalent to 1.5 şâ' or approximately 6.3 litres. In the Ottoman Empire the Iranian keylece was equivalent to 1/20 müdd and generally known as kile.

(ISAM) A unit of volume which varied according to the region.

In Iraq = 2.5 litres

In eastern Iraqi = 2 litres

In Palestine = 6.3 litres

Keylî (OS) Things measured by the kile.

Keyyâl (OS) A person who measures by the kile, keyyâliyye.

(EÇ) 10/359 And then came the weighers by keyyâl, that is those who weigh wheat. They number 2000. The sievers: Even if wheat and barley and lentils and rice and broadbeans and chickpeas and opium seeds be all mixed up together, they separate them in the twinkling of an eye.

(EÇ) 10/459 the superintendent of the warehouse and the clerk of the warehouse and the keyyâl number 23 altogether, and dressed in precious robes they go joyfully from the exchange to their houses.

(EÇ) 10/462 And they call them kerreteyn, that is on their second coming they receive five or ten kuruş worth each of sugar from each captain. And they sell the post of chief tarrâs for one purse and the post of chief keyyâl for one purse and the post of Coptic clerks for one purse.

Kezame (OS) The ring to which the strings of a balance are attached.

Khankhar (Byzantine) = 10,000 dahekans 138 8/9 m = 45 kg and 333 1/3 g

Khonix (HRD) 1.08 litres

Kıbıl see Kabal

Kırat (OS) 1. Unit of weight equivalent approximately to 2 decigrams and varying over time used to measure precious stones such as diamonds and emeralds. For gold it was a measure of 0.176 g and for silver 0.186 g.

2. 1/12 of an arşın or approximately 6 cm.

3. One fourth of a deng.

4. A unit of area used in Egypt, today equivalent to 1/24 feddan or 175.035 sq m.

(ML) A unit of weight equivalent to 2 decigrams used for measuring diamonds and other precious stones. In the past it was equivalent to 1/24 of a miskal.

In the pre-Islamic era this unit was borrowed by the Arabs from the Byzantines. The constant equivalents of this system are as follows: 1/3 kg made a ratl, 1/72 of this was a miskal (4.55 g), and 1/1728 of this was a kırat (0.19 g). Today the kırat has various values both as weight and in the monetary system. For example, in Istanbul it is equivalent to 0.2073g, in Damascus 20.2 g, in Baghdad 0.2103 g, and in Egypt this is the sole unit used for all goods. Here the kırat is equivalent to 0.193 g. The kırat is also used to measure the fineness of gold. For gold coinage the kırat is equivalent to 1/24 dinar (0.177 g).

Kırat-ı örfî: Traditionally a unit of weight equivalent to four or sometimes five grains of barley.

Kırat-ı şer'i: A unit of weight equivalent by law to 5 grains of barley.

(MLT) Unit of weight formally used by the Turks. = 0.2128 g

(HI) (şerî) = 0.2232 g.

(Ottoman, standard) = 4 dang = 0.2004 g.

(ISAM) Unit of weight and volume.

1. As a unit of weight it is largely used to measure precious metals and gems. It various according to the type of metal. 1 kırat of gold is 0.2125 g, and 1 kırat of silver is 0.2475 g.

2. As a unit of volume it is approximately 0.06 litres.

(OŞG) One twelfth of an arşın or approximately cm.

(T.1) = 4 şa'ir = 0.20046 g.

(MZP) The name of a unit of weight used to measure precious substances like diamonds and other gems. One fourth of a miskal was called a denk, one fourth of a deng a kırat, one fourth of a kırat a buğday, likewise one fourth of a buğday

fitil, half a fitil a nakir, half a nakir a kıtmir, and half a kıtmir a zerre.

Kırat-ı örfi: According to some interpretations of the law, this was a unit equivalent to four average barley grains, and according to others 5 average barley grains.

At the mint 1 kırat was regarded as equivalent to 4 wheat grains.

These 4 barley grains were regarded by scholars as equivalent to 5 barley grains, and therefore as equal to the kırat-ı şer'iye.

Kırat-ı şer'i: A term used for the weight of 5 average barley grains.

(WH) In Iraq one miskal of gold was equivalent to 20 kırat (1 kırat = 3 habbe), and one miskal of silver was equivalent to 12 kırat (1 kırat = 4 habbe).

Since 1 miskal is equivalent to 4.233 g, the following values are valid for Iraq:

1 kırat of gold = 0.212 g

1 kırat of silver = 0.247 g

1 habbe of gold = 0.0706 g

1 habbe of silver = 0.062 g

These values also obtain for Iran.

In Arabia, in Egypt and Syria, the values are as follows:

In these countries 1 kırat is always equivalent to 1/24 miskal or 1/16 dirhem, and therefore,

1 kırat of gold = 0.176 g

1 kırat of silver = 0.186 g

1 habbe of silver = 1/60 dirhem = 0.495 g.

In North Africa 1 miskal = 4.722 g, and therefore 1 habbe = 0.0787 g.

As a unit of volume in Egypt today 1 kırat = 0.0 64 litres.

As a unit of area in Egypt today, it is equivalent to 1/24 feddan or 175.035 sq m.

The equivalent of 1 harruba or a kırat is an average of 0.195 g (E. T. Rogers, "Unpublished Glass Weights and Measures", JRAS X, New Series 1878, pp. 102-4, W. M. F. Petrie, page 114, a.a.O.). Here we arrive at a value of 3.125 g for a 16 kırat weight.

As a weight for commodities the kîrât (karat, keration) varies: Both according to canonical law and in practice in Iraq 1 kîrât is always 1/20 miskal and (according to canonical law) 5 habbe or most of the time 3 habbe. Thus it is equivalent to 1/14 of a 3.125 gram dirhem (0.2232 g). In Mecca, Egypt, Syria and Anatolia kîrât was always 1/24 miskal or 1/16 dirhem, and generally equivalent to 4 habbe. That is in Anatolia it is a weight of 0.2004 g, and in the other regions mentioned is 0.195 g. A list with further information and details of kîrât weights can be found in H. Sauvaire. These are based on a very low dirhem weight of 3.0898 g instead of 3.125 grams, and cannot go further than arousing theoretical interest.

(EÇ) 1/114a Walking about in such an abundance of mire and in those winter conditions, not a kırat of mud was to be found on his boot or even on its iron tip, with such a degree of cleanliness and purity did he walk and perform the five prayers with the congregation.

(EÇ) 3/52b He excavated the ground from which not a kırat could be prised by gigantic crowbars, never mind daggers, with his dagger and buried the gold belt, and after ten months came back and finding the place precisely which he had marked by a cloud in the sky, he dug up the gold from the ground.

(EÇ) 3/166a If the vigorous man takes one kırat of these aforementioned medicines he becomes sick according to the curse of the Pharaoh and Karun as proclaimed.

(EÇ) 4/278a For Kaya Sultan there was brought a royal crown and a jewelled crown and seven jewelled kaftans and 40 rubies and 100 spinels of Badakhshan and 100 turquoises and 50 chrysolites and 50 lustrous glittering diamonds as beloved by women, each weighing 10 kırat, and two turquoise dagger hilts, and 6 caskets of aloe wood. Indeed, one of these panelled caskets was itself made of aloe wood and contained exactly forty vakiyye of Hoten musk and exactly 200 pieces of amber.

(EÇ) 4/325a A miskal is 100 grains of barley in weight, and a kırat is five grains of barley.

(EÇ) 5/10b It was a chest whose central compartment was brimful of diamonds weighing 20, or 30 or perhaps 40 kırat, each the size of a yeh-çırağ [a kind of ruby that glows in the dark].

(EÇ) 5/35a They removed the soil in the mout, and threw it into the River Turla that flows to the north of the castle, until not a kırat of stone and earth remained.

(EÇ) 6/152a And likewise the Mother Mary seated upon a throne with a queen's crown upon her head was depicted with diverse jewels and around her neck many hundreds of strings of solitaire pearls, and her fingernails of diamonds of 40 or 50 kırat each, and her eyes of yeh-çırağ [a kind of ruby that glows in the dark] all sent by the wives of kings. These pictures are works of enchantments, not like those on paper.

(EÇ) 7/67a And his sash was a rope girdle like those of monks, but hanging around his neck was a diamond in the shape of a lamb that weighed 40 kırat. The wonder lies in what a great size the diamond must have been for the master engraver to carve its limbs and head and horns, so as to create the figure of a lamb. This humble servant entered the presence of the Holy Roman Emperor many hundreds of times in 40 or 50 days, and examined that lamb most carefully. In truth it is a diamond lamb of 40 or 50 kırat that swings constantly around his neck and is almost all the cause of his splendour, there being nothing else.

Kırba (OS) Leather water bag with a narrow neck and broad below used for carrying water. Water carriers' skins and milk skins are also called kırba. It is a container with a capacity of 13,000 dirhem or 32 okıyye.

(HI) Leather bag.

(OŞG) Container used for carrying water, and leather water bag

(EÇ) 1/160b These tradesmen all go on foot with tellâtin [kind of leather] water bags on their backs, and their clothes consist of black coats of sole leather stretching from head to foot, and on their heads are egret quills and diverse flowers, and in their hands ihtab [a kind of glass] and glass and crystal and rock crystal bowls and dishes brimful of pure water, and crystal and agate and jade and jasper inside the water lend magnificence to the occasion.

(EÇ) 1/194b diverse water skins and kırba and water dispensers with taps decorate their floats as they pass by in procession.

(EÇ) 6/83b Concerning the Fountain of Water of the Spirit: This is a most excellent fountain. But this city is a fortress on the summit of a steep rock, so that no charitable deed or act of piety is more precious than water, and each day 10,000 horse loads of water from the Danube are carried in kırba

(EÇ) 10/280 They are filled to the brim and in the morning 500 water carriers from the fortress carry water from the fountain for the use of the households in the castle, and they receive one esin for four kırba.

(EÇ) 10/423 All the soldiers and many thousands of poor people with kettledrums and tambourines come from the place and decorate the gifts sent to Mecca and carry them in procession, and the commander of the caravan of pilgrims [to Mecca] and the many hundred mule loads of the guests and pilgrims and the camels carrying water which will go to the holy Kaaba loaded with many thousands of kırba of clean water and heavy loads, and soldiers without end, and glorious dervish sheikhs and the steward of the commander of the caravan beat the kös drums as they passed in procession, bringing the gifts for Mecca to the Kara Meydan, and they unload these gifts in the courtyard of the sebilhane [place where drinking water is distributed free] of Tahir Beybars, and place them there.

(EÇ) 10/605 and below this low minaret is a great cistern for the sebilhane, so large that it contains sufficient for all the pilgrims who take from here 15,000 raviye, that is kırba carried by camels, of water.

Kısım (OŞG) Cupped hand, palm. The amount that can be held in the cupped palm.

Kıst (ML) 1. A unit of volume formerly used by the Arabs. It was approximately half a litre, and in the early period of Islam was widely used.

2. Accuracy and fairness in measurement, weighing and sharing out.

3. Share, division.

4. Instalment, the amount of a debt repaid each time.

(ISAM) The Greek form of this word is xestes and the Latin form is sextarius. It is a unit of volume which varies from place to place. According to Ebû Ubeyd one kıst is equivalent to half a ṣâ' (137 litres).

In Iraq there are two measures by this name: the small kıst of 1.2158 litres and the large kıst, which is double the quantity, equivalent to 2.4316 litres.

In Egypt one kıst is equivalent to 2.1016 litres.

Kıstar (OS) Measurement.

Kıstas (OS) 1. Measurement, measure, unit of measurement.

2. Large balance.

3. That which weighs most accurately.

4. Instalment, something paid in installments.

Kısteyn (OS) Two shares, two measures, two parts.

Kıtmir (ISAM) A very small unit of measurement. It is equivalent to half a nakir, and two times a zerre. Since one nakir is half a fetil, one kıtmir is 0.00125 grams.

(WH) An extremely small, negligible unit of weight, equivalent to 1/20736 of a cev' of 0.045 grams.

(MZP) The name of a unit of weight equivalent to half a nakir.

(EÇ) 5/57a At Nigbolu seven of the infidels started to talk but spoke mere trivialities [nakîr ü kıtmîr]

(EÇ) 6/44b In the garden of the school they wrote mere trivialities [nakîr ü kıtmîr] for me and then I boarded the boat again

Kıyas Comparison.

(OS) 1. To evaluate in accordance with something similar, to infer.

2. To measure.

Kıyrat see Kırat

Kıyye see Okka

Kifaf (OS) Pans of a scale.

Kiffe (OS) Pan of a scale.

Kile (MZP) Term used for a grain measure. There are various types. The Istanbul kile, İbrail kile and so on. The values of these kiles varied. That of Istanbul was 18-20 okka depending on the type of grain, and averaged 25 kilograms, and the İbrail kile was 70-80 okka, averaging 100 kilograms. The kile was divided into kutu. One Istanbul kile was 8 kutu.

In the time of sailing ships, it was also used as a nautical measurement of weight instead of today's tonilato. One tonilato is equivalent to 36 kile.

İbrail kilesi: The name of a grain measure attributed to the Romanian city of İbrail (Brailow). It was equivalent to four Istanbul kile and approximately 100 kilograms.

(ML) A container of a specific capacity used for measuring grain. The fraction of a kile was a kutu, and 8 kutu made one Istanbul kile.

Istanbul kilesi: Depending on the type of grain 18-20 okka (an average of 25 kilograms)

İbrail kilesi: 70-80 okka (an average of 100 kilograms)

(HI) = 4 şinik = 8 kutu = 50 kadeh or kase = 5000 habbe

(Standard) = 36 litres = 37 cubic decimetres

(Standard) = 20 okka = 25.659 kg

(Istanbul in 1500) = 18 okka and 350 dirhem = 24.215 kg

(Niğbolu) = 100 okka = 128.294 kg

(Sofya) = 50 okka = 64.122 kg

(Zishtovi, Turnovo) = 80 okka = 102.535 kg

(Hezargrad) = 60 okka = 76.976 kg

(İzladi) = 20 okka = 25.659 kg

(Yenibazar) = 44 okka = 56.449 kg

(Sarajevo in 1565) = 22 okka = 28.225 kg

(Işkodra in 1536) = 36 okka = 46.285 kg

(Işkodra in 1520) = 80 okka = 102.535 kg

(silk) = 40 okka = 51.267 kg

(Mohacs, 16th century) = 24 okka = 30.768 kg

(Peçuy, 16th century) = 32 okka = 41.054 kg

(Hungary, July 1579) = 30 okka = 38.488 kg

(Balıkesir) = 16 okka = 20.527 kg
(Mardin, Adana) = 16 okka = 20.527 kg
(Bursa) = 12 okka = 15.395 kg
(Isparta) = 14 okka = 17.961 kg
(rice, Edirne) = 9 okka = 11.546 kg
(rice) = 10 okka = 12.828 kg
(Crimea) = 4 standard kile = 85-90 okka = 109-115 kg
(Akkerman in 1500) = 40 okka = 51.317 kg
(Konya, Karaman) = 24 okka = 30.790 kg
(Ankara) = 24 okka = 30.790 kg
(Malatya in 1528) = 10 okka = 12.829 kg
(Diyarbakır in 1528) = 10 okka = 12.828 kg
(İzvornik) = 132 okka
(Sarajevo) = 50, 64, 66 okka
(Kilis, Bosnia) = 66 okka = 84.678 kg
(Depelen) = 38.484 kg

Pirinç kilesi: Kile of rice. Half of a kile of wheat.

(ISAM) An Ottoman unit of volume. Various different values are still used in different regions of Turkey. Since 1841 its value has been set at 32.2 litres. Among the Ottomans 1 kile of wheat was 22.656 kg, and 1 kile of barley was 22.25 kilograms.

(OS) Former unit of weight. Forty litres of grain.

(OŞG) A grain measure whose weight varied according to the type of grain. The value varied in different parts of Anatolia and at different times. Thus in the late middle ages the kile of Diyarbakır, Arapkir and Çermik was half an official Istanbul kile.

Harman kilesi: A large measure of grain.

(PGI) The amount varied according to the type of wheat or other grain. Thus a kile of soft wheat of the type known as Polish wheat was equivalent to 21 or 22 okka, a kile of the bard wheat of the Crimea known as arnavutka was equivalent to 23 or 24 okka, the Diyarbakır kile was equivalent to 130 okka, a kile of grain other than flour and wheat 20 okka, a kile of rice 10 okka and 100 dirhem, and the Khorasan kile was equivalent to 1 demirli, that is 11 okka. In Kurdistan 1 kile is equivalent to 4 şinik, 1 şinik to 4 ölçek, and 1 ölçek to 4 rub'.

(Old Testament) = 13 litres

(WH) Pegolotti of Florence wrote in the 14th century that in southern Anatolia 1 kile was equivalent to 1/20 moggio (müdd, see under Keylece). In the Ottoman period the official kile of Istanbul was calculated at 20 okka for wheat, that is 25.656 kg. For barley the kile was probably approximately 22.25 kilograms. For flour the Istanbul kile of 20 okka = 25.656 kg was used. On the other hand 1 kile of rice (in the 17th century) was only 10 okka or 12.828 kg. Since 1841 the kile has been equivalent to 35.27 litres everywhere in Turkey, which is equivalent to the former wheat weight of 20 okka. Apart from the official Istanbul kile there were numerous local kile measures. In the late middle ages in Diyarbakır, Arabgir and Çermik a kile was used which was half the size of that in Istanbul, and equivalent to 12.828 kg for wheat and 17.635 litres. In those years a kile in Urfa was equivalent to 4 Amid kile, or 51.312 kg of wheat by weight or 70.54 litres. In addition, there was an Ottoman kile equivalent to 8 Amid kile, whose value was 102.6 to 4 kg of wheat by weight or 141.08 litres. In Iran in the 1300s Gazan Han set 1 kile at 10 menn, to be enforced about the country. The units of volume in question were to be defined separately for each type of grain, and the maximum capacity was to be 10 menn = 8.33 kg. It is thought that this new regulation by which 1 Iranian kile = 1/10 tağar (tağar being an animal load of 100 menn) was based on ancient tradition.

(T.2) (New) = 10 ölçek = 0.270270 old kile.

(ZK) A measure equivalent to two teneke [tin], being a 12 kg kerosene tin. This measure is used regionally as one or two kile. It is used in Uşak, Afyon, Elazığ, Kütahya and Gaziantep.

(EÇ) 1/166b These coffee sellers, all fully armed, proceed past on litters measuring their bags of coffee by the kile.

(EÇ) 2/258a Apart from this in the lands of Abaza they sow millet for pasta [a kind of porridge made in the Caucasus]. One kile yields a hundred kile of millet.

(EÇ) 2/287b Description of praiseworthy qualities and crops: From the length of the harsh winter, from the sowing of cereals to storing them in the granary takes sixty days. One kile of seed yields eighty kile. One kile of millet yields a hundred kile. Seven types of wheat are grown. Awnless wheat is a white wheat like a camel's tooth.

(EÇ) 2/320b In short all foodstuffs and beverages are bought and sold at prices set by the law of Şeyh Safi. Wheat and rice and other cereals are never measured by the kile [that is by volume], but always by weight.

(EÇ) 2/360a The abundance of revenues from cereal crops is mainly from wheat and therefore there is a surplus for the following year. One kile yields eighty kiles of cereal. However, there are no vineyards, vegetable gardens or orchards due to the harsh winters.

(EÇ) 2/347a from one wheat grain come 20 or 15 stems, and every ear of grain carries 100 grains, so that one kile yields eighty kile in this fertile land.

(EÇ) 3/36b This time Joseph attempts to detain his full brother Benjamin. When distributing wheat to his brothers using a gold kile, he conceals the gold measure beneath the load of Benjamin's camel, and then declares that the kile is lost. Searching for it he pretends to discover it in Benjamin's load, and declaring that the thief has been found they imprison Benjamin, his other brothers never defending him.

(EÇ) 3/111b From the chief of the nobles, Gülâmî Efendi, we took 300 kile of barley and went to the office of the emir

(EÇ) 3/121b In these mills 50 Silister kile each of flour is produced day and night. Their wheels turn at such speed that one cannot see them.

(EÇ) 3/125a Thanks to their respect for guests, God the Creator has granted them such abundance that one kile of seed yields 56 or 70 kile.

(EÇ) 4/312a All the people here are farmers who cultivate their own wheat and so make a livelihood. Indeed, and one kile yields eighty kile of wheat and barley.

(EÇ) 4/385a And from the entire province of Cizre the lord receives each day one rub' kile of goods.

(EÇ) 5/53a They loaded 2000 kile of wheat and 5000 kile of millet onto ships from Akkirman and Kili.

(EÇ) 5/58b In the granary belonging to one of the sergeants of the fortress, someone named Kargılı Halil Ağa, was 1000 kile of millet and 3000 kile of wheat.

(EÇ) 5/59a By the wisdom of God 20 vessels from Akkirman with 3000 fully armed warriors and 20,000 kile of wheat and flour and chickpeas and other provisions arrived in that place.

(EÇ) 6/153b Indeed, in the pact of Süleyman Han it is ruled that from our villages in Herzegovina they must purchase 40,000 kile of wheat with their own coinage.

(EÇ) 7/57b Another wonderful skill: In this city of Vienna they have built various iron hand mills which can be placed in saddle bags or sacks and taken on campaign, and with these two kile of flour can be ground in one hour.

(EÇ) 7/67b It is a thing like an Edhemî conical cap, circular and pointed and the size of a wheat kile [measuring container] of Rom [Anatolia].

(EÇ) 7/170a And as every king accedes to the throne, as a good omen they each place a jewelled gold chain. The weight of this crown is about as much as a Rûmî [Anatolian] kile.

(EÇ) 10/322 Description of the pool of Ümmü'l-kıyâs: The name Ümmü'l-kıyâs is an error of the vernacular. In the Arabic language the correct word is Mikyâs, meaning water kile, which is a metaphor for pool.

(EÇ) 10/540 And like wheat, hemp and heldine [a type of cereal that grows in Egypt] and red millet grow widely. One kile yields 100 kile.

Kilindir (ISAM) Comes from the Greek kylindros. A unit of volume that varies from place to place. The Istanbul kilindir is 2.1125 litres.

(OŞG) A vessel made of tin or zinc with handles and weighing 2 okka.

(WH) A scoop made of tin or tin plate used in the Ottoman Empire. It derived from the Greek kylindros. As a unit of volume it was equivalent to 2 okka = 2.5656 kg. The person who gives this information, 'ain constantinopolitanische klunder oder mos' says that it was equivalent to 6 Viennese seidels or 2.1225 litres.

Kilo (ML) Suffix which when placed in front of a unit means that it is multiplied by 1000: Kg, km.

Kilogram (ML) 1. A basic unit of weight in the international decimal system (symbol kg).

2. A unit of force equal to the gravity exerted on a mass of one kilogram.

3. One of the six fundamental units of the decimal metric system. This unit is equivalent to the weight of a standard made of iridium and platinum kept in the Breteli pavilion in Sèvres and was endorsed at the Conference on Weights and Measures which convened in Paris in 1889. This standard is 27 mg more than the mass of a cubic decimetre of water of maximum density.

Kilogram-metre: the metre-kilomgram-second gravitational unit of energy or work equal to a kilogram mass acting through a a distance of 1 metres in the direction of the force.

Cubic kilogrammetre: Unit of concentration of a particular substance in a mixture; it is equal to the concentration of 1 kg of this substance in a total volume of 1 cubic metres.

(T.2) = 1000 g

Kilometre (ML) Unit of length of 1000 metres (symbol km). It is equivalent to 1093.6 yards or 0.6214 miles.

