MEASURES AND WEIGHTS IN THE ISLAMIC WORLD
AN ENGLISH TRANSLATION OF WALTER HINZ’S HANDBOOK ISLAMISCHE MAßE UND GEWICHTE
FOREWORD BY PROFESSOR C.E. BOSWORTH, F.B.A.

M. ISMAIL MARCINKOWSKI

Dr. M. Ismail Marcinkowski was born in 1964 in Berlin (West), Germany. In 1993 he obtained his M.A. in Iranian Studies, Islamic Studies and Political Science from the Free University Berlin, where he studied with Prof. Dr. Bert G. Framberger. In 1998 he received his Ph.D. in Islamic Civilization from the International Institute of Islamic Thought and Civilization (ISTAC), Kuala Lumpur, Malaysia.

Dr. Marcinkowski has published more than 40 articles in leading journals, as well as several books, in the United States, Europe, India and Southeast Asia. His works focus on the most part on Persian history and culture (especially during the Safavid period), as well as on Persian cultural influences in Thailand and the eastern Indian Ocean region. ISTAC has published in 2002 his award-winning book Mirza Rafi’i’s Dastur al-Muluk: A Manual of Later Safavid Administration, Annotated English Translation, Comments on the Offices and Services, and Facsimile of the Unique Persian Manuscript. His most recent book is Persian Historiography and Geography: Berthold Spuler on Major Works Produced in Iran, the Caucasus, Central Asia, India and Early Ottoman Turkey, with a foreword by Professor Clifford Edmund Bosworth, F.B.A. (Singapore: Pustaka Nasional, 2003). Among his forthcoming books is Religion and Politics in Iraq: Shi‘ite Clerics between Quietism and Resistance, with a foreword by Professor Hamid Algar, University of California at Berkeley (Singapore: Pustaka Nasional, 2003).

The present work constitutes the first English translation from the original German of the late Professor Walther Hinz’s acclaimed reference book Islamische Maße und Gewichte, umgerechnet ins metrische System on measures and weights which have been used throughout the Muslim lands both in the past and in the present times. Hinz’s work, originally published by E. J. Brill in Leiden, the Netherlands, more than three decades ago, still constitutes an indispensable tool for research for anyone with an interest in the civilization of the Muslim lands, from the Maghreb, over the countries of the Fertile Crescent and the Iranian world, to the Indian subcontinent.

Dr. Marcinkowski, who has lived several years in the Middle East and Southeast Asia, is a member of distinguished scholarly associations in the United States, Germany and Thailand, and is presently Associate Professor of History at ISTAC.

"Dr Marcinkowski's translation of Hinz's concise but detailed work on Islamic weights and measures will make this useful reference available to the modern scholarly world in general, for which English is becoming the lingua franca."

Professor Clifford Edmund Bosworth, F.B.A.,
Professor Emeritus of Arabic Studies in the
University of Manchester, England

MEASURES AND WEIGHTS
IN
THE ISLAMIC WORLD

AN ENGLISH TRANSLATION
OF WALThER HINZ'S HANDBOOK
ISLAMISCHE MAßE UND GEWICHTE
We would like to thank the Islamic Mint Sdn. Bhd. (www.islamicmint.com.my) for their generosity in allowing us to use the photograph of the Islamic dinârs and dirhams for this bookcover. The Islamic dinâr is a specific weight of gold equal to 4.25 grams and the Islamic dirham is a specific weight of silver equal to 2.975 grams. These weights follow the known standard established by Caliph Umar ibn al-Khattab (may Allah be pleased with him), that is, 10 dirhams is to 7 dinârs (muhqâls). The inner section of the coins are inscribed with the words: There is no god except Allah and Muhammad is the Messenger of Allah and on the outer section:

"Verily this is your community and it is one community.
And I am your Lord, therefore beware."

Concept and Art Direction: Ajmal M. Razak Al-Aidrus
Design: Aida Melly Tan Mutalib

INTERNATIONAL INSTITUTE OF ISLAMIC THOUGHT AND CIVILIZATION (ISTAC),
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA (IIUM),
KUALA LUMPUR
2003
The acquisition of any knowledge, whatever, is always useful to the intellect, because it will be able to banish the useless things and retain those which are good. For nothing can be either loved or hated unless it is first known.

Leonardo da Vinci (from his Notebooks)

TO PROFESSOR SAYYID AHMAD KAZEMI MOUSSAVI,
A MENTOR AND FRIEND
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[This entry has been added to the English translation from the appendix ("Anhang") of Hinz's German text, see ibid., p. 67]

3. Linear Measures

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3.2 arash
3.3 aṣbāʿ
3.4 ashīl
3.5 bāʾ
d.6 bāb
3.6 bahr
3.7 barīd
3.8 dhirāʾ
3.8.1 dhirāʾ al-ʿamal
3.8.2 al-dhirāʾ al-ʿammah
3.8.3 al-dhirāʾ al-balādīyyah
3.8.4 dhirāʾ al-barīd
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FOREWORD

By Professor C. Edmund Bosworth F.B.A, Professor Emeritus of Arabic Studies in the University of Manchester

There is a great need for a work in English on the weights and measures prevalent in the pre-modern Islamic world, hence I am very happy to commend Dr Marcinkowski’s English translation of Walther Hinz’s monograph *Islamische Maße und Gewichte*. Although it was published nearly half-a-century ago in the *Handbook of Orientalism* series, it has stood the test of time and has not been replaced. The only work which has supplemented it subsequently is the article “Makāyil wa-mawāzin” in the *Encyclopaedia of Islam* (new edition) by the Israeli economic historian, E. Ashtor, and the British authority on Muslim India, J. Burton-Page, but this is necessarily briefer and more general than Hinz’s work. It has doubtless been the great complexity of the topic which has deterred many scholars from further work here. Although early Islamic weights and measures were firmly rooted in the pre-Islamic Ancient Near East, as their names show (e.g. the weight *ratl* goes back, via Aramaic, to a Greek original, and the measure of capacity used in Iraq for such things as grain, the *kurr*, goes back to distant Sumerian times), they became richly differentiated in early Islamic times and over the various lands making up the caliphate and its successor states. It is the complexity of these regional variations which makes the task of evaluating so difficult today.

The late Prof. Dr. Walther Hinz was born in 1906 and died at Göttingen, the University where he had been Professor, in 1992. He was well qualified to deal with these complex problems since his expertise spanned both the Ancient Near East and the Islamic world, with a particular emphasis on Persia across the whole spectrum of its history. Thus his first major work, whose translated title is *Iran’s Rise to a National State in the Fifteenth Century* (Berlin and Leipzig 1936), elucidated what had been, until then, the obscure origins of the Şafawiyyah dervish order in Azerbaijan and its eventual transformation into a militant Shi’ite
movement which became the basis of the Şafavid empire, one of the most powerful Islamic states of the age and the great rival of Ottoman Turkey. Later in his career, however, Hinz became equally interested in pre-Islamic Persia, and especially in the little-known kingdom of Elam which flourished in southwestern Persia in the early part of the first millennium B.C. and the Elamite script and language. One of his works here is available in English, _The Lost World of Elam_ (London 1972).

Dr Marcinkowski's translation of Hinz's concise, but detailed work on Islamic weights and measures will make this useful reference work available to the modern scholarly world in general, for which English is becoming the _lingua franca._

Castle Cary, Somerset, England, 10 March 2003

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**TRANSLATOR’S PREFACE**

The present work constitutes the first English translation of Prof. emer. Dr. Walther Hinz’s acclaimed reference book (originally compiled by him in German) _Islamische Maße und Gewichte, umgerechnet ins metrische System_ on measures and weights which have been used throughout Muslim lands, both in the past and in the present. Hinz, born in 1906 in Stuttgart, was appointed Professor of the History of the Near East by Göttingen University in 1937 and was the second scholar to hold that position. His _Habilitationsschrift_ on the emergence of Şafavid Iran, entitled _Iran Aufstieg zum Nationalstaat im fünfzehnten Jahrhundert_ (Berlin and Leipzig: Walter de Gruyter, 1936), is still considered by many as a valuable piece of scholarship on that particular historical period—despite allusions therein to certain “racial theories” which had been in vogue in Germany at the time. Because of his affiliation to the “Third Reich”, Hinz was replaced in 1946 by Hans-Heinrich Schaedler. After Schaedler’s death in 1957, Hinz was able to return to Göttingen University where he took over the Chair of Oriental Philology. He retired in 1975 and was succeeded by Professor David Neil MacKenzie. Hinz died in 1992 in Göttingen.*

In spite of Hinz’s role during the darkest period of German history, his contributions have to be considered as still of value

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2 Based on the information provided by the computer website of the Seminar for Iranian Studies of Göttingen University: refer to http://www.gwdg.de/iranist/history.htm (English version); http://gwdult9.gwdg.de/awent/Geschichte.htm (the more detailed German version).

Ergänzungsband I, Heft 1 (Leiden: E. J. Brill, 1970) [i.e., the German original of the present English translation].


During my teaching, I have observed that my students face problems with regard to converting measures and weights, which they frequently encounter in the course of their research into the metric system. Since they usually have no command of the German language, they are not aware of Professor Hinz’s momentous contribution. I thus felt compelled to prepare some sort of my own “teaching-material”. I hope that scholars from various disciplines (as well as the general reader with an interest in the Middle East) without access to the German language might find this English translation useful for their particular purpose.

In the preface to the 1970 (i.e., second) edition of his work, on which the present translation is based, Hinz referred to various reviews of it which had appeared since it was first published in 1955. Although I had no direct access to these reviews, I would like to give Hinz’s bibliographical references for the convenience of the reader:


In the same preface, Hinz also mentioned two other studies which are said to contain information relevant to the subject: see A. Grothmann, Einführung und Chrestomathie zur arabischen Papyrskunde, vol. I (Prague 1954), pp. 140–180., and H. Prell, “Die schwarzen Ellen der Araber” in Zeitschrift der Deutschen Morgenländischen Gesellschaft, vol. 110 (1960), pp. 26–42.
According to Hinz (ibid.), there already exists a Russian translation of his work by Yu. Bregel under the title *Musul’manskie mery i vesa s perevodom v metričkuju sistem* (Moscow 1970), which is said to contain an appendix (pp. 75–131) by Elena Davidovic under the title “Materialy po metrologii srednevekovoy Sredney Azii” (“Materials on the Metrology of Medieval Central Asia”), and a bibliography, again by Yu. Bregel (pp. 132–143). My friend, Prof. Dr. Mehmet İpeşiiri, who is now Head of the Department of History at Fatih University (İstanbul, Turkey) and visiting scholar at ISTAC, had also told me about the existence of a Turkish translation, but I have been unable to verify this. It should be noted that another very detailed and interesting study in Arabic of the Muslim measures and weights by Maḥmūd Fa’khūrī and Salāḥ al-Dīn Khawwām, entitled *Maṣūʿat waḥdāt al-qiyyās al-ʿarbābīyyah wa-ʾl-islāmīyyah*, was published in Lebanon recently (Beirut: Maktabah Lubnān, 2002). As admitted by the two authors themselves, however, their work is greatly indebted to Hinz’s work and to the sources used by him.

The present English translation follows as closely as possible Hinz’s German original. No extra information with regard to its contents have been added by me (since I do not claim to be a metrologist), and the wording of the footnotes as well as the bibliographical arrangement of the information given therein have been maintained. Some editorial changes, however, have been deemed necessary:

(1) The numbering of the footnotes of the German original restarts for every page. I have changed this to consecutive numbering throughout the entire English translation.

(2) Like the German original, the present English translation, too, does not contain an index. Instead, the table of contents appears as a quick-reference in order to facilitate the finding of individual entries further.

(3) The system of transliteration is thought to adhere closely—at least with regard to the original Arabic expressions—to that of the *Journal of Islamic Studies* (Oxford, United Kingdom), which in turn is congruent with the style of ISTAC’s biannual scholarly journal *Al-Shajarah*. I faced, however, certain problems with regard to Persian and (Ottoman-) Turkish terms, especially with synonyms for the respective Arabic terms. I have tried to adhere closely to the pronunciation in these two last mentioned languages. The expert should be able “to discover” what is being referred to, whereas the non-specialist may want to overlook such academic “particularities”.

(4) The change of the transliteration system referred to above affected the alphabetical sequence of entries in the English translation, which thus differs at times from Hinz’s original.

(5) The entries (as they appear in the English translation) have been provided with numbers, since they had been unnumbered in Hinz’s original.

(6) Dates given throughout the English translation follow the Gregorian calendar.


(8) The additional informations and corrections in Hinz’s “Anhang” or appendix to his German original (see *Islamische Maße und Gewichte*, p. 68) have been incorporated into the particular entries of the English translation. The only two exceptions made with regard to the significant information provided by Hinz concern the terms *khūfāw* and *sunqūrī*, which necessitated two completely new entries (i.e., 3.13 *khūfāw* and 2.2.36 *sunqūrī*).

I wish to express my gratitude to Prof. Dr. Syed Muhammad Naqib al-Atas, the former Director of the *International Institute of Islamic Thought and Civilization* (ISTAC) in Kuala Lumpur, Malaysia, a renowned scholar and thinker, for accepting the present work for publication. He has always taken a profound and encouraging interest in my studies.
and research activities at ISTAC.

Moreover, I am indebted to Prof. Dr. Mehmet Işıkli for his general encouragement. It was a remark by him which caused me to embark on the translation of Hinz’s *Islamische Maße und Gewichte*.

I would like to express my gratitude to the publishing house of E. J. Brill, Leiden, the Netherlands, for granting the right to publish the present English translation of Hinz’s original German *Islamische Maße und Gewichte*. Above all, I am indebted to ISTAC’s Publication Unit, and above all, to Assoc. Prof. Dr. Ajmal M. Razak Al-Aidrus, ISTAC’s Deputy Dean of Research and Publication for proofreading this work and for seeing it through the press. I would also like to thank Ms. Aida Melly Tan Mualilb for her smooth cooperation. I have also to thank Ms. Elisabeth Rickens and Dr. Sudandaranbal Saminathan, both lecturers at the University of Malaya, who went through my first draft and made invaluable suggestions.

*M. Ismail Marcinkowski*

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1. **Weights**

1.1 The method of determining mithqāl and dirham

The basis for all Islamic weights is the *dirham*, which originated in the Greek *drachma*, and the *mithqāl*, which goes back to the Roman *solidus*. The canonical rate (i.e., in accordance with the *shari‘ah*) between the *mithqāl* and the *dirham* is 10:7. In reality, however, the rate is 3:2. The process of determining the remaining weights depends on the reliable and exact ascertaining of those two units. So far this task has not been done satisfactorily. Throughout the Islamic world, numerous *mithqāl* and *dirham* weights have developed which differ with regard to location and time. The statements which are to be found in local sources often contradict each other and appear at times blurred if seen through the glasses of the canonical copyists.

1.1.1 Numismatic weights

The *dirham al-kayl* or the “weight dirham” [Gewichts-Dirham], as well as the *mithqāl* (a high-grade commodity weight), has principally to be distinguished from the weights of silver *drachmas*.

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* The wording and arrangement of the numbered footnotes in this translation follow closely Professor Hinz’s German original (transl.).

† The gist of this part was already published in the *Festschrift for A. Zeki Velidi Togan* (Istanbul, 1955, pp. 264–72). I should like to consider its present augmented reprint as indispensable for reasons of completeness and convenient accessibility.
and gold dinārs, which shall be dealt with below.

The mithqāl weight of the classical Islamic gold dinārs can be determined with a high degree of precision. In this case we must not proceed from the coins themselves, but rather from the glass weights, which have been produced for their gauging. The most exact glass weights from the year 780, which have been discovered so far and which agree up to a third milligram (!) result in an average weight of 4.231g² or 65.3 grains for the dinār. This is in agreement with the measurements which had been carried out by Casanova with regard to some hundreds of preserved glass weights.³ One glass weight of 18 mithqāl, which appears to be reliable since its derivations amount only to 1/18 of a one-mithqāl-piece, weighs 76.23g⁴. Therefrom we derive as accurately as possible a weight of 4.233g for the classical gold dinār.