Square kilometre: The area of a square, each of whose sides are 1 km, or one million square metres.

Cubic kilometre: The volume of a cube, each of whose sides are 1 km in length, or one billion cubic metres.

(T.2) = 1000 metres.

Kilte (ML) Bunch, stack, heap.

Kintar see Kantar

Kirah (MZP) One sixteenth of an arşın. It is a corruption of the Persian kirağ.

(PGI) One sixteenth of a Turkish arşın, or approximately 4.5 cm.

Kist (WH) A unit of volume known as xestes in Greek, and sextarius in Latin.

In Iraq it had two separate values. The small kist was equivalent to 3 rtl of liquid, or 1.2158 litres. The large kist was double this quantity, equivalent to 2.4336 litres.

In Egypt 1 kist was probably equivalent to 1/2 sâ or 2.106 litres.

Kol (TDK) The limb of a human body stretching from the shoulder to the tip of the fingers.

(OŞG) The length of the arm from the shoulder to the tip of the fingers, araş, zirâ.

(ML) The distance from a scale pan to the point of support.

Konak (OŞG) 1. The distance to a halting place.

2. The distance between two halting places.

3. A day's journey with livestock, a journey of one day.

4. The distance covered in six hours.

Kor (Old Testament) = 10 bat = 370 litres

Kot (OŞG) 1. A large wicker basket.

2. A large grain measure made of wood encircled by bands and larger than a teneke.

Kova Bucket.

(OŞG) A container made of iron, zinc, leather, wood or tin with a handle at the top usually used for carrying water or liquids or lifting water from a well.

(ML) 1. A container in the form of a conical cylinder with a handle used for drawing water or for carrying all kinds of liquid and dry substances.

2. The amount that a kova contains.

(EÇ) 3/26a In these timbers are pegs each weighing 100 or 150 vakiyye, and many thousands of water buckets [kova] on the turning wheel.

(EÇ) 1/160a They lead telâtin maşak [a kind of container made of a type of leather] and telâtin buckets [kova] onto piebald purebred Arab horses of delicate build.

(EÇ) 6/131a For whosoever wishes to draw water there are iron wheels around this well, and everyone hangs their buckets and bowls onto these wheels and in the twinkling of an eye these are lowered to the bottom of the well, and as soon as one of the cogs of the wheel is pressed in a moment the buckets are lifted out full of water, without need of any man's endeavour, trouble or fatigue, but only by means of springs

(EÇ) 6/166a If anyone wishes to draw water from the Neretva he immediately attaches his bucket to the ring of the chain, and dropping it by the chain it descends like a thunderbolt to the River Neretva and is filled with water close to the rocks. Then as the bucket is drawn up by means of wheels, buckets come from above the chain and from these they fill cups and jugs and take them away.

(EÇ) 7/15b Indeed soldiers of the House of Osman gathered around this well and halted there, and many times day and night 100,000 soldiers drew hundreds of thousands of buckets of water from this well, yet its waters diminished by not even a drop.

Kovan Beehive.

(OS) A basket or box of various shapes made to house bees.

(EÇ) 8/255b Afterwards they amuse and diverted themselves in the vineyards and gardens below at a distance of two hours, and in the mountains, where there were many hundreds of thousands of beehives, and many well-kept farms

(EÇ) 8/325b And beehives were marked with numbers in altogether 71,000 places.

Krina (HI) 2 kabal

Kuba' (OS) Large measuring container.

Kucak Embrace.

(TDK) 1. The area between the open arms and the chest.

2. The amount that can be contained between the open arms and the chest.

(EÇ) 5/140a On the bank of the River Tutla is a fine and strong fort roofed by 3000 reeds and planks, and having a bazaar of shops, orchards and gardens, and each of the timbers of the fort are larger than a man's embrace [kucak].

(EÇ) 5/128a I dismounted from my horse and found that with infantry marching steps the length of this long tree was exactly 470 strides, and this extraordinary tree that is the work of God could only be embraced by 18 men. There are outstanding trees of such great size.

(EÇ) 6/64a The oak posts of this strong and great bridge reach to the summit of the sky, and each of the oak piles are so thick that two men can embrace them.

(EÇ) 6/72a Along the edge of the River Danube stretches a strong and fortified embankment with four-cornered bastions that is a fort worthy of Şedâîd [ancient king of Iran], and each of the oak and Valonian oak posts are so thick that a man can embrace them with difficulty, and in time they have been transformed into ebony.

(EÇ) 6/139b In short, in this place we passed along the River Lig, through the village of Kadinaluka and the village of Islavkoça and across the high pasture of Kuradağ, but we escaped with our lives from the infidel brigands only with difficulty, and travelled through great and extensive woods of huge tall trees that formed a canopy like the heavens above our heads, each so large that it took ten men to embrace their trunks.

(EÇ) 7/153a Such a thick tree is this, with altogether 170 branches, and so massive that only ten men can embrace it, and each of these 170 branches can only be embraced by five or six men. Only God can calculate the numbers of its branches and twigs.

(EÇ) 7/170a All say that this Höşeng Şâh is a prophet and come to pay their respects at this ancient shrine. The Heşdek Tatars, who are all Muslims, also visit here. Encircling it is a great wall like unto a castle. Indeed, the length of the tomb is 70 strides. At its head is a standing pillar of porphyry that only three men can embrace.

(EÇ) 8/233a This beautiful mosque has a main dome that is leaded and within the prayer hall is a magnificent plane tree that is the work of God, and that five men holding hands can embrace.

(EÇ) 8/234a The shrine of Hasan Baba Sultan, who is buried in this excursion place, and next to whom is a great tall plane that it takes 15 men to embrace.

(EÇ) 8/265b Each of the branched trees is so thick that ten men cannot embrace them.

(EÇ) 8/313a In short it is such a beautiful place, that no such lovely bed of flowers, a world of such delight and charm, and a mosque of the sky that its like is not to be found in any land, because all the beams are cypress trees that it takes two men to embrace.

(EÇ) 8/324a But each great tree and each green cypress tree is so thick that two or three men are needed to encompass them, because all these cypress trees are 1000 years old and chief among trees, and the timber of not one is rotten.

Kulaç Fathom.

(OŞG) 1. The distance between the tips of the fingers of both arms when spread wide.

2. A nautical measurement of 1.66 m used for measuring depth.

(ML) 1. The distance between the tips of the fingers of both arms when spread wide.

2. A unit of length formerly used in France equivalent to 1.624 m or five feet.

3. A former unit of length used by seamen equivalent to 1.66 m (British seamen still use a fathom of 6 feet or 1.83 m).

(MLT) Fathom, 1.828 m.

(HRD) 6 feet, or 4 dirsek [cubit], 1.776 m.

(Old Testament) = 4 arşın = 1.78 m.

(MZP) The name of a unit of measurement used to measure the depth of the sea, wells and other waters, and long objects such as cloth and rope. The kulaç is the length between the tips of each hand when the arms are opened, and is equivalent to 2 mimar arşın [architect's arşın]. The former French measurement known as the Paris fathom was equivalent to 6 feet, or 1.95 m.

(ÖNB) 5 kadem = 2.5 zira-ı mimari. Used in excavations.

(EÇ) 1/9a The Black Sea is a deep black sea that was left by the dark sea of Noah's flood and whose depth is 80 fathoms.

(EÇ) 1/131a A year previously this pinewood is cut by many hundreds of craftsmen into slender stakes each one fathom long with the two ends sharpened like a shuttle and so they are dried.

(EÇ) 1/133a A great scholar of the stars by the name of Ali Kuşcu dug a well 105 fathoms deep in order to draw up astronomical tables.

(EÇ) 1/139a At the great summit of that high mountain is a well from which pure cold water emerges at 3 fathoms.

(EÇ) 1/139b But the swordfish is an idle fish that is unworthy of the weapon it carries, and when its sword of Dulhuk [legendary king of Persia] one fathom long on its nose hits target and enters a hole in the net, it is deprived of all power of movement.

(EÇ) 1/163b They dive to a depth of 70 fathoms, and stopping for a moment rise up 70 fathoms. This is such a miraculous skill that it is not humanly possible. They bring out sponges from the sea and salvage cargoes from sunken ships.

(EÇ) 1/205b Using the science of geometry they excavate the mountains to a depth of 70 and 80 fathoms to discover they water of life that they know exists there, and by means of water channels carry this water from the mountains to the city.

(EÇ) 2/255b The great river of Faşa: This is a great river as wide as the Danube. In places it is one mile wide, and in others narrows to half a mile. But the depth is only 8 and 10 fathoms.

(EÇ) 2/261a The Sea of Azov freezes to a depth of two fathoms. For five months it is iced in, and the roads and mountain passes are similarly impassable, and after November this imperial navy in the Black Sea suffers great adversity.

(EÇ) 2/267b The eastern side is a rock precipice 100 fathoms deep.

(EÇ) 2/277b And the depth of this lake is 20 fathoms, and its water of life is pure and clear.

(EÇ) 2/292b And every night the bridge over the river is drawn up so that the castle rock is left like an island, and from the highest summit of the castle they let down ropes of 100 fathoms by windlasses and draw water up to the castle to quench their thirst.

(EÇ) 2/306a The Sea of Van is deadly poisonous, but this is the water of life, and its depth is 70 fathoms.

(EÇ) 5/68b Karye-i Bâki Well: This well built village in the district of Silister is famous for a well 150 fathoms deep.

(EÇ) 5/94b And there are divers employed who dive to the bottom of the sea 50 or 60 fathoms below.

Kupa Cup, goblet.

(TDK) 1. A cup, bowl or vessel with a stem made of gold, silver, bronze or crystal, and whose width is generally larger than its height.

2. The amount contained in a kupa.

(EÇ) 7/65b And each year in accordance with the law of Süleyman Han they pay taxes of (—) thousand Hungarian gold pieces and 70 silver kupa, and 2000 silver vessels each weighing 1 vukıyye, and silver basins like chests or like those of pools and fountains.

Kuranga (MLT) A unit of measurement formerly used by the urks. = 297 g

Kurr (WH) This unit of volume was first used by the Babylonians, and in Iraq it was equal to 30 kâra or to 60 kâfîz, each of 8 mekkuk.

In the 10th century in Baghdad and Kufa 1 large or complete kurr was 60 kâfîz (1 kâfîz = 8 mekkuk, 1 mekkuk = 3 keylece, 1 keylece = 600 dirhem of wheat), 2700 kg.

In Vasit and Basra at that time 1 kurr = 120 kâfîz (1 kâfîz = 4 mekkuk, 1 mekkul = 15 rıtl, 1 rıtl = 128 dirhem). Thus 1 kurr was 2880 kg of wheat. On the other hand, the adjusted kurr (el-kurr'l-mu'addal) was 60 kâfîz. However here 1 kâfîz = Baghdad rıtl, which in turn was 609.375 kg of wheat. According to another 10th century source the large kurr = 60 kâfîz = 480 mekkuk = 1440 keylece. This made 5760 rub or 7200 rıtl. That is, 1 keylece according to ar-Razî was 5 rıtl = 650 dirhem. El-Harezmî on the other hand put it at 600 dirhem. According to this, 1 kurr is = 22925 kg of wheat (not 2700 kg). It is thought that this is more probable than the higher value, because in the 14th century el-Omerî gives the following values for the 30 kâra Baghdad kurr for various types of grain [Cf Kâra]: 1 kurr of wheat = 2925 kg, 1 kurr of barley, chickpeas, lentils = 2437.5 kg, 1 kurr of rice = 3656.25 kg. The average value of 1 Baghdad kurr of wheat on the basis of the above information was therefore approximately 2.9 tons or 36 hectolitres. El-Mukaddesî records that in Iran (in Huzistan) 1 kurr as used in the wheat trade was 1250 menn, and in the barley trade 1000 menn. This would mean that for wheat it was 1015.6 kg, and for barley 812.5 kg, or approximately 12 hectolitres. In the 18th century Chardin speaks of a kurr of water in Iran, saying that it was 1200 Baghdad rıtl, each equivalent to 130 dirhem, which would make 4875 litres.

Kurşun çahını (OŞG) The nearest place that a bullet can reach.

Kustar (OS) Balance, measurement.

Kustas (OS) Large balance.

Kutu Box.

(OS) 1. Container, usually lidded, made of thin wood, cardboard, tin, plastic and so on.

2. The name of a measure used for measuring grain.

3. One kutu was 2.5 okka (3.21 kg), and 8 kutu made one kile.

4. Small, often decorative, containers of various kinds.

5. Grain measure equivalent to 1/8 of a kile, 4.62 decilitres.

6. Half an ölçek; a grain measure two okka in weight.

(ML) A kind of measure used for granular substances. One kutu is 3.210 kg, 8 kutu is a kile, or approximately 25 kg.

(HI) One eighth of a standard kile = 4.60 2 decimetres.

(T.2) = 10 zarf

(MZP) The name of a unit of measurement used for grain. One kutu was 2.5 okka (3.21 kg), and 8 kutu made one kile.

(OŞG) Half an ölçek; a grain measure two okka in weight. A measure equivalent to 1/8 of a kile; şinik, çanak.

(EÇ) 1/172a The company of hot pâlîde makerc In entirety they consist of 800 tradesmen, who never have their own shops but from the hot pâlîde shops described above purchase many thousands of bakrac of pâlîde, and arrange them attractively over boxes [kutu] containing fire. In one hand they have trays with a hole in the centre adorned with pottery and porcelain Kütahya cups, and in the shopping streets and bazaars they pass by calling

out, 'I have spiced pālūde, scalding pālūde, my dear.'

(EÇ) 1/179b These merchants pass by in shops adorned with canopies and awnings upon floats, decorated with boxes [kutu] of white honey in the comb and barrels of honey on many hundreds of carts pulled by horses. And they pass by with the superintendent of honey, all fully armed.

(EÇ) 1/202a The box makers. They have 100 shops and number 1000, and their patron saint is Hurrem-i Hindī, who lived in Yemen and who girded the belt of Veys el-Karanī, and whose tomb is in Ethiopian Sevākī. They pass by, their shops on litters adorned with boxes [kutu].

(EÇ) 1/203a to it they add pekmez of Kuşadası sprinkled with cinnamon and cloves and ginger and coconut, and it stands in their shops, in boxes large enough for a man to enter, and the doctors of the law and the wise men and the sheikhs come each day and buy it in many thousands of copper mugs, and the coppersmiths come and work there. I have never seen taverns and boza shops and coffee houses where there were so many prostitutes. It is a secret of He who is glorious and He whose name is exalted that this is similar to box boza and the rice drink of Egypt and another type of box boza that they call maksima in the Crimea.

(EÇ) 4/278a Inside a henna box for Kaya Sultan was pure gold jewellery and jewelled Khorasani bracelets and an Arabian anklet and six ornamented kebānī [a sort of jewellery].

(EÇ) 5/127a and taking from the splendid goods and rare fabrics one box of silver and one box of gold thread and seven lengths of European velvet and seven lengths of broadcloth for trousers and seven beasts of burden...

(EÇ) 7/136b Moreover they wrap these apples in cotton wool inside white boxes, and take gifts of many hundreds of boxes of apples to the hans and sultans and vezirs of the Crimea. Many thousands of boxes and many hundreds of fragrant apples wrapped in cotton wool they carry by ship all the way to Istanbul, and present them as gifts to the Ottoman sultan, and to the doctors of the law and to the vezirs.

(EÇ) 10/864 And they give to each one glittering gold nugget and ten ox horns of civet and 5 civet cats in cages and 10 cages of talking parrots and one box of musk and one box of ambergris and one box of antidote and one load of large cardamom, and after such great gifts and rewards, make many apologies

(EÇ) 10/901 two loads of gold nuggets and one bale of civet and one bale of zimrān [an aromatic plant] and one box of musk and 60 pieces of fragrant ambergris and one box of humeibān that is a type of black plant. They make a man's mind fragrant with their scent. And one large box made from karça, which is the root of a plant. Its scent exceeds that of violets. And one box of land skink and one box of sekseibān [?] ointment and one small container of sulphur ointment and six large boxes of small cardamom. For all these we had a receipt and they were written down in letters.

(EÇ) 10/929 10 camel loads of provisions and 10 boxes of coral and agate and Ceylon stones and cat's eyes and musk and ambergris and civet and pearl prayer beads

(EÇ) 10/960 virgin Ethiopian girls and four delightful ornamented young dark skinned lads and one box of pearls and one box of Ceylon stones and one box of agate and one box of antidote and one box of musk and three pieces of fragrant ambergris and one large box of cardamom

Küfe (OŞG) 1. A large and strong basket generally woven from the branches of willow or other trees, for carrying loads.

2. The amount contained by a küfe.

(ML) A deep and large basket made from wooden bands or woven from branches. Some are in the form of a large basket, and others shallow containing 40-50 litres. They taper towards the bottom.

(EÇ) 1/205b The porters, that is poor labourers, with picks in their hands and spades on their shoulders, and with küfe and baskets, pass by calling out, 'Let us labour and toil, let us make peace with our rights, then let us get down to work,' and their weapons are picks and spades.

(EÇ) 4/259b Chanting the prayer of Muhammad and calling out the name of God with shouts and cries, they threw their küfe and bags and şille [type of container] full of soil of the inauspicious Timur into the sea.

Külah Cone.

(ML) A container made of paper folded into a cone for holding small amounts of sugar, nuts and other dry substances.

Külçe Ingot.

(TDK) Blocks of metals or alloys that have been melted and poured into a mould.

(PGI) Also known as küri, it is used to measure handkerchiefs or printed cloth. Twenty handkerchiefs and 20 bolts of printed cloth make one külçe, so one külçe is equivalent to 20 pieces of things like this.

(EÇ) 1/175b These tradesmen decorate their shops upon litters with külçes of gold and silver thread, and hang the front with gold thread woven like fishing nets, and make lamps from hanks of silver thread, so that each shop is as ornamented as a Chinese temple

(EÇ) 1/179a They erect tents upon their carts and decorating them with clean clothing, baskets of hazelnuts and pistachio nuts, grapes and figs, and diverse külçe candles

(EÇ) 1/185b These also place ingots of copper on their floats and wield their shovels pretending as if they were smelting copper as they pass by in procession

(EÇ) 1/186 Upon pack horses they thread diverse seed pearls of Hormuz and single pearls on strings, making them into külçe, and decorate their shops with pearls like fishnets as they pass by in procession.

(EÇ) 2/322a After these displays I received from my lord Sefer Paşa two Georgian boys and one horse and one külçe of mohair Georgian socks and 100 kuruş.

(EÇ) 4/284b But 50 külçe of köse [?] turban cloth and 500 pieces of Hoten musk and 300 pieces of fragrant raw ambergris from China, and 100 pairs of cups and bowls made of Chinese porcelain, and other diverse Indian curiosities

(EÇ) 5/148a First in a southerly direction in the province of Lepoşka near to the city of Mostar in the sub province of Herzegovina, that is from the infidels of (—) came ten purses and 50 donkey loads of dried figs more delicious than clarified honey and pressed in külçe in the form of wheels.

(EÇ) 5/163a many different leathers as soft as cotton wool tanned from ten külçe of fragrant telātin hide and 10 külçe of German bear and German elk leather

(EÇ) 6/177b Immediately I took 10 külçe of gold thread inside one velvet turban, and one silver harness and one sword with

jeyhānī gilding in a gold plated scabbard and one silver chased quiver and one finely crafted tengrūr tent.

(EÇ) 7/174b But now another business made its appearance and my sovereign king of kings appointed me ambassador and told me to take 1000 külçe of diverse furs and one külçe of sable furs and 1000 pairs of walrus teeth and 50 pairs of hawks and falcons and toykun [perhaps bustard?] birds and two thousand pairs of ruby red telātins [a kind of soft leather made in Russia] and 1000 külçe of sable fur linings and three pairs of white sable furs and three pairs of black fox furs and one kantar of fragrant ambergris and as well many thousand other types of rarities and curiosities 100 purses of gold for my sultan, and diverse gifts and a hundred purses of gold for the vezirs and doctors of the law and other noblemen and gentlemen in positions of authority.

(EÇ) 10/445 and with Indian cypresses and javelin poles and several külçe of turban cloth and Kaaba kohl they paint the eyes and deceive.

Külek (OŞG) 1. A wooden bucket in the form of a half barrel for carrying water or for milking.

2. A wooden box for holding fat.

3. A bucket with a handle, gerdel. A container for honey, zerde or yogurt.

(EÇ) 3/19a Since the Ramazanoğulları who are among those feared by the sultan of Egypt Yusuf Selahaddin make milking bowls and külek and similar things, in colloquial language they call it Külek Castle and Kövelek and Gülek Castle.

Küli see Külçe

Küme Cluster, group, heap, pile, set.

(OŞG) Puddle, mound, heap, pile; a large number of animate or inanimate things.

(EÇ) 1/31a They were piled up in many separate küme in Terebane Park.

(EÇ) 1/64b The keepers of the hounds escaped in ones and twos. Outside the commander had given gifts and rewards to the mob of keepers of the hounds within, and they heard and came out in clusters [küme] saying 'Mercy O Husrev-i Şîrān of the excellent House of Osman'.

(EÇ) 3/100b But one group [küme] of mounted rabble came with us and stood like inanimate things

(EÇ) 5/144a Immediately a large group of mounted and infantry infidels passed, and following them one group [küme] on foot and one group [küme] of around 50 mounted infidels passed, and they too went by breathing heavily.

(EÇ) 6/102b Truly the infidels are numerous, but the foot soldiers with muskets remained at a distance of two cannon shots, and on this battlefield seven groups [küme] of Halpuz infidels were surrounded and chased and slaughtered

Küp Large jar.

(TDK) 1. Pottery jar with a small base and broad body used for storing water, pekmez, oil and other liquids, or flour, wheat and other cereals. Wine jar, water jar.

2. The amount contained by a küp.

(EÇ) 1/36a Sultan Murad III had two magnificent jars of solid white marble that had come from the island of Marmara brought and placed inside the mosque. Such jars [küp] had never been seen in the land of Jem or Jemshid or Darius. Each one is the size of a hammam dome and carved from a single block. Each one must be large enough to contain 1000 kile of wheat. They stand inside the mosque filled to the brim with the water of life, one to the left and one to the right

(EÇ) 1/125b When the late Piyāle Paşa commenced construction, to the north side seven enormous jars [küp] of gold were found, and this place is still visible and manifest. And those jars are the marble jars which stand inside the sebilhane (kiosk for the distribution of drinking water] at the top of Uzun Çarşı in Istanbul.

(EÇ) 10/266 There are dining trays from the time of Külāvan, some empty and many tinned, and one erdeb of finely sifted salt and 50 great containers glazed inside and out, like water jars [küp] but with broad bases, and mouths wide enough for a man's head to enter.

Kürek Spade, shovel, dustpan.

(OŞG) A tool that is flat or has raised edges with a short or long handle, and made of wood or iron, used for lifting or moving embers, snow, soil and similar substances.

(EÇ) 1/131a At once all the craftsmen gathered together and using shovels began to throw many hundreds of kantars of iron bars into the sea of bronze.

(EÇ) 1/154a circular wooden troughs and picks in their hands, and some with brushes and shovels in their hands and baskets on their backs, and with sacks and baskets made of thorn and straw, and they march in procession with great shouts.

(EÇ) 1/154 these too carry enormous picks and crowbars and sledge hammer and wedges and spades and deep baskets and axes at their waist and in this style they march past in tumult.

(EÇ) 7/58 When the hamam [bathhouse] becomes too hot the bath attendants lift these red stones with iron shovels and set them aside, and at once the bath cools down. If they again place those stones upon stoves the bath becomes hot again.

(EÇ) 7/88a The Austrian emperor brought forty or fifty thousand serfs and freemen with picks and lathes and and shovels, and 3000 kantar of gunpowder and around 2000 bombshells, and began to make ready around the castle.

Küri see Külçe

Lagun (DLT) A hollow implement like a measuring cup used for drinking things like ayran and milk.

Laza (OŞG) 1. A very small trough, a honey trough.

2. The largest size of laundry or bread trough.

Lenger (OŞG) 1. A large shallow dish made of pottery or copper.

2. The amount contained in a lenger.

(EÇ) 4/221a When the Paşa reached that delightful place he decided upon the Royal Pavilion, and in a single moment a magnificent feast was prepared, with all the gold and silver lengers and porcelain and onyx and celadon bowls.

(EÇ) 4/230a Our lord Paşa came out of this hamam and in accordance with the illustrious imperial laws a magnificent feasting board was prepared, and when it was adorned with no less than 200 silver lengers and delicious fragrant drinks the fragrant odour perfumed a man's brain.

Lepton (Byzantine) = 2 barley grains = 0.09 grams

Levh (WH) Unit of volume used in Iran. In Morocco the modios was known as lebh, and each was equivalent to 80 ukiyye of wheat by weight or 120 local müdd.

One levh is approximately 520 litres.

Libbra grossa (HI) (Genoa) = 348.450 grams

(Venice) = 357.749 grams

Libbra sottile (HI) (Genoa) = 316. 750 grams

(Venice) = 301.230 grams

Libre (ML) A unit of weight (libra) formerly used by the Romans and approximately equal to 327.45 grams. Originally it was divided into ten or twelve ons [ounces]. In the Anglo-Saxon countries the libre [pound] is today the basic unit of weight and equivalent to 0.4536 kg.

(Roman) = 12 unciae = also ponds or as = 327.450 grams.

Lidre (HI) (Seljuk and Ottoman, standard) = 100 dirhem = 320.7 grams

(silk) = 120 dirhem = 384.840 grams

(silver, Serbia) = 115 dirhem = 368.805 grams

Litra (HI) (Byzantine, argiriki litre) = 333.333 grams

(Byzantine, logariki litra) = 322.320 or 319 grams

(Epirius) = 427 grams

(ODB) (Lat. *Libra*) 1. The most important Byzantine unit of weight, with a value varying between approximately 324 grams and 319 grams. In the monetary system established in the year 309 or 310 by the Emperor Constantine I, 1 logarike litra = 72 solidi = 12 ounces = 1.728 keratia = 6.912 sitokokka = 1/100 kentenarion.

2. The soualia litra was a special unit of weight for oil or wood = 4/5 logarike litra = 256 grams = 30 soualiai litrai of olive oil = 1 thalassion metron.

3. A unit of measurement used in regions like Cyprus and Trabzon which had military relations with the Islamic countries: argyrike (silver) litre = 12.5 logarikai ounglai (= 333 grams). It is related to the Arab ratl, which is equivalent to 337.6 grams.

Litre (T.2) An ôşr-i zirâ or cubic decimetre, the basis for liquid and grain measures, and a vessel which contains exactly 1 kg of water.

(ML) Equivalent to a cubic decimetre. Metrologists define the litre more precisely as the volume of 1 kg of distilled water at 4 degrees Centigrade under pressure of 76 cm of mercury. According to this definition the litre is approximately 1/30000 larger than a cubic decimetre. The decimal multiples and fractions of the litre are each ten times larger or smaller than the one preceding them. At the Convention of Weights and Measures held in 1964 the definition of a litre as set by metrologists was abolished due to the confusion arising from the slight difference between the cubic decimetre and a litre (one in 28 million); and and resolved that the word litre could from now on refer only to the cubic decimetre, and not for very precise measurements of volume.

Lodra (Old Testament) = 327.45 grams

(ML) A former unit of weight. There were two kinds:

Kantar lodrası: 100 dirhem (128 grams)

Vezne lodrası: 120 dirhem (153.60 grams)

Since the kantar is 44 okka, and the okka is 4 lodra, one kantar was 176 lodra. 30 vezne lodrası made one vezne, and 1 vezne was 3600 dirhem. The vezne lodrası was used for weighing expensive goods like silk.

(WH) In the late middle ages the lodra was 176 Ottoman dirhem, that is 564. 432 grams. The vezne lodrası used by the Ottomans was 120 dirhem = 384.9 grams. 30 vezne lodrası made 1 vezne, or 3600 dirhem. In the Maghrib there was a lodra of 133 1/3 dirhem, which was 416.67 grams.

(HI) = 176 dirhem = 0.564 kg

(PGI) 176 dirhem

(OŞG) This was equivalent to 176 Ottoman dirhem or 564.432 grams. The Ottomans also used a unit of measure which they called vezne lodrası which was equivalent to 384.9 grams.

(MZP) The word derives from the Arabic rıtl, which in Italian became rottolo and in Greek litre. There were two types of lodra, one described as the kantar lodrası and the other as the vezne lodrası. The kantar lodrası was 100 dirhem (128 grams). Since the kantar was 44 okka, and the okka was 4 lodra, one kantar made 176 lodra.

(EÇ) 1/178b And on floats weighmasters place loads onto the steelyards, declaring 'A full 40 kantar and 5 lodra of linen belonging to Halil Çelebi.' And so they weigh the goods of the merchants as they pass in the procession.

Log (Old Testament) = 0.51 litres.

Lokma Morsel, mouthful.

(OŞG) The amount of food that can be swallowed at one time; a mouthful of food.

Lukna (HI) (cereals, Smederovo) = ,140 or 144 okka = 186.320 or 191.851 kg.

(Braniçevo) = 72 okka = 93.360 kg.

(Serbia) = 4 Edirne kile = 92.372 kg.

Luknieca (HI) (Serbia) = 0.5 lukna

Lukno see Lukna

Lûle (OŞG) Spout, roll, pipe bowl.

1. Spout used to measure water in a water supply system. Four çuvaldız made one masura, and four masura made one lûle.

2. A cone made of paper for holding things like tobacco, boiled sweets, nuts and so on.

3. A roll of various things: a lûle of clotted cream. A ringlet of hair.

4. Formerly the clay or wooden bowl of a long slender pipe.

(OS) 1. Small pipe attached to a fountain, tap and so on, masura.

2. Unit for measuring water.

3. Clay bowl for holding tobacco attached to a pipe.

4. Hair rolled like a pipe.

(MLT) Unit of measurement formerly used by the Turks. = 10.9055 litres.

(MZP) Name of a unit of measurement for water. Four masura made one lûle. In title deeds lûle is not used, but instead masura or rarely hilâl.

Sanat Ansiklopedisi gives the following explanation:

'So that water collected in the reservoirs and channelled to the city to supply houses, public fountains, bathhouses and so on was distributed equally, the amount was measured in distribution chambers by these small narrow conical pipes attached to the end of the water pipes or to the side of water towers. The water measure known as lûle was the amount of water that flowed through an aperture into which a piece of lead weighing 30 dirhem in the form of a sphere would fit. One lûle made four masura and each masura was 4 çuvaldız. The term çuvaldız derives from the fact that this aperture was the thickness of a packing needle. One çuvaldız of water was one fourth of a masura and one sixth of a lûle.

(EÇ) 1/97a And in some corners are diverse pools and fountain jets and gushing springs flow in cascades, and in the clean water many sunny-faced lads swim like lords of the sea and all the fountains for ablutions and the spouts [lûle] of the washbasins and the bowls are of gold and silver, and into some of the washbasins pure water both hot and cold flows from a single spout, and all the floor is of yellow stone and porphyry and seng-i firah [a type of marble] and onyx and Yemen stone and turquoise of Nishapur.

(EÇ) 1/105a between two bricks an iron tobacco bowl [lûle] projects that is admired by all the people

(EÇ) 2/228a And in every corner there is set a fountain with two spouts [lûle] from which pours the water of life.

(EÇ) 2/287b First of all in the market is the spring of heaven with two spouts [lûle] and outside Erzincan Gate is the Camel Fountain pouring the water of life.

(EÇ) 3/13b Inside that dome are 366 spouts of pure cold water which are distributed from the dome to the city

(EÇ) 3/26a All the bath wrappers are of many coloured silk, and there are drying cloths and face towels and clean mats everywhere, and inside the hamam are all Hanafi wash basins and a pool of health giving water whose spouts are all gilded.

(EÇ) 3/31b Some say, 'Ağa, rein in your horse and light my pipe bowl [lûle] with your flint.'

(EÇ) 10/223 And in the prayer hall are Hanafi water spouts [lûle] and several date palms.

(EÇ) 10/280 And they have spouts [lûle] two arms in breadth.

Mahtum (ISAM) A unit of volume which varied from region to region and century to century. There were two main types:

haşimî mahtumu: Approximately 17 litres.

haccac mahtumu: Approximately 4.2125 litres.

(WH) When the haşimi mahtûm first came into use it was equivalent to 32 rıtl = 13 kg of wheat or approximately 17 litres.

In the time of the Calipb Omar the haccac mahtûm was equivalent to 1 ṣâ' = 1 kafîz = 5 1/3 rıtl (of grain) = 4.2125 litres.

In the 10th century 1 mahtûm = 1/6 kafîz or 1 makkuk + 1 keylece = 1.5 mekkuk. According to my calculations of the mekkuk and kafîz for both values, the value of 1 mahtûm in Iraq was approximately 10 litres.

In Ahvaz 1 mahtûm equalled 2 ṣâ' or 3 kaff, that is 8.425 litres.

Mana see Menn

Mânn see Menn

Marzbân In Aleppo in the 12th century 4 marzbân was equivalent to 1 mekkuk, which above we calculated to be 105 litres. Thus in Aleppo 1 marzbân was approximately 26.25 litres. In Mesopotamia 1 marzbân was equivalent to 16 mişka, each being 37.5 dirhem (of wine), so 1 marzbân was exactly 1.875 litres.

Maslak (PGI) 1. A small pool with three to five spouts [lûle].

2. A small pool from which water is distributed by small pipes.

Mastala (OŞG) A half barrel, gerdel; a small bowl, trough.

Masura (ML) Unit of running water. The amount of water which could flow through an aperture into which a lead ball weighing 30 dirhem (1 dirhem is 2.97 g) can just fit; one fourth of a lûle and four times a çuvaldız.

(MLT) A liquid measure formerly used by the Turks. = 1.3631 m

(OS) A unit of measurement for running water.

1 masura = 4 çuvaldız

1 çuvaldız = 2 hilâl

2 çuvaldız = 1 ikilik

2 masura = 1 kamış

8 masura = 1 lûle

3 lûle = 1 salma.

(OŞG) 1. Short slender reed pen.

2. A specific and official measurement of water used for the distribution of water in a supply system. It was equivalent to one fourth of a lûle and four times a çuvaldız.

(MZP) A term of measurement used for flowing water. *Lehçe-i Osmani* gives the following definition: 'Masura, colloquially masra, a short and slender reed pen; pamuk masurası: a stylus around which cotton is wound attached to the shuttle of a spinning wheel. Spout of running water.

Official measure of water. One quarter of a lûle was equivalent to 4 çuvaldız. The masura had both fractions and multiples. One masura was 4 çuvaldız, 1 çuvaldız was 2 hilâl, 2 çuvaldız was 1 ikilik, 2 masura was 1 kamış, 8 masura was 1 lûle, and 3 lûle was 1 salma.

(EÇ) 5/181a they place a shin inside a reed masura and these are sent from every province to their sultan

Mâşa (WH) The value of this Indian unit of weight in the second half of the 16th century can be calculated as

follows: 1 silver Akbarı rupee weighed 111/2 mâşa, and examination of this silver coin has found it to be exactly 11.5484 g. Therefore the weight of 1 mâşa is found to be 1.0042 g.

Maşrapa Mug, tankard.

(OŞG) 1. A vessel with a handle made of silver, copper, zinc etc.

2. The amount contained by a maşrapa.

(EÇ) 1/213a and the doctors of the law and the wise men and the sheikhs come each day and buy it in many thousands of copper mugs [maşrapa], and the coppersmiths come and work there. I have never seen taverns and boza shops and coffee houses where there were so many prostitutes.

(EÇ) 10/741 In this city are seven medrese and 11 dervish convents and 3 kiosks for the distribution of drinking water, but of these kiosks the Rıdvân Çorbacı Sebîl in front of the customs house on the dock is entirely adorned with china tiles and to its windows bowls and mugs [maşraba] are attached by chains, and these are tinned and gilded mugs.

Medimnos (HRD) 51.84 litres

Medara see Medre

Medre (ML) The name of an Ottoman grain measure and a vessel containing 6 okka of wine.

(OŞG) A liquid measure of 4 kilindir, each equivalent to 2 okka.

(MZP) A term used for a grain measure and a wine vessel containing 6 okka. In the first edition of *Lehçe-i Osmani* printed in 1293 AH, it is defined as 'A measure of sown crops and arable land, and similar measure,' but in the edition dated 1308 AH it says only 'crop measure'. The 6-okka vessels used for carrying wine taken from the large barrels in the sellers of taverns were also known as medre.

(WH) An Ottoman liquid measure of 4 kilindir, each of 2 okka. It was equivalent to 10.256 litres.

(caviar, Akkerman in 1500) = 4.349 kg.

(copper) = 5750 dirhem = 18.442 kg

(wine) = 8 or 9 okka = 10 or 11.5 kg.

(Serbia) = 10 pinte = 4 okka = 5.131 kg.

Mehenk see Mihenk

Mekayis (OS) Sizes, proportions.

Mekâyil (OS) Measures, grain measures, kiles.

Mekîl (OS) 1. To measure

2. Thing measured by the kile. Mekîlat: Cereals and similar things.

Mekkuk (ISAM) A water vessel with a broad base and narrow neck. Used as a unit of volume since ancient times. Although its value varies from region to the region, one mekkuk is equal to 1.5 sâ'. One mekkuk is 4.125 litres.

In 10th century in Iraq, particularly in Baghdad and Kufa 1 mekkuk was 3 keylece, each of which was equivalent to 600 dirhem. Therefore the mekkuk was equivalent to 5.625 kg of grain.

In Basra and Vâsıt 1 mekkuk was equivalent to the weight of 7.5 menn or 15 rıtl, each 128 dirhem, which was equivalent to 6 kg. If we take 77 kg of wheat to be 1 hectolitre, then for the weights above we obtain a volume of 7.307.77 litres.

El-Mukaddesî on the other hand speaks of the Mesopotamian mekkuk as equal to 15 rıtl or 6.074 kg of wheat. According to Er-Razî the Iraqi mekkuk was equivalent to 1/8 kafîz, that is 6.084 kg of wheat. The average value of 7.5 m thus calculated for the mekkuk is corroborated exactly by two notes by Mar Eliya, according to which in Iraq 1 mekkuk of wine was equivalent to 48 sumn (one eighth), each equivalent to 50 dirhem. In addition 1 mişqa was equivalent to 1/64 Diyar Rebi'a mekkuk, or 37.5 dirhem (of wine). Both of these make the Iraqi and Mesopotamian mekkuk 7.5 litres. For the Mosul makkuk in the 13th century we find a larger value. This mekkuk, according to İbnü'l-Esîr, was 1/14 of a Damascus girara, or approximately 14.6 kg (of wheat) or 33.75 rıtl of flour = 13.689 kg, and as a unit of volume was approximately 18.8 litres. In the Arracan region of Iran this was 4.056 kg of wheat or approximately 5.1 litres. In Jundushapur the mekkuk was 3.5 menn, equivalent to 2.839 kg or approximately 3.7 litres. The Syrian mekkuk has a completely different value. In the 12th century in Aleppo 1 mekkuk was 19 Şeyzer sünbül, eachof 1.5 rıtl. Since 1 Şeyzer rıtl was 684 dirhem (each 3.125 g) this means that 1 Aleppo mekkuk must have been approximately 61 kg of wheat. Meanwhile, documents for the 14th and 15th centuries are more reliable. According to al-Ömerî, 2.5 Aleppo mekkuk were approximately equivalent to 1 Damascus girara or 81.75 kg of wheat. According to el-Kalkaşandî 1 Aleppo mekkuk was equivalent to 7 Egyptian vayba or 81.2 kg of wheat, which would make approximately 105 litres. In Er-Remle 8 mekkuk was equivalent to 1 kafîz, and so the mekkuk was 19 litres.

Mencem (OS) Beam of a balance.

Menn (ML) An obsolete unit of weight whose value varied according to the place where it was used. In some places it was known as a batman. In India its value varied, being 14, 16 or 20 kg. The Turkish okka was the same as the Tabriz menn or 1283 g.

(HI) (standard, Iran and Asia minor) = 260 dirhem = 833 g.

(heavy) = 12 okka = 15.388 kg.

(light) = 6 okka = 7.694 kg.

(Tabriz) approximately = 3 kg

(Diyarbakır) = 580 dirhem = 1.860 kg

(Harput) = 1800 dirhem = 5.773 kg

(Egypt) = 812.5 g

(Syria) = 819 g

(Seljuk) = 977 g

menn-i şahi = 2 menn approximately = 6 kg

(PGI) A unit used for weighing dates in the region of Baghdad and Basra and equivalent to 24 rıtl of 570 dirhem each.

(WH) The menn is the mine of antiquity and equivalent to 2 rıtl of 130 dirhem each.

A note by İbn Bibi makes it clear that the small (şer'î) menn of 260 dirhem = 833 g was the main unit of weight used by the Anatolian Seljuks. In addition to this the value varied from region to region, and below are those that I have been able to discover:

1335 Sivas: Since 2/4 menn= 1 rutolo (rıtl) in Akko, and the latter was 2.2 kg, the Sivas menn must have been 977 g.

1518 Mardin: 1 batman = 12 nügi (each 78 dirhem), so the Mardin menn was 3 kg.

1518 Erzincan: In this region the Hasan Padişah batman was in use. This batman was equivalent to 12 nügi of 160 dirhem each. It was a weight of 6.157 kg.

1518 Diyarbakır: 1 menn was here 1580 dirhem, or 5.067 kg.

1518 Harput:1 menn was 1800 dirhem, or 5.773 kg.

1581 Erivan: 12 batman were here 14 Tabriz menn, making 1 Erivan menn 3.36 kg.

1581 Van:1 batman = 21/2 Tabriz menn or 7.1 kg.

1581 Tokat: 3 batman was equivalent to 10 Aleppo rıtl (1 Aleppo rıtl = 2.28 kg), so 1 Tokat menn was 7.6 kg.

1650 Erzurum: According to J. B. Tavernier (I, 20) a local batman as used for calculating customs duties on silk was taken to be 16 libres or 7.83 kg.

Probably the weight of the batman in Van, Tokat and Erzurum was identical, and was probably the same as the Kervan batman (6 okka = 7.77 kg) which was still widely used in Anatolia in the 19th century.

(EÇ) 4/310b And in praise of its foods: First of all bread costs one Kazbekiye for a loaf weighing 3 menn of the Şeyh Safî standard. A kazbekî is a coin weighing 2 dirhem, and what they call a menn is 260 dirhem, so since a loaf weighing three menn costs one kazbekiyye, that means that two vukiyye of bread costs one munkir, but their bread is black in colour.

(EÇ) 4/325a A sâ' is 1040 dirhem. A müdd is 520 dirhem. A sumn is 260 dirhem.

Merca (WH) A Maghrib unit of area equivalent to 40 square Reşşâşî arşın.

Since this arşın is equivalent to 54.04 cm, 1 merca was equivalent to 467.4 sq m.

Merhale (MLT) A unit of length formerly used by the Turks. = 45.480 km

Mesâha (OS) 1. To measure a place. A chain used for measuring in mesâha.

2. A unit of measurement, b'ud.

(EÇ) 10/160 Şuruki is an arid village without irrigation, and a village that has been recorded in mesâha, that is it has been measured.

Mesakîl (OS) Plural of miskal, a unit of weight equivalent to 1.43 dirhem.

Metrata (HI) (wine, Genoa) = 2 baril = 156 kg.

Metre (ML) The basic unit of length. Its fractions are generally decimetre, centimetre and millimetre. A measuring instrument 1 m in length.

Originally the metre was defined in France as one in 4 million of a meridian. Then it was adopted in turn by every country (but was not obligatory in some), and became the basis of all systems of measuring weight and length. From the time of the First Convention of Weights and Measures (Paris 1889) until October 1960 its international standard was a length between two parallel lines on a rod of platinum and iridium alloy (90 percent platinum, 10 percent iridium) at a temperature of 0 degrees Centigrade. This prototype is still kept in the Breteuil Pavilion in Sèvres.

Square metre: The area equivalent to a square, each of whose sides are 1 metre in length.

Cubic metre: The volume equal to that of a cube, each of whose sides are 1 metre in length.

Metric system: All the measurements based on the metre.

Metriti (Old Testament) = 40 litres

Mevazin (OS) Measures, balances.

Mevzûn (OS) 1. Weighed.

Mezrû' (OS) Something measured by the arşın. Plural, mezrûât.

Mına (Old Testament) = 60 shekels = 982.33 g

Mızrak Spear, lance, javelin.

(ÖNB) An indeterminate measure of height. There were five times times of day called the evkat-ı mekrûhe, each of which was equivalent to the sun's height above the horizon of a mızrak (spear) length. In our country this is equivalent to 40-45 minutes.

(EÇ) 3/51b When we went to the rescue of Murtezâ Paşa in Revân with 50,000 soldiers from Erzurum, we dug through snow the height of a mızrak with much trouble and fatigue, and with difficulty arrived in seven days at the place called Deveboynu two stages from Erzurum, and there pitched our tents and pavilions upon the snow, and that night a blizzard and tempest and furious tumult raged.

Micr (WH) An Egyptian weight of 18 kırat, today 3.51 g.

Migrab (WH) (Its exact spelling is uncertain). This unit of measure was used around Mardin in Anatolia in the 16th century. Its weight was equivalent to 3 nügi of 98 dirhem each, or 750 g.

Mihek see Mihenk

Mihenk Touchstone, Lydian stone.

(OS) A stone used to test the purity of gold. Criterion. An instrument for distinguishing false from genuine.

(EÇ) 10/394 They are skilled jewellers and decorators. When they see the Paşa they rub it against the mihek and can tell its purity, whether it is honey, or oil, or poison, or of the nature of Ilbat water.

Mikrometre Micrometre.

(ML) 1. More often called a micron. An instrument for measuring small objects and shapes.

2. An instrument able to measure small lengths with great precision.

3. A measurement of length equivalent to one part in one million of a metre.

Mikron Micron. See Mikrometre

Miktel (OS) A measure with a capacity of 15 sâ".

Mikyal (OS) Units of measurement, grain measures, kiles.

Mikyas (OS) An instrument for measuring or comparing. Measure.

Mil Mile.

(ML) 1. A unit of distance.

2. A unit of distance used by the Romans equivalent to 1000 strides (1481 metres).

3. Sign made of stone or wood erected by the road to indicate distance.

Coğrafi mil (geographic mile): The distance of an arc of 1 minute on the equator, 1854 m.

Deniz mili (nautical mile): Also known as *mil-i bahrî*. The length of an arc of one minute at any place on a meridian of a globe equal in size to the earth, 1853 m. The Germans and French and other seafaring nations and reckon one nautical mile at 1852 m.

Kara mili (land mile): A length of 1609.3 m. Generally used when travelling on rivers and lakes. In the United Kingdom, since it was defined by statute, it is called a statute mile. In the past it was also known as mil-i berrî.