According to the canonistic rule of 10:3 we derive for the classical silver dirham a weight of 2.97g or 45.833 grains. Such gauge weights, originating from the second half of the 8th century, had indeed been encountered by W. M. F. Petrie. However, according to Casanova, it is very likely that the practical mithqāl:dirham rate of 3:2 had been adhered to, since its gauging from the glass-dirham resulted mostly in 2.82g (43.52 grains). The numismatic discoveries offer rich supporting evidence for the value of both silver dirham figures.

Only under the dynasties of the Ayyūbids [of Egypt and Syria, 1169–13th century, in Syria longer] and the Almohads [in North Africa and Spain, 1130–1269] did an exception occur: their gold dinār weighed 4.722g⁵. With regard to price declarations in early and high medieval times we come across at times qirāt and ḥabbah in gold and silver. According to Ibn al-Mu'ādh⁶ [Cordoban Muslim scholar, fl. 11th century], one mithqāl of gold equalled in [Arab] ‘Irāq, 20 qirāt, at 3 ḥabbah each, whereas a mithqāl of silver equalled 12 qirāt at 4 ḥabbah each. Since one mithqāl in those cases equals 4.233g, we derive for ‘Irāq the following rates: one gold qirāt = 0.212g, one silver qirāt = 0.247g, one gold-ḥabbah = 0.0706g and one silver ḥabbah = 0.062g. These rates also apply to Iran. In the Arabian Peninsula and in Egypt and Syria, the rates are: one gold qirāt = 0.176g, one silver qirāt = 0.186g, one silver ḥabbah = 1/16 dirham = 0.0495g, since the qirāt there always equalled 1/24 mithqāl or 1/16 dirham.⁷ In the Maghrib, however, we have to proceed from the rate of one mithqāl at 4.722g, which results in 0.0787g for one ḥabbah.⁸

1.1.2 Commodity weights

*Mithqal* and *dirham* as high grade commodity weights reveal essentially divergent values which differ from the numismatic weights. An Egyptian commission which had been appointed by Khedive Muhammad ‘Ali [r. 1805–48] in 1854 standardised the *dirham al-kayl* (“weight dirham”) at the weight of 3.0898g⁹ Sauvain, to whom we owe much for the most detailed studies on Islamic metrology so far, based his calculations, as mentioned in his own introduction, on the above figures. Decourdemanche, however, considered the statement of the Egyptian commission as completely wrong.¹⁰ However, Decourdemanche’s *dirham al-kayl* in turn, calculated by him at 3.148g, is too heavy, and his

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7 Ibid., p. 289 ff.
8 Refer to Revue Numismatique 4 XII (1908), p. 218.
10 Revue Numismatique 4 XII (1908), p. 222: “M. Sauvain a pris pour base la donnée complètement fausse de la commission égyptienne, au sujet d’un poids de 3 gr 0898, à donner au dirhem légal.”
own derivations of mithqāl weights, therefore, erroneous.\(^{11}\)

We shall now put aside theoretical considerations and keep to the available gauge weights since the beginning of Islamic history. Let us first turn to the well-preserved, Umayyad Syrian \textit{ratl} weight of the year 744\(^{12}\) which was published in 1939. It weighs 337.55g and should constitute the so-called \textit{ratl rūmi}, i.e., a Provincial Roman pound at 72 solidi/mithqāl. Since one “weight \textit{dirham}” amounted to \(\frac{2}{3}\) mithqāl, this \textit{dirham al-kayl} equals exactly 3.125g. Abbāsid glass weights, which had been found in Egypt, amount to an average weight of 0.195g for one \textit{kharrubāh} or \textit{qīrāt} with a high degree of accuracy.\(^{13}\) Therefore, we arrive at 3.123g for the “weight \textit{dirham}” at 16 carat. A \textit{ratl} weight in the Louvre at 140 \textit{dirham} which weighs 437.2067g (obviously originating from the Fāṭimid period [909–1171]), results in 3.123g for one \textit{dirham}, which is a further confirmation of our approach.\(^{14}\) The official Egyptian government statement of 1924, according to whose almanac one \textit{dirham} equals currently 3.12g, is in agreement with it.\(^{15}\) Ultimately, the figures which had been derived by Queipo for the “weight \textit{dirham}” oscillate around an average of 3.125g.\(^{16}\) Therefore, we have to operate with the derived weight of the standard \textit{dirham} of 3.125g (48.225 grains), unless the statements in the sources prescribe locally different figures. From the said figure of 3.125g for the canonic “weight \textit{dirham}”, we derive the weight of the canonic mithqāl (namely from the fixed rate of 7:10) at 4.464g (68.888 grains). This canonic mithqāl weight, however, is less in practical usage compared with the special weights which are current in certain countries.

1.1.2.1 Egypt

In Egypt, the practical mithqāl weight of 24 carat at 0.195g corresponded to 4.68g (72.222 grains),\(^{17}\) thus, exactly \(\frac{1}{72}\) of the ancient Egyptian–Roman pound. Official documents calculate it even today at 4.68g.\(^{18}\) According to al-Dhahabi [1274–ca. 1350],\(^{8}\) 20 Egyptian mithqāl equalled 21 canonic mithqāl,\(^{19}\) which corresponded exactly to a rate of 4.68g to 4.46g. A further confirmation results from the following calculation: \(\frac{2}{3}\) of the so-called “black” yard of 54.04cm at the Nilometer of the island of al-Raudah\(^{20}\) equals 36.033cm or one foot, which, elevated into a cube, equals 46,784cm, i.e., 10,000 mithqāl, and from which again an Egyptian mithqāl of 4.68g results.\(^{21}\)

1.1.2.2 Syria

With regard to 12\(^{th}\) century Syria, we have the statement by al-Shayzari [fl. end of 12\(^{th}\) beg. of 13\(^{th}\) centuries],\(^{22}\) according to

\(^{11}\) Ibid., pp. 216 and 224, respectively.


\(^{14}\) Journal Asiatique 8 IV (1884), p. 310.

\(^{15}\) Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien (Berlin, 1925), p. 25.

\(^{16}\) Don V. Vasquez Queipo, Essai sur les systèmes métriques et monétaires, vol. 2 (Paris 1859), pp. 221, 222, 225, 231, 240.

\(^{17}\) Refer to al-Maqrizi, in: Journal Asiatique 11 IV (1884): 277.


\(^{19}\) The German original places this scholar erroneously in the 19th century, which appears to be a printing-mistake (transl.).

\(^{20}\) Journal Asiatique 9 IV: 280. According to this informant (Journal of the Royal Asiatic Society, New Series, 14 (1882), p. 276), 128 Egyptian qīrāt = 25 g, which results in turn for the mithqāl (= 24 carat) in 4.68 g.

\(^{21}\) Refer to Queipo, Essai sur les systèmes métriques et monétaires, vol. 2, p. 402.

\(^{22}\) As stated in Journal Asiatique 1 IV (1884), p. 279.
which one mithqāl corresponded to $1^{11}_12$ dirham or 24 qirāt or 85 habbah. However, if the dirham is calculated at a standard value of 3.125g, the result for the Syrian mithqāl would be 4.427g. More probable in this case is the canonic value of 4.46g. Therefrom, we derive for the Syrian dirham weight (according to rate $1^{11}_12:1$) 3.14g. In the 19th century the dirham weight in Aleppo had even been stated as 3.167g. We are on somewhat more solid ground regarding the weights of Damascus. Here the mithqāl amounted to a slightly lesser weight than in Egypt, in as far as 100 mithqāl of Damascus equalled only 987/4 of the Egyptian mithqāl. Therefore, we arrive at a Damascene mithqāl of 4.62g. Since 600 Damascene dirham equalled only 5921/2 Egyptian dirham, we arrive at 3.086g for one Damascene dirham, thus approximating the figure which, as already mentioned, had been used by Sauvare, namely, 3.0898g.

1.1.2.3 Anatolia

In Anatolia since the times of the Ottomans (presumably even earlier), the mithqāl equalled one mithqāl 17/25 qirāt miṣrī (i.e., since 1 Egyptian mithqāl = 4.68g and 1 qirāt = 0.195g) 4.81g. The corresponding weight of one Ottoman dirham weight amounted to 3/5 of a mithqāl, namely (as even today) 3.086g.

1.1.2.4 ‘Irāq

With regard to ‘Irāq there is a statement by the English traveler

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28 i.e., al-‘Irāq al-‘Arabi, “Arab ‘Irāq”, Mesopotamia, to be distinguished from

John Fryer from around 1675 with regard to Baṣrah: “1 miscal = 12 valls, and 1/2 Ruttee”, i.e., 12½ Indian wāl. Since according to the same informant, 85 wāl equalled one ounce Troy or 31.104g, we arrive at 4.452g for the ‘Irāqi mithqāl, i.e., obviously (as in Syria) at the canonic mithqāl of 4.46g. A useful confirmation is presented by Barrett, according to whom “100 meticals of Balsara weigh 17 ounces and a half sottil Venetian” around 1584. Since a light Venetian ounce equalled 25.1g, we arrive at 4.4g for the mithqāl of Baṣrah. We can thus, without hesitation, assume the canonic mithqāl weight for ‘Irāq, namely as 4.46g. We have already determined this mithqāl weight as corresponding to the dirham weight; thus we can consistently work with a standard figure, namely 3.125g.

1.1.2.5 Iran

The method of determining the mithqāl and dirham weights for Iran presents considerable difficulties. Until the High Middle Ages, the mithqāl weight followed apparently the ancient Sāsinid silver weight of 4.3g. This seems not only to be confirmed by the numismatic weights of the early 14th century, but also by the Florentine Pegolotti (around 1330), who stated that 55½

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Iranian “saggi” (exagia, mithqāl) equaled one Venetian marco d’argentō, or 238.5g, which in turn results in a mithqāl of 4.3g. One hundred of such mithqāl (of Tabrīz) equaled then 93½ [mithqāl] in Trebizond,33 from which the mithqāl of the [Byzantine] Commene empire is calculated at 4.6g. Correspondingly, this last mentioned mithqāl became later current throughout Iran.

The earliest information about this mithqāl dates from the 16th century: at that time in Shirāz one mithqāl equaled 1/50 of a Portuguese marco of 229.49g, i.e., 4.6g.34 This Iranian mithqāl is also mentioned in the 17th century.35 According to Hanway,36 in the 18th century the mithqāl amounted to 71.1888 grains, i.e., 4.613g. In the year 1890 the rate of 250 mithqāl: 37 ounces Troy had been fixed officially for bullion transactions of coins in Tehran, which resulted in the mithqāl value of again 4.6g.37 By way of the gauge weights of the Iranian customs department, however, the mithqāl was standardized at 71.61 grains or 4.639g.38 Thus, we should be able to fix the average figure for the Iranian mithqāl since the 16th century at 4.6g. Clear data concerning the corresponding medieval Iranian dirham weight are not available. Approximately since the middle of the 14th century the canonical mān weight (= 2 ḥal at 130 dirham each = ca. 5.6kg) seems to have been superseded by the even today effective mān-

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35 To be calculated from the gold-estimations according to the statements by Th. Barker, Calendar of State Papers, Colonial Series, East India, 1625–1629, p. 332.

weight of Tabrīz at about 3kg. According to [the French traveler] Jean Baptiste Tavernier, the last mentioned consisted of 900 dirham39 = 6 livres at 16 ounces = 2.937kg, which result in 3.26kg for the Iranian dirham. Proceeding from a mithqāl of 4.6g, which was current in late mediaeval Iran, one dirham would equal 3.22g (according to the rate 10:7). The [French traveler] Chardin40 calculated the mān “poids de Tauris” [i.e., of Tabrīz] toward the same time as Tavernier, i.e., around the year 1665, at 5 livres 14 ounces = 2.876kg, which means 3.2g for the dirham. There seems to be some indication that throughout Iran the prevailing dirham weights had been heavier than those of the other Islamic lands. I would like to suggest 3.2g as an average figure for the Iranian dirham. Besides this, there also existed in 16th century southern Iran some special weights: with regard to Lār, a Portuguese source41 fixes one farāsīlah at 10 mān, at 24 ʿaṭīyāḥ each, at 10 mithqāl each. One farāsīlah was equal to 23 Portuguese arratel or 10.556kg, which means 4.4g for the mithqāl. Presumably, Lār had, during the 16th century, a canonical mithqāl at 4.46g. In the 16th century, the mithqāl in Hūrmūz [at that time in Portuguese hands] equaled 1/60 of a Portuguese marco, i.e., 3.825g, and was, therefore, probably the lowest mithqāl weight in the Middle East.42

1.1.2.6 Qipchaq*

In the Qipchaq area, during the 14th century 45 “saggi della Tana”, i.e., mithqāls from [the northern Black Sea harbour] Azov,

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* Referring here to the area of the Golden Horde in southern Russia (transl.).
amounted to 7 $\frac{1}{2}$ Genoese ounces at 26.47g per ounce.\(^43\) Thus, this mithqāl amounted to 4.41g, i.e., the Qipchaq area had a canononic mithqāl at 4.46g, like Syria, 'Iraq and Lār.

1.1.2.7 India

In Sindh and Bengal during the Middle Ages, 70 mithqāl equalled 102 $\frac{1}{2}$ Egyptian dirham al-kayl at 3.125g (per dirham al-kayl).\(^44\) This Indian mithqāl weight amounted thus to 4.58g. In 16\(^{th}\) century Calicut 6 $\frac{1}{2}$ mithqāl equalled one Portuguese onça at 28.7g (one mithqāl equalled perhaps 4.46g).\(^45\) In 17\(^{th}\) century Socotra [an island off the southeastern coast of Yemen], the mithqāl amounted to 4.69g, for Payton remarked with regard to the local “kintall” (quinār = 10,000 mithqāl), that “it contained by our Beame one hundred, three pounds and a halfe,” i.e., 46.9476kg.\(^46\)

1.1.2.8 Maghrib

In North Africa and Muslim Spain [al-Andalus], only the mithqāl at 4.722g was considered canononic, as was the case with the numismatic weights.\(^47\) The corresponding dirham amounted to 3.3g.

1.1.2.9 East Africa

In 16\(^{th}\) century Portuguese East Africa, there existed in Sofala a


\(^{45}\) Duarte Barbosa, in: *Colleção de noticias para a historia e geographia das nações ultramarinas* 2, no. 7 (Lisbon, 1813), p. 393.

\(^{46}\) Purchas, *Extra Series*, IV, p. 293.

\(^{47}\) H. Sauvare (Journal Asiatique 8 III (1884), p. 369) calculated 4,729 g. J.-A. Decourdemanche (”Étude métrologique et numismatique sur les nsqals et les dirhems arabes,” Revue Numismatique 4 XII (1908), p. 216), fixed this mithqāl, which he traced back to the [`Abbāṣid] caliph al-Muṣṭāfīr (754–75) at 4.72 g $\frac{1}{3}$ g = $\frac{1}{6}$ of the Roman-Egyptian ounce of 28 $\frac{1}{3}$ g.

\(^{48}\) *Journal Asiatique* 11 XVI (1920), pp. 67 and 68.


\(^{50}\) *Journal Asiatique* 7 XIV (1879), p. 527; *Journal Asiatique* 7 XV (1880): 257; *Journal Asiatique* 8 III (1884), p. 374.


\(^{52}\) Quatremère, in: *Notices et Extraits des Manuscrits de la Bibliothèque du Roi*, vol. 13, p. 173.

\(^{53}\) *Journal Asiatique* 6 V (1865), p. 57.
ever, one *baḥār* consisted theoretically of 333 *mann*. What they referred to were most probably *manns* of Baghdad at 260 *dirham*, which results for the *baḥār* in 270.562kg (while taking as standard the *dirham* at 3.125g).