American nautical mile: 1852 m

British nautical mile: 1853 m

(OS) 1. Tool used for applying kohl to the eyes.

2. Sign erected by the road to indicate distance.

3. A measurement of distance that has various values in different countries.

4. Long objects of circular cross-section such as needles, arrows, rolling pins and posts.

Mil-i Bahrî: British nautical mile, 1852 m.

Mil-i Berrî: Land mile, 1609 m.

(MZP) The name of a unit of length. One mle is 2500 mimarî zirâ. At an average pace it is the distance covered in 20 minutes. It varies in length in different countries.

In navigation it is regarded as a distance of 1852 m, and referred to as mil-i bahri.

It is the name of a tool used for applying kohl. Long round objects such as needles, arrows and posts, and the shaft or pin on which something turns are also known as mil.

Emyal cetveli: A table showing distances between harbours and coastal towns and cities.

Emyal-i bahrî: See miles. A distance of 6080 feet or 1852 m.

(T.2) **Mil-i a'şârî**: A distance of 1000 metres.

(Old Testament) = 8 bow shots = 1480 m.

(EÇ) 4/325a A fersah is 12,000 strides. A mil is 4000 strides.

(EÇ) 1/28a When the occupants of the castle loaded the cannon once more and took bearings, in two hours the ships made a distance of 20 miles.

(EÇ) 1/51b Girniye and Baf and Magosa and Lefkoşa are Paşa sub-provinces and the island of Cyprus is 770 miles in circumference, and a great island. On this large island are 30,000 Islamic soldiers and 150,000 infidels.

(EÇ) 2/268a The length of the Black Sea extending from northern Anatolia, past Trabzon and as far as the strait of the River Faşa is 1500 miles. And again from the strait to the land of the Abaza is 1700 miles.

(EÇ) 4/325a The sâ' is 1040 dirhem. The mud is 520 dirhems. The menn is 260 dirhem. The ratl is 130 dirhem. The istâkl is 600 dirhem. The dirhem is 32 barley grains in weight. The miskâl is 100 barley grains in weight. The kırat is five barley grains in weight. The dânk is 1/---3. The fersah is 12,000 strides. The mile is four thousand strides.

(EÇ) 7/108 And this land of the Crimea is a triangular peninsular of 770 miles on the shore of the Black Sea, and on the right hand to the west is a lagoon, a shallow body of water formed by the sea.

(EÇ) 9/256 'And these islands and this island where we reside is a quarter of the land, or 87,000 miles'. So they certainly write in accordance with the science of geometry and astronomy. But in terms of the zirâ-i esved that they call mile it is four thousand zirâ, and every zirâ is 24 parmak. In his *Cerîde*, İbn(î)-verdî said that 'According to Ptolemy the circumference of the world is 24,000 miles. That is 80,000 fersah [furlongs]. And every mile is 3000 zirâ in Meccan zirâ. And each zirâ'-i mezbûr is 3 şibir. And each şibir is 12 ısba and 5 şâ'ir, the amount of its width.' Thus they write the exact calculation of the mile down to every karat in the land registry of Rhodes, and all the islands are described and written according to this calculation. At one time I rode about these islands and wrote of them to the best of my ability, recording the calculations in miles that I obtained from this registry.

Miligram Milligram.

(ML) Unit of weight equivalent to one part in a thousand of a gram.

Mililitre Millilitre.

(ML) Unit of volume equivalent to one part in a thousand of a litre.

Milimetre Millimetre.

(ML) Unit of length equivalent to one part in a thousand of a metre.

(T.2) = 0.001 metre.

Milimikron Millimicron.

(ML) Unit of length equivalent to one part in a thousand of a micron.

Milva (WH) An Egyptian unit of volume equivalent to 2 kadeh, today 4.125 litres.

Mimar arşını see Zirâ'-ı Mimarî

Mina (Greek) = 436.6 g

(Hult) = 100 drachmas = 435.6 g

Minare boyu Height of a minaret.

(TDK) Term used to describe a height of between 10 and 20 metres.

(ML) An approximate height varying from 20 to 30 m.

(EÇ) 2/290a This well-knows place is the beginning of Pasin Plain. But in the winter season in this place known as Deveboynu there is snow the height of a minaret, and many people lose their lives in avalanches

(EÇ) 5/133a The River Pileve passes through Gölhisar and the mountains of the town of Varçal Vakfi to the foot of Yayiçse Castle, where the River Pileve plunges from a cliff the height of five minarets to mingle with the River Virbaz. No wonder who has not see in this place has seen anything in the misshapen-faced world.

(EÇ) 6/165a But in truth it is necessary to build an arched bridge over the rocks at this place, because on both sides the cliffs rise to the summit of the sky and the River Neretva flowing the height of a minaret below is such a broad and great river, that it was by necessity that the great architect Sinan constructed such a magnificent arched bridge. The travellers of the world have not seen such a great arch.

(EÇ) 8/232a Below there on the edge of the town, beneath the cliffs which reach to the summit of the sky, waters the breadth of three minarets of Süleymaniye leap in cascades such that it is an amazing sight, and from the thunderbolts of the flowing springs one's ears roar like thunder and the tributary of all these waters mingle with the River Vardar.

Miryametre (T.2) = 10,000 metres.

Miskal (MLT) Unit of weight formerly used by the Turks. = 4.5 g

(OS) A unit of weight that has varied in value over time and place, equivalent to 24 kırat (about 4.5 g, 1 kırat being the weight of 5 average barley grains, or 1/14 of a dirhem), used for weighing gold or pearls.

(ML) A unit of measurement equivalent to 1/3 dirhem (4.5 g). Used for measuring precious metals and pharmaceutical substances.

(HI) (Mediaeval Islamic) 4.233 g.

(Ottoman, standard) = 1.5 dirhem = 24 kırat = 4.81 g.

(T.2) = 24 kırat = 96 şa'ir = 6 dang = 6000 mustard grains = 1.5 dirhem = 4.81104 g.

(WH) Under Islamic canonical law the ratio of the dirhem to the miskal was 7/10, which in practice was 2/3.

In Egypt the miskal (24 kırat of 0.195 g) was 4.68 g or 72.222 habbe (see el-Makrizi, JA i IV, 1884, p 277). This was exactly one part in 72 of the ancient Egyptian and Roman measure. Officially it is still taken to be 4.68 g (MSOS, Westasiat, S. ud. 1925, 25). According to ez-Zehebî in the mid-19th century 20 Egyptian miskal were = 221 Islamic miskal (JA 9 IV, p 280). He writes (JRAS New Series XIV 1882, p 276) that 128 Egyptian kırat were 25 g. This would make 1 karat to be 0.195 g and one miskal (= 24 kırât) to be 4.68 g. Further confirmation is provided (see K. A. C. Creswell's study of the Nil unit of measure in *Early Muslim Architecture*, Bd. II, Oxford 1940, p 290 and William Popper's extensive study in *The Cairo Nilometer*, Berkeley, Los Angeles 1951, p 105, in which this measure is calculated at 53.9-54.1 cm; and compare the appendices and corrections in D. Müller-Wodarg's *Der İslam* (31), Berlin 1954, pp 189-199) by the 54.04 cm long black Nile rule on the island of ar-Ravdaz, of which 2/3 = 36.033 cm = 1 ayak. When we cube this we find 46,984 cm = 10,000 miskal, which shows that the Egyptian miskal was 4.68 g.

With respect to Syria, we have the information provided by the 12th century writer eş-Şîrâzi, according to whom 1 miskal = 1 5/12 dirhem = 24 kırat = 85 habbe. If we calculate the dirhem at the standard value of 3.125 g, we find that the Syrian miskal was 4.427 g. However, it is more likely that this was equivalent to the şer'î miskal of 4.46 g. In that case we can calculate the value of the Syrian dirhem to be 3.14 g. In the 19th century the dirhem weight used in Aleppo is said to have been 3.167 g (L. C. Bleibtreu, *Handbuch der Münz*, Mass-u. Gewichtskunde, Stuttgart 1863, p 29). On the subject of weights used in Damascus we have more specific data. Here the value of the miskal was slightly less than that of Egypt. 100 Damascus miskal were equivalent to 983/4 Egyptian miskal, which would make one Damascus miskal to be 4.62 g. Since 600 Damascus dirhem make only 592 1/2 Egyptian dirhem, then the Damascus dirhem would have been 3.086 g, which is approximately equal to the value of 3.0898 g given by H. Sauvaire.

With respect to Iraq we have the observations of the English traveller J. Fryer, who came here in 1675. He says that in Basra one miscal was 12 valls and 1/2 a ruttee, or 12 1/6 of an Indian wal'i. The same author says that 85 wal = 1 oz Troy weight, which is equivalent to 31.104 g, making the Iraqi miskal 4.452 g. W. Barrett confirms this information, saying that in 1584 100 Basra miskal were 17.5 oz. Since a light Venetian oz was 25.1 g, the Basra miskal would have been 4.4 g. We have already established the weight of the dirhem according to this miskal, so we can conclude that the standard value for Iraq was 3.125 g.

(EÇ) 1/32b And five miskal each of pure water from other springs is weighed with cotton wool, and then this cotton wool is tossed into the water and allowed to soak it up. This cotton wool is after dried in the fiery rays of the sun and then weighed again. Since the cotton wool soaked in the water of the Şem'ûn Spring was found to be lighter than all the others, it was agreed that this water was purer than all the others, and Sultan Muhammad the Conqueror always drank of this water.

(EÇ) 1/188a Boron is a white mineral like a kind of lime which is found in Persia and in Canca, that is Gümüşhane in Erzurum. It is formed into conical moulds like the sugar loaves of Egypt, and brought to Istanbul where they pay one şâhîye per miskal. It is a wonderful mineral, but in Buda and the infidel lands of Germany and Sweden I have seen them form boron into rush cones.

(EÇ) 1/191a they come to the royal bazaar and purchase one miskal of musk from Hoten, then divide the grains of one load of pomegranates and let them lie together for one night, and in the morning it is ready

(EÇ) 3/153a Koca Murâd considered not the expenses entailed and to each craftsmen presented many gifts, and when all the stone and wood and other materials for this mosque were calculated, they said that each miskal of its stone had cost one gold coin.

(EÇ) 4/325a A miskal is the weight of 100 barley grains.

(EÇ) 4/405a And one miskal consumed every morning rids the body of bile and spleen and phlegm and the other humours, and of worms in the abdomen.

(EÇ) 8/277b Apart from water everything one could wish for is to be found in this city, but yet there is no water. Since water is found only by the miskal there are no fountains, nor sebillianes nor hamams in this city.

(EÇ) 8/341a And these fish eggs they cover with yellow bees wax and sell throughout the land of the Franks at a gold piece for

the miskal. And each egg weighs 50 dirhem.

(EÇ) 10/273 Every snake is sufficient only for one miskal of incense tablets. None of its cooked organs are appreciated, and these are discarded.

(EÇ) 10/413 And one danik [dang] is the weight of 10 barley grains. And 4 danik is one dirhem.And one dirhem is 40 plump barley grains. And one miskal is 100 hınta.

(EÇ) 10/419 But this gold is so fragrant that it might be yellow musk, and it is all reddish in colour. And each one is a ball of fully one miskal. Each miskal is 100 hınta in weight. And 100 gold pieces are cut so as to weigh exactly 1⅙ dirhem.

(EÇ) 10/590 To the holy mausoleum of Seyyid Ahmed[ü']l-Bedevî he presented two green turban cloths and two batman of aloe and 50 miskal of raw ambergris and one small silk rug and one silk prayer rug and two camphor wax candles such that each candle was the size of a man and weighed 100 batman .

Mişâr (ML) One tenth.

(OS) 1. A tenth of a tenth.

2. A thousandth part of the unit of measurements such as the dirhem.

Mişâr-ı dirhem: One in a thousand parts of the decimal dirhem or gram. = 0.1 g.

Mişâr-ı zirâ': One in 1000 parts of the decimal zirâ or metre. = 0.001 m.

Mişka (WH) This unit of volume is only known to have been used in Mesopotamia. It was 1/64 of a Diyar Rebi'a mekkuk and consisted of 39.5 dirhem of wine. Thus it was exactly 117.19 cm³. This unit of measure was equivalent to 33 3/4 of olive oil or 105.49 g, and 50 5/8 of honey or 158.2 g.

Miyar (ML) A measure of fineness used for precious metals to indicate the weight and degree of purity by law.

(OS) Measure. Something indicating the value and quality of a substance.

Mizan (ML) Balance, scales, measuring instrument.

Mizane (HI) (from the Italian mezzane) = 0.5 karatil.

Mna see Mina

Modios (HI) (Byzantine, Gallipoli) = 583.17 m.

Moggio (HI) (for wheat in Venice) = 4 staio = 333.2 litres.

More (PGI) A measure of 15 okka used for wine in Armenia.

Moz (HI) (Albania) = 160 okka = 205.280 kg.

Mozo (MZP) The name of a unit of weight. In a document in the Ottoman Archive (Saray, tarihi, 2 Z 1210, sıra numarası 2338) it writes, 'To each of ninety trains of camels belonging to the First Imperial Stables on the pastures of Edirne and Hayrabolu should be given one mozo of salt by the superintendent of the İnoz Salt Works.' From this we can conclude that the mozo was used in the 19th century.

Mudd see Müdd

Mudy (ISAM) A unit of volume used in Damascus and Egypt. It is not the same as the müdd and is equivalent to 15 mekkuk. One mudy is 61.875 litres.

(OS) A measure used by the people of Damascus equivalent to 15 kile.

Mukayese Comparison.

(OS) Comparing one thing to another.

Mut see Müdd

Muzaraa (OS) To sell by the arşın.

Muzur (HI) (salt, Salonica, 1478) = 45 okka = 57.726 kg.

(rice, Silister) = 150 okka = 192.42 kg.

(Albania, 1583) = 32 okka = 41.049 kg.

(salt, Ahyolu) = 90 okka = 115.452 kg.

Müdd (ML) Grain measure used by the Ottomans in Syria and Egypt, and in some provinces of Anatolia. Its value varied according to the place. The Kütahya müdd was 20 kile, the Diyarbakır müdd was 16 kile, and the Siverek müdd was 8 kile.

(HI) (standard) = 20 kile = 1000 kase = 100,000 habbe = 513.16 kg.

(MZP) The name of a unit of weight. *Lehçe-i Osmani* defines it as 'müdre, karamut, a type of batman.' It was used until recent times for weighing olives in Midilli [Mytilene]. In *Tacü't-Tevarih* (vol 1, p 189) it is called the Kütahya müdd. Like the batman its value varied from place to place. In Kütahya 1 müdd was 20 Istanbul kile, in Diyarbakır 16 Istanbul kile, and in Siverek 8 Istanbul kile.

This term is defined in *Türk Lugati* as 'a measure used for foodstuffs. According to the people of the Hejaz it was equivalent to one and one third of a rıtl. In Iraq it was taken to be two rıtl.'

(WH) The canonical müdd (particularly in Medina) used in the early years of Islam was 1/4 şâ.

According to Ebu Hanife the müdd was 2 Baghdad rıtl.

According to Ebu Yusuf it was 1 1/3 rıtl.

The rıtl mentioned by Ebu Yusuf must have been the Medina rıtl, because both are equivalent to 812.5 g of wheat. Since 77 kg of wheat is equivalent to 100 litres, then we can deduce the canonical müdd to have been 1.05 litres.

Since we know that a normal weighing vessel dated 1195 used for measuring contained 1/4 şâ' = 337 dirhem of water, the above value is confirmed by the fact that here the value of 1 müdd is found to be 1.053 litres.

In medieval Anatolia there were many different müdd used as units of volume.

The information given by el-Ömeri in 1330 compares the müdd with the Egyptian irdabb, which was equivalent approximately to 69.5 kg of wheat or 90 litres.

According to this, the müdd as used in Kastamonu, Konya, İznik, Manisa, Antalya and Karahisar was identical in value to the irdabb.

In Denizli it was 3/4 irdabb (approximately 67.5 litres), and in Kütahya and Bursa 11/4 irdabb (approximately 112.5 litres).

In 1518 the müdd of Anatolia is recorded more reliably.

At that time in Mardin 8 Istanbul kile was 100 müdd. That is, 1 müdd was equivalent to 2.052 kg of wheat or 2.66 litres.

In Harput 1 müdd = 8 Istanbul kile, which was equivalent to 205.25 kg by weight or 266.7 litres.

More important was the Anatolian müdd, or as it was later called, the Ottoman imperial müdd.

In 1335, Pegolotti recorded that in the region of southern Anatolia facing Cyprus, 1 moggio (müdd) of grain was equivalent to 20 ghille (kile).

The Register of Kitchen Stores for the year 1474 during the reign of Mehmed II specifies that 1 müdd was officially equal to 20 kile, that is 513.12 kg of wheat, and approximately 445 kg of barley, or to a volume of 666.4 litres.

(EÇ) 4/325a The sâ' is 1040 dirhem, and the müdd is 520 dirhem.

Müdlük (HI) The amount of land required to sow one mud of seed, or according to the fertility of the land, one sixth, one ninth or one twelfth of a çiftlik [farm].

Müzy see Mudy

Nakır (ML) A plank or stone with a hollow carved in it. The small hollow in a date stone. A small trivial thing. A synonym of kıtmir. Nakir ü kıtmir.

(MZP) The name of one of the fractions of a miskal. *Kamus-ı Osmanî* defines nekir as 'The small groove in a date stone, also meaning a negligible thing. kıtmir meaning the thin membrane attached to that stone.'

(EÇ) 5/57a At Niğbolu seven of the infidels started to talk but spoke mere trivialities [nakîr ü kıtmîr]

(EÇ) 6/44b In the garden of the school they wrote mere trivialities [nakîr ü kıtmîr] for me and then boarded the boat again

Naşş (WH) A former Arabic unit of measurement used mainly in Mecca. It was equivalent to half a ukiyye (62.5 g) or 20 dirhem.

(ISAM) A unit of measurement used particularly in Mecca. It was half an okiyye or 20 şer'î dirhem. 59.5 g.

Nâzz (OS) Dirhems and dinars.

Nekir (ML) A unit of weight used in Ottoman times, one of the fractions of a miskal. One fourth of a miskal was a denk, one fourth of a deng a kırat, one fourth of a kırat a buğday, one fourth of a buğday a fitil, and one fourth of a fitil a nekir.

(ISAM) A very small unit of weight, equivalent to half a fetil. = 0.0025 g.

(WH) A small negligible unit of weight, six of which made one fetîl. Therefore theoretically 1 nekîr was one part in 2592 of a 0.045 g cev'.

Nevâ (WH) An Arabic unit of weight of 5 dirhem.

Neytal (OS) A measure of a beverage.

Nisab (OS) 1. A measure of alms, amount.

2. The amount of property for which alms should be given.

3. Fundamental, basic. Capital goods. Degree, limit.

4. In canonical jurisprudence a nisab of gold was 20 miskal; of silver 200 dirhem (that is 600 g); of sheep and goats 40 in number; of cattle and buffalo 30 in number; and of camels 5 in number.

Nisbi (OS) (Nisbiye). That which is compared. Proportional to another, or a previous one. What is compared to others. By proportion, proportionally.

Nişan (MZP) The name of a fraction of the dönüm. If each side of a dönüm consisting of a square whose sides measure 40 arşın, is divided into ten and then into ten again, each of these parts was called nişan.

Nohud Chickpea.

(WH) This Iranian unit of weight was 1/24 miskal.

This weight, which was used until the 15th century, was equivalent to 0.18 g, and later (until 1935) equivalent to 0.195 g.

(EÇ) 5/133b They related that the deceased possessed knowledge of chemistry and would eat and drink nothing in 24 hours but swallow ten grains [habbe] of gold the size of chickpeas, never eating bread or water. Therefore since he died of perfect asceticism his reverend corpse did not rot.

(EÇ) 8/378a And for dysentry he who takes a dose of this alum the size of two chickpeas on an empty stomach, his diarrhoea is staunched as if at God's command, but take it not to excess, because it damages the heart, although it destroys all worms in the heart.

Nomisma (Byzantine) = 24 carats = 4.53 g

Nügi (WH) A unit of weight used in Anatolia in the middle ages. In Mardin in 1518 1 nügi was 200 dirhem = 641.4 g or 78 dirhem = 250.1 g. There was therefore a difference in value in the same city at the same time. In Çermik on the other hand 1 nügi at that period was 200 dirhem = 6 and 41.4 g (*Tarih Vesikaları*, I, pp 100,102,195.)

(HI) (silk) one part in 12 of a batman.

(standard) 72 miskal = 366.392 g.

(Mardin, Ergani, 1516) 200 dirhem = 641.4 g.

(silk, Erzincan, 1576) 160 dirhem = 513.120 g.

Obolus (Hult) = 2 hemiobols = 8 chalkoi = 0.728 g.

(Roman) = 3 siliquae = 1 dimidium scripulum = 0.568 g.

Ogdoon (Greek) = 54.57 g.

Oguyı (PGI) A 60 dirhem weight used in Haley.

Ok atımı Bowshot.

(Old Testament) = 400 arşın = 178 m.

Okka (TDK) A unit of weight equivalent to 1283 g. 400 dirhem made an okka. Kıyye.

(ML) A former unit of weight equivalent to 400 dirhem and 1283 g.

(OS) A former unit of weight. Also known as okiyye, vakiyye, vukiyye, kıyye, kıyye-i atika. Approximately 400 dirhem. At the present time 1282 g.

Kıyye-i âşârî: Kilogram. A unit of weight of 100 g

(HI) (standard) = 4 ratl rûmî = 400 dirhem = 1.2822945 kg.

(heavy okka used in Mesopotamia) = 3.210 kg

(Egypt, Jiddah, 19th century) = 1.050 kg.

(Albania) = 1.412 kg.

(MZP) A canonical term used for 40 dirhem. In

vernacular use the unit of weight called okka or kiyye varied from town to town, the most common being 400 dirhem.

(PGI) 400 dirhem. The Van okka was 460 or 470 dirhem in Istanbul, the Bayezid and Hoy okka were 700 dirhem, and the Basra okka was 550 dirhem. In other words 100 Basra okka made 142 Istanbul okka .

(T.1) = 400 dirhem = 1 . 282945 kg.

(T.2) (old) = 1.282945 new okka

(T.2) (new) = 1000 dirhem = 0.779457 old okka

(ZK) A unit of weight of 400 dirhem or 1283 g. In Malatya an okka was a grain measure of 1 kg and 200 g, and known as the hokka. There half a hokka was 600 g.

A unit of weight of approximately 1300 g, kıyye (Ör. Türkçe Sz. p 1682). In Uşak the term okka had a metaphorical meaning. On this subject Haşim Tümer says, 'This word is not only used of a unit of weight, but has a metaphorical meaning. It meant a mature excellent person. Of a perfect person without any deficiency it was said that he was 'a full okka, 400 dirhem man' (*Uşak Tarihi*, p. 243).

(EÇ) 1/182b So they make rockets of three layers each greater than the other which rise to the summit, but your humble servant in the time of his youth, when enjoying himself with his friends, made a rocket for Customs Superintendent Ali Ağa that had seven layers, in which a pine pole was hollowed out and into one end of the great rocket were placed seventeen okka of gunpowder, and on the top of the seven rockets was attached a great parchment cone, and at the base of the pine pole were attached eagle pinions, and fired it on the sea at the celebrations of the birth of Kaya Sultan.

(EÇ) 1/32b To this day all the sultans drink this pure water brought every day by three men each provided by the chief cellarer and the chief water carrier. They fill silver güğüms each weighing 20 vakiyye to the brim and load them onto three pack horses each. In the presence of the superintendent of water trusted men of the chief cellarer seal the mouths of the güğüms with red beeswax and bring to the sultan whenever he desires.

(EÇ) 1/60a over the royal gallery are six emerald lamps sent as gifts by the vezir of Ethiopia Ca'fer Paşa that they have made into a chandelier with jewelled gold chains over a seal of Solomon, and each lamp weighs six vakiyye and is the size of a circular bowl, and in each are green lamps enamelled in gold and with jewelled gold feet.

(EÇ) 1/75a And at the stern and stern of each are fifty balyemez cannon which shoot iron cannon balls each weighing 40 vakiyye

(EÇ) 1/89a Colloquially it is called Şeftâlü [Peach] Mosque. Because a peach tree sprouted outside the mihrab wall the year it was built, and it is a great tree which produces peaches, four of which weigh one vakiyye.

(EÇ) 1/146b And each cow has a name, and each gives 40 *or* 50 vakiyye of milk.

(EÇ) 1/166b All of them are fully armed, and their many hundreds of shops upon floats and litters are decorated with magnificent fabrics and diverse flowers, and they skin well fattened and enormous Karaman and Türkman sheep and Osmancık sheep from Muhalıc and Bursa, and Kili sheep from the Black Sea weighing forty or fifty vakiyye.

(EÇ) 1/168a If one vakiyye of meat in Istanbul is sold for one kuruş, they give three akçe for one vakiyye of meat, and each month they receive payment from each chamber and obtain the difference from the Minister of Finance.

(EÇ) 1/175b One vakiyye of coffee is sold for three akçe and two akçe are paid to the superintendent

(EÇ) 1/176b After them the Powder Factory Superintendent with his officers and sergeants and engineers and men carrying mortars weighing 10 vakiyye each on their shoulders march past in line

(EÇ) 1/180b Sour pomegranates grow in the garden of a woman near to Avretbâzarı that by the grace of God each weigh one and a half vakiyye, and it is not possible to purchase one as a gift of the sultan for a copper less than two gold pieces. Each grain weighing a dirhem is like a Badakhshan ruby. If a sick person eats one grain they find eternal life immediately. And in Sağlün Orchard grow large juicy figs like skins of rosewater such that four make one vakiyye.

(EÇ) 2/230b The trout here each weigh one or two vakiyye.

(EÇ) 2/238b On every side the mausoleum is adorned with many hundreds of gold and silver torches and jewelled lamps and candlesticks ornamented with pure gold each weighing forty and fifty vakiyye, and torch holders and censers and rosewater sprinklers, such that it is a luminous dervish convent.

(EÇ) 2/283b The orchards and gardens adorn the world with their foodstuffs and praiseworthy ingredients for drinks, and a sour pomegranate weighing one vakiyye and 500 dirhem grows here, each grain of which is the size of a cornelian cherry.

(EÇ) 3/76a Description of its cereal crops: Wheat and barley and chickpeas and lentils grow in abundance. One kile yields 40 kile. One vakiyye of bread costs 1 akçe and 6 vakiyye of horse feed costs 1 akçe.

(EÇ) 3/112b Ten melons cost 1 penez. Each melon weighs 10 vakiyye. The penez is a coin of silver and copper inscribed in the writing of the Wallachian infidels. This copper coin is used in the market towns and cities along the Danube, but not accepted in any other cities. And 10 water melons cost 1 penez and 1 vakiyye of bread costs 1 penez and 1 vakiyye of meat costs 1 penez and 1 tin of honey costs 4 penez and 1 vakiyye of butter costs 10 penez. The cost of every other commodity can be compared.

(EÇ) 7/141b And 1 vakiyye each of white bread and fat meat costs 1 akçe. And one and a half vakiyye of beef and camel meat costs 1 akçe. But a vakiyye of horse meat costs two akçes.

(EÇ) 6/31a Ten dirhem of bread rose to 1 akçe and 1 (—) of feed to 1 kuruş and 1 vakiyye of biscuit to 1 gold piece and 1 kiyye of coffee to 1000 akçes and 1 vakiyye of tobacco to 10 kuruş.

Omer (Old Testament) = 3.70 litres

Onghion (HI) (Epirus) = 11 dirhem = 35.277 g

Onki (HI) (Serbia) = 6 miskal = 28.863 g.

Ons (ML) 1. One twelfth of any unit of measurement used by the Romans.

2. One twelfth of a Roman libre, that is 27.288 g.

3. One sixteenth of the former Paris libre, that is 30.594 g.

4. A former unit of weight whose value varied in different countries in between 24 and 33 g. The ons is sometimes mistakenly confused with the English ounce.

5. A unit of measurement for water flow set by the Roman authorities at 285 litres per minute.

Oran (OS) Ratio, proportion.

Ounce (ML) In the English avoirdupois system of weighs a sixteenth part of a pound, or approximately 28.349 g.

(ODB) (Gk. Ounqia, Lat. Uncia) Unit of weight equal to 1 twelfth of a litra. If 1 logarike litra is 320 g, then 1 ounce is approximately 26.7 g.

Öbek (OŞG) Pile, cluster.

(EÇ) 1/31a The buried treasure that Muhammed revealed in Haghia Sophia was piled like mountains in mounds and heaps [öbek öbek].

Ölçek (ML) 1. Container used for measuring grain.

2. A unit of weight equivalent to a quarter of a kile (average 25 kg), or 4 okka.

3. A quantity equivalent to a specific measure: Two measures of barley.

(MZP) The name of a unit of weight, equivalent to one fourth of a kile.

(OŞG) A fourth of a kile, şinik; small kile; one ölçek of chickpeas; half an ölçek was one kutu, two okka.

(T.2) = 1 litre (the basic unit for measuring liquids and grain, equivalent to the cubic decimetre, and a vessel containing exactly 1 kg of water.)

= 10 kutu

(Old Testament) = 6 kab = 13 litres

(ZK) One ölçek is two teneke. For wheat a unit of measure equivalent to 32 kg.

One measure of chickpeas is equivalent to one and a half measures of wheat. (Sivaslı, Karaboyalık).

Uşak Halk Takvimi, p 74. In Malatya an ölçek is a grain measure of half a girat (7.5 kg).

Ölçü Amount, size, measurement, unit of measure.

(ML) 1. The amount of something calculated in any unit, or by comparison with the same amount of the same substance.

2. A unit used for such a calculation.

3. The quantity calculated as a result of measuring.

4. An instrument used for measuring length.

5. A specific size.

Ölçü birimleri (Units of measurement): Amounts accepted as terms of comparison for calculating length, weight, time and so on.

(OS) 1. Evaluating a quality or quantity as a proportion of a specific unit agreed upon, measure.

2. Any device used for measuring.

3. The actual size of an object.

Ölkü (OŞG) Balances, scales and steelyards used for measuring, and measuring units.

Öşr-i dirhem (T.2) Tenth of a dirhem.

= 10 g.

Öşr-i zirâ' (T.2) Tenth of a zirâ'.

= 0.5 m

Övendere Goad.

(ZK) Stick with a pointed end used for spurring on animals, üvendire.

This stick was used as a measuring rod: 12 övendere long.

Pad-mân (HI) (Pehlevi) see Batman.

Paket Packet, package.

(OŞG) 1. An object that has been wrapped and tied up for carrying by hand or sending.

2. A container, usually made of cardboard, in which a certain number or quantity of things are placed: A packet of tea, a packet of cigarettes.

Palma Palm.

(HRD) 4 palma = 1 ayak, 6 palma = 1 dirsek

Parasang Furlong.

(HRD) Iranian unit of measurement equivalent to 30 stad, that is 5.328 km.

Parmak Finger, toe.

(TDK) 1. Each of the fairly long jointed members that form the end part of the hands and feet of human beings and some animals.

2. One twelfth of the English foot, inch, pus, equivalent to 25.4 mm.

3. One part in 24 of a zira and arşın, approximately 3 cm.

4. The amount of a thick liquid which adheres to the finger when dipped into it.

(ML) 1. English unit of length, one twelfth part of a kadem, inch = 25.4 mm.

2. One part in 24 of an arşın.

3. A former unit of length equivalent to 18-19 mm used by the Egyptians, Greeks and Romans in particular.

(MLT) A unit of length formerly used by the Turks. = 2.16 cm.

(OŞG) 1. One twelfth of the length of the arm.

2. One twelfth of a kadem.

3. Approximately 3 cm.

4. 1/24 of an arşın.

5. 1/10 of an arşın in the metric system.

6. The amount taken with the finger: A finger of honey.

Parmak tutamı: The amount that can be held by two fingers.

(MZP) The name of a unit of length equivalent to 1/24 of an arşın. The Arabic is usbu. It is equivalent to the first section of the thumb.

The reason for the arşın being divided into the 24 parts or parmak is that in canonical matters things were usually divided into 6, 12 or 24 parts. By the year 994 H (1585-86) this was known as boğum. A parmak was the width of the index finger nearest to the nail when laid flat.

One boğum made 2.5 parmak.

One parmak was divided into 12 parts known as iplik or hat. The parmak was a fraction of the ayak until the introduction of the metric system.

Twelve hat made one parmak, and 12 parmak made one ayak.

1/16 part of an ayak, 0.0185 m.

12 hat = 3.15 cm.

A unit of measure equivalent to the width of a finger.

(EÇ) 7/66b It has large ears and a nose a span in length like a broken half akçe board or a large ğod nose the size of a Morea aubergine, and the nostrils are large enough for three fingers to fit inside, and from inside the nostrils emerge moustaches like those of a 30-year-old man, and his black moustache reaches to his ears

(EÇ) 7/66b And he is constantly combing his waving hair with a comb and his fingers [parmak] are the size of Lanka cucumbers.

(EÇ) 9/256 'And these islands and this island where we reside in a quarter of the land, or 87,000 miles'. So they certainly write in accordance with the science of geometry and astronomy. But in terms of the zirâ-i esved that they call mile is four thousand zirâ, and every zirâ is 24 parmak.

(EÇ) 10/478 They sow the seed at night and by the grace of God it has grown two parmak by the morning. The third day it is possible to graze animals.

(EÇ) 10/489 And they cover these eggs with two parmak of manure and dash the inside of the oven in this way with eggs, then light a gentle fire beneath. But still they burn dung not wood.

Parseng (OS) The weight placed in the pan of a balance to make both sides equal.

Pastal see Pastav

Pastav (ML) Bolt of broadcloth with gilded selvages. The wholesale regulations for Istanbul and Galata specified that each bolt should be 50 arşın (approximately 34 m) in length. Colloquially known as pastal or postal.

(OŞG) 1. A bolt of broadcloth with gilded selvages.

2. A bolt of very fine woollen cloth, or other kinds of woollen cloth.

3. Bolt of fabric.

(HI) (standard) = 50 arşın = 32.5 m

(Akkerman in 1500) = 21 arşın = 13.65 m

(EÇ) 5/148a The following day they brought out through a gate of the castle of Şibenik five purses and 20 bolts [pastav] of coarse woollen broadcloth and 3000 Venetian gold pieces as gifts

(EÇ) 5/150b as gifts to the Paşa they presented rifles and 20 bolts of dibâ [brocade] and seven bolts of coarse woollen broadcloth in diverse colours, and to ten men who had been delivered from captivity they gave each a horse and length of broadcloth for trousers

(EÇ) 5/163a They gave European velvet and 10 pairs of wheel-lock pistols with gold inlaid holsters and 10 bolts [pastav] of coarse woollen twill in various colours and 50 pairs of a type of patterned German tapestry whose diverse designs were as magical as a chameleon and which are found nowhere else.

(EÇ) 7/39a From Ahmed Ağa, the janissary commander of the place, two purses and one slave and two horses and five rifles and one bolt [pastav] of broadcloth and five lengths of satin for trousers

Pay Share.

(TDK) 1. The part, share or division falling to each one of several people who divide a whole between them.

Payvasik (Byzantine) = 50 litres = 16.320 kg

Pele (ML) Balance pan.

Pentadrachmon (Greek) = 21.83 g.

Peymane (WH) An Iranian unit of measure used for wine, vinegar, clarified mutton fat and similar substances. In the year 1300 Gazan Han set standards of measure such that 10 Tabriz menn always equalled 8.3 kg. In other words vessels with a capacity of 1 peymane were of different sizes depending on the substance they were used to measure.

Pinter (OŞG) Half a şinik; lesser şinik.

Pitemi see Bitemi

Plethron (HRD) 100 ayak

Polovaç (HI) = 0.5 kabal

Poluknice (HI) (grain, Serbia) = 12 okka = 15.393 kg.

Pondera (ODB) Unit of weight used for commercial goods.

Postal see Pastav

Pot (PGI) Unit of weight equivalent to 1000 dirhem used for raw and spun silk.

Pound (ML) In Turkish this measure is known as libre. It is a basic unit of mass, from which its fractions and multiples, with their very complex ratios, are derived. The Imperial Standard Pound is made of platinum and weighs 0.453 kg.

Pranga Fetters.

(OS) 1. Thick chains attached to the legs of prisoners in the past.

2. The name of an iron weight weighing 2 okka and 100 dirhem together with its ring handles.

(EÇ) 8/296b Beating their drums 20,000 armed and decorated soldiers in formation and 10,000 prisoners of war chained in fetters [pranga], each with a red flag in their hands and hoes and picks at their waists marched past.

(EÇ) 8/306a And in one corner are two times one hundred thousand and sixty thousand cannon poles and cannonballs large and small, and three times 100,500 iron cannonballs and 60,000 stone cannonballs and 70,000 calthrops all of iron and 100,000 iron cannon makas [type of shot] and 40,000 billme gülle [type of shot] and 40,000 fetter [pranga] shot and 150,000 chain shot and 100,000 naphtha shot and 40,000 skins of naphtha and tar and 70,000 chain torches and a stock of flambeaux with several wicks

Pşit (Byzantine) = 3 barley grains = 0.14 grams.

Put (OŞG) 1. A can of wheat or oil.

2. Three or four ply wire thread spun by tradesmen.

Püskü (OŞG) Pinch, the amount that can be held between the tips of two fingers.

Quadrans

(Roman) = 3 unciae = 81.860 grams.

Quincunx (Roman) = 5 unciae = 136.440 grams.

Ratıl

see Rıtl

Ratl see Rıtl

Reba' (OS) Length.

Rey (WH) When this measure first appeared it was known as the Rey (Rhages) menn. South of Tehran today, however, it is known for short as rey. It is equivalent to 4 large menn = 12 kg (until 1953 it was generally taken to be 11.88 kg).

Rezme (ISAM) A unit of weight used particularly for iron. = 24.3 kg.

Rıtl (HI) An obsolete liquid measure.

(standard) = 12 okiya = 333.6 g.

(Istanbul, 18th century) 876 dirhem = 2.809 kg.

(Jiddah, 19th century) = 113 dirhem = 360 grams.

(Mesopotamia, 19th century) = 1 okka = 1.283 g.

(Syria, 19th century) = 2 or 2.5 okka = 2.564 kg or 3.205 kg.

(Sivas) = 1440 dirhem = 4.618 kg.

(Ahlat and Nizip, 11th century) = 300 dirhem = 962.1 g.

(standard, the lidre or litre of the Arab countries) = 12 okiya = 337.55 grams.

(Andalusia) = 453.3 g.

(spices, North Africa, 11th-12th centuries) = 140 dirhem = 437.5 grams.

(silk, Aleppo, 17th century) = 700 dirhem = 2.217 kg.

(Syria) = 600 dirhem = 1.850 kg.

Rıtl folfoli: (spices, Egypt) = 144 dirhem = 450 grams.

Rıtl kebir: (Egypt) = 160 dirhem = 500 grams.

Rıtl-ı rûmî: (Anatolia) = 100 dirhem = 320.7 grams.

Rıtl-ı zâhiri: (Syria) = 480 dirhem = 1.5 kg.

(ISAM) The equivalent of the Greek litron. In medieval Europe it was known as rottola. This word meaning a large cup or goblet was used as a unit of volume and weight.

a) As a unit of volume it varied in value from place to place. The Baghdad rıtl was 0.408 m.

b) As a unit of weight it was normally 130 dirhem. There were two types, the Şâmî and Baghdad rıtl.

Şâmî rıtl: 480 dirhem.

Bağdadî rıtl: 128 4/7 dirhem.

(ML) Large wine cup. A unit of measure equivalent to 130 dirhem of barley or wheat. 8 rıtl makes one sa.

(MLT) Unit of weight formerly used by the Turks. = 386.10 grams.

(MZP) Term used for a weight of 130 dirhem. According to the *Kamus*, there were two types of rıtl, the Şamî and the Bağdadî. The Şamî rıtl was 480 dirhem and the Bağdadî rıtl 128 and four sevenths dirhem. In some places this name is given to the amount of grain that can be held in the two cupped hands of a man of average size, and is approximately equivalent to 128 dirhem.

(PGI) Likewise it is used in Haley and is 12 oguyi or 720 dirhem. Around Baghdad and Basra the rıtl is 570 dirhem and in Egypt 144 dirhem. Therefore 100 Egyptian rıtl made 36 Istanbul okka.

(T.1) = 480 dirhem = 1539.5342 grams.

(WH) The rıtl rûmî is a measure of 337.55 grams, and may therefore be the equivalent of 72 Roman solidi/miskal. Since 1 dirhem by weight = 2/3 miskal, this dirhemü'l-keyl is calculated to be exactly 3.125 grams. A Fatimid period rıtl weight of 140 dirhem weighing 437.2067 grams that is in the Louvre confirms our conclusion that the dirhem is 3.123 grams.

This unit of weight may be pronounced as rıtl, rotl or ratl. In medieval Europe it was known as the rotolo or similar forms of the word. It derives from the Greek litron, and is the unit of weight most widely used in the Arab world. H. Sauvaire has prepared a list of rıtl values taken from 165 different documents, but instead of converting these at the value of 3.125 grams, has used the lower value of 3.0898 grams. Below I give the most common values of the rıtl. In principle 1 rıtl = 12 ukiyye (ons) = 1/100 kintar, therefore readers must refer to the sections under these headings. In the middle ages the rıtl-ı rumî was = 272 miskal = 102 6/7 dirhem, which was probably 321.428 grams. Among the many equivalents for the weight of the rıtl in Anatolia the most important are as follows: the Istanbul rıtl (in the 16th-17th centuries) was 876 dirhem, and if we take the dirhem to be 3.207 grams this would make 2.8 kg. In Urfa the rıtl was 2400 dirhem, or 7.697 kg. In Sivas the rıtl was 1440 dirhem = 4.618 kg. Pegolotti says that it existed in the 14th century, because according to him 1 Akkâ kintar, which we have calculated to be 220 kg, was equal to 47 Savastro rıtl, which would make 1 Sivas rıtl to be 4.68 kg.

In Ahlat and Nusabybin in the 11th century 1 rıtl = 300 dirhem. If the weight of the dirhem at that time was 3.207 grams, this rıtl would then be 962.1 grams.

(EÇ) 4/325a The sâ is 1040 dirhem. The müdd is 520 dirhem. The menn is 260 dirhem. The ratl is 130 dirhem.

Rottolo see Rıtl

Rub' see Rubu

Rubu (ML) A quarter. It was used together with the arşın for measuring fabric. Colloquially it was known as the urub or rub, and was also used as a grain measure.

(HI) One eighth of a çarşı arşın.

(WH) As a unit of volume 1 rub' (rub'a) in Egypt was equal to 1/4 kadeh. Today this is officially 0.516 litres.

In the early Islamic era one Hâşimî rub' in Iraq was 1 şâ or 4.2125 litres.

In Andalusia the unit of volume known as the rub' was equivalent to 18 rıtl, each 12 ukiyye (1 ukiyye = 8 miskat) for wine, or 8.16 litres. This is exactly half of the Spanish arroba for wine of 16.17 litres.

(PGI) In Egypt it was used for weighing rice. It is equivalent to 100 Egyptian batman or 3 Egyptian zenbil.

(OS) 1. Quarters.

2. One of the fractions of the çarşı arşın, which was used before the adoption of the metric system for measuring silk, woollen, cotton and other fabrics. Colloquially the rubu was pronounced urub. It was

1/8 of an arşın. 1/16 of an arşın was called kerah.

Ruzme This was a balya [bale] used particularly for silk, and equivalent to a weight of 30 menn or 7800 dirhem = 24.3 kg.

Sâ' (ML) A type of grain measure which had various values in the Islamic countries. In Iraq one sa was 1040 dirhem, and in the Hejaz over 600 dirhem. Alms given in Ramazan were measured in this unit, which was equivalent to 520 dirhem of wheat or 1040 dirhem (3.5 kg) of barley.

(OS) A grain measure of 1040 dirhem. Kile.

(ISAM) A unit of volume that varied from region to region. The canonical sâ' was a volume of 4 müdd. According to the Hanefids it was 8 Baghdad rtl, but generally calculated at 5 1/3 Baghdad rtl. Since the Baghdad rtl was equivalent to 128 4/7 dirhem of wheat or barley, 1 sâ' can be calculated to be the volume of 685.7 dirhem of wheat or barley. Since the weight of water as a ratio of wheat is 100/79, 1 sâ' was equivalent to 867.9 dirhem of water. If one dirhem of water is taken to be 3.17 grams, than 1 sâ' = 2751 grams = 2.75 litres.

(MZP) The name of a unit of weight. A grain measure of 1040 dirhem. Kile. In Iraq 1 sâ' = 1040 dirhem. In the Hejaz it was slightly more than 600 dirhem.

For the giving of alms in Ramazan it was calculated at 520 dirhem of wheat or 1040 dirhem of barley.

(WH) The canonical sâ' is 4 müdd.

The exact calculation of this unit of measurement, which is very important for other Islamic units of volume, is made possible by data from the Ayyubid period.

According to a record for the year 1195 a measuring container of 1 müdd held 337 dirhem of water = 1.053125 kg/litre. This would make 1 sâ' to be 4.2125 litres.

If we calculate this measure in terms of wheat (1 hl = 77 kg) we arrive at a value of 3.24 kg. Islamic sources describe the sâ' sometimes as 5 1/3 rtl and sometimes as 8 rtl. It is my belief that the former value is that of the Medina sâ' and the latter that of Baghdad. These are all equivalent to 3.245 kg of wheat, giving the value calculated above of 4.2 litres.

(EÇ) 4/325a The sâ' is 1040 dirhem. The müdd is 520 dirhem.

Saat = 0.5685 new arşın.

Safra Ballast.

(TDK) 1. Weights placed in the bottom of ships and sea vessels of all sizes in order to keep them balanced and at the minimum draw.

2. Weights attached to the lower edge of some fishing nets to keep them below the surface of the water.

3. Weights used in balloons to enable the pilots to adjust the height by throwing them out as required.

(EÇ) 2/250b The third gate is Moloz Gate. In the Greek language moloz means small ballast stones. Since the beach at this spot consists entirely of pebbles, they call it the Moloz Gate. And in the Laz language moloz means buttresses constructed to support a wall that seems in danger of collapsing.

(EÇ) 3/125a Vessels still enter this harbour and lie within it, but malicious seamen have so often tipped their ballast stones into the harbour that it has filled up and is no longer safe. Yet if rulers wished the High Admiral could sail here with the imperial fleet and clear the harbour, and if they did not spill their ballast into the harbour, and if those that did so were hung from the yard arm it would be beneficial.

Sagu (DLT) Unit of measurement. Sagulamak means to measure.

Sagulamak (DLT) To measure using a unit of measurement.

Sahan Dish.

(OS) 1. Shallow dish made of copper, brass, ceramic etc used as a unit of measurement.