The *baḥār* gained universal significance in the international spice trade throughout the countries of the Persian Gulf and the Indian Ocean. The extraordinary fluctuations which we encounter regarding the fixing of the *baḥār* weight are the result of locally differing extra charges, which had been added to the net weight, based on old customs. This extra charge, called *picoitá* in Portuguese, represented a substitute for natural dwindling processes in favour of the buyer. The most detailed compilation of *baḥār*-weights is contained in the *Lyvro dos pesos de Ymdia* of 1554 by the Portuguese state finance official, Antonio Nuñez of Goa, which Hormūz again has been dealt with most comprehensively.

1.2.3.1 Hormūz

Principally, one *baḥār* consisted of 20 *farāsilaḥ* at 10 *mann* (per *farāsilaḥ*). The so-called “small *farāsilaḥ*” tare weight of Hormūz, which was the basis, amounted to 10.37kg for the *farāsilaḥ*, and therefore to 207.4kg for the *baḥār*. The remaining *baḥār* weights of 16th century Hormūz were as follows:

<table>
<thead>
<tr>
<th>Commodity</th>
<th><em>farāsilaḥ</em></th>
<th><em>baḥār</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Rock candy, preserved ginger</td>
<td>10.395kg</td>
<td>207.9kg</td>
</tr>
<tr>
<td>(2) Cloves, nutmeg-blooms</td>
<td>10.5kg</td>
<td>210kg</td>
</tr>
<tr>
<td>(3) Rose-water</td>
<td>[blank]</td>
<td>211.4kg</td>
</tr>
<tr>
<td>(4) Nutmeg</td>
<td>10.6kg</td>
<td>212kg</td>
</tr>
</tbody>
</table>

(5) Cinnamon, fine aloewood, ivory, sandalwood, Chinese camphor, walrus teeth, wax, sulphur, tin 10.89kg 217.8kg

(6) Sugar, alum, steel, Brazilwood (excluding tare), lead, copper (including tare) 11.35kg 227kg

(7) Myrrh, lesser aloewood 11.4kg 228kg

(8) Antimony 11.9kg 238kg

(9) Cotton [blank] 242.6kg

(10) Cardamom, cubeb-pepper, clove stalks, long pepper, dragon’s blood, aloe 12.44kg 248.8kg

(11) Pepper, varnish, ginger, incense, saffron, oak-apples, Brazilwood (including tare) 12.5kg 250kg

(12) [p. 10] Wheat, barley, rice, hemp, tallow, sumach, sesame, coal, fish-glue, flax seeds, butter, sesame-oil, mustard-seeds, soap [blank] 420.88kg

With regard to Hormūz, Barrett in 1584 distinguished between a small and a big *baḥār*-weight: for the small *baḥār* he quoted 220kg and 246.4kg (thus, most probably the same figures as the *baḥār*-weights no. 5 and no. 10 in the above list) and for the big *baḥār*, 422kg (thus no. 12 in the above list).55


55 “Spices and drugs they weigh by the bar, and of ever sort of goods the weight is different” (Hakluyt, *Extra Series*, VI, 14).
1.2.3.2 Lar

The bahar of Lār in southern Iran had been quoted in the 16th century as 3 quințal 2 arroba 27 arratel (Portuguese), and thus as 218.9kg (corresponding to no. 5 of our above list).

1.2.3.3 Mecca

During the second half of the 17th century in Mecca, there existed a bahar at 15 farasila, at 10 local mann (per farasila) = 30 raf of 27 pounds AVoidupoids per farasila. This amounted to 183.7kg for the bahar.

1.2.3.4 al-Mukhā (“Mokka”, in Oman)

Toward the beginning of the 17th century, one bahar of cotton equalled 30 raf and fluctuated between 332 and 344 pounds AVoidupoids, i.e., between 150.6kg and 156kg, depending on the goodwill of the seller.

1.2.4 baqilah

One Egyptian baqilah (“bean”) consisted of 4 shamunah or 12 qiray, and therefore weighed 2.34kg (since we determined one qiray to be 0.195g).

1.2.5 batman (see mann)

1.2.6 bay’ah

One bay’ah of silk or amber equalled 100 Egyptian raf, and corresponded thus to 4.5kg.

1.2.7 boghchah

A weight of 4 batman at 1,580 (Ottoman) dirham (per batman), thus 20.268kg.

1.2.8 chārak

An Iranian weight, a “quarter” of the big mann, today 750g.

1.2.9 dām

An Indian weight, originally of a copper-coin, standardized under the Mughal emperor Akbar [r. 1556–1605] toward the end of the 16th century, which according to Moreland equalled 323.5 grains, or 20.963g.

1.2.10 dāng

Its Arabized form being daniq, the expression dāng signifies generally “a sixth”. In particular as a unit of weight and currencies it refers to 1/6 dirham, or more frequently, to 1/6 dinār-mithqāl.

1.2.11 darakhmi

A weight designation for the (Greek) drachma among physicians, which equalled 3.3105g, according to Sauvaire. According to Decourdeanche, it was identical with the Attic drachma at 4.25g. Decourdeanche’s view seems to be more probable.

59. Ibid., pp. 398–400.
61. *Tarih Vesikleri*, vol. 2 (Ankara, 1941), 101; the above statement is referring to Mardin, around 1518.
1.2.12 dinār

As a weight unit, theoretically equal to one mithqāl, and as a weight of gold coinage (as already mentioned earlier) to 4.223g.

1.2.13 farāsilah

In European accounts appearing as frassola, ferasilah or other forms; \( \frac{1}{10} \) of a bahār (see bahār) or 10 man (per farāsilah).

[Hinz adds in the 'Anhang' (appendix) to the German original: See O. Löfgren, Arabische Texte zur Kenntnis der Stadt Aden im Mittelalter, vol. II, 2 (Uppsala and Leiden 1950), p. 49].

1.2.14 fatīl

A tiny (fictitious) weight, \( \frac{1}{4232} \) of a jau, as far as 6 fatīl correspond to one fals, 12 fals equal one khardal, and 6 khardal equal one jau (see jau) or 0.045g.\(^{65}\)

1.2.15 fitr

A weight unit, which was prevalent in medieval Iran, being \( \frac{1}{10} \) of a “pack-animal’s load” (kharvār) [“Saumlast”], and thus as a rule 10 man, or 8.33kg. The Buyid ʿAqīd al-Dawlah (r. 949–82) fixed the fitr at 12 man (see below under man) or 10kg, and the “pack-animal’s load” [Saumlast] at 120 man or 100kg.\(^{66}\)

1.2.16 gandum

An Iranian “wheat corn”, being of the same weight as the jau (see jau) or “barley seed”, today corresponding to 0.048g.

1.2.17 ḥabbah

The weight of an Arabic “barley seed”, about which prevails a considerable degree of confusion in the relevant literature. Sauvage presented in the periodical Journal Asiatique (8, IV, 1884, pp. 296–7) a list of the individual ḥabbah weights, which rather complicates the situation (apart from the conversion at an erroneously low rate of 3.0898g for one dirham, instead of the standard at 3.125g).

There are certain essential aspects which we have to note in this context:

(1) the canonical tradition, according to which one ḥabbah equalled \( \frac{1}{100} \) mithqāl, thus 0.0446g, applied in practice only as an approximative figure.

(2) Principally, the ḥabbah was predominately a numismatic weight, not a commodity weight (see 1.1.1 above).

(3) Even as a commodity weight, one ḥabbah equalled always (i.e., in practice) \( \frac{1}{96} \) mithqāl,\(^{67}\) and thus fluctuated, depending on the local mithqāl weights. On the basis of, for instance, the Egyptian mithqāl at 4.68g, one ḥabbah is calculated at 0.048g.

One dirham theoretically equalled different amounts of ḥabbahs: sometimes 48, sometimes 60 ḥabbah, and sometimes it is impossible to make out whether the corresponding dirham refers to the numismatic or the commodity weight. For this present context the two following useful supporting evidences should be mentioned: according to al-Muqaddasi [fl. 10th century]\(^{68}\) with regard to Syria, and to al-Maqrizi [d. 1441]\(^{69}\) with regard to medieval Egypt, 60 ḥabbah equalled one dirham. Working with one dirham at 2.97g, we would thus arrive at 0.0495g for one ḥabbah, whereas the result would be 0.0521g if working with the weight dirham assumed to be 3.125g. From the information pro-

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\(^{65}\) Ali Qummi, Shams al-Siyāq. MS Aya Sofya (İstanbul), no. 3986, fol. 121b.

\(^{66}\) Ibid., fol. 124b–125a.

\(^{67}\) Journal Asiatique 7 XIV (1879), p. 513.

\(^{68}\) Bibliotheca Geographorum Arabicorum (2nd edition), [vol. ?], 182.

\(^{69}\) Al-Nuqād al-Islāmiyyah (İstanbul, 1298 lunar/1881), p. 8.
vided by al-Muqaddasi it also becomes apparent that one dinár (4.233g) of 24 qirât equalled 84 habbah. Accordingly, one habbah is calculated at 0.0504g. For all practical purposes, we should thus arrive at the round figure 0.05g (disregarding deviating numismatic weights).

However, it is important to note that in 19th century Egypt the habbah at 1/18 mithqâl gained the upperhand, which, according to Lane, amounted to 127/128 grains or 0.064g, and which in turn corresponded to the medieval ‘Iraqi silver weight of the habbah. Today, one habbah in Egypt amounts officially to 0.065g.

1.2.18 himl

In ‘Iraq, the “camel load” consisted theoretically of 300 mann or 600 rafi at 130 dirham (per rafi), and was thus 243.75kg. The custom rates of eastern Anatolia around the year 1518 led to a similar result, according to which, for example, in Urfa the rate of one “camel load” to a “pack animal’s-load” [Saamlari] was 3:2. Since the latter (see yük) was standardised at 162kg, the “camel load” is to be calculated at 243kg. Even during the 19th century Blau remarked that a camel carried on the average 180 Turkish qoppa, i.e., about 230kg. In practice, however, much higher loads were apparent: thus, Tavernier writes in the 17th century that in the mountainous areas of Asia Minor, a “camel load” amounted to 800 livres (about 300kg) on the plains even up to 15 quintaux (around 735kg). In Egypt, flour had been weighed at one himl or 300 rafi, i.e., 135kg, varnish and pepper at 500 rafi or 225kg, carded cotton at 553 1/3 rafi or 249kg, and linen and Brazilwood at 600 rafi, i.e., 270kg. Because of the lack of more precise figures, an approximate weight of one himl or about 250kg was considered.

1.2.19 istâr

From the Greek stater, a weight of 4 1/2 mithqâl (at 4.46g) or 6 3/5 dirham, thus equal to 20g.

1.2.20 jau

An Iranian “barley seed” equalled 1/4 tašû or 1/16 dans or 1/86 mithqâl, and was thus (up to approximately the 14th century) equal to 0.045g (calculating one mithqâl at 4.6g) (see also the next following paragraph).

1.2.21 jauzah

The “ordinary nut”, weighing 7 mithqâl / darakhmi or 14 big shâmînah; the “royal” jauzah weighed 6 mithqâl / darakhmi. According to my own calculation (one Attic drachma = 4.25g), the first mentioned “ordinary nut” weighed 29.75g and the second mentioned “royal nut” 25.5g. Sauvaires calculations were 23.1735g and 19.863g, respectively.

1.2.22 khardol

The weight of a “mustard seed”, amounting to 1/70 habbah, of

71 Journal Asiatique 8 III (1884), p. 419.
73 Commerciale Zustände Persiens (Berlin, 1858), p. 197.
75 Journal Asiatique 8 III (1884), pp. 418–19.
76 Supporting evidences are to be found in H. Sauvaires, Journal Asiatique 8 III (1884), p. 377, however, with different conversion rates. (In Ibn Batûtah, vol. 3, p. 298, not 5 istâr, as stated in the French edition, is to be read, but rather correctly 5 isâr = “5 sîr”).
77 ‘Ali Qummi, Shams al-Sîyâq, MS Aya Sofya, no. 3986, fol. 121b; Sâ‘ûdatnâmah, MS Aya Sofya, no. 4190, fol. 26b.
which 60 corresponded to the weight of a silver dirham (at 2.97g),
thus at 0.000707g.

1.2.23 kharābah

The weight of a “carobtree seed”, equalling that of one qirāt (see below under qirāt), i.e., \( \frac{1}{24} \) mithqāl or 0.195g.

1.2.24 kharvār

According to the Persian medieval administrative handbooks, a kharvār (literally “a donkey load”) constituted a “horse”, “ox”, “mule”, or “donkey load”\(^8\). Moreover, only seldom a difference between the weight of a “pack animal’s load” [Saumlast] and a “camel load” was made. Asud al-Dawlah (r. 942–82) standardised the kharvār during the Būyid period at 10 fitr, at 12 mann (per fitr)\(^8\). This resulted in a “pack animal’s weight load” [Saumlastgewicht] of fairly accurately 100kg (calculating the then mann at \( \frac{5}{6} \) kg). When Ghāzān Khān [r. 1295–1304] standardised the measurements and weights of the Ilkhanid empire around 1300, he fixed the “pack animal’s load” (as cereal weight called raghūn) at 100 mann, and thus at 83.3kg,\(^8\) which equalled actually a “donkey load”. Around 1440 in Fars, a kharvār equalled 200 mann-i shar’i (thus exactly twice the previous mentioned figure) or 166.67kg. This “pack animal’s load weight” corresponded to a “mule” or “horse load”\(^8\). From East Anatolian documents around 1518 it can be inferred that this amounted in reality to the double of that of a “donkey load”\(^8\). According to the levy-book [Hebebuch] of the Ağ Qoyunlū Türkmen ruler Üzün Hasan (r. 1453–78), a so-called “normal load” (aşıt yük) in eastern Anatolia equalled 8 boghchah (see boghchah), and thus equalled 162.144kg. It was, therefore, also equivalent to a “horse” or “mule load”.

In Iran, however, the kharvār had apparently been fixed since the middle of the 14th century at 100 mann of the big standard,\(^8\) namely at 288kg. The kharvār at 300kg (adjusted to the metric system in the 19th century) continues to exist in Iran up to the present. With regard to one actual “horse” or “mule load”, Blau\(^8\) consistently referred in the 19th century to 120 ogah or around 154kg. This, however, should not be taken as the weight unit of the kharvār, which amounted always to 300kg. In Turkistan, the smaller kharvār (at 83.3kg) seems to have persisted longer than in Iran: since [the Timūrid ruler] Ulugh Beg (r. 1409–49), one jarīb (958 m²) of land carried only 4 kharvār of cereals which would only have been possible by considering the older kharvār weight.\(^8\) In the 16th century Qandahār, one kharvār equalled 40 local mann or 10 Hindūstān-mann,\(^8\) i.e., (presumably) 251.25kg. With regard to silk, the “pack animal’s load” in Iran as early as the 15th century amounted to only half of the big mann, i.e., about 150kg, as stated by Barbaro:\(^9\) “due some di sita che sono al modo nostro libre mille di peso,” or 301.23kg.

1.2.25 lodra

In later medieval times one lodra weighed 176 (Ottoman) dirham or 564.432g.\(^9\) The Ottoman or so-called vezne lodrasi, (of which

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\(^{80}\) Saʿīdattūnāmah, MS Aya Sofya, no. 4190, fol. 27b.

\(^{81}\) ‘Ali Qummi, Shams al-Siyāq, MS Aya Sofya, no. 3986, fol. 124b.


\(^{83}\) ‘Ali Qummi, Shams al-Siyāq, MS Aya Sofya, no. 3986, fol. 124b.

\(^{84}\) Čeviri Vekilli, vol. 1, pp. 185 and 187.

\(^{85}\) ‘Ali Qummi, Shams al-Siyāq, MS Aya Sofya, no. 3986, fol. 125a.

\(^{86}\) Commercielle Zustände Persiens, p. 201.


\(^{89}\) Quoted in Ramusio, Navigationi et viaggi, 3rd edition, vol. 2 (Venice, 1574), 106a.

30 equalled one vezne or, 600 dirham, i.e., 384.9g. In the Maghrib, there existed a lodra [ludrah] at 133 1/3 dirham, thus resulting in 416.67g.

1.2.26 mann

The mann, the ancient mina, equalled canonically 2 rafi at 130 dirham (per rafi).

1.2.26.1 Arabian Peninsula

Mecca had, up to the high Middle Ages, a mann-weight of 260 dirham (812.5g) as one rafi (see below under rafi). With regard to later medieval times, al-Fāsi [1373-1429] mentioned other mann-weights for Mecca: around the year 1320, one mann of meat amounted to 6 2/3 Egyptian rafi or 3kg, while between around 1327 and 1346, 3 Egyptian rafi (wheat, honey and dates) amounted to 1.35kg. Around 1612, Sarts reported from al-Mukhā ["Mokka"] that the mann fluctuated, depending on the goodwill of the weigher, between 2.3 and 2.4 pound Avoirdupois, i.e., between 1042.5 and 1080.64g, thus, on an average, 1.06kg.

1.2.26.2 Egypt

The mann in Egypt amounted always to 2 rafi of Baghdād at 130 dirham (per rafi), and therefore to 812.5g. Around 1410, this mann is still documented as 260 dirham alone. The European confirmation for this comes from Pegolotti, who around 1335 in Alexandria, calculated 100 mann at 257 libbre genovesi (sottile) at 316.75g each, which is 814g for one mann, around 1335 in Alexandria. In practice, however, the mann-weight was less important in Egypt than the rafi.

1.2.26.3 Syria

In medieval Syria, too, the mann-weight seldom prevailed in comparison with the local rafi-weights. Where it appeared, it seemed to have always been the canonic mann at 260 dirham, as documented for the second half of the 12th century by al-Shayzari [fl. 13th century]. Proceeding from 3.15g for the Syrian dirham, one mann amounted to 819g.

1.2.26.4 ‘Irāq

In medieval ‘Irāq, the mann weight prevailed. The rate was always one mann = 2 Baghdādian rafi (see below under rafi). This rafi, however, amounted to 128 3/4 dirham or 401.78g according to one school, and to 130 dirham or 406.25g according to the other [p. 17]. In correspondence with the documented figures for Egypt, Syria and Fārs, we, therefore, fix also throughout for ‘Irāq (at least since the high Middle Ages) the mann-weight at 260 dirham, or at 3.125g (per dirham), which thus results in 816.5g [Hinz corrected this figure in the ‘Anhang’ (appendix) to the German original to 812.5g]. For 16th century Baghdād as well as for neighbouring Iran, there is evidence for a new, big mann-weight, which was probably already in use in earlier times. Around 1584, 100 mann amounted to 722 pound Avoirdupois in

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92 Journal Asiatique 8 IV (1884), p. 274.
97 La pratica della mercatura, p. 62.
98 Book of al-Muhtarib (Cairo 1946), p. 16.
Baghdād.\textsuperscript{99} Such a “mana of Babylon” thus weighed 3.275kg. In Basrah, 20 mann equaled one qīnṭār at 514 $\frac{1}{2}$ pound Avoirdupois.\textsuperscript{100} One “mana of Balsara” was thus equal to 11.699kg. In the year 1675, John Fryer\textsuperscript{101} calculated the Basrah-mann of 28 sīr at 24 pounds or 10.886kg. We should, therefore, perhaps assume 11kg as the average figure. Possibly, this mann is identical to the Ottoman vezne at 30 lodra or 11.545kg.

1.2.26.5 Iran

In Iran the mann has persisted up to modern times, and even today it has yet not been replaced entirely by the kilogram.\textsuperscript{102} The Arab geographers of the 10\textsuperscript{th} century mentioned an impressive number of such mann weights:

<table>
<thead>
<tr>
<th>Location</th>
<th>One mann in dirham / in grams (one dirham = 3.2g)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirāz, Ahvāz</td>
<td>260 dirham/833g</td>
<td>Ibn Hawqal, 215; al-Muqaddasi, 417</td>
</tr>
<tr>
<td>Fasā</td>
<td>300 dirham/960g</td>
<td>al-Muqaddasi, 452</td>
</tr>
<tr>
<td>Nīrūz</td>
<td>320 dirham/1,024g</td>
<td>al-Muqaddasi, 452</td>
</tr>
<tr>
<td>Arrājān</td>
<td>390 dirham/1,248g</td>
<td>al-Muqaddasi, 452</td>
</tr>
<tr>
<td>Khirmān</td>
<td>400 dirham/1,280g</td>
<td>Ibn Hawqal, 267; al-Istakhrī, 203</td>
</tr>
</tbody>
</table>

Out of these mann weights, essentially only three survived during the central and later medieval period: (1) the small mann weight of 260 dirham or 833g (\$\frac{5}{6}$ kg), (2) the big mann weight of around 3kg, and (3) the medium mann weight of 1,920g.

The development was as follows:

(1) The small or canonical mann weight (mann-i shar’i) = $\frac{5}{6}$ kg remained the leading weight up to the middle of the 14\textsuperscript{th} century in Iran. When Ghāzān Khān [r. 1295–1304] carried out his reform of the measurements and weights of the Ilkhanid empire around 1300 the canonical mann weight of 260 dirham then prevailing in Tabriz was raised to the level of the imperial standard.\textsuperscript{103} Al-‘Umarī [d. 1348/49], too, confirmed that around the year 1335. He stated that in the capital, Tabriz, wheat and barley were not measured but weighed instead, and that this was done by the exclusive usage of the mann weight of 2 Baghdādīan raṭl or 260 dirham.\textsuperscript{104}

\textsuperscript{100} Ibid.
\textsuperscript{102} Numerous supporting evidences with conversions into kg or lb. are provided by A. K. S. Lambton, Landlord and Peasant in Persia (London, New York and Toronto 1953), p. 409.
\textsuperscript{103} Rashid al-Din, ed. K. Jahn, p. 290.
\textsuperscript{104} Al-Qalqashandi, Šubḥ al-A’ša’, vol. 4, pp. 422–23.
The shift of prevalence from the canonic *mann* to the *mann* of around 3kg over (for details, see above) appears to have taken place towards the middle of the 14th century, since from the Jalayirid period [1336–1432] onwards there is evidence which makes it probable that throughout their empire [*Irāq, Kūrdistān and Adharbāyjān*] weighing had already been carried out in accordance with the big *mann*. It was the same with the 15th century. However, from the administrative handbook, *Shams al-Siyāq*, it appears that during the Tinurid period [end of 8th century–911/end of 14th century–1506], high grade commodities were still weighed according to the big *mann*.

Under the Šafavids (1501–1722), the small *mann* weight at 833g seemed to have been no longer in usage anywhere, with the exception of, perhaps, Hormūz, where it was used during the 16th century as a silk weight at 216 Hormūz–mithqāl, of which 60 each corresponded to one Portuguese marco at 229.48g. This Hormūz *mann* amounted therefore to 826g, but was only used for raw silk. In Iran proper, the big *mann* at 3kg had since the 16th century been called "*mann* of Tabriz", which, prior to that, had been the designation for the canonic *mann*. The exact determination of the big *mann* weight, which, as already mentioned, was predominant in Iran up to the 20th century, is difficult. The present official conversion rate of the *mann*-i Tabriz at 3kg is a 19th century adjustment to the European weight system. For the period from the 16th to 18th centuries, the sources present the following picture:

| 1566 | “The *batman...* may be 6 pound and a half of English weight,"106 thus ............... | 2.948kg |
| 1581 | One *Batman* of Teuris = 9 Lerra of Venice (Venetian pounds),109 thus ............. | 2.711kg |
| 1638 | “*Batman* tauriss ist 6 Hambürger Pfunde”110 at 484.12g each, thus .................. | 2.905kg |
| 1660 | “Une *man* est de 900 drachmes ou six livres, et la livre de seize onces,”111 thus .... | 2.937kg |
| 1670 | “Le *man* de petit poids (poids de Tauris) revient à 5 livres 14 onces, poids de Paris”112 at 489.506g, thus ............... | 2.876kg |
| 1680 | “A *Mann* Taberez 6 - and a half,”113 i.e., a *mann*-i Tabriz = 6 1/2 pounds Avoirdupois, thus ................. | 2.948kg |
| 1711 | “*Mann* Tabrees...is nearest 6 3/4 l. Avoirdupois,”114 thus ..................... | 3.062kg |
| 1802 | “40 *Muni* Tabrees or 280 lbs,”115 thus one *mann*-i Tabriz = ......................... | 3.175kg |

If we pay special consideration to the evidences provided by the also otherwise reliable Chardin [1643–1713] and compare them with the *mann*-i shāh (which is twice as heavy), dealt with [below] under (4), a figure of between 2.88kg and 2.9kg will

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105 Extant in the *Risalah-yi Falakiyyah*, MS Aya Sofya, no. 2756, my edition in vol. 4 of the *Veröffentlichungen der Orientalischen Kommission der Akademie der Wissenschaften zu Mainz* (Wiesbaden 1952), fols. 110a and 115b.

106 *Ali Qummi*, MS Aya Sofya, no. 3986.


appear for the 16th and 17th centuries for the mann of Tabriz. This figure had certainly increased since the early 18th century to around 3kg, and which has been (since 1935) official.

(3) The third early medieval Iranian mann weight, namely at 600 dirham or 1920g, remained in force predominantly in modern Iran, from where its usage seemed also to have extended to the area of the Golden Horde in Southern Russia. As late as 1335 this weight had been explicitly confirmed for [the temporal Ilkhanid residence] Sulṭāniyyah (between Qazvin and Zanjān).116 At the same time, it had been used in Tabriz as a silk weight and amounted to 6 libbre 2 once genovesi117 or 1.912kg. Around the middle of the 16th century, this mann [p. 20] was also confirmed for Hormūz, where it consisted of 25 quiaç (Portuguese for ṣūqiyah, i.e., "ounce") at 2 11/16 Portuguese onças118 or 1.925kg. Tremendously significant is the observation of our informant [i.e., Nuñez], according to whom only in the caravanserais ("logias") was the mann calculated at 25 quiaç, whereas throughout the stalls of Hormuz only 24 quiaç at 1.848kg was conceded to the buyer. Thus, there existed a wholesale mann weight and a retail mann weight!

(4) During the third quarter of the 15th century, Üzün Hasan [r. 1453–78], the ruler of the Aq Qoyunlu Türkmen, introduced a weight standard which was named Ḥasan Pādīshāh batmann after him.119 This new mann weight in eastern Anatolia, the only area where we were able to locate it, comprised 12 niği at 160 dirham (per niği) (at 3.207g each) and thus weighed 6.157kg. It has not been proven yet, but it is probable that this extraordinary mann weight became generally prevalent in 16th century Şafavid Iran. The supporting evidences are as follows:

115 E. S. Waring, A Tour to Sheeraz (London 1807), p. 15.
116 Al-Qalqashandî (based on al-Umarî), Subh al-Aʿṣāḥî, vol. 4, p. 423.
117 Pegolotti, Pratica della merestura, p. 12.
männ of Tabriz. Since the 18th century, the männ-i shāh (then also called batman of Shirāz or of Rasht) amounted to exactly 6kg in practice.\textsuperscript{124}

(5) During the Šafavīd period, there existed furthermore a special wine weight, since in Iran liquids were also weighed and not measured. In the 17th century, this was known as "old männ" (männ-i kuhneh). According to Tavernier (I, p. 733) "la men de keuhne" equalled 9 livres = 4.4055kg. According to Fryer (p. 211) one "Maund Cannala" (sic) equalled 9 \(\frac{1}{16}\) pounds or 4.252kg. As an average figure, we propose 4.3kg for the wine männ. Apparently, this männ was a weight which was peculiar to [the then capital] Isfahān and amounted, according to Newberry,\textsuperscript{125} to \(1\frac{1}{2}\) times the weight of the männ of Shirāz at 2.9kg, i.e., 4.35kg.

(6) Finally, some special weights of later medieval Iran have to be mentioned:

<table>
<thead>
<tr>
<th>1568</th>
<th>Lāhijān (in Gilān): &quot;The Laighon batman...is little above 40 li. weight,&quot;\textsuperscript{126} thus ...</th>
<th>c. 18.2kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1525</td>
<td>Lār (in southwestern Iran): one männ = (\frac{1}{200}) bahār = mithqal,\textsuperscript{127} the bahār at 3 (Portuguese) quintal 2 arroba 27 arratel, thus one männ in Lār equalled ........................</td>
<td>1.090g</td>
</tr>
<tr>
<td>1554</td>
<td>Hormūz: according to the reliable statements of Nuñez,\textsuperscript{128} one männ of Hormūz equalled...</td>
<td>961g</td>
</tr>
</tbody>
</table>

1.2.26.6 Anatólia

From a brief note in the chronicle of Ibn Bibi [d. c. 1285],\textsuperscript{129} it appears that throughout the empire of the Rūm-Saljūqs, too, the weight unit of the small (canonic) männ at 260 dirham or 833g had been predominant. However, there existed also without doubt a range of varying local weights of which the following are known:

| 1335 | Sivas: 2 1/2 menes = 1 ruotolo (rañ) of Akko.\textsuperscript{130} Since the latter amounts to 2.2kg the Sivas-männ amounts to .......................... | 977g |
| 1518 | Mardin: 1 batman = 12 nügi at 78 dirhem each,\textsuperscript{131} thus the Mardin-männ weighed ... | 3kg |
| 1518 | [p. 22] Erzincan: if the Hasan Pādishāh batman at 12 nügi (see above under (4)) was used, equalling .......................... | 6.157kg |
| 1518 | Diyarbekir: one männ of ʿĀmid [old name of Diyarbekir] corresponded to 1,580\textsuperscript{132} dirham and thus weighed .......................... | 5.067kg |
| 1518 | Harput: one männ amounted there to 1800 dirham,\textsuperscript{133} thus .......................... | 5.773kg |
| 1581 | Erivan: there 12 batman amounted to 14 männ of Tabriz,\textsuperscript{134} thus one Erivan-männ equalled .......................... | 3.36kg |
| 1581 | Van: one batman corresponded to 2 1/2 männ of Tabriz,\textsuperscript{135} thus .......................... | 7.1kg |

\textsuperscript{124} Blau, Commercielle Zustände Persiens, 158.
\textsuperscript{125} In: Purchas, Extra Series, vol. 8, p. 463.
\textsuperscript{128} Journal Asiatique 11 XVI (1920), pp. 55 and 266.

\textsuperscript{129} MS Aya Sofya, no. 2985, p. 478.
\textsuperscript{130} Pegolotti, Pratica della mercatura, p. 50
\textsuperscript{131} Tarih Vekilleri, vol. 1, p. 103.
\textsuperscript{132} Ibid., pp. 97 and 184.
\textsuperscript{133} Ibid., p. 191.
\textsuperscript{134} J. Newberry in: Purchas, Extra Series, vol. 8, p. 469.
\textsuperscript{135} Ibid., p. 468.
Tokat: 3 batman corresponded to 10 ratl of Aleppo\[^{136}\] at 2.28kg each, thus one mann amounted in Tokat to \(\ldots\) \(\ldots\) \(7.6\) kg

Erzurum: According to Jean-Baptiste Tavernier (I, p. 20) and in the context of import-taxes for silk, 16 livres amounted to one local batman, which weighed thus \(\ldots\) \(\ldots\) \(7.83\) kg

It is possible that the batman weight of Van, Tokat and Erzurum did not differ among themselves, but rather they had been identical during the 19th century in Asia Minor with the still existing so-called “carvan batman” of 6 oqqa or 7.77kg.\[^{137}\]

1.2.26.7 Qipchaq [Southern Russia]

Saray (on the Volga): “una mena = 6 libbre 2 once” (Genoese); accordingly one mann weighed in the capital of the empire of the Golden Horde (as well as the silk mann of Tabriz) \(\ldots\) \(\ldots\) \(1.912\) kg

Urganj: in Khivah, as well as in Otrar,\[^{139}\] one mann amounted to 3 libbre 9 once (Genoese) and thus weighed \(\ldots\) \(\ldots\) \(1.88\) kg

1.2.26.8 India

In 16th century Qandahār, one mann was said to have equalled \(\frac{1}{4}\) Hindūstān-mann.\[^{140}\] If this refers to the Akbar mann, which had been fixed (see below) at 25.155kg, the Qandahār mann amounted to 6.289kg. In 14th century Delhi, there existed a mann at 40 sār at 70 Indian mithqāl\[^{141}\] each, which thus amounted to 12.824kg. A more or less reliable confirmation for this comes from Ibn Baṭṭūṭah [1307–68 or 77] (II, p. 74), according to whom, one mann of Delhi equalled 25 Egyptian ratl (11.25kg).