2. The amount contained by a sahan.

(EÇ) 1/133a It has a hall overlooking the sea capable of seating a thousand people, and its kitchen contains a thousand sahan and has skilled cooks

(EÇ) 1/145b In the cellars of the tekke are more than a thousand sahan and cooking pans and ladles and cauldrons and copper tableware, and friends if desired can stay as guests for five to ten nights passing the time pleasantly.

(EÇ) 3/108a And apart from these there are neighbourhood mosques. There is a medrese and an imaret where throughout the year in the early morning and early evening all travellers rich and poor, young and old as one are given a dish of soup and a loaf of bread each, and to each hearth is given a tallow candle and to each horse fodder, its bounty being abundant morning and night.

(EÇ) 5/116a At these times all the people of Belgrade give great feasts to one another in rooms heated by stoves. These feasts consist of 40 and 50 dishes of food and 10 different kinds of sweetmeats and cakes and 10 different kinds of conserves of fruit, and the people gather together in groups to amuse themselves and drink together.

Sahfa (WH) A unit of volume used in the Maghrib. In Tenes it was equivalent to 48 kadûs, each of 3 müdd, and so equivalent to 151.4 litres; in Nukûr it was equivalent to 25 müdd or 26.28 litres; and in Morocco (until 1294) was equivalent to 40 local şâ' = 50 şâ' = 210.28 litres. In Morocco after 1294 the sahfa was equal to 40 şâ' or 168.23 litres.

Salkım Bunch.

(OS) 1. A bunch of something that hangs.

2. Small stalks of grapes making up a large bunch.

(EÇ) 1/38b Gülâbî Ağa came to the place of conversation and in the presence of them all he was presented with a loaf of bread and one akçe and one gold piece and a bunch of grapes and a date and an olive

(EÇ) 3/43b To conclude these are such enormous dates that we had never seen their like in Basra or Lahsa or Cevazir or in heavenly Baghdad or in the exalted Cairo of Egypt. Truly it is a sight for saints and prophets. It is divided into male and female. If the Franks are so fortunate as to find one of the 20 or 30 branches of dates, they take 100 gold pieces.

(EÇ) 4/346a The male date never bears fruit and if a splinter from the male date is embedded in the bark of the female date, the female date takes as much pleasure as if it had engaged in sexual intercourse, and produces 20 or 30 branches of dates, such that each bunch weighs 40 and 50 batmas. And supposedly the female date menstruates. And they say that the date palm lives for 3000 years.

Salma (MZP) The name of a water measure. 24 masura made one salma. This expression was used by the water engineers.

(MLT) Liquid measure formerly used by the Turks. = 32.7144 litres.

Sâmûna (WH) The sâmûna was equivalent to 1/4 bûkile, that is 0.585 g. Probably there was another larger sâmûna of 1/2 garama or approximately 1.7 g. For details about this very rare unit of weight see H. Sauvaire's work.

Sandık Chest, crate.

(TDK) 1. A rectangular item of furniture with a lid used for storing various possessions.

2. A rectangular wooden measure open above and below used for measuring substances like sand and gravel for construction purposes.

(OŞG) A very large box; a container with a lid and lock used for storing clothing and personal possessions.

(HI) A wooden box of various sizes.

(figs) = 220 okka

(opium) = 60 okka

(in Akkerman in 1500) = 88 okka

(EÇ) 4/279a Apart from these goods which were sold, the clothing inside chests weighing 40 yük belonging to the hanım sultan [princess] and the wife of the new han and various freed women slaves were on no account seized

(EÇ) 10/452 And with 500 sandık of lamps the entire great procession and all the tradesmen with trays on their heads

(EÇ) 10/675 And of his spoils of war he spent 3000 sandık of gold on building a mosque like unto heaven in Alexandria and Damascus

Santigram Centigram.

(T.2) = 1 gram.

Santimetre Centimetre.

(ML) A unit of length equivalent to one hundredth part of a metre.

(T.2) = 0.01 m.

(MLT) **Santimetrekare** (cm^2) = 0.0001 m^2

Sapo (HI) Unit of weight used for salt and clarified butter in the Crimea. = 16 keylçe = 410.416 kg.

Sater (Byzantine) = 17 carats = 3.4 g.

Scripulum (Roman) = 2 obolo = 6 siliquae = 1.137 g.

Sehm (WH) Egyptian unit of area, today equal to 1/24 kirat or 7.293 sq m.

Sele (ML) 1. Shallow, broad basket.

2. The distance between the points of the thumb and index finger when spread apart. Colloquial form of sere, a measure smaller than a karış [span].

(OŞG) Basket, a large basket with handles.

(EÇ) 1/180a The greengrocers in the market go to buy and sell fruit, and each seize a sele and sepet of fruit

(EÇ) 5/73a Murtazâ Paşa presented as gifts to each vezir 50 porcelain plates and various sweetmeats and cakes and a sweet dish as made in the city of Hama and seles filled with various excellent juicy fruits and other kinds of food and drinks after the hour of afternoon prayer

Semis (Roman) = 6 unciae = 163.73 g.

Semissis (ODB) In the late Roman and Byzantine periods this was the name of a small gold coin weighing 2.78 g.

Semuncia (Roman) = 2 sicilici = 4 drachmas = 13.644 g.

Senc (ML) A suffix meaning 'that which weighs, measures, evaluates' used to form compound words.

Sence Sanja. A weight used not for weighing goods but for checking the weight of silver coins. An Arabic word deriving from the Persian *seng*, meaning stone.

Sepet Basket.

(TDK) 1. A container for carrying food and other articles woven from rushes, reeds or thin branches, and generally having a handle.

2. The quantity contained by a basket.

(OŞG) A large container with or without handles woven from rushes, from willow branches cut lengthways, or date palm fibres.

(EÇ) 1/174b Basket fishermen: These number 200, and travel along the Bosphorus in caiques, and wherever there is no current there they place bread into baskets and all kinds of fish enter them and cannot get out again. These baskets are woven from a kind of rush. Crabs, crayfish, shrimps, silluna [type of shellfish], octopuses, grey mullet, hermit crabs, lobsters, eels and suchlike vermin of the sea enter these baskets, but of them all lobsters are the largest of this sinful food. Carrying the awesome lobsters and other creatures which they have caught with their baskets, they all march past with loud cries, causing fear.

(EÇ) 1/180a The greengrocers with stalls in the market enter to buy fruit and each seizes a sele [flattish wicker basket] and sepet of fruit, endeavouring to take it by force, and inside the ships there is a shouting and yelling, arguments and screaming, and words of abuse against one another's mothers and fathers and children, and they break one another's heads open and blood flows as they take the fruit; and so they march past in procession beneath the Processional Pavilion.

(EÇ) 1/194b Makers of basket chests: These number 105, and the number of their shops is 305, and they decorate their stalls with chests raised on feet and basket chests [sepet sandıka], and pass by fully armed.

(EÇ) 5/9a This humble servant enjoyed friendly intercourse with all the princes and tribal chiefs and highborn gentlemen of Bitlis, receiving from each of them so many gifts that in a short time four basket chests [sepet sandıka] filled with garments and other curiosities and precious goods and seven thoroughbred Arab horses, and so night and day celebrated new year in the manner of Khwarizm.

(EÇ) 5/15b The han of Bitlis sent to our Paşa kind letters of affection and gifts, and our six horses and two sepet of garments belonging to this humble servant, and to each of our four slaves 10 gold pieces as travelling expenses and an outfit of military garb, and to this humble servant he sent gifts of 200 kuruş and two mule loads of sweet confections and other foodstuffs.

(EÇ) 7/136b Moreover they wrap these apples in cotton wool inside white boxes, and take gifts of many hundreds of boxes of apples to the hans and sultans and vezirs of the Crimea. Many thousands of boxes and many hundreds of fragrant apples wrapped in cotton wool they carry by ship all the way to Istanbul, and present them as gifts to the Ottoman sultan, and to the doctors of the law and to the vezirs.

Septunx (Roman) = 7 unciae = 191.02 grams.

Serc (MLT) Unit of length formerly used by the Turks. = 17 cm.

Sere (ML) The distance between the tips of the thumb and forefinger when spread apart. In the Ottoman system of measurement 4 sere made 1 arşın (68 cm).

Sesuncia (Roman) = 1.5 unciae = 6 sicilici = 40.93 grams.

Sextans (Roman) = 2 unciae = 54.58 grams.

Sextula (Roman) = 4 scripula = 8 oboli = 4.548 grams.

Sırık Pole.

(OS) An inexact measurement of height.

(EÇ) 10/714 This strait is very difficult to navigate. Every year many ships are wrecked. But the harbourmaster always measures the sea with poles [sırık] that he holds in his hand from small rowing boats at the mouth of the strait.

(EÇ) 1/177b These ceflaters too are fully armed and proceed past in dignified fashion upon thoroughbred Arab horses, holding steelyard poles [sırık] and with 40 cloths wrapped around their waists.

Sırt (OŞG) The load that a person can carry on their back.

Sir (WH) The Iranian sîr (formerly the ser) was 1/14 mann, and until 1935 equivalent to 74.24 grams, but after that date was officially set at 75 grams.

Sicilicus (Roman) = 6 scipula = 2 drachmas = 6.822 grams.

Sihaf (HI) Large skin of cheese.

(Akkerman in 1500) = 4 kantar = 225.796 kg.

= 0.5 kantar = 22 okka = 28.224 kg.

Sikke Coin, stamp.

(OS) 1. Stamp. Mark, steel or stamp whose purpose is to mark where a thing came from and to whom it belongs.

2. Dirhem.

3. Stamp struck upon a coin.

4. Minted coin.

(ML) A unit of weight used in the east. The word sikke derives from the Jewish skekel, meaning to weigh. According to the bakil [?] system, the sikke's value was one part in 60 of a miri, and among the Jews 11.424 grams. In Mesopotamia and among the Persians it was 8.42 grams.

(EÇ) 1/130b Description of the cannon moulding chamberc And in this factory are chambers in many places in which they construct the moulds for the cannon, and inside this mould in place of shot, so that the barrel is large enough to contain cannon balls weighing 40 and 50 vakiyye, they spread upon the iron shafts a paste made of a mixture of 40 and 50,000 eggs with clay, and wrapping string around the iron shafts place it inside the mould, and below hold it suspended by means of iron sikke.

Sikla (HI) (wine, Epirus) = 50 or 60 okka.

Siklos (Byzantine) = 36 carats = 6.8 grams.

Sikt (WH) A bale of silk, synonymous with ruzme, equivalent to 24.3 kg.

Siliqua (Roman) 0.189 grams.

Silme Flat, as in flat tablespoon.

(OŞG) Used in reference to a measuring container filled to the rim but without being heaped.

Sini (OŞG) A large tray without a rim; a dinner tray around which meals were eaten; a circular metal vessel used in place of a table at meals.

(EÇ) 1/39b In the heavenly fragrant Damascus, the height of felicity, inside the cavern right in the centre of the Emeviyye Mosque, is a gold sini.

(EÇ) 1/142b At the imaret [public kitchen, hospice] of Mihrimah Sultan throughout all the months of the year once in the early morning and once in the late afternoon travellers staying in this guest-palace are given one copper tray [sini] with a bowl of wheat soup and a loaf of bread, and every night a candle each, and for every horse sufficient fodder, all without payment. But to those who remain more than three days nothing is given.

(EÇ) 1/160a The börek makers too passed by with diverse böreks of Damascus and sini böreks [layered savoury pastries baked in a circular tray] on their heads and inhstalls carried on floats, and distributed börek to the people.

(EÇ) 2/277a And there is a dining hall for all guests and neighbours which not only provides food in abundance throughout the year for young and old, men and women, but up to this day every night after the nightfall prayer gives to those in staying in the guest-palace copper trays [sini] with a bowl of soup, one to each hearth, and for each person a loaf of bread, and to each hearth a tallow candle, and to each horse, mule, camel and donkey a bag of fodder, brought by officers of the pious foundation.

(EÇ) 3/108a And whether Muslim or non-Muslim every Friday night each person is served with a tray [sini] containing pilaf and meat stew and safron rice pudding and soup.

(EÇ) 5/99a That too is one of the charitable works and pious deeds of the late Kara Piri Paşa which in summer and winter provides to each traveller a copper tray containing a bowl of wheat soup and a loaf of white bread, and to each hearth a tallow candle, and to each horse as swift as the breeze a bag of fodder, all of which are brought by the officials of the endowment and distributed to the guests.

Sitil (OŞG) 1. Copper water vessel with handles; large bucket; handled jug or ewer.

2. Large metal bucket in which water is given to horses.

Skenes (HRD) Egyptian unit of measure equivalent to 60 stad, so 1 skenes was 10.656 kilometres.

Snig (Byzantine) = 4 carats = 0.75 or 5/9 g.

Sofra (OŞG) 1. Wooden or metal tray used instead of a table.

2. A sofra full of various dishes.

Som (HI) (silver, Altın Ordu) = 5 oz.

Somar (HI) 12 Istanbul kilo = 307.966 kg.

(PGI) 30 batman, that is 180 okka, or 16 ölçek. In some places one somar was 120 okka.

(EÇ) 2/288b This prosperous city is so cheap that 1 somar of the most excellent camel's tooth wheat is (—) batman. Five somar costs 1 kuruş. Two lots of horse fodder cost one akçe and one somar of barley costs (—) akçe.

(EÇ) 3/86a One sheep costs 10 akçe, one cow costs one rub' and two vakiyye of white bread costs one akçe and one somar of wheat (—) and fodder 10 akçe.

(EÇ) 3/87b On non-Muslim feast days 100 sheep and five head of cattle and 50 somar of wheat are cooked and distributed to the guests.

(EÇ) 3/90a Our lord Muttezâ Paşa retired to the city of Sivas and each day supplied rations of 100 sheep and 500 somar of barley and 10,000 loaves of bread and various vegetables and other food and drink, not to mention sugar and coffee and musk and raw ambergris and saffron and wax candles, and made a great feast three times, each time presenting a fur like unto that of Ibrahim Han.

(EÇ) 4/207a First of all Diyarbakır itself lies in stony country. But seven kinds of excellent wheat and barley and unesteemed broad beans come from its villages and are sold at 10 akçe the somar.

(EÇ) 8/324b First of all one kile of wheat is sown by the farmers and in some places yields 100 kile of the finest many-grained wheat. They call a kile of this a mahnar, and in Egypt they call it an erdeb. In Diyarbakır and Erzurum they call it somar. In Baghdad they say sa'ân, and in Anatolia they say kile.

Some (HI) (Iran, 15th century) = 155.615 kg.

Sporta (WH) Term meaning a load which in medieval Egypt referred to goods weighing 500 rtl, which in theory was equivalent to 222.4656 kg. According to the calculations of G. da Uzzano in the 14th century, one sporta was equal to 720 light Venetian pfund = 206.886 kg.

Staio (HI) (cereals, Venice) = 83.3 m.

Stad (HRD) 600 Greek feet make an Athenian stad of 177.6 m.

Stater (Byzantine) = 4 drams = 16.32 g.

(Greek) = 873.2 g.

Ster (HI) (Morea) = 110.802 kg.

Sunbul see Sünbül

(WH) A Syrian unit of volume that in Şeyzer was = 21.5 rtl, each of 684 dirhem, and so equivalent to 3.206 kg of wheat or approximately 4.16 m.

Surh (WH) A small Indian unit of weight used in the time of the Babur ruler Ekber (abandoned in the 16th century), equivalent to 1/8 mâşa or 0.125525 g.

Suva' (OS) A unit of measurement used in Islamic countries and also known as sa'. A vessel used for drinking water. Maşraba.

Süken (DLT) A kind of basket hung on one side of a donkey pack.

Sümek (OŞG) A quantity of wool tied to a distaff for spinning. *Today I could only spin two sümek of wool.*

Sümn (WH) This was 1/8 kadeh in Egypt, today 0.258 litres. In Kayrevan it was equivalent to 6 müdd (see kaffiz) = 6.318 m.

Sünbül see Sunbul.

(ISAM) A Syrian unit of volume approximately = 24.16 litres.

Sürahi Jug, bottle.

(OŞG) A ewer without a spout. A small damacana [demijohn].

Süyüm (OŞG) The length of yarn which is pulled out when the spinner stands up with the wool spindle in the hand. Approximately 70-80 cm.

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Ṣa' see Sâ'.

Şaira (WH) Barley grain. Persian cev. As a unit of weight it is equivalent to 1/96 of a miskal, or an average of 0.05 g. Also see Habbe.

Şakul see Çekül.

Şekel Shekel.

(Old Testament) = 2 beka = 14.55 g.

Şihta (HI) (metal, Serbia) = 120 verkçe = 1313.28 kg.

Şimel (ZK) The amount that one hand can grasp when picking plants such as vetch or chickpea.

Şinik (TDK) 1. A grain measuring container with a volume of 8 kg.

2. The amount contained in a şinik.

(ML) 1. A grain measure.

2. The amount contained in a şinik.

3. There are two types of şinik, one used for liquids and grains, and the other for measuring by weight. In the first case 1 kile is a hectolitre, 10 şinik make a decalitre,1 şinik is a decalitre, and 10 ölçek make a litre. In the second case 1 Istanbul kile is 4 şinik, 1 şinik is 2 kutu, 1 kutu is 2 zarf. In the Ottoman period a quarter of a kile in Rumelia was known as şinik. The Istanbul and Rumelian kiles were different. The Rumelian kile was 80 okka, and therefore the şinik was 20 okka. The Istanbul kile was an average of 20 okka, and therefore one Rumelian şinik weighed the same as one Istanbul kile.

(MLT) A unit of weight formerly used by the Turks. = 2.5 kg; as a unit of area = 25,000 square metres; as a liquid measure = 9.25 litres.

(OŞG) 1. A unit of measure equivalent to 1/8 kile, also known as the çanak or kutu.

2. A grain measure equivalent to 1/4 of a kile.

3. A grain measure weighing approximately 7.5 kg.

(OS) The amount of a cereal contained by a tin with a capacity of 10 litres. Half a kerosene tin. A grain measure used in the region of Isparta.

(HI) Used for 0.5 kile or 0.25 kile.

(ZK) Grain measure equivalent to half a tas.

The word şinik (şiniş, şınık, çinik, çiniyh, çiniyh) is one of the most common units of measure used in Anatolian dialects. It is used in Uşak, Afyon, Amasya, Aydın, Balıkesir, Bolu, Bursa, Çorum, Denizli, Diyarbakır, Eskişehir, Erzincan, Isparta, İçel, Istanbul, Kastamonu, Kırklareli, Kütahya, Muğla, Niğde, Samsun, Sinop, Sivas, Tokat and Yozgat. It is a grain measure equivalent to 6 kg, and half of a demirli (Afyon).

(MZP) The name of a unit of weight. *Lehçe-i Osmanî* explains that sümün derives from the Greek, that it is the same as çanak and kutu. Works

on metrology give two kinds of şinik, one for liquids and grain, and the other a unit of weight. In the first case 1 kile (hectolitre) = 10 şinik (decalitre), 1 şinik (decalitre) = 10 ölçek (litre); and in the second one Istanbul kile = 4 şink, 1 şinik = 2 kutu, 1 kutu = 2 zarf.

Although in Rumelia one-quarter of a kile was called a şinik, the Istanbul and Rumelian kiles were different.

Since the Rumelian kile averaged 80 okka, the şinik is 20 okka. In this case the Rumelian şinik was the same as the Istanbul kile, since the Istanbul kile averaged 20 okka.

(Old Testament) = 1 litre

(T.2) = 2 kutu

(EÇ) 4/324b And no man should lay a hand on the abundant goods in the fine bazaar, all foods and drinks, eggs and cooked chicken, soup and pilaf and herise are sold by weight, and never by kile and şinik and sibe and peymâne.

(EÇ) 7/61b And right at the summit there is a gold globe made of solid gold weighing a full 150 vukiyye. They say it could hold 10 şinik of wheat.

Şirvanca (WH) It is not certain whether this word is spelt and pronounced like this. It is a trade term used for a weight of lime equivalent to 200 menn or approximately 166.67 kg.

Şişe Bottle.

(TDK) 1. A tall vessel with a narrow mouth made of glass for holding liquids, particularly drinks.

2. The amount contained in a bottle.

A glass or crystal vessel of various shapes and sizes used for all types of liquids.

(EÇ) 2/261b From the imperial armoury were taken 7000 swords, 2000 shields, 2000 rifles, 5000 bows, 40,000 arrows, 6000 pikes, 5000 şişe hand bombs and and many thousands of munitions for all kinds of weapons, which were all recorded and distributed to the Islamic troops.

(EÇ) 3/23b Arriving in Egypt, from the Nile at the foot of the city of Mansûre he took four bottles of water and chanting a powerful spell and declaring 'Great Protector of the Way', one division of the Nile immediately cleaved the ground behind this Jew, and he came all the way to the city of Menzile.

Şütürbâr (OS) The weight of one camel load.

Tabak Plate, dish.

(OŞG) 1. A flat or shallow vessel used for food.

2. A flat object like a plate.

3. The amount contained by a plate.

(EÇ) 10/890 When Ramazan came they cooked pilaf made of rice, marrow, colocasia and cauliflower. Each day there was abundant food of 1000 tekne. To his presence they bring 5 types of food and 200 Sudanese plates of food.

Tabut (OŞG) Crate for transporting eggs. One crate contains 1400 eggs.

(ML) Long crate used for eggs.

Tadımlık Taste.

(OŞG) A small amount of a food eaten just to try the taste.

Tağar (OŞG) 1. A grain measure that varied according to place and the type of produce.

2. A unit of weight equivalent to 10 batman, varying in volume according to the type of grain.

3. A grain measure like the large kile.

4. A large grain measure equivalent to a camel load.

5. The Baghdad dağar was a measure of 800 okka.

6. A large leather bag carried on the shoulder or on the back.

7. An earthenware jar with a wide mouth and narrow bottom.

(HI) (heavy tağar) = 1560 okka = 2000 kg.

(Mosul) = 200 okka = 256 kg.

(Crimea) = 150 okka = 192.42 kg.

(Epirus) = 20 okka = 25 kg.

(Iran) = 100 mann = 83.4 kg.

(ISAM) The weight of an animal load used in Iran. Approximately 83 kg.

(ML) A grain measure, also known as dağar.

(MLT) A unit of weight formerly used for wheat by the Turks. = 1040 kg.

(WH) An animal load used in Iran which from 1300 was set at 100 Tabriz menn, each of 250 dirhem. It was equivalent to 83.4 kg. As a unit of volume it varied according to the type of grain, since its value by weight was always 100 menn.

(MZP) The name of a grain measure. The Baghdad tağar was 800 kiyye (okka).

(PGI) Used around Mosul to weigh grain, and equivalent to 200 Mosul vezne or 160 okka.

(EÇ) 4/342b Praise of their cereals: In the pure soil of Baghdad, by the command of God, such corn grows that one tağar of wheat yields 80 tağar, and other crops grow there in abundance like barley, millet, mung beans, broad beans and rice.

(EÇ) 4/353b There are no fertile places in the land of Iraq like its own district. Indeed, by God's command one tağar of seed ..

(EÇ) 4/375a the Lord Jonas was afive, and wandering thirsty night and day he himself ground 150 tağar to obtain fine flour.

(EÇ) 8/268a Supposedly it is a tree like that of Yemen, but so that it does not attract attention they show it to no one, and in the winter months they cover it with felts and light a tağar of fire inside the felt. It is a ridiculous sight.

Talent (Old Testament) = 60 mına = 58941 g.

(Byzantine) = 10,000 drams 125 litres = 40 . 8 kg .

(Hult) = 60 mına = 26.196 kg.