Under the Mughals, several different mann weights developed: in the second half of the 16th century the mann-i Akbari had been standardised at 40 sār at 30 dām each.\[^{142}\] Since one dām (see dām) amounted to 20.963g, we calculate the mann-i Akbari at 25.155kg. Confirmation of this comes from Fryer (loc. cit., p. 205), according to whom, one “Mauld Ecberry” is equal to 30 “pice” (paysa = dām), of which 18 amounted to 33 pounds Avoirdupois. This would result in 25.1745kg for the Akbarī mann. Up to the year 1636, in Surat the bigger mann amounted to 40 sār at 18 paysa each or 33 pounds Avoirdupois, i.e., 14.969kg, and the smaller mann corresponded to 25 pounds or 11.44kg.\[^{143}\] Since 1636, the former had increased to 40 sār at 20 paysa each, i.e., 16.783kg.\[^{144}\] According to Sparr de Homberg, the bigger mann then weighed 34 \(\frac{1}{2}\) Dutch pounds or 16.733kg.\[^{145}\] The mann of Āgra (“Mauld Pucka” in Fryer, loc. cit., p. 205) or mann-i Shāhjahānī amounted to double the bigger mann of Surat, or 33.56kg. A most reliable confirmation for this comes from Sparr de Homberg,\[^{146}\] according to which one mann-i pādishāhī was equal to 69 Dutch pounds or 33.546kg.

1.2.27 māshah

This Indian weight ascertained as follows is for the second half of the 16th century: one silver rupee of [the Mughal emperor] Akbar

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\[^{136}\] Ibid., p. 472.

\[^{137}\] Blau, Commercielle Zustände Persiens, p. 177.

\[^{138}\] Pegolotti, Pratica della mercatura, p. 4.

\[^{139}\] Ibid.


\[^{141}\] Al-Qalqashandi (based on al-’Umari), Subḥ al-A’ṣha’, V, p. 82.


\[^{146}\] Ibid.
[r. 1556–1605] weighed 11 1/2 máshah, which was according to numismatic evidence, exactly 11.5484g. Thus, one máshah amounted to 1.0042g.

1.2.28 *mighrab* (transliteration uncertain)

A weight in 16th century Mardin (eastern Anatolia) of 3 *nügi* at 78 dirham (per *nügi*) and thus equal to 750g.

1.2.29 *miýr*

An Egyptian weight of 18 *qirât*, today weighing 3.51g.

1.2.30 *naqîr*

A tiny, fictitious weight unit. 6 *naqîr* amounted to one *fatîl* (see *fatîl*). Thus, one *naqîr* is, theoretically, equal to 1/259 of a *jau* of 0.045g.

1.2.31 *nashsh*

An ancient Arabian weight peculiar to Mecca, which weighed half an *uqiyah* at 20 dirham, and thus 62.5g.

1.2.32 *nawâ*

An Arabian weight of 5 dirham, and thus 15.6g.

1.2.33 *nügi*

A weight which was prevalent in medieval Anatolia. In Mardin (around 1518), one *nügi* amounted to 200 dirham, i.e., 641.4g, or to 70 dirham, i.e., 250.1g—in the same city and at the same time! In Çermik, one *nügi* then equalled 200 dirham or 641g.

1.2.34 *nukhud*

A “pea”, a Persian weight unit (see also *tasû*), amounted to 1/24 *mithqal*, and was thus until the 15th century 0.18g, and later (until 1935) 0.195g.

1.2.35 *oggâ*

An Ottoman weight unit of 400 dirham at 3.207g (per dirham), i.e., 1.2828kg.

1.2.36 *qamîhah*

A “wheat corn”, an Egyptian weight of 1/64 dirham or 1/4 *qitrât*, weighing today 0.0488g, thus, the substitute for the medieval *habbah* (see *habbah*, above).

1.2.37 *qîntâr*

One *qîntâr* (centner) amounts, in principle to 100 *rafl* (see *rafl*), but under certain circumstances also to 10 *mann*. As designation for a large amount of gold, one *qîntâr* equals 10,000 *dînâr* or

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148 *Tarikh Vesiklar*, vol. 1, p. 102.
152 Ibid.
153 *Tarikh Vesiklar*, vol. 1, pp. 100, 102 and 195.
154 Refer to R. Vasmer, in: *Islamica* 6 (1934), pp. 139 and 153; since 1935 one *nukhud* amounts officially to 0.2 g (Lambton, *Landlord and Peasant in Persia*, p. 406).
42.33 kg of gold. The following qinṭār-weights had been in use throughout Muslim countries:

1.2.37.1 Egypt

In medieval Egypt, 5 kinds of qinṭār had been distinguished:

1. The qinṭār fulūlī for spices and similar commodities was mainly prevalent in Alexandria and consisted of 100 raṭl at 144 dirham (per raṭl)\(^{156}\) and thus weighed 45 kg. European statements, however, result in a slightly lower figure. This should not necessarily cause doubt concerning the accuracy of the oriental basis of calculation, since it was perhaps based on certain commercial practices of medieval Levantine trade. With regard to the “pepper-centner”, Da Uzzano\(^{157}\) mentioned around 1440 that one cantaro foraro equaled 128 libbre fiorentine (i.e., 43.456 kg) or 144 libbre sottili in Vigna (i.e., 43.38 kg). In an English report of the year 1584 from Alexandria,\(^{158}\) it was stated that the weight of Alexandria is called “Pois Forforeine, which is a Kintall” in that place, which maketh a Marseils 109.2 li of Marseils weight.” Since one livre of Marseilles was equal to 407.93 g, the result for one qinṭār fulūlī is, according to this calculation, 44.464 kg. Today one qinṭār fulūlī amounts officially to 44.928 kg.\(^{159}\)

2. The qinṭār laythī consisted of 100 raṭl laythī (see raṭl laythī, below) at 200 dirham (per raṭl laythī) and thus weighed 62 kg. Although the informant of 1584 referred to under (1) did confuse that centner with the qinṭār jarwī (see (3)), he nevertheless calculated that centner quite accurately at 150 pounds of Marseilles or 61.189 kg.

\(^{156}\) According to Nāṣīr-i Khusraw [1004–between 1072 and 1077], Sufar-Nāmah, ed. Charles Schefer (Paris 1881), 51 (Persian text); and al-Qalqashandi, Ṣubḥ al-A’ṣha’ III, p. 445.

\(^{157}\) La pratica della mercatura, p. 111.

\(^{158}\) Hakluyt, Extra Series, vol. 5 (Glasgow, 1904), p. 272.

\(^{159}\) Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien (Berlin 1925), p. 25.

(3) The qinṭār jarwī consisted of 100 raṭl jarwī (see raṭl jarwī, below) at 312 dirham (per raṭl jarwī) and thus weighed 96.7 kg. Da Uzzano equated the “cantaro Gervi” around 1440 with 318 Venetian pounds\(^ {160}\) or 95.8 kg.

(4) According to Da Uzzano (loc. cit.), the “cantaro di mena” or “centner in menna” of the Levantine merchants had been valued at 250 Florentine pounds or 84.875 kg. According to our own calculations of the Egyptian (canonic) menna of 260 dirham at 3.125 g each, we would arrive at 81.25 kg. According to Pegolotti (op. cit., p. 62), around 1335 in Alexandria this menna-centner equaled 257 Genoese pounds or 81.4 kg, which comes very close to our calculations.

(5) Gonzales\(^ {161}\) mentioned a particularly heavy qinṭār for around 1665, which was said to have consisted of 24 rub’ at 10 raṭl kabir (per rub’), 160 dirham (per raṭl kabir). This would result in 5 kg for the rub’ and in 120 kg for the “Quintaer”.

1.2.37.2 Syria

The Syrian qinṭār weights are the equivalent of one hundred times the weight of the local raṭl weights (see raṭl). In Damascus, one qinṭār weighed accordingly, on the average, 185 kg. However, the Damascus qinṭār increased in the course of the 17th century to 150 Ottoman ogga or 192.4 kg, a fact substantiated by numerous documents.\(^ {162}\) An adjustment towards the weight system of the [Ottoman-] Turkish conquerors had thus taken place, the exact date of which has not been ascertained yet. Since then in Aleppo, the qinṭār weighed 100 raṭl at 720 dirham each.\(^ {163}\) The Florentine Pegolotti has provided (around 1335)

\(^{160}\) La pratica della mercatura, p. 110.

\(^{161}\) Anthūonis Gonzales, Hierusalemische Reyse, II. Deel (Antwerp 1673), p. 85.

\(^{162}\) Refer, for instance, to the document no. LXI in: Franz Babinger, Das Archiv der Bosniaken Osman Pascha (Berlin 1931), p. 129.

\(^{163}\) For instance al-Qalqashandi, Ṣubḥ al-A’ṣha’, vol. 4, p. 216, during the early 15th century, as well as even L. C. Bleibtreu, Handbuch der Münz-, Maß- und Gewichtskunde (Stuttgart 1863), during the 19th century.
quite useful conversion rates (loc. cit., pp. 49 and 53): according to him, the Aleppo qintar weighed either 725 Genoese pounds, i.e., 229.6kg, or 670 Florentine pounds, i.e., 227.5kg. From it we derive an average figure of 228kg, which confirms at the same time our fixing of the Aleppo-dirham at 3.167g. In Hamah, the qintar had the same weight as in Aleppo, i.e., 228kg.

1.2.37.3 ‘Iraq

In late medieval ‘Iraq, the qintar at 100 mann seems to have prevailed. Barrett calculated around 1584 in Bagdad, the “qintall” of 100 “manas” at 722 pounds of London, or 327.5kg, thus referring to a derivative of the big Iranian mann weight at around 3kg, converted to centners. He also stated with regard to Basrah: “20 manas is the qintall of Balsara, which is ... of London 514 li. 8 ounces”, i.e., 233.376kg.

1.2.37.4 Iran

Apparently, the Iranian qintar stepped behind the more common kharvar (the “donkey-load” [Saumlast]), the latter weighing mostly 100 mann. An exception to this was the raw silk trade. The administrative manual Shams al-Siyaq compiled around the year 1440, fixed such a qintar at 30 mann. Since this mann seems to refer to the so-called silk mann at around 1.9kg (see above), this qintar apparently weighed 57kg. The qintar weights of Hormuz during the Portuguese suzerainty in the 16th century until the year 1722 [i.e., the collapse of the Safavids] can be traced back to the Portuguese quintal at 58.749kg.

1.2.37.5 Anatolia

In the Rüm-Saljuq empire as well as under the Ottomans, one qintar consisted of 100 lodra (see lodra, above) at 176 dirham (per lodra) and thus weighed—until today—56.443kg.

1.2.37.6 Maghrib

Maghrbine qintars, if we come across them at all, are to be calculated at one-hundred times the setting of the corresponding raij-weights. An English record of 1584 mentioned, with regard to Algiers, a qintar for high grade commodities, such as spices etc., at 120 pounds Troy or 44.79kg (which refers most probably to the Egyptian qintar fulful) and a “great Cantare” for crude commodities, such as metals etc., at 180 “li. subtil of ours here” or 67.18kg.

1.2.38 qirat

The weight of a qirat (carat, keration) as a commodity weight fluctuated (as a numismatic weight: see above under 1.1.1). Both, canonically as well as in practice, but also in ‘Iraq, one qirat equalled always 1/50 mithqal and consisted (canonically) of 5, but mostly of 3 ḥabbah, thus weighing 1/14 of the weight of the dirham at 3.125g or 0.2232g. In Mecca, Egypt, Syria and Anatolia, one qirat always equalled 1/54 mithqal or 1/16 dirham and consisted mostly of 4 ḥabbah, weighing thus in Anatolia, 0.2004g and in the remaining mentioned areas, 0.195g. More detailed elaborations and a list of qirat-weights are found in the work of Sauvaire, which, however, is only of “theoretical” interest (besides an erroneously low dirham fixing at 3.0898g, instead of 3.125g).

1.2.39 qismar

A tiny, fictitious weight unit, 1/20736 of a jou of 0.045g.

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165 Hakluyt, Extra Series, vol. 6, 10–11.
166 "Ali Qummi, MS Aya Sofya (Istanbul), no. 3986, fol. 132b.
170 "Ali Qummi, Shams al-Siyaq, MS Aya Sofya (Istanbul), no. 3986, fol. 121b.
1.2.40 raṭl

The raṭl (also pronounced ṝḥl or raḥl, and by medieval Europeans mainly as rotolo or the like), derived from the Greek litron, constitutes the preeminent weight unit throughout the Arabic dominated countries of the Orient. Sauvaire\(^{171}\) presented a list of raṭl weights with 165 individual supporting evidences, while, however, almost always converting at too low dirham-weight of 3.0898g, instead of 3.122g. Below, the most important raṭl-weights are listed. Since one raṭl equalled generally 12 ʿiqiyah (ounces) and also \(\frac{1}{100}\) qinṭār, that what has been stated under the headwords “ʿiqiyah” and “qinṭār”, too, has to be taken into consideration.

1.2.40.1 Arabian Peninsula

During the early Islamic period one raṭl in Mecca equalled 12 ʿiqiyah at 40 dirham\(^{172}\) (per ʿiqiyah), and thus 1.5kg. In the course of the Middle Ages, the raṭl of Mecca had become equal to one Baghdadian raṭl (perhaps under “Abbasid influence”, namely 230 dirham or 812.5g.\(^{173}\) During the later medieval times, the Meccan raṭl amounted exactly to one Baghdadian raṭl. This is to be concluded from a remark by Fryer according to which, a farāsīlah of 27 pounds avoirdupois consisted of “30 Rottulas” in Mecca around the year 1675.\(^{174}\) From this the Meccan raṭl of the 17th century can be calculated at 408.23g, the exact value being 130 dirham at 3.125g (per dirham), i.e., 406.25g. In Medina, a raṭl amounted to 10,200 dirham or 625g, according to al-Muqaddasi [fl. 10th century] (BGA III (2) 99). However, the more accurate value was apparently 195 dirham, namely 1 \(\frac{1}{2}\) Baghdadian raṭl at 130 dirham (per raṭl) or 609.375g.\(^{175}\) With regard to al-Mukhā

[“Mocca”, in Oman] during the 17th century, it has been reported that the “Rottula” fluctuated between 521.24g and 544.32g, depending on the goodwill of the weighing person, and thus, on average, amounting to 530g.\(^{176}\) In Yemen, the raṭl equalled the Baghdadian raṭl, namely 130 dirham or 406.25g, according to al-Muqaddasi (p. 99).

1.2.40.2 Egypt

During the ‘ABBASID period, the Egyptian raṭl, as it became evident from vitreous gauge weights, consisted of 12 ʿiqiyah at 8 dirham (per ʿiqiyah), thus weighing 300g.\(^{177}\) [p. 29] At the time of the Fāṭimids (if not earlier), and therefore during the 11th and 12th centuries, the Egyptian raṭl weighed 140 dirham or 437.5g. A gauge weight in the Louvre weighed indeed, as mentioned initially (see 1.1.2), 437.2067g. It is impossible to say when the raṭl weight at 12 ʿiqiyah (per raṭl), or 144 dirham, i.e., 450g, appeared for the first time in Egypt. In any case, from the 12th century onwards up to modern times, it had assumed a commanding position alongside with the raṭl kabīr.\(^{178}\) Principally, spices and finer commodities were weighed by the raṭl at 450g, which was also called raṭl fulūlī. Nowadays, it is officially fixed at 449.28g.

\(^{171}\) Journal Asiatique 8 IV (1884), pp. 307–16.

\(^{172}\) Ibid., 7 XIV (1879), p. 461.

\(^{173}\) Ibid., 8 IV (1884), pp. 234 and 236.


\(^{176}\) This figure has been mentioned by I. Saris in the year 1612 (in Purchas, Extra Series II, p. 391), according to which 20 raṭl (fluctuated in al-Mukhā between 23 and 24 pound Avoirdupois.

\(^{177}\) Such a gauge-weight has been dated by the year 1777/93 and considered as half an ounce. It weighs 12.2 g (P. Casanova, Catalogue des pièces de verre des époques byzantine et arabe. Mém. de la Mission Arch. Française au Caire, VI, Paris 1897, p. 385). E. Th. Rogers published a vitreous quarter-raṭl gauge-weight (“Unpublished Glass Weights and Measures”, in: Journal of the Royal Asiatic Society, n.s. X (1878), p. 110), which weighs 1143.4 grams or 74.086 g. According to the former weight the raṭl weighed thus 292.8 g, according to the latter 296.344 g (instead of the required 300g). This is either the result of dissipation (due to usage or fracturing), or there existed in Egypt during the early ‘Abbasid period a dirham-weight of 3.087 g, as in Damascus.

since the dirham has been standardized in present-day Egypt at 3.12g.

The "big ratl" or ratl kabir at 160 dirham or 500g had been used for ordinary commodities, as emphasised explicitly by a 17th century source. The ratl kabir dates probably back to 'Abbāsīd times. Such a gauge weight, referred to as "big ratl", is to be found today in Ann Arbor (Michigan, U.S.A.) and weighs 492.6g. However, a small piece of it has broken off, so it might have weighed 500g originally.

For certain kinds of commodities, two more ratl weights had been used in medieval Egypt: the ratl laythi at 200 dirham or 620g, and the ratl jarwi at 312 dirham or 967g. With regard to Damietta, a ratl at 330 dirham or 1031.25g had been reported.

1.2.40.3 Palestine

In medieval Jerusalem, the ratl amounted to 800 dirham or 2.5kg. This information from a 12th century source had been confirmed by a Jewish source of the 17th century which rated such a ratl at 5 Bohemian pounds (at 514.35g each). During the 19th century, however, the ratl [p. 30] amounted to 900 dirham or 2 1/4 oqqa, thus to 12 uqiyyah of 75 dirham (per uqiyyah) or 2.886kg.

In Ramla, one ratl equalled 743 dirham or 2.321kg. However, the reports about the ratl of 'Akkā [the ancient

Ptolemies, the St. Jean d'Acre of the crusaders] are contradictory: according to Pegolotti (pp. 49 and 53) the qintar there equalled, during the 14th century, 100 ratl at 12 uqiyyah (per ratl), at 44 pesi (or mithqal) each, being 670 Florentine pounds or 227.225kg. Since one of the two 'Akkā ratls during the 19th century weighed still 2.207kg— the other one weighing 2.037kg— we arrive at the probable value of 2.2kg.

1.2.40.4 Syria

The ratl of Damascus equalled always 600 dirham. Since these 600 Damascene dirham amounted only to 592 1/2 Egyptian dirham at 3.125g (per dirham) we arrive at 1.85kg for the ratl of Damascus. This was also confirmed by Da Uzzano in the 15th century, according to whom one such "ruotolo" equalled 1/100 "cantaro" at 600 light Venetian pounds or at 542 1/2 Florentine pounds, which resulted in a value fluctuating between 1.87kg and 1.84kg, and thus on the average in exactly 1.85kg.

Two informants in the 11th century mentioned a ratl at 480 dirham or 336 mithqal for Aleppo, which refers to the zahirī ratl, named after the Fatimid caliph [Abū'l-Hasan 'Ali b. al-Hākim] al-Zāhir [r. 1021–36]. It can thus be calculated quite accurately at 1.5kg.

However, already toward the end of the 12th century, another source ascribed to the Aleppo ratl a rate of 12 uqiyyah at 60 1/2 dirham (per uqiyyah) and thus 724 dirham. If we assume (as done in the case of the previous calculation) a value of 3.14g

179 A. Gonsales, Hiervolensche Reyse, II (Antwerp 1673), p. 85.
181 Journal Asiatique 8 IV (1884), p. 221
182 Ibid., p. 222.
183 Ibid.

190 Da pratica della mercatura, p. 113.
192 Al-Shayzari, Book of al-Muhaṣṣab, p. 16.
for the Aleppo dirham, we arrive at 2.273 kg for the new raṭl. During the 14th century, however, al-‘Umari [d. 1348/49] ascribed to the Aleppo raṭl 4 dirham less, i.e., 720 dirham, a state of affairs which continued up to the 19th century. During the 19th century, the dirham in Aleppo certainly equaled 3.167 g, resulting, with regard to the raṭl, in 2.28 kg. Most probably all three sources for this paragraph refer to one and the same Aleppo raṭl of 2.28 kg, and the difference between 724 dirham during the 12th century and 720 dirham since the early 14th century is perhaps only an indicator for the shifting of the Aleppo dirham from 3.14 g to 3.167 g. For further confirmation of this, we had already referred to above to the qinār (see qinār, above) in Aleppo, which, according to Pegolotti, weighed on the average 228 kg around the year 1335.

In Aleppo, there existed, besides the raṭl at 720 dirham (at least since the 17th century) a special raṭl for Syrian silk at 700 dirham (i.e., 2.217 kg), a further raṭl for Persian silk at 680 dirham (i.e., 2.153 kg) and finally a raṭl for metals and spices at 600 dirham (i.e., 1.9 kg). The raṭl of Tripoli [in present-day Lebanon] equaled 630 dirham and weighed 1.968 kg, if the dirham is calculated at 3.25 g. In Hums [in today’s Syria], the medieval raṭl amounted to 864 dirham (i.e., 2.7 kg). According to the same source, it amounted to 660 dirham (i.e., 2.062 kg) in Hāmah [in present-day Syria]. The rate in Shayzar for one raṭl was 684 dirham or 2.137 kg; however, the Aleppo-raṭl of 2.28 kg was already customary in Hāmah during the 17th century.

1.2.40.5  ‘Irāq

The raṭl of Baghdād was considered canonic: according to the view of one Muslim legal school, it amounted to 128 2/7 dirham, and, according to another to 130 dirham. Around the year 1050, [the Christian author] Mār Eliyā of Nusaybin seemed to opt in favour of the first mentioned value, whereas later sources, from the end of the 12th century onwards up to the 14th century, asserted throughout a value of 130 dirham. In practice, this second value at 130 dirham or 406.25 g seemed to have prevailed, and we would like to apply this therefore generally. [Hinz adds in the ‘Anhang’ (appendix) to the German original, based on an information by H. Hermelink: according to the Muṣtif al-‘Ulām, p. 14, the Baghdādian raṭl was apparently not based on the dirham but on the mithqāl and amounted to 90 mithqāl. In this manner the rate of one raṭl amounting to 128 2/7 dirham according to one legal school could be explained. It was rounded up by another school—and also in practice—to 130 dirham].

1.2.40.6  Anatolia

During the Middle Ages, the so-called raṭl rūmī consisted of 72 mithqāl at 102 6/7 dirham, thus weighing presumably 321.428 g [Hinz adds in the ‘Anhang’ (appendix) to the German original, based on an information by H. Hermelink: The so-called raṭl rūmī at 72 mithqāl corresponded to 108 dirham and weighed, in accordance to the gauge weight, exactly 337.55 g].

Out of the abundance of Anatolian raṭl weights, we would like to refer to the following:

The raṭl of İstanbul amounted to 876 dirham and weighed thus (the dirham calculated at 3.207 g) 2.8 kg (during the 18th century).

194 Bleibtreu, op. cit., p. 29.
197 Al-Shayzarī, Book of al-Muḥāṣib, p. 16.
199 Journal Asiatique IX, p. 298.
200 For instance, al-‘Umari and al-Qalqashandi (Subh, I V, p. 422).
202 Ibid., p. 237.
In Urfa [a city in eastern Anatolia] the ṛaḍīl amounted to 2,400 dirham,\(^{203}\) thus weighing 7.697kg.

In Sivas [a city in central Anatolia], the ṛaḍīl amounted to 1,440 dirham\(^{204}\) or 4.618kg. This has been confirmed by Pegolotti (op. cit., p. 50) during the 14\(^{th}\) century, since, according to him, one qintār of ‘Akkā [in Palestine], which we had previously calculated at 220kg, equalled 47 ṛaḍīl of “Savastro”, which, in turn, resulted in 4.68kg for the Sivas ṛaḍīl.

In Ahlat [Akhlāt, a town in eastern Anatolia] and Nusaybin [in Upper Mesopotamia], one ṛaḍīl amounted to 300 dirham during the 11\(^{th}\) century.\(^{205}\) In the event that the dirham at that time amounted already to 3.207g, this ṛaḍīl would have to be calculated at 962.1g.

1.2.40.7 Iran

In Iran, the mann replaced always the ṛaḍīl. Even in cases where the Arab geographers mentioned the ṛaḍīl, the mann was usually referred to. For instance, when al-Muqaddasi [fl. 10\(^{th}\) century] (loc. cit., p. 452) mentioned that the big ṛaḍīl of Shīrāz amounts to 1,040 dirham, he meant the big mann of Fārs. In Hormūz (during the time of the Portuguese supremacy from the 16\(^{th}\) century to 1722), the ṛaḍīl was equivalent to the Portuguese arratel at 458.976g.

1.2.40.8 Turkistān

In Urganj (khanate Khivah) during the 14\(^{th}\) century, one ṛaḍīl amounted to 330 dirham,\(^{206}\) thus weighing 1,031.25g. The same

raḍīl was also prevalent in Saray on the Volga, the capital of the Golden Horde.\(^{207}\)

1.2.40.9 Maghrib

Prior to the Fāṭimid period, one ṛaḍīl in Northern Africa amounted to 130 dirham (406.25g), thus being equal to the Baghdadian ṛaḍīl, with the exception of pepper, where it amounted to 140 dirham or 437.5g. Under the Fāṭimids, however, the ṛaḍīl increased to 140 dirham\(^{208}\), thus weighing uniformly 437.5g during the 11–12\(^{th}\) centuries. According to Ibn Baṭṭūṭah [1304–68/69 or 77] (loc. cit., vol. IV, p. 317), the Maghribine ounce, i.e., \(\frac{1}{12}\) ṛaḍīl, equalled during the 14\(^{th}\) century a Damascus quarter-ounce, i.e., 12.5 dirham. Thus, the Maghribine ṛaḍīl would amount to 150 dirham or 468.75g. With regard to Morocco around the year 1500 we have a somewhat obscure report, according to which one ṛaḍīl equalled 12 ʿūqiyah at 11 \(\frac{1}{12}\) dirham al-kayl (per ʿūqiyah)\(^{209}\). If this dirham, amounting to “55.4 barley-seeds of medium weight”, equalled 3.3g (which would be in accordance with the mīthqāl at 4.722g), this would result in a weight of 440g for the Moroccan ṛaḍīl, thus approximately the same as the Fāṭimid ṛaḍīl. On the other hand, Ibn Baṭṭūṭah (loc. cit., vol. III, p. 382) has mentioned also a Maghribine ṛaḍīl at 180 dirham (20 Maghribine ṛaḍīl supposedly being equal to 25 Egyptian ṛaḍīl at 144 dirham (per ṛaḍīl)), which would result in 562.5g. In Fez and Marakesh during the 14\(^{th}\) century, one ṛaḍīl equalled presumably 16 ʿūqiyah at 21 dirham (per ʿūqiyah),\(^{210}\) being 336 dirham or 1,108.8g. In Andalusia [in Spain], the ṛaḍīl weighed 12 ʿūqiyah at 8 mīthqāl (per ʿūqiyah)\(^{211}\) or 4.722g (for one mīthqāl), and thus 453.3g.

\(^{203}\) Ibid., p. 239.
\(^{204}\) Ibid., p. 237.
\(^{205}\) Nasir-i Khusraw, ed. Charles Schefer, p. 6 of the Persian text; Mār Eliyā, referred to by H. Sauvaire, in: Journal Asiaticque 8 IV (1884), p. 216.
\(^{206}\) V. G. Tiedzezanssen, Sbornik materialov otroyashchikya k istorii Zolotoy Ordy (St. Petersburg 1884), p. 220.
\(^{207}\) Quatremère, Notices et extraits, XIII, p. 287.
\(^{208}\) Al-Muqaddasi, BGA, III (2), p. 240.
\(^{209}\) Arab Archery (Princeton 1945), p. 115.
\(^{210}\) Al-‘Umari, in: al-Qalqashandi, Subk, V, pp. 177–78.
\(^{211}\) Journal Asiaticque 8 VI (1886), p. 171.
1.2.41 ray

Originally the “mann of Ray” ([the ancient] Rhages), immediately to the south of Tehran; today called “ray” in short, consisting of 4 big mann or 12kg (until 1935 mostly 11.88kg).

1.2.42 ruzmah

A “bale”, used mostly for silk, weighing 30 mann or 7,800 dirham or 24.3kg.

1.2.43 sha’irah

A “barley-seed”, the Persian jau, and as a weight unit \( \frac{1}{96} \) of a mithqāl, on the average 0.05g (see ḥabbah).

1.2.44 šāmūnah

The šāmūnah amounted to \( \frac{1}{4} \) bāqilah (see bāqilah), weighing thus 0.585g. Apparently, there existed also a bigger šāmūnah at \( \frac{1}{2} \) gharāmah or 1.7g. More information on this weight, which appears seldom in the sources, is to be found in the work of Sauvaint.

1.2.45 shirvanchah

The pronunciation and transcription of this expression is not certain. The technical term for a load of limestone at 200 mann or approximately 166.67kg.

1.2.46 siqf

A (silk) “bale”, equivalent to a ruzmah (see ruzmah, above), and thus 24.3kg.

1.2.47 sir

The Persian sir (older pronunciation: sēr) amounted to \( \frac{1}{40} \) mann (see mann), and thus equalled 74.24g until 1935, and since then officially in Iran 75g.

1.2.48 sporta

A “load”, in medieval Egypt a common designation for a quantity of goods amounting to 500 ṭail, and thus theoretically 222.4656kg. According to the conversion rates of Da Uzzano from the 14th century, however, one sporta amounted, in reality, to approximately 720 light Venetian pounds, and thus to 216.886kg.

1.2.49 surkh

A small Indian weight, towards the end of the 16th century at the time of the Mughal emperor Akbar [r. 1556–1605] standardized at \( \frac{1}{6} \) māsha (see māshah above), and thus weighed 0.125525g.

1.2.50 tamūnah

In Khūzistān, one dāng amounted to \( \frac{1}{6} \) dīnār comprising 48 tamūnah. One tamūnah thus weighed 0.0147g.

1.2.51 ūnk

An Indian weight, during the 16th century, at the time of Akbar [r. 1556–1605], amounting to one tōla 8 māsha 7 surkh, thus

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212 Ibid., 8 IV (1884), p. 209.
213 Ibid., 8 III (1884), pp. 398 and 400 n. 2.
214 Suʿūdat-Nāmah, MS Aya Sofya no. 4190, fol. 29b.
216 La pratica della mercatura, p. 109
218 * A province in Southwest Iran (transl.)
weighed the same as a dām,\textsuperscript{219} namely 20.9628g.