(HRD) In Athens after Solon it was 36.39 kg when used for buying and selling goods. As a weight for coinage it was 25.92 kg. One sixtieth part of a talant was a mana.

Tamûna (WH) In Huzistan 1 dâng = 1/6 dinar (48 tamûna). The weight of 1 tamûna was 0.0147 g.

Tanâb (WH) A unit of length used in Iran in the 17th century. It is the same as the aşl' of the Arabs. Therefore 80 zar-i şer'î or şer'î arşın (each 49.875 cm) made 1 tanâb. Thus, like the aşl, it was equivalent to 39.9 m. 150 tanâb made 1 fersah.

Tane Grain, seed; piece, single individual thing.

(OŞG) 1. One item or grain of many.

2. The seeds of some plants.

3. A measure like barley, wheat, seeds of chickpeas.

(EÇ) 8/307a In 40 or 50 days a type of wheat grew such that each dane [tane] resembled a pearl, and it was like the many-grained camel's tooth wheat.

Tânk An Indian unit of weight. During the reign of Ekberin the 16th century 1 tola was equivalent to 8 mâşa 7 şurh and 1 dam. or 20.9628 g.

Tartı Balance, scales; the act of weighing; weight.

(ML) The act or method of weighing, and the result of such an act.

Weighing equipment: Analitical balance, weighing machine, hand steelyard, hand balance, barrel scale, hydrostatic balance, steelyard, jewellers balance, automatic indicating scale, Roberval balance, semi-automatic scale, spring balance etc.

(OŞG) Çeki, scales. The weight of any object.

Tas Bowl, small circular container.

(OŞG) 1. Metal bowl with a round base: soup bowl, bath bowl, water bowl.

2. A grain measure consisting of half a kerosene tin.

(ZK) A grain measure made from half a kerosene tin. Approximately 5 kg. This unit of measurement is used in Afyon, Denizli, Niğde and İçel.

Two tas equal half an ölçek, or 1 teneke. Half a tas = şinik.

Taslak (ZK) One quarter of a melon or watermelon.

Tasû (WH) An Iranian unit of weight known in Arabic as tassûc. It was equivalent to 1/4 dâng or 1/24 miskal, and until the Safavid period was approximately 0.18 g. From the 16th century onwards it became 0.195 g.

Tasuc see Tasû

Tatık (OŞG) A taste of something, a sip. A small amount of a food just sufficient to taste.

Tay (OŞG) 1. Equivalent, equal.

2. One side of a horse load, bale.

3. Counterweight, counterbalance.

(HI) ((Bale, bundle) = 700 pieces (of kirbas, a coarse cotton cloth)

(PGI) Half a horse load. A measure of linen and other fabrics.

Tefe (OŞG) 1. Bobbin of a loom.

2. Hank of silk.

3. Stack of gold, silver or copper leaf.

4. A bale of various commercial goods.

5. A large skein of silk wound on a wheel and weighing more than one okka.

(PGI) A unit of weight for raw silk, equivalent to 160 dirhem.

Silver tefe: 11 okka.

Tegâr see Tagar

Tekerlek Wheel.

(OŞG) 1. Circular object. A wheel of Kaşar cheese, a wheel of opium, a wheel of beeswax.

2. (For vehicles) two-wheel, four-wheel.

3. In races, a space the size of a wheel: to win a race by a wheel.

(EÇ) 7/120b And we loaded wheels of fresh cheese onto our pack horses and set out in an easterly direction.

(EÇ) 9/269 "The next day you will arrive at the festival" he said, and gave us 16 portions of fodder and 20 loads of bread and five wheels of cheese, and 1 black Arab horse, and six strong Arab men.

Tekne Trough.

(OŞG) A rather long container consisting of a hollowed out log, or made of wood or stone used for kneading dough or washing laundry. *I kneaded a tekne of dough.*

(EÇ) 2/257b They brought us 100 tekne of roasted mutton and black-eyed pea soup and honey water and boza and pasta and yâhanî [?] and strained honey and many beautiful faced young men and virgins waited upon us.

(EÇ) 7/155 The Circassian at once went outside, amused himself for a while and returned bringing a tablecloth of cowhide to the gathering, a wooden trough of delicious honey and a trough of cheese and a trough of pasta.

Tenbelîd (HI) half a horse load = 300 lidre = 96.21 kg.

(EÇ) 2/338b First of all the Han of Revân sent 3000 head of sacrificial animals, and the chief merchant, partner of the shah whose name was Yezdânbaş, was a Kızılbaş with a white head but a black heart. All his loads and tenbelîds were unpacked and the customs duties charged according to the law upon the shouts of the customs superintendent, an Armenian named Tatas.

Tencere Cooking pot, saucepan.

(OŞG) 1. A deep metal vessel with a lid in which food is cooked.

2. The amount contained by a cooking pot.

(EÇ) 1/145b In the cellars of the tekke are more than a thousand sahan and cooking pans and ladles and cauldrons and copper tableware, and friends if desired can stay as guests for five to ten nights passing the time pleasantly.

(EÇ) 10/520 Description of the crown of the Pharaoh: This is an octagonal headdress made of camel leather the size of a large cooking pot, and its corners embroidered.

Teneke Tin. Container made of tin.

(TDK) 1. Tin plated sheet of soft steel.

2. As a unit of measure, a volume of approximately 20 litres. *A tin of kerosene, a tin of olive oil.*

(ML) 1. Tin plated sheet of soft steel.

2. A container made of such metal sheet with a volume of approximately 20 litres.

(EÇ) 1/188b The teneke makers: They number 305 and have 300 shops. Their patron saint is unknown. They sell tinned iron teneke from Poland, and Czechia and England and brass teneke.

(EÇ) 3/112b This copper coin is used in the market towns and cities along the Danube, but not accepted in any other cities. And 10 water melons cost 1 penez and 1 vakiyye of bread costs 1 penez and 1 vakiyye of meat costs 1 penez and 1 tin of honey costs 4 penez and 1 vakiyye of butter costs 10 penez.

Teneke payı (PGI) While the smaller measurement used by

architects is the parmak, in the vernacular three small measurements are used known as çırpı payı, teneke payı and cam payı. These are equivalent to a specific value. For example, 2 cam payı make 1 parmak.

Tepeleme (OŞG) Heaped. Something filled so that its spills over the edges.

Tepsi Tray.

(ML) A flat utensil used for carrying several cups, plates etc at the same time.

(OŞG) A flat shallow container in various forms made usually of metal and copper, in which baked goods are prepared, off which food is eaten, and upon which things like coffee or tea are placed. *We baked three trays of börek; sherbet was served to the guests on trays.*

(EÇ) 5/44a Thanks be to God, this humble servant full of sin received spoils in this battle of seven young lads and three girls as beautiful as the sun and seven Hungarians infidels and 10 rifles and 17 small silver trays and one silver crucifix and two silver Hungarian style stirrups and one silver cup and many kinds of cheap knickknacks, and by the grace of God returned safely to our unit.

(EÇ) 10/888 And I adorned a coffee tray with 10 sherbet bowls.

Terazi Scale, balance.

(ML) 1. An instrument for weighing by comparing the mass of two objects in pans balanced from the ends of a beam.

2. A long pole is used by tightrope walkers to keep their balance.

Terazi eli: The part of a hand scale held in a hand.

Terazi dili: The indicator in the centre of a balance beam which shows when it is balance.

Terazi gözü: Balance pan.

Terazi kolu: Balance arm to which the pans are attached.

Terazi tablası: The flat surface on which objects to be weighed are placed on automatic scales.

(OŞG) 1. A weighing device consisting of two pans suspended from either end of a beam.

2. A device of various different kinds used for measuring the weight of a solid or liquid object. A large scale, steelyard, mason's balance, water balance, spirit balance, air balance (barometer), heat balance (thermometer).

(PGI) For silver and equivalent to 5000 dirhem.

(EÇ) 1/166b The dancers of the butchers pass by with cleavers in their hands cutting meat in half and in quarters, and weighing it in scales with brass pans, crying "The finest meat at an akçe for 10 vakıyya, buy it my heart, give the best my heart, a fine kebab meat, the finest minced meat."

(EÇ) 1/176b And for everyone the weighmasters weigh their goods with a balance and receive payment accordingly.

(EÇ) 2/300b And in all the stalls in all the royal souks and in the market squares hang balances with brass and iron chains.

(EÇ) 4/295a They sell wheat and eggs and cooked chicken and white bread and in short, all goods by weight. Indeed, even the cooks sell soup, kebab and pilaf by weight.

Testi Jar, jug.

(TDK) 1. A pottery vessel with or without a spout, with a handle, broad body and narrow neck.

2. Used in Armenia for wine and equivalent to 15 okka.

(EÇ) 7/137b They take gifts of honey and yellow butter in jars to the provinces.

(EÇ) 1/38b Embarking in a caique from Galata they proceeded in the direction of Unkapanı and gave a jar of wine to Gülâbî Ağa. Saying that this would test me they gave me a jar of wine.

(EÇ) 1/215a Six hundred Jewish tavern keepers marched past in procession carrying crystal and rock crystal, Murano glass and jewelled porcelain cups, and distributing sugar sherbet in place of wine to the populace from jars in their hands.

(EÇ) 6/68a They place diverse roses, hyacinths, sweet basil, lilies, violets and redbud blossom in jars around the hall.

(EÇ) 7/40b They take clear and shining ruby coloured, white and yellow wines in pointed pottery jars as gifts to men of vice, calling it kenkuşiye wine. And there is arrak like white milk.

(EÇ) 8/266b But it is a ridiculous sight to see the donkeys which bring the water being loaded with jars of water in the castle and when they arrive at the well below, the men there fill the jars with water and chase the donkeys back up to the castle.

Teşbîr (OS) 1. To measure by the endâze and other units.

2. To measure by spans.

Tetartemorion (Greek) = 208.3 g.

Tetarton (Greek) = 109.15 g.

Tetradrachmon (Greek) = 17. 46 g.

Tillîs (ISAM) Iranian unit of volume. Approximately 127 litres. The tillîs used by the Turks is a weight for wheat equivalent to 8.32 litres or 6.41 kg.

(WH) According to el-Mukaddesî this Egyptian unit of volume was equivalent to 8 vayba, each of 15 Baghdad menn, or 97.5 kg of wheat. But this unit is no longer in use. The oldest tillîs must have been approximately 127 litres.

In the late middle ages 1 tillîs = 150 Egyptian rıtl = 67.5 kg of wheat, or approximately 87.7 litres, which was almost the same as a Cairo irdabb.

In the 19th century 1 tillîs was approximately 225 kg or approximately three hectolitres. The Turkish unit of volume was half a kile = 1/80 müdd, equivalent to the volume of 6.41 kg of wheat or 8.32 litres.

Tolca see Tüle

Tomar Scroll, roll.

(OŞG) 1. Paper rolled up lengthways.

2. Something that is rolled up.

Ton (OS) 1. A unit of weight of 1000 kg.

2. The weight of 1 cubic metre of distilled water at a temperature of + 4 degrees Centigrade.

(HI) (Kefe, 1940) 50-55 arşın = 32.5-35.75 m.

(T.2) = 1000 kg.

Top Whole, bolt, ream.

(OŞG) 1. The entirety of a thing. A bolt of fabric.

2. A stack of 500 sheets of paper.

3. An entire length of fabric woven on a loom.

4. Bunch.

(HI) = 20 arşın = 13 m.

= 50 arşın = 32.5 m.

(silk, taffeta) = 100 arşın = 65 m

(silk, fine silk gauze) = 120 arşın = 78 m

(velvet) = 15 arşın = 8.45 m

Topak (OŞG) Spherical, globular, in the form of a ball. *Three balls of cheese, a ball of dough.*

Topuz yükü (DLT) A pack on an animal that it is impossible to ride on top of.

Torba Bag.

(TDK) A small sack of various shapes and sizes gathered at the mouth and usually woven from thread or hair.

Tridrachmon (Greek) = 13.1 g.

Triens (Roman) = 4 unciae = 109.15 g.

Trimission (Byzantine) = 8 carats = 1.51 1/9 g.

Tritemorion (Greek) = 291.07 g.

Tul (OS) 1. Height.

2. Length.

3. Life.

Tûlâ (T.2) = 1000 kg.

Tûle (WH) An Indian unit of weight also known as tolça. In the 16th century during the reign of Ekber 12 māşa made 1 tola, which was 12.0504 g.

Tulen (OS) Lengthwise, in height.

Tult (PGI) One third of a zenbil.

Tuluk see Tulum

Tulum Skin used as a container.

(OŞG) The skin of a sheep, goat or cattle removed whole for the purpose of using as a container. Such skins were used for carrying water, honey, cheese, grape molasses etc.

(HI) (Akkerman) = 1 or 1.5 kantar.

(EÇ) 1/35a Loading soil of Holy Mecca and 70 camel loads of Zemzem water in skins filled to the brim they rode swiftly to Istanbul in haste, and mixing these with lime commenced repairing the dome of Haghia Sophia.

(EÇ) 1/188b In the Hungarian language we inquired of them, and discovered that in that place a kind of white porous grindstone was heaped up like mountains, and when they are fired mercury pours from them into pits, and this they fill into skins of dog leather.

(EÇ) 5/133a There are many gardens and orchards here. There is a strange kind of pear called yere basmaz. This is found nowhere else in the world. They brought 40 of these pears to Melek Ahmed Paşa. The largest weighed 1 vakıyye and 7 dirhem. Some weigh 380 and 390 dirhem, and from these pears they make a kind of sherbet and pickle. Each one is like a skin filled with honey, but the juice of this pickle makes those who drink it tipsy.

(EÇ) 8/306a And in a cellar are 40,000 kantar of pitch and 1000 skins of resin and 700 barrels of tar and 77 skins of Persian naphtha and 40 cellars full of ship's hawsers and cables and life-saving ropes and marlines and other equipment in amounts that only God knows.

(EÇ) 8/350a From the imperial cellar each year a cellarer comes and purchases many hundreds of skins of Aydonat olives for the sultan.

(EÇ) 10/483 All the pilgrims leave Egypt and stay here for three days and nights and fill many hundreds of thousands of skins of Nile water to take away.

(EÇ) 10/589 On that road is the bazaar of makers of water skins, flasks and cugele [a kind of leather container].

(EÇ) 10/867 Hüseyin, the ruler of this castle, brought a gift of a hundreds skins of boza to the Berber ruler and celebrated the Feast of Sacrifice with the Berber tribe.

Tura see Çile

Turbunlanmak (DLT) To investigate, compare, measure.

Turklamak (DLT) To measure.

Turplamak (DLT) To make a sample.

Turra (HI) see Çile

Turumlamak (DLT) To measure the depth of water according to one's own height.

Tutam Handful.

(OŞG) 1. The amount that can be grasped in the hand, handful.

2. A unit of measure the width of four fingers.

3. The length of an object measured with the closed fist. "How can you boast of 60 tutam, O infidel, it is nothing compared to my cornelian cherry rod," and "mine with forty tutam of black hair" (from the *Book of Dedem Korkud*).

(MLT) A unit of length formerly used by the Turks. = 8.64 cm.

Tuvaz (MLT) A unit of length formerly used by the Turks. = 1.968 m.

Tümen (OŞG) 1. 10,000.

2. Large group, many.

(EÇ) 2/295b And inside the royal souks are fabulously wealthy men and generous merchants, each of whom has many hundreds of thousands of tümen goods and treasures like unto those of the Pharaoh and Croesus, who engage in trade by land and sea.

(EÇ) 2/296a Observing such things in the city of Nakhshivan I received from the Han 10 tümen of Abbasî coins and fifty lipaçe [a coin] and one karaçabuk [a type of horse] horse and letters to the Han of Tabriz.

(EÇ) 2/297b After us came gifts of 40 tümen of bisitî [a coin used in Iran] and one decorated litter, a karaçabuk[a type of horse] thoroughbred horse and one piedbald chestnut jogtrot horse and seven camel loads of food and drink and fruits.

(EÇ) 2/306b And two Georgian lads carried brocade and cloth of gold and woven chains and musk and raw ambergris and magnificent rugs and cloth and Georgian slave boys. And to my share fell 10 tümen of Abbasî and 2 tümen of bisitî and one Georgian slave boy and one sable Persian-style fur vest and one Persian-style set of garments.

(EÇ) 2/314b Promising to send them to Erzurum we presented our lord the Paşa with one sable fur and 10 pairs of Gilan bows and six Georgian slave boys and 10 pairs of walrus teeth and 3 pieces of fragrant ambergris, recording them all in the courtesy letter, and to this humble servant were presented travelling expenses of 10 tümen of bisitî [a coin used in Iran] and to 45 of our men 10 tümen of Abbasî [a kind of coin], and we said farewell to the nobles and ruling men of Baku, and the Han from his affection accompanied us out of the fortress of Baku.

Ukiya (HI) = 27.8 g.

(Arab caliphate) = 72 miskal = 346.392 g.

(Seljuk) = 100 dirhem = 320.7 g.

(Syria, 19th century) = 66.5 dirhem = 213 g.

(Maghrib, 19th century) = 10 dirhem = 32 g.

Also see Ratl and Ünge.

(WH) With a few exceptions the ukiyye or ons was in principle 1/12 rtl. H. Sauvaire gives a detailed list of ons weights, some of which are entirely theoretical, together with a conversion table to the dirhem, based on a value of 3.0898 g instead of 3.125 g. Below only the most significant ounce values are given: In Arabia the şer'î ons in Mecca during the early Islamic period was 40 dirhem or 125 g. In the 17th century J. Fryer calculated the Mecca ons to be 1/15 rottula = 0.9 lb avoirdupois. In Egypt the ons was always 12 dirhem = 37.5 g, or today officially 37.44 g. In Syria the ons was 50 dirhem = 1/12 rtl = 154.166 g. According to ey-Şeyzerî the Aleppo ons was 60 1/3 dirhem or 189.4 g, when the dirhem is calculated at 3.14 g. According to el-Kalkaşandî it was 60 dirhem or 190 g, when the dirhem is calculated at 3.167 g. The Hama ons was 50 5 dirhem = 171.87 g. According to the same source, the Homs ons was 72 dirhem = 225 g. In Jerusalem the ons was 66 2/3 dirhem = 208.33 g. In Iraq the Baghdad ons was 10 5/6 dirhem = 33.85 g.

Uncia (Roman) = 4 sicilici = 8 drachmas = 27.288 g.

Urub see Rubu

Urubiye (OŞG) A quarter gold piece.

Usbu' (OŞG) Also spelt isbi', isbu' or isbu', this word means finger. As a unit of measure it was 1/24 of an arşın and 1/12 of an ayak, so it varies according to the values given for these units. The usbu' of the official arşın was 2.078 cm, and of the kara [land] arşın 2.252 cm.

(ML) 1. Finger.

2. An obsolete unit of length calculated at 90 cm or 1/24 of an arşın.

(MZP) The term used for a unit of length equivalent to 6 barley grains side by side. Usbu' or isbu is in Arabic word meaning finger.

(ISAM) One quarter of a kabza or approximately 1.925 cm.

Uşara (OS) A length of 10 zirâ.

Ünge (HI) (silver, from the Greek ungia or Latin uncia) = 6 miskal = 9 dirhem = 28.863 g.

Vakiyye see Okka

Vâl (WH) An Indian unit of weight equivalent to 3 ratti = 1/32 tola = 1/80 ounces Troy weight = 0.3766 g.

Varil Drum.

(OS) 1. A cylindrical closed vessel made of metal usually used for holding liquids.

2. The amount contained in a drum, used for measuring petrol and equivalent to 158.8 litres.

(HI) A barrel with a capacity of up to 20 medre. For wine in Genoa it was equivalent to 78 kg.

Vask (WH) In early Islamic times 1 vask or camel load was equivalent to 60 şa' = 252.3456 litres. When used for wheat this was 194.3 kg. During the time of Harun er-Reşid 1 vask was equivalent to 2.5 Peygamber vask = 630.864 litres, or approximately 485.765 kilograms of wheat. Later sources again define 1 vask as 60 Peygamber şa'.

(ISAM) A unit of volume equivalent to 60 şâ'. 1 vask was 165 litres, or approximately 132 kgs of wheat.

Vayba (WH) A unit of volume mainly used in Egypt. In early times it was equivalent to 10 menn or 12.168 kilograms of wheat. In the 14th and 15th centuries it was equivalent to 16 kadeh (each kadeh being 232 dirhem) = 11.6 kg of wheat, or in practice 15 litres. In 1665 A. Gonsales records that 1 vayba of rice was equivalent to 8 kadeh (each being 3 large rtl) = 1.5 kg, from which we can deduce that 1 vayba was 12 kg of rice or 12.5 litres by volume. In the 19th century the vayba was 33 litres. The Ottomans readjusted the values so that 1 irdabb was defined as 100 okka of wheat, and this vayba was equivalent to 5/6 of an Ottoman kile or 21.367 kg of wheat. In er-Remle the vayba was 1/4 kafiz or approximately 37.8 litres. In Tunisia in 1330 1 vayba was approximately 12 müdd or approximately 12.6 litres.

(ISAM) An Egyptian unit of volume equivalent to 24 müdd or 6 sâ'. 1 veybe = 16.5 litres. The veybe was formerly half this quantity.

Verkçe (HI) see Şihta

Vezne (OS) Balance. Counting house, cashier's desk, cashiers office.

1. Scales, balance.

2. Weighing place. In the past gold and silver coins were counted by weight as well as number, leading to this meaning as a place where money was exchanged. In government departments and large organisations the officer in charge of receiving and distributing money was called veznedar.

3. Powder chamber.

(HI) (standard) = 120 dirhem = 384.84 g.

= 30 lidre = 3600 dirhem = 11.54 kg.

= 72 lidre = 7200 dirhem = 23.09 kg.

(Baghdad) = 78 okka = 100.066 kg.

(Mosul) = 10 okka = 12.282 kg.

(OŞG) A unit of weight equivalent to 30 lodra or 20 dirhem = 11.5.4 kg.

(ML) Weighing device, balance.

(MLT) Formerly a unit of weight used by the Turks. = 10.692 kg.

Vezne ledresi: Formerly a unit of weight used by the Turks. = 356.4 g.

(MZP) A term meaning cash desk. In Arabic vezne means a weighing place. In the past gold and silver coins were counted by weight as well as number, leading to this meaning as a place where money was exchanged. In government departments and in banks and large organisations the officer in charge of receiving and distributing money was called veznedar.

Vezne ledresi: The name of a unit of weight of 120 dirhem. Thirty ledre were known as vezne, so the vezne was 3600 dirhem. The vezne ledresi was used for weighing precious goods like silk.

(WH) The Ottoman vezne was equal to 30 lodra, and 1 lodra was 120 dirhem (1 dirhem being 3.207 g). Thus 1 vezne = 11.545 kg. In Basra in 1581 1 vezne was 1/16 Aleppo kintar, which makes 14.24 kg.

(EÇ) 2/302b In short the prices of all foods and drinks are set according to the law of Şeyh Sufi and sold by weight. The kile is never used for wheat, rice and other grain. All are bought and sold by weight. Alas for he who violates the words, 'God is One' inscribed on weights. They extract his guts from beneath his arm. That is the law of Iran.

Vikr (WH) Animal load.

Vukiyye see Okka

Vukiyye-i Aşârî (MZP) A unit of weight. One vakiyye-i aşarî was 312 dirhem.

(T.2) = 1000 g.

Yarda Yard.

(ML) Unit of length used in Britain and some Commonwealth states. 1 yard = 914.4 mm = 3 feet = 36 in = 1/2 fathom.