1.2.52 tāsū

A Persian weight-unit, the arabicized fāsūj at 1/4 dāng or 1/32 mithqāl,\textsuperscript{220} amounting to approximately 0.18g up to the ʿCāfvid period [1501–1722], and to 0.195g since the 16th century.

1.2.53 tōla

An Indian weight, also called tōlchah. During the 16th century, at the time of Akbar [r. 1556–1605], 12 māshah (see māshah) amounted to one tōla,\textsuperscript{221} which thus weighed 12.0504g.

1.2.54 ʿuqiyah

The ʿuqiyah or “ounce” equalled, in principle, 1/12 raṣf (apart from certain exceptions). A complicated and in part purely theoretical list of ounce weights had been prepared by Sauvaire,\textsuperscript{222} which is however based on a conversion rate of 3.0898g for the dirham instead of 3.125g. Only the most significant ounce-weights are listed below:

1.2.54.1 Arabian Peninsula

The canonic ounce is to be found during the early Islamic history in Mecca as a weight at 40 dirham\textsuperscript{223} or 125g. Fryer gives for the Meccan ounce with regard to the 17th century this rate: 1/15 rotula = 0.9 pound Avoirdupois + 15 = 27.08g.\textsuperscript{224}


\textsuperscript{221} Ṣā’in-e Akbari, Bibl. Indica, n.s. XXX (1894), vol. III, p. 125.

\textsuperscript{222} Journal Asiatique 8 IV (1884), pp. 301–304.

\textsuperscript{223} Al-Maqrīzī, Poids et mesures, transl. S. de Sacy, p. 36.

\textsuperscript{224} A New Account of East-India (London 1698), p. 36.

1.2.54.2 Egypt

One ounce in Egypt equalled always 12 dirham or 37.5g, and today, officially, 37.44g.\textsuperscript{225}

1.2.54.3 Syria

The Damascene ounce amounted to 50 dirham\textsuperscript{226} or 1/12 raṣf (look up there) or 154.16g. The ounce of Aleppo, according to al-Shayzari [fl. 13th century],\textsuperscript{227} amounted to 60 1/3 dirham at 3.14g (per dirham), thus to 189.4g, and according to al-Qalqashandi [1355–1418],\textsuperscript{228} to 60 dirham at 3.167g (per dirham) thus to 190g. One ounce of Ḥamah equalled 55 dirham\textsuperscript{229} or 171.87g. The ounce of Hums amounted, according to the same source, to 72 dirham = 225g. The ounce of Jerusalem amounted to 66 2/3 dirham\textsuperscript{230} or 208.85g.

1.2.54.4 ʿIrāq

The ounce of Baghdad equaled 10 1/6 dirham\textsuperscript{231} or 33.85g.

1.2.55 vāl

An Indian weight, corresponding to 2 raṭṭi or 1/32 tōla (see tōla) or 1/80 ounce Troy\textsuperscript{232} or 0.3766g.


\textsuperscript{226} Al-Shayzari, Book of al-Muḥtasib, p. 16.

\textsuperscript{227} Ibid.

\textsuperscript{228} Al-Qalqashandi, Subh, IV, p. 216.

\textsuperscript{229} Al-Shayzari, Book of al-Muḥtasib, p. 16.

\textsuperscript{230} Journal Asiatique 8 IV (1884), p. 387.

\textsuperscript{231} Ibid., p. 302.

cases, the sources permit only the stating of the approximate weight of the grain which had been measured in the individual dry measures. Their volume could be calculated by taking into consideration the fact that 75–77 kg of wheat or 60–72 kg of barley equaled 100 litres.

2.2 Measures of capacity (in alphabetical order)

2.2.1 ‘ashīr

A dry-measure; one ‘ashīr equaled \(\frac{1}{10} \) qa‘īf or \(\frac{1}{600} \) kurr,\(^{236}\) thus, according to my calculations stated below, approximately 6 litres.

2.2.2 birshālah

A dry-measure for grain in Tilimsān (Tlemcen [in northern Morocco]), corresponding to 12 \(\frac{1}{2} \) ratl or 2,000 dirham,\(^{237}\) i.e., about 8.5 litres.

2.2.3 buṭṭah

The Egyptian flour measure of a buṭṭah corresponded to the weight of 50 ratl or to a volume of 24 qa‘īf (see qa‘īf, below) or to 1 \(\frac{1}{2} \) waybah (see waybah, below).\(^{238}\) These values could only be reconciled by calculating the buṭṭah at approximately 22.5 litres or probably 17.5 kg flour.

2.2.4 farq

This dry measure equaled 3 šā‘ in Medina,\(^{239}\) and thus 12,617 litres. In ‘Irāq and [Upper?] Mesopotamia, one farq of wheat amounted to 36 Baghdādian ratl\(^{240}\) at 406.25 g each, thus

\(^{234}\) Tarīḥ Vesikaları I, p. 101.
\(^{236}\) Journal Asiatique 8 VII (1886), p. 421.
\(^{237}\) Ibid., p. 150.
\(^{239}\) Al-Maqrizī, Poids et mesures, transl. S. de Sacy, p. 50.
14.625kg, corresponding to a volume of 19 litres.

2.2.5 ghirārah

A Damascene dry measure for grain, literally “sack”, consisting of 12 kayl or 72 mudd (of Damascus).\textsuperscript{241} According to al-‘Umari [d. 1348/49], one ghirārah + 1\textsuperscript{1/2} mudd amounted to 3 Egyptian irdabbi.\textsuperscript{242} The irdabb was calculated at around 69.6kg (wheat), or around 90 litres as a dry measure. Thus, we arrive at a weight of around 204.5kg (wheat) for the ghirārah or a volume of around 265 litres.

In the late medieval period, ghirārah of Gaza [in Palestine] amounted to \(\frac{1}{2}\) ghirārah of Damascus (thus about 306.75kg of wheat or around 397.5 litres). In Jerusalem the ghirārah equalled 3 Damascene ghirārah or about 613.5kg of wheat or around 795 litres.\textsuperscript{243}

2.2.6 irdabb

An Egyptian dry measure for grain, consisting of 6 waybah at 8 big or 16 small qadah. The exact determination is difficult: according to al-Muqaddasi [fl. 10\textsuperscript{th} century],\textsuperscript{244} each of the 6 waybah of one irdabb consisted of 15 mann (wheat). If we assume for such a mann 260 dirham at 3.125g each we will arrive at a weight (for grain) of 73.125kg for the irdabb. More reliable, however, appears to be a report by al-‘Umari [d. 1348/49] from the 14\textsuperscript{th} century,\textsuperscript{245} which had been confirmed by al-Qalqashandi [1355–1418] in the 15\textsuperscript{th} century,\textsuperscript{246} according to whom in Cairo one irdabb amounted to 6 waybah or 24 rub’ or 96 small qadah, one qadah equalling 232 dirham (wheat). Consequently, one irdabb is to be calculated at 69.6kg (wheat), or 56kg of barley, or rather, as a measure of capacity, c. 90 litres. This calculation seems to be the most reliable, although some of the supporting evidences also lead to other conclusions. The most serious deviation is contained in the report by Gousales around the year 1665\textsuperscript{247} which mentioned an “Ardeb” at 6 “Vvibbe” at 8 “Cadde” each. Such a “Cadde” (i.e., the big qadah) was said to have contained exactly 3 ratl (“pondt”) rice at 160 dirham each or 1.5kg. This corresponded to a value of 1.56 litres for the big qadah (since one litre of rice weighs 960g) and resulted in exactly 75 litres for one irdabb.

With regard to the 18\textsuperscript{th} and 19\textsuperscript{th} centuries, we notice a doubling of our irdabb value of about 90 litres insofar as now one irdabb consisted of 96 (small) qadah at 442 \(\frac{1}{2}\) dirham each,\textsuperscript{248} thus corresponding to a weight (for grain) of 132.856kg. However, according to a second source,\textsuperscript{249} one irdabb consisted of 96 qadah at 445 \(\frac{1}{2}\) dirham, corresponding to a weight (for grain) of 133.7kg. Consequently, one irdabb was to be calculated at about 182 litres which corresponds to the observation by Lane, according to whom (around the year 1836) one irdabb amounted exactly to 5 bushels or 181.735 litres.\textsuperscript{250} Currently, one irdabb equals 198 litres in Egypt and corresponds to 150kg of wheat, 120kg of barley, 140kg of maize, 155kg of beans, or 157kg of lentils.\textsuperscript{251}

\textsuperscript{240} Al-Muqaddasi, BGA III (2), p. 146.
\textsuperscript{241} Al-Qalqashandi, Şubh, IV, p. 181.
\textsuperscript{242} Referred to by M. Guadelfoy-Demombynes, La Syrie à l’époque des Mamelouks d’après les auteurs arabes (Paris 1923), p. 137.
\textsuperscript{244} BGA III (2), p. 204
\textsuperscript{245} Referred to by M. Guadelfoy-Demombynes, La Syrie à l’époque des Mamelouks d’après les auteurs arabes (Paris 1923), p. 137.
\textsuperscript{246} Al-Qalqashandi, Şubh, III, p. 445.
\textsuperscript{247} Hierversalische Reysse. II. Deel (Antwerp 1673), p. 84.
\textsuperscript{248} Journal Asiatique 8 III (1884), p. 404.
\textsuperscript{249} Rudd al-Mukhtar, in: ibid.
\textsuperscript{250} E. W. Lane, An Account of the Manners and Customs of the Modern Egyptian, vol. II (London 1836), p. 317.
\textsuperscript{251} According to the almanac of the Egyptian government for the year 1924, in: Mitteilungen des Seminars für Orientalische Sprachen, Westasiatische Studien (Berlin, 1925), p. 27.
In Fāyūm during the Middle Ages, one _irdābb_ amounted to 9 _waybah_ (instead of 6 _waybah_ in Cairo),252 thus corresponding to about 135 litres (104.4 kg wheat).

2.2.7 _jarīb_

One _jarīb_ amounted to 7 _qaṭīz_ as a dry measure in Medina during the 7th century under the caliph 'Umar [r. 634–44].253 At a slightly later period, it was reported that such a _qaṭīz_ equaled presumably one _sā‘_ or 5 1/3 _ratl_ (as a weight of grain).254 Below the _sā‘_ had been calculated at 4.2125 litres or rather at 3.245 kg (with regard to wheat). In this manner we reserve for the _jarīb_ as a dry measure of early Islamic history, the value 29.5 litres or of 22.715 kg (wheat).

In Iran, the _jarīb_ amounted always to 10 _qaṭīz_. However, the _qaṭīz_ measures fluctuated considerably: in eastern Iran during the 10th century, for instance, there existed _qaṭīces_ at 2 1/2 _mann_ and at 1 1/2 _mann_255 and, corresponding to this _jarīb_, dry measures at about 26 litres and about 16 litres. With regard to Fars [in southern Iran] during the same period, we would like to refer to the following _jarīb_ dry measures:256

<table>
<thead>
<tr>
<th>City</th>
<th>1 <em>jarīb</em> = 10 <em>qaṭīz</em> at about 16 <em>ratl</em> each or about</th>
<th>65 kg or 83 litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirāz</td>
<td>1 <em>jarīb</em> = 1 3/20 of the <em>jarīb</em> of Shirāz or about</td>
<td>74.75 kg or 97 litres</td>
</tr>
<tr>
<td>Bayḍah</td>
<td>1 <em>jarīb</em> = 3/4 of the <em>jarīb</em> of Shirāz or about</td>
<td>81.25 kg or 105 litres</td>
</tr>
</tbody>
</table>

During the 14th century in Iran, one _jarīb_ equaled 120 _mann_ of Tabrīz at 260 _dirham_ (per _mann_ of Tabrīz) (at 3.2 g per _dirham_), which was based on the standardization of Ghāzān Khān [Ilkhānid, r. 1295–1304]257 and amounted to a weight of exactly 100 kg wheat or a volume of about 130 litres.

2.2.8 _kārah_

This dry measure, which prevailed especially in 'Irāq, equaled 2 _qaṭīz_ or 16 _makkāk_.258 According to al-‘Umarī [d. 1348/49],259 one _kārah_ (wheat) equaled 240 _ratl_ or 97.5 kg, thus about 120 litres. With regard to barley, chickpeas and lentils, it amounted to 200 _ratl_ or 81.25 kg, and with regard to rice to 300 _ratl_ or 121.875 kg.

Since we have already calculated an average of 60 litres for the 'Iraqi _qaṭīz_, we should be able to fix the _kārah_ at approximately 120 litres.

2.2.9 _kayl_

In Damascus, one _kayl_ equaled 1/12 _ghirārah_ (see _ghirārah_) or 17 kg (wheat) or about 22.08 litres.260 In Aleppo, one _kayl_

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253 Abū Yusuf, _Kitāb al-Kharāj_ (Bulaq-Cairo 1302/1885), p. 27.
254 Ibid., p. 30.
259 Ibid., pp. 145–46.
260 Al-Qalqashandi, _Subh_, IV, p. 181.
amassed to 1/22 maqkuq (see makkök, below) or 6.56 litres. In the area of Dīyār Rabi'ah, one kayl amounted to 1/16 of the local makkök or 469 cm³.

2.2.10 kaylah

In Egypt, this dry measure amounted to 8 qadah (see qadah) or about 7.5 l, today officially it is 16.5 litres. In the semi-independent principality of Lār, the “quela” (Portuguese variant for kaylah) amounted during the 16th century to 1/8 alqueira at 13.566 litres, one kaylah thus being 1.7 litres.

2.2.11 kaylah (kaylchah)

In 'Irāq during the 10th century, this dry measure of presumably Iranian origin amounted to 1/2 maqkuq (see makkök, below) or 600 dirham (of grain) or 1,875 g or (more exactly) 2.5 litres. Less exact is the statement of al-Muqaddasi [f. 10th century] according to which the 'Irāqi kaylah is said to have corresponded to 2 mann (1,625 g). More to the point is the information provided by al-Rāzī, who stated that one kaylah equaled 1/22 makkök or 5 ratl (2,031.25 g).

In eastern Iran, one kaylchah amounted to 1/3 makkök or 1 1/8 mann, i.e., 1,523.4 g (wheat) or quite exactly 2 litres, according to al-Jauhari (d. 1003 in Nayshāpūr). This statement would correspond to that in the Tāj al-‘Arūs, according to which one kaylchah amounted to 1/2 sā’, which we had already calculated at 4.2057 litres. Al-Muqaddasi ascribed to the kaylchah in Marāghah (in Adharbājjan) 1/6 qafiz at 1/2 mann, i.e., 1,352 g (wheat) or about 1.75 litres. In Iran in the course of the middle and later periods of the Middle Ages, the kaylchah amounted 1/6 qafiz with regard to wheat, and to 1/10 (see jarīb) regarding barley or to 12 mann at 260 dirham each. The kaylchah is therefore to be calculated at about 1.67 kg with regard to wheat, and at about 2 kg or 2.2 litres with regard to barley.

Al-Muqaddasi reports furthermore the existence of a kaylah in Palestine (Ramlah and ‘Ammān) which amounted to 11/2 sā’, thus to about 6.3 litres.

In the Ottoman Empire, the Persian kaylchah corresponded to 1/20 mudd and was mostly called kile (see kile).

2.2.12 kharrūbah

A dry measure in Egypt, equalling 1/16 qadah (see qadah), thus during the Middle Ages about 0.06 litre, today officially 0.129 litre.

2.2.13 khib

A Persian expression, literally a “tube”; a wine measure. Around the year 1300, Ghaçan Khan [Ikhnānī, r. 1295–1304] standardized the khib as follows: with respect to supply to the Court and

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265 Al-Khwārizmī, Maśūṭī al-‘Ulām, ed. G. van Vloten (Leiden 1895), p. 15.
266 BGA III (2), p. 129.
268 Abu Bakr Muḥammad b. Zakariyyā‘, fl. about 854–925 or 35, known as “Rhazes” to the medieval West (transl.).
269 Journal Asiatique 8 VIII (1886), p. 130.
271 Sa‘ādat-Nāmah, MS Aya Sofya no. 4190, fol. 28b.

* An eminent dictionary by Sayyid Muḥammad Murtadā‘ al-Zabīdī, d. 1791 (transl.).
to gifts of honour, the “tube” had to consist of 5 paymânâh at 10 mann of Tabriz (per paymânâh), i.e., 50 mann at 260 dirham each, or about 41.7 litres, and with regard to the supply for drinking-bouts and feasts, the khîk was calculated at 4 paymânâh or 40 mann or about 33.4 litres. 273

2.2.14 kîle [kilah]

The Florentine Pegolotti had mentioned already during the 14th century274 with regard to southern Anatolia the rate: one “ghille” = 1/20 “moggio” (mudd; compare the above entry kâylchah [2.2.13]). Under the Ottomans, one kîle of wheat was officially (i.e., in Istanbul) calculated at 20 oqqa,275 thus at 25.656kg, and one kîle of barley at presumably 22.25kg. With regard to flour, too, the “bushel” (kîle) [Hinz: Scheffel] of Istanbul at the rate of 20 oqqa = 25.656kg was current.276 Rice, however, was, during the 17th century merely measured at a rate of one kîle = 10 oqqa.277 Since 1841, the kîle in Turkey amounted uniformly to 35.27 litres278 and thus corresponded to the old wheat weight of 20 oqqa.

Throughout Anatolia there existed, apart from the official kîle of Istanbul, a number of local bushel measures: Diyarbekir, Arapgir and Çermik had, during the late Middle Ages, a kîle half the size of that of Istanbul,279 thus amounting to a weight of 12.828kg of wheat, and measuring 17.635 litres. In Urfa, the kîle, then, amounted to 4 bushels of Ämîd [i.e., Diyarbekir],280 thus corresponding to a weight of 51.312kg of wheat, and measuring 70.54 litres. In addition to this, there existed also a so-called “Ottoman kîle” at 8 bushels of Ämîd,281 thus corresponding to a weight of 102.624kg wheat, and measuring 141.08 litres.

With regard to Iran, it should be mentioned that around the year 1300 the Íkhsânî Hızârân Khân [r. 1295–1304] fixed the kîlah throughout his empire at a weight of 10 mann. The corresponding dry measures had to be manufactured specifically for each kind of grain, so that the content of the dry measure always amounted to 10 mann, i.e., 8.33kg.282 This arrangement appears to have been based on older customs insofar as one kîlah in Iran equalled 1/10 taghâr [Hinz: Saumlust, i.e., a “pack animal’s load”].283

2.2.15 kilinder

A handle vessel made from tin or plate, prevalent in the Ottoman Empire (from Greek kylindros), as a dry measure equalling 2 oqqa or 2.5656kg. Our source284 states that “ain constantinopolitanische klander oder mos” corresponded to 6 Viennese “beermugs” [Hinz: Seidel], which would thus result in 2.1225 litres.285

2.2.16 kurr

This originally Babylonian dry measure amounted in ‘Irâq principally to 30 kârah or 60 qafîz at 8 makkûk each. During the 10th century, in Baghdâd and Kûfah one big or “full” [Hinz: vollmâssige] kurr amounted to 60 qafîz at 8 makkûk (per qafîz), at 3 kaylahâ (per makkûk), at 600 dirham (weight of grain), i.e., 2,700kg. In Wâṣîf and Bâṣrah, one kurr equalled then 128 qafîz at 4 makkûk (per qafîz) at 15 rafi (per makkûk) at 128 dirham (per

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274 La pratica della mercatura, p. 43.
275 TOEM, no. 49, p. 53; Tarih Vesikalari I, p. 188.
276 Vakiflar Dergisi I, p. 41.
277 Zeitschrift der Deutschen Morgenländischen Gesellschaft 18, p. 728.
279 Tarih Vesikalari I, pp. 103, 194 and 196.
280 Ibid., p. 185.
281 Ibid., p. 96.
ratl), i.e., 2,880kg (wheat). In contrast to that, the so-called “balanced” or “standardised” kurr (al-kurr al-ma‘addal), also consisted of 60 qafiz, but only at 25 Baghdadian ratl, and amounted thus to 609.375kg (wheat). According to another source from the 10th century, the big kurr equalled 60 qafiz or 480 makkak or 1,440 kayaljah, and was calculated at 5,760 rub ‘or 7,200 ratl, which meant one kayaljah, according to al-Râzî, weighed 5 ratl or 650 dirham instead of 600 dirham as stated by al-Khwârizmî. Accordingly, the weight (of grain) for one kurr is rather 2,925kg (instead of 2,700kg). This slightly higher figure appears to be more exact, since in the 14th century al-'Umarî [d. 1348/49] mentioned (with regard to the Baghdadian kurr at 30 kârah for the various kinds of grain) the following weights (refer also to what has been stated under the entry kârah):

one kurr wheat = 2,925kg
one kurr barley, chick-peas, lentils = 2,437.5kg
one kurr rice = 3,656.25kg

An average weight of probably about 2.9 tons or a dry measure of 36 hectolitres results from the above statements regarding one kurr of wheat.

With regard to Iran, al Muqaddasi [fl. 10th century] mentions (loc. cit., p. 417/8) a kurr in Khuzistan which amounted to 1,250 munn for wheat, and to 1,000 munn for barley. This would correspond to 1,015.6kg for wheat and 812.5kg for barley, thus to about 12 hectolitres. As late as the 18th century, Chardin [1643–1713, a French traveler to Iran] referred to a kurr of water for Iran, which he calculated at 1,200 Baghdadian ratl at 130 dirham (per ratl), i.e., at 4,875 litres.

2.2.17 lauh

In [the Moroccan city of] Fez, the modius was called lauh and contained 100 local mudd at 80 uqiyah (as a weight for grain). Since one ounce amounted in Fez to 13 1/3 dirham, a weight of about 400kg for one lauh of wheat, or a dry measure of c. 520 litres results.

2.2.18 makhtâm

The original makhtâm hâshîmî (awwal) corresponded to a weight (of grain) of 32 ratl, i.e., 13kg or about 17 litres. The makhtâm of al-Hâjîj, amounted to one ša‘ of the time of the second caliph ‘Umar [r. 634–44] or one qafiz or 5 1/3 ratl (of grain), i.e., 4.2125 litres (see ša‘). During the 10th century, one makhtâm amounted to 1/6 qafiz or one makhtâm + one kayaljah = 1/6 makkâk, thus in both cases, in accordance with our calculation of the makkâk or rather of the qafiz in ‘Irâq, to about 10 litres. In Ahvâz, one makhtâm equalled 2 ša‘ or 3 kaff, thus amounting to 8.425 litres (look up under ša‘).

286 Al-Khwârizmî, Mafâtîh al-‘Ulam, ed. G. van Vloten (Leiden 1895), p. 15.
287 Ibid., p. 67.
289 Abû Bâk Mu‘âmammad b. Zakariyyâ‘, c. 854–925 or 35, known as “Rhazes” to the medieval West (transl.).
290 Abû ‘Abdallâh, fl. second part of 10th century (transl.).
291 In: al-Qâqishândî, Sihih, IV, p. 422.
292 Also according to the Risâlah al-Shamsiyah (quoted by Sauvage, loc. cit., p. 122), one kurr of barley equalled 6,000 ratl = 2437.5kg.

294 Known to me is the modius, a Roman corn-measure which approximately amounts to a peck or a quarter-bushel (transl.).
295 Journal Asiatique 8 VIII (1886), pp. 132.
296 Abû Yusuf, Kiûb al-Khâraj (Bulâq-Cairo 1302/1885), p. 31.
297 Umayyad governor in ‘Irâq, d. 714 (transl.).
298 Abû Yusuf, Kiûb al-Khâraj, pp. 21 and 30.
300 Al-Râzî, in: Journal Asiatique 8 VIII (1886), pp. 135.
302 Present-day capital of the province of Khuzistân in Southwest Iran (transl.).
2.2.19 makkūk

In 10th century 'Irāq, especially in Baghdad and Kūfah, one makkūk amounted to 3 kaylah at 300 dirham (per kaylah), and corresponded to a weight (of grain) of 5.625kg. In Baṣrāh and Wāṣīṭ one makkūk corresponded to a weight of 7 1/2 manṭ or 15 ḫal at 128 dirham (per ḫal),298 i.e., 6kg. If we base our calculations on the rate of 77kg wheat for one hectolitre with regard to the above weight figures we arrive at a dry measure of 7.3 litres and 7.77 litres, respectively.

On the other hand, there is the report by al-Muqaddasi [fl. 10th century] (loc. cit., p. 145) with regard to the Mesopotamian makkūk, according to which, one makkūk equalled 15 ḫal or 6,074kg of wheat. According to al-Rāzī,299 one 'Irāqi makkūk amounted to 1/6 qafīz (see qafīz), and thus to 6.084kg of wheat.

The average figure of 7.5 litres derived in this manner for the makkūk had been confirmed by two notes in the work of Mār Elyā,300 according to which one 'Irāqi makkūk of wine contained 48 thumm ("eights") at 50 dirham (per thumm). Moreover, one mishqā (see mishqā) amounted to 1/16 makkūk of Diyyār Rabi‘ah, namely 37 1/2 dirham (wine). Both figures resulted in 7.5 litres for the 'Irāqi and Mesopotamian makkūk.

With regard to the makkūk in Mossul,301 during the 13th century, a higher figure had been reported. According to Ibn Āthīr302 (vol. VI, p. 9), it corresponded to 1/16 ghirārah of Damascus (see ghirārah), and thus to about 14.6kg of wheat (ibid., vol. XII, p. 292) or to 33.75 ḫal of flour, i.e., 13.689kg and as a measure of capacity to about 18.8 litres.

With regard to the Iranian regions, it has to be mentioned that Arrājin had a makkūk of 5 manṭ,303 i.e., 4.056kg of wheat or about 5.1 litres, whereas Gondeshāpur had a makkūk at 3 1/2 manṭ304 or 2.839kg of wheat or about 3.7 litres.

The Syrian makkūk, however, was of a completely different size. During the 12th century, one makkūk in Aleppo amounted to 19 sunbūt of Shayzar at 1 1/2 ḫal.305 Since the ḫal of Shayzar equaled 684 dirham at 3.125g (per dirham), one makkūk of Aleppo corresponded most probably to about 61kg of grain. More reliable, however, appear to be some statements from the 14th and 15th century: according to al-'Umārī [d. 1348/49]304 1 1/2 makkūk of Aleppo amounted on the average to one ghirārah of Damascus and was thus equal to 81.75kg (wheat). According to al-Qalqashandi [1355–1418],305 one makkūk of Aleppo equalled 7 Egyptian wēybah, and was thus equal to 81.2kg (wheat), or in both cases, around 19 litres. In Ramlah,306 8 makkūk amounted to one qafīz (see qafīz). One makkūk thus in this case amounted to about 19 litres.

2.2.20 marzbān (pl.: marāzīb)

In 12th century Aleppo, 4 marzbān amounted to one makkūk,307 which we had calculated at 105 litres. One marzbān of Aleppo corresponded therefore to 26.25 litres. In Mesopotamia, one marzbān amounted to 16 mishqā at 37 1/2 dirham (wine)308 (per

299 Journal Asiatique 8 VIII (1886), pp. 158.
* Abū Bakr Muhammad b. Zakariyyā‘, c. 854–925 or 35, known as "Rhazes" to the medieval West (transl).
300 Journal Asiatique 8 VIII (1886), p. 155.
** A city in present day 'Irāq (transl.).
*** Izz al-Dīn Abī‘l-Ḥasan 'Allī, eminent historian, author of al-Kāmil, c. 1160–1233 (transl.).
302 Ibid., p. 417.
303 Al-Shayzarī, Book of al-Muqtaṣīb, p. 17.
304 M. Gaudefbrev-Demounynes, La Syrie à l'époque des Mamelouks d'après les auteurs arabes (Paris 1923), p. 137.
305 Al-Qalqashandi, Šubh, IV, p. 216.
* A town in Palestine (transl.).
mishqā’), one marzbān was thus exactly 1.875 litres.

2.2.21 metre (medre, medara)

An Ottoman measure for liquids at 4 kilinder at 2 oqqa (per kilinder),\(^{309}\) and thus 10.256 litres.

2.2.22 milwah

An Egyptian dry measure at 2 qadah (see qadah), today 4.125 litres.\(^{310}\)

2.2.23 mishqā’

This measure of capacity, which apparently existed only in Mesopotamia, amounted to \(\frac{1}{64}\) makkūk of Diyār Rabi‘ah and had a capacity of 37 \(\frac{1}{2}\) dirham of wine. It is thus to be calculated at exactly 117.19 cm\(^3\).\(^{311}\) With regard to oil, its capacity was 33 \(\frac{3}{4}\) dirham or 105.47 g, and with respect to honey 50 \(\frac{3}{5}\) dirham or 158.2 g.

2.2.24 mudd

The canonical mudd of the early Islamic period, especially in Medina, amounted to \(\frac{1}{4}\) sā‘.\(^{312}\) According to Abū Hanifah,\(^{313}\) its capacity was 2 Baghdadian rafīl. According to [his disciple] Abū Yūsuf [d. 798], it amounted to 1 \(\frac{1}{2}\) rafīl, which here, however, refers probably to the Median rafīl. In both cases, the result is 812.5 g (wheat). If we work with 77 kg per 100 litres, the result will be 1.05 litres for the canonic mudd. Since we know from a note from the year 1195 concerning a gauge vessel that \(\frac{1}{4}\) sā‘ (see sā‘) could hold 337 dirham of water, we arrive at an exact confirmation of 1.053 litres for one mudd.

2.2.24.1 Egypt

From the chronicle of Ibn ‘Abd al-Ḥakam, who flourished during the \(^{7th}\) century, al-Maqrizi [d.1441]\(^{314}\) observed that one waybah at that time consisted in Egypt of 6 mudd. Since we have been able to calculate the waybah (see waybah) at exactly 15 litres, we arrive at 2.5 litres for the Egyptian mudd of the early Islamic period. However, we lack information concerning the Egyptian mudd during later times.

2.2.24.2 Syria

During the late Middle Ages, 72 mudd amounted to one ghirārah of Damascus, whereas 73 \(\frac{1}{2}\) mudd corresponded to 3 Egyptian irdabb.\(^{315}\) Consequently, one Syrian mudd was to be calculated at 2.84 kg wheat or 3.673 litres.

2.2.24.3 Palestine

In Jerusalem, one mudd amounted to \(\frac{3}{4}\) qafiz at 4 waybah (per qafiz) at about 24 sā‘ (see sā‘), thus to about 100 litres. In ‘Ammān, one mudd corresponded to 6 kaylajah or about 9 sā‘, thus amounting to about 37.8 litres.

2.2.24.4 Maghrib

In Fez, one mudd of wheat weighed 80 ṣiqiyah (see lauḥ) at 41.6 g (per ṣiqiyah) or 3.328 kg, which corresponded to approximately 4.32 litres. In Morocco, one mudd equalled (around the year

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\(^{309}\) Hans Derschwan, Tägliche einer Reise nach Konstantinopel, ed. Franz Babinger (Munich and Leipzig 1923), p. 47


\(^{311}\) Mår Eliyā, in: Journal Asiatique 8 VIII (1886), p. 126.


\(^{*}\) Eponym of one of the four legal schools of the Sunnites, d. 768 (transl.).


\(^{315}\) Al-Qalqashandi, Subḥ, IV, p. 182.