Yarımlâ (OS) A unit of measure of 2 fitre.

Yart (DLT) Cup for drinking water. A measure used for wine and other liquids.

Yeni arşın see Arşın

Yıgaç (DLT) Fersah (an obsolete measure of distance). Tree, piece of wood; the male genital organ.

Yük Load.

(ML) 1. All the things carried by vehicles or animals.

2. The amount that a vehicle or animal is capable of carrying.

3. A sum of 100,000 kuruş.

4. The maximum load limit of a measuring instrument. The maximum values that a measuring instrument can measure without exceeding the acceptable margin of error.

(OŞG) 1. A load is officially equivalent to 8 bobça or 166.144 kg. In general terms it means a horse or mule load. Although a camel load is regarded as equivalent to 180 okka, in Anatolia depending on whether the road to be travelled was flat or mountainous, the load varied from 390 kg 2 735 kg.

2. A quantity of money with a value of 100,000 kuruş.

3. The amount that an animal can pull or carry in packs on either side.

Araba yükü (cartload): A cartload of watermelons, a cartload of firewood, a cartload of straw.

Arka yükü: The amount that a person can carry on their back, equivalent to 30 okka in weight.

(HI) (silk in Bursa) = 405 lidre = 155.86 kg.

(silk, Erzincan) = 10 batman = 61.574 kg.

(mining, Serbia) = 4 kile = 102.636 kg.

(silk, Mardin) = 8 boğça = 3 batman = 126.4 okka = 162.179 kg.

= 1 kabal (syn. lukna).

(mining, Serbia) = 4 kabal = 99.576 kg.

(Albania) = 120 okka = 153.936 kg.

At yükü (horse load) = 150-200 kg.

(PGI) A unit of measure used for cloth and similar goods usually regarded as equivalent to 140 or 150 okka, but which varies according to the goods in question. In Trabzon the yük used for weighing grapes is 80 okka. Ottoman accountants take one yük to be a figure of 100,000. Both this name and the quantity are borrowed from India. In India the number 100,000 is called lek.

(WH) The Turkish animal load (also see Harvar) in eastern Anatolia was 8 boğça, each boğça being 4 Amid batman (1 batman = 1580 dirhem; 1 dirhem = 3.207 g). Thus the weight of an ordinary animal load was 162.144 kg. The animal load as used in the silk trade (harir yükü) in 1518 in Erzincan was regarded as equivalent to 10 batman, each batman being 6.154 kg, so making 61.5 kg.

(EÇ) 1/86a they went out through Demirkapu Gate with 40,000 cartloads of spoils and 100,000 prisoners of war

(EÇ) 5/116a And 300 dirhem of pure white bread costs 1 akçe and mutton is 6 penez, and lamb 5 penez and beef 3 penez and 3 vukıyye of kapkca yogurt 2 penez and 15 eggs 1 penez and 1 arka yükü [back load] of apples or onions or cucumbers or marrows or cabbage or leeks or garlic 1 penez, but rice and coffee and sugar are expensive, because this city is 12 halts from Salonica.

(EÇ) 8/276a Even some pregnant women carry loads of 200 vukıyye on their backs. And there are women who carry loads of 250 vukıyye on their backs with a newly born child in their arms, but young strong men carry loads of 300 or 400 vukıyye. They are powerful infidels, but in the cities if they eat wheat bread they become ill.

Yüksükle ölçmek To measure with a thimble.

(OŞG) To give in mean quantities, to begrudge.

(EÇ) 1/191a They hunt white doves and songbirds and place them in cages, and the goldfinches lift tiny buckets the size of thimbles, from bowls beneath their cages using their beaks and claws and so drink from the bucket. Likewise the mankır bird is a strange bird that carries mankır [tiny coins] inside its cage.

Zar (WH) A term used for the Iranian arşın (also known as gez, or rarely as zirâ). The most important two types of zar were the şer'î arşın or zar-ı şer'î and the Isfahan arşın. The value of both can be deduced

from the values explained in the previous section. Thus 1 fersah was 7500 Isfahan arşın or 12,000 şer'î arşın. So we can calculate 1 zar-ı şer'î (the same as the Arab şer'î arşın, see the discussion of ez-zirau'ş-şer'iyye) at 49.875 cm. So 1 zar-ı Isfahan = 8/5 zar-ı şer'î = 79.8 cm. This Isfahan arşın was calculated by Sparr de Homberg in 1681 at 14/16 aunes d'Holland, which makes 81.63 cm. We do not know which of these values is correct.

Zarf (T.2) = 0.1 litre.

Zebane (OS) Parts resembling the indicator of certain devices like balances.

Zer'î Something measured by the arşın.

Zerre Particle, mote, speck.

(MZP) The name of a unit of weight. In Arabic it means something so small that it is barely visible to the naked eye. It was half a kitmir. 1 zerre = 0.000625 g.

(EÇ) 4/209a He arrived in Diyarbakır and made abundant gifts to his lordship, but the sheikh accepted not a zerre, only praying.

(EÇ) 6/64b The garrison of Özek Castle collect taxes from the merchants who come and go. It is public land and no one can proceed one zerre without paying tax on their goods.

(EÇ) 7/153b And if you take a zerre of anything the doors are closed and men of bronze who wait there with maces smash you to pieces.

Zirâ (ML) A unit of length equivalent to the distance from the elbow to the end of the middle finger, varying from 75 to 90 cm.

1. The length of the arm or hand. A length of 24 parmak. Arşın.

2. The length of the arm from the elbow to the tip of the middle finger. (75-90 cm).

3. One of the positions of the moon in the sky.

4. Skin. A container for cheese, water, butter and similar things.

(HI) See arşın.

(MZP) The name of a unit of length. The dictionary meaning is wrist or arm, or more precisely that part from the elbow to the end of the middle finger. As a technical term it means the length equivalent to this, which is also known as arşın.

Tersane zira'ı: Formerly the name of a unit of measure used at the naval arsenal. It was equivalent to 24 cannes. This zirâ' was 3 parmak longer than a mimarî zirâ', because the mimarî zirâ' consisted of 24 parmak and was equivalent to 75 cm, and since 1 m was equivalent to 37 French pus, an old tersane zirâ' which consisted of 24 kane [canne] was equivalent to 30 French pus. Therefore the tersane zirâ' of 27 parmak was 3 parmak longer than the mimarî zirâ'.

(NS) In various sources this is defined as a distance from the elbow to the end of the middle finger, the distance from the shoulder to the end of the fingers, or the distance between the end of the fingers when the arms are outstretched, so it varied in value over time and place. Among the Ottomans it was usually synonymous with the arşın, the zirâ'-i çarşı = çarşı arşını and zirâ'-ı mimârî = mimar arşını.

(OŞG) At various times in different Islamic countries, the zirâ used for various purposes ranged from 54.04 cm to 91 cm. (Also see Arşın).

(ÖNB) In dictionaries this means arm or wrist, that is the part from the elbow to the tip of the middle finger. When measuring it is the length equivalent to this. In Turkish it is called arşın. The plural form is ezru or ziraat. There are several different kinds.

(PGI) At various times in different Islamic countries, the zirâ used for various purposes ranged from 54.04 cm to 91 cm. (Also see Arış and Arşın).

(WH) When we encounter this term in the Iranian cultural sphere we must compare it with definitions of zar and gez. In Turkey today 1 zira = 65 cm. We must also compare it to the ez-zirau'l-İstanbuliyye. In India a royal arşın (zira'-i padişahî) was equal to 40 angoşt, and equivalent to 32 inches or 81.28 cm. Ekber adjusted this measure to 41 angoşt at the end of the 16th century, and his royal arşın was therefore 83.31 cm. In 1647 in Agra the old arşın of 81.28 cm was officially revived.

The number of arşın measures used in the Islamic countries is excessive. The first is the Nile arşın dating from 861 found on the island of er-Ravda in Cairo. According to studies carried out during the French campaign in Egypt led by Napoleon and which were checked by K. A. C. Cresswell in 1927, this is an average of 54.04 cm. This is the land arşın of the Abbasids. Now I give the different arşın measures in alphabetical order. With respect to Iran the fractions of the gez and zâr are important.

(T.2) **Aşîr-i zirâ'**: = 0.01 m.

(EÇ) 1/10b All the porters with rocks and Khorasan gypsum in their hands dropped these to the ground and in the twinkling of an eye foundations had been raised one royal zirâ above the ground.

(EÇ) 1/14a From Yedikule as far as the pillar of Ebû Eisârî he built a double fortification and strong solid wall, such that the height of the first wall is 21 zirâ'-ı mülkî [royal zirâ'] and the height of the inner wall 70 zirâ' and the width is 20 zirâ', and the height from the bottom of the moat outside the walls up to their foundations is 42 zirâ', and along the base is pure water, and between the two walls a platform of brick dust and lime mortar lend strength. And the width of this platform is exactly 80 zirâ', and between the outer and inner walls is a place like the Imm Gardens.

Zirâ'-ı amme: (ÖNB) An arşın of 6 kabza or 24 parmak. Its square is 576 parmak.

In Turkey they call this arşın zirâ'-ı mimari, and it is used in the measurement of land and architecture.

Its fractions are as follows:

zirâ'-ı mimari: 24 parmak, 0.758 m, that is 758 mişarı ziraat.

parmak: 12 hat = 3.15 cm.

hat: 12 nokta = 0.263 cm.

kadem: 12 parmak.

kulaç: 5 kadem.

kulaç: 2.5 zirâ'-ı mimari. Used for excavation.

(WH) The 'bayağı arşın' [ordinary arşın] was probably the kara arşın of 54.04 cm. A. Gonsales drew a picture of a quarter of a bayağı arşın in 1665, giving its length as 13.2 cm, which would make the arşın 52.8 cm. This small discrepancy may derive from a printing error.

Zirâ'-ı aşarî: (ÖNB) As mentioned in the law code dated 14 September 1285 H and 20 Cemazi el ahir 1286 H, the measuring system for area, length and weight adopted in Turkey was based on the metre or zirâ'-ı aşarî, defined as a length equal to one part in 10 million of a quarter of the circumference of the globe.

(T.2) = 1 m (this zirâ'-ı a'şârı or metre is equal to one part in 10 million of a quarter of the equator. It is on this that the system of weights and measures is based.)

Zirâ'-ı bennâ: see zirâ'-ı mimarî

Zirâ'-ı bilaliye: (WH) The name of this arşın derives from Bilal ibn Ebi Bürde (who died in 739). This was also called the small Hashimid arşın, and was 2 2/3 asba (1 asba is 2.252 cm) larger than the kara arşın, its length being 60.055 cm.

Zirâ'-ı dur: (WH) Also known as the fiddiya, this arşın was probably instituted by Kadı İbn Ebi Leylâ Yeşar. It was smaller than the kara arşın by 1 2/3 asba and equivalent to 50.3 cm.

Zirâ'-ı haşimiye: (WH) Another name for the large haşimî arşın of 8 kabda or 32 asba was the royal or ziyadî arşın, and took its name from the Abbasid caliph al-Mansur (754-75). Compared to the 50.3 cm arşın discussed above, this was 7 2/3 asba (width of a finger) larger. If we take the width of a finger to be 2.078 cm, then the haşimî arşın was 66.27 cm. We calculated the royal arşın to be 66.81 cm or 86.21 cm (see zirâ'-ı melik). Therefore we find the average value of the haşimî arşın to be 66.5 cm. The small haşimî arşın was identical to the bilâl arşın, at 60.055 cm.

Zirâ'-ı haşimiye-yi kübra: (ÖNB) This arşın is 5 2/3 parmak longer than the zirâ'-ı sevda. Mansur was the first to introduce it to Haşimiye. It is also called the ziyadiyye, because Ziyad measured the region with this. The people of Ehvaz also used this measure.

Zirâ'-ı haşimiye-yi suğra: (ÖNB) This arşın is 2 2/3 parmak longer than the zirâ'-ı sevda. It was invented by Bilâl İbni Ebi Burde. Therefore it is also known as zirâ'-ı bilaliye. It is said that Ebu Müsel Eş'arî also used this. It was used in Basra and Kufa.

Zirâ'-ı kadiye: (ÖNB) This arşın is shorter than the zirâ'-ı sevda by 1 2/3 parmak. It is also called zirâ'-ı dur. It was first introduced by Kadı İbni Ebi Leyla, and was used by the people of Kelvaz.

Zirâ'-ı kirbas: (ÖNB) An arşın equivalent to 7 kabza or 28 parmak used for fabrics.

In Turkey this is called the çarşı arşını, which is 1 parmak 10 hat and 6 nokta shorter than the zirâ'-ı mimarî.

çarşı arşını = 0.68 m, that is 680 mişarı zira.

endaze = 8 rubu' = 2 kirah, 1 kirah = 2.9 cm.

endaze = 0.65 m, that is 650 mişarı zira.

(WH) This Egyptian arşın used for measuring white sackcloth was identical to the bayağı arşın (zirau'l-amme), which as stated was probably the same as the kara arşın (zirau's-sevda), and equivalent to 54.04 cm.

Zirâ'-ı kisra: (ÖNB) An arşın of 7 kabza, that is 28 parmak. This is also called the zirâ'-ı melik. It is equal to the zirâ'-ı kirbasiye.

Zirâ'-ı mesaha: (ÖNB) An arşın of 7 kabza and an upright finger used for measuring land. This zirâ'-ı has been found to be 1 kabza and 1 parmak larger than the zirâ'-ı mimari used in Turkey.

Zirâ'-ı mimari: (ÖNB) An arşın of 6 kabza, that is 24 parmak. It square is 576 parmak, and it is used for measuring land and in architecture.

Its fractions are as follows:

zirâ'-ı mimari: 24 parmak, 0.758 m, that is 758 mişarı ziraat.

parmak: 12 hat = 3.15 cm.

hat: 12 nokta = 0.263 cm.

kadem: 12 parmak.

kulaç: 5 kadem.

kulaç: 2.5 zirâ'-ı mimari. Used for excavation.

(WH) The building arşın was identical to the carpenter's arşın (ez-zira bi'n-neccârî) used in Egypt. This was 8/5 of the hand arşın of the middle ages. Below we have estimated the zirau'l-yed to be 49.875 cm, and therefore we can conclude that the medieval construction arşın was 79.8 cm. In the 19th century Mahmud Bey calculated the hand arşın to average 49.32 cm, which would make one carpenter's arşın 78.9 cm. When this value is compared to others, it seems a bit high, other calculations making it 77.5 cm. In the second half of the 19th century, with the introduction of the metric system, the Egyptian carpenter's arşın was set at 75 cm.

(NS) A kind of arşın of 60 engüst (60 x 1.263 cm), 24 parmak (24 x 31.572 mm) or 6 kabza, equivalent to 757.728 mm.

Under the metric system this length was set at 75.8 cm, but it is not known when Ottoman architects began to use this measure. During the reign of Selim III an ebony mimar arşın standard marked on one side in 24 parmak each of 12 hat, and on the other in 20 parmak each of 10 hat was made and placed in the library of the Imperial Engineering School.

(T.2) = 0.758 yeni [new] arşın = 24 parmak.

Zirâ'-ı mizaniyye: (ÖNB) An arşın equivalent to two zirâ'-ı sevda and 2/3 of an arşın and 1/3 parmak. It was first used by the Caliph Me'mun. It was used for measuring the area of houses, streets, rivers and streams.

(WH) This terazi arşını instituted by the Abbasid caliph el-Ma'mûn was equivalent to 2 2/3 kara arşın + 2/3 aşba (finger width), and used for measuring water channels. According to the above calculations it was 145.63 cm in length.

Zirâ'-ı ömeriyye: (ÖNB) This arşın is 1 zira, 1

kabza and 1 vertical thumb' length. It was first instituted by Omar. It was found by adding the length of the longest, shortest and medium arşın, dividing the total by three, and adding 1 kabza and 1 thumb length. Both sides were plated in tin. This arşın rule was used on the orders of Omar for measuring the area of arz-ı sevad.

(WH) The arşın of the Caliph Omar was half a terazi arşın, and according to my calculations equivalent to 72.815 cm.

Zirâ'-ı sevda: (ÖNB) An arşın the length of an arm. It was invented by Harunü'r-Reşid, who took it to be the arm length of a black slave in his retinue, and was therefore called by his name. It was used for measuring buildings, the height of the Nile waters, and for measuring cloth.

(WH) The kara arşın of 24 aşba (finger width) introduced by the Abbasid caliph el-Ma'mûn was 54.04 cm according to the Nile measure found on the island of ar-Ravda.

Zirâ'-ı yusufiye: (ÖNB) This arşın is 2/3 parmak less than the zirâ'-ı sevda. It was first instituted by Imam Ebu Yusuf, and was used by magistrates in Baghdad for determining the areas of buildings.

(WH) This arşın is named after the famous judge Kadı Ebu Yusuf (d 798). It was 2/3 parmak less than the kara arşın, so it was equivalent to 52.55 cm. But it is probable that the data on this is erroneous. The yusuf arşın was 2/21 shorter than the kara arşın, which makes it 48.9 cm. In all likelihood the yusuf arşın was identical to the şer'î arşın or el arşın of 49.875 cm.

Zirâ'-u'l-mimari: see zirâ'-ı mimari

Zirâ'-u'l-amel: (WH) The arşın used by the Egyptians was identical to the haşimi arşın, which according to my calculations (see ez-zirau'l-hâşimiyye) was on average 66.5 cm.

Zirâ'-u'l-belediyye: (WH) According to measurements for the 19th century the usual length of this arşın was 58.26 cm, and it was identical to the pik, that is the zirau'l-bezz used for cloth. E. W. Lane reports the cloth arşın to be 22 2/3 inches, which makes 57.57 cm.

Zirâ'-u'l-berid: (WH) This 'postal arşın' was the same as the şer'î arşın of 49.875 cm.

Zirau'l-bezz: (WH) The cloth arşın was one of the most widely used types of arşın in the middle ages, and in commerce with the countries of the eastern Mediterranean was called the pik [pike]. According to al-Kalkaşandî, the Egyptian cloth arşın as used in Cairo was the same as 1 hand arşın plus 4 asba = 1 1/6 hand arşın. If we take the latter to be 49.87 5 cm (see zirau'l-yed) we can obtain the value of the cloth arşın used in Cairo as 58.187 cm. This value exactly corroborates the information given in the 1440s by G. da Uzzano. Since the Venetian arşın was 68.34 cm, that would make the pik 58.15 cm (picchi 114 d'Alessandria sono in Vinegia braccia 97)... The cloth arşın of Alexandria was therefore equal to that of Cairo. In an illustration dated 1665, A. Gonsales specifies that a quarter arşın was 14.5 cm, which would make the full arşın 58 cm. He adds that this was used for measuring Indian fabrics. European fabrics, on the other hand, were measured with the Istanbul arşın, which according to his illustration was 64.4 cm (actually 68.579 cm). According to al-Kalkaşandî the Damascus cloth arşın was 1/12 larger than the Cairo arşın, which would make 63.035 cm. In Aleppo, according to the same writer, the cloth arşın was 1/6 larger than the Cairo arşın, which would make 67.9 cm. W. Barrett confirms this with out doubt, when he tells us that 100 pikes in Aleppo in 1584 were 103 *codes* in Hormuz. Since the Portuguese codo was 66 cm, this would make the Aleppo cloth arşın 67.98 cm. In the 19th century 1 pike was 67.7 cm in Aleppo. In Syrian Tripoli the cloth arşın was 1/10 longer than the Cairo arşın, or 64 cm. In Jerusalem in the 19th century the cloth arşın was equivalent to 25.5 in or 64.77 cm. In Iraq in the 16th century, the cloth arşın in Baghdad and Basra was 82.9 cm. This has been calculated according to the information given by W. Barrett, according to which 82 'Babylon' (Baghdad) pikes were equivalent to 100 Aleppo pikes or 100 Baghdad pikes, equivalent to 125 2/3 Hormuz codes, each 66 cm. In the 19th century Bleibtreu reports the Baghdad cloth arşın to the 80.26 cm. In international commerce with India (as in Iran in the middle ages) the Aleppo cloth arşın was used. In Surat in the 17th century a small arşın of 27 inches (68 cm) was used, which was the same length as the Aleppo arşın. In addition there was a large arşın of 36 inches (91 cm).

Zirâ'-u'l-badid: (WH) The 'iron arşın' of 28 şer'î asba was used as a cloth arşın in Egypt and the Hejaz in the 15th century, and was equivalent to 7/6 of the hand arşın (zirau'l-yed). Thus it was a length of 58.87 cm, as calculated for the cloth arşın (zirau'l-bezz) of Cairo and Alexandria.

Zirâ'u'l-hindâse: (WH) E. W. Lane gives the value of 25 inches (approximately 63.5 cm) for the arşın that was used mainly for measuring Indian fabrics. Today this Egyptian unit of length is exactly 65.6 cm. Probably this is the old hâşimî arşın.

Zirâ'u'l-İstanbuliyye: (WH) This arşın used for cloth in Istanbul was also used in later times for measuring European cloth in Egypt. E. W. Lane sets this value at 26.5 in (approximately 67.3 cm). According to Bleibtreu this arşın was 68.579 cm in the 19th century. It began to be used in Cairo in November 1920.

Zirâ'u'l-kayme: (WH) This arşın was identical to the şer'î arşın or hand arşın (zirau'l-yed), and 80 of these arşın made 60 haşimî arşın, and we have already calculated one haşimî arşın to be 66.5 cm.

Zirâ'u'l-melik: (WH) This royal arşın is identical to the large haşimî arşın. It was 5 2/3 aşba (finger width) larger than the kara arşın of 54.04 cm. According to another piece of information in the same source, it was 1 9/40 of the kara arşın. In the first case this would make the royal arşın (taking finger width to be 2.252 cm) 66.81 cm, and in the second case make it 66.21 cm. In practice the royal arşın is an average of 66.5 cm.

Zirâ'u'l-mesâha: see Zirâ-ı mimari

Zirâ'u'l-mürsele: (WH) 12,000 of this arşın made 1 fersah. According to my calculation, this measure is therefore identical to the 49.875 cm şer'î arşın or hand arşın (see zirau'l-yed).

Zirâ'u'l-yed: (WH) The hand arşın of the Egyptians, as specified above, was identical to the şer'î arşın, and 1-1 2/3 aşba smaller than the kara arşın of 54.04 cm (see ez-zirau's-sevda) or equivalent to 1/3 of the terazi arşın (ez-zirau'l-mizaniyye). In the first case, since 1 aşba is to .252 cm, the hand arşın must be 50.3 cm, and in the second case is calculated at 48.54 cm. The length of the hand arşın can be calculated more precisely on the basis of the information given by el-Kalkaşandî, which would make 1 hand arşın to be 6 kabda, each kabda (hand width) being 4 aşba (finger width); and therefore 8 of this arşın was equivalent to 6 haşimî arşın. Therefore we can conclude that the zirau'l-yed was 49.875 cm. This measure was found to average 49.32 by Mahmut Bey in the 19th century.

Zirâ'u'r-Reşâşiyye: (WH) The reşâşî arşın of 6 kabda that was mainly used in the Maghrib and Spain was identical to the kara arşın (zirau's-sevda), and so equivalent to 54.04 cm.

Zirâ'u'ş-şer'iyye: (WH) The şer'î arşın was the same length as the Egyptian hand arşın (zirau'l-yed) and according to my calculation was 49.875 cm.

Zirâ'u'z-ziyadiyye: (WH) This arşın was used in early Islamic times by Ziyad b. Sumayya to do measurements in Iraq, and was the same length as the royal arşın (zirau'l-melik) or the large haşimî arşın, approximately 66.5 cm.

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