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TRANS-MEDITERRANEAN BULLION FLOWS, 1100–1500, AND THEIR EFFECT ON COIN PRODUCTION

Among the many wider themes of Medieval monetary history and numismatics upon which the broad brush of Michael Matzke's work has touched, the subject of trans-Mediterranean bullion flows occupied a particularly important place.[1] His ground-breaking studies of Tuscan coinage from the tenth to the thirteenth centuries began with research on finds of *denari* from the Tuscan city of Lucca that had been shipped across the Mediterranean Sea to the Middle East during the early Crusades.[2] Both the chronicle evidence and coin finds suggest that Lucca's *denari enriciani,* so-called because they were struck in the name of an emperor Henry *(Enrico),* were among the preferred coinages of the Crusader armies and settlers in the Crusader States, alongside French *deniers* especially of Valence.[3] The volumes of silver and silver-based coinage exported from Europe to the Middle East during the early Crusades are impossible to calculate, but scholars have supposed that the figure was in the hundreds of thousands of coins if not millions.[4] Whatever their numbers, the exports constituted the first great wave in what would turn out to be a sustained flow of silver across the Mediterranean that continued until the fifteenth century.[5]

The intricacies of trans-Mediterranean bullion flows also informed Matzke's classification and dating of the introduction of Genoa's so-called *grosso minore* in the weight of the *miliarese* to about 1200.[6] The *miliarese* (Lat. *miliarensis*) was a common

1 On Medieval bullion flows, see Watson 1967; Day 1978; Attman 1981; Spufford 1988, pp. 163–86, 339–62.

2 Matzke 1993a; 1993b.

3 In his chronicle, Raymond d'Aguilers, a canon of Le Puy, specifically identified the coins of Lucca among those of seven different mints, otherwise entirely French, that effectively made up the early Crusader coinage. In addition to the *deniers* of Valence, the French coins included those of Chartres, Le Mans, Le Puy, Melgueil and Poitou. The chronicler noted that all but the coins of Le Puy traded at eight or nine shillings *(solidi)* to one gold coin described as an *aureus,* presumably in reference to the contemporary Byzantine *hyperpyron* of Alexius I Comnenus. He wrote that the coins of Le Puy traded against the other silver-based coinages at 2:1 and therefore against the *aureus* at 16–18:1. See D'Aguilers 1866, p. 278. The extensive evidence from coin finds in the Crusader states is discussed in Metcalf 1995; Kool 2013.

4 Metcalf 1995, pp. xiii, 169, 244.

5 Watson 1967, p. 7.

6 *MEC* 12, pp. 259–61. The hoard evidence perhaps suggests a later dating of the introduction of Genoa's *grosso minore* in the second half of the thirteenth century. For example, see Baldassarri – Ricci 2013, p. 282. Whatever the correct dating, Matzke's

unit of account in the Mediterranean basin, reckoned at one-tenth of a *bezant,* and it was represented in the circulating currency of the later twelfth century by the quadrangular Almohad half-*dirhem,* which formed the basis of the Almohad caliphate's silver coinage.[7] The half-*dirhem* initially weighed about 1.50 g, but later issues from about AH 558 / 1163 AD onwards, which were mostly anonymous and undated, were lighter; the average weight is closer to 1.40 g.[8] Examples of Genoa's silver *grosso minore* obtain a maximum weight of just over 1.40 g, very similar to that of many of the anonymous and undated Almohad coins, whereas Genoa's larger and heavier *grosso maggiore,* which appeared by about 1217, ideally weighed about 1.70 g or more. Matzke's dating of the Genoese *grosso minore* hinged largely upon its close metrological correspondence to the effective weight standard of the Almohad half-*dirhem.* He argued that the similarity was intended to facilitate accounting in Genoa's maritime trade with the Barbary coast of North Africa.

A fundamental component of trans-Mediterranean trade between the maritime states of Christian Europe and Islamic North Africa around 1200 lay in the countervailing flows of silver and gold coinage and bullion across the Mediterranean Sea between Europe and North Africa. These bullion flows were by-products of differences between regions in the bi-metallic ratio, or the price of silver relative to gold, which created opportunities for arbitrage. In the Early Middle Ages, silver flowed northwards from the Islamic world while gold drained from Europe towards the South and South-East. By 1100, the flows began to reverse; silver now leached from Europe while gold, much of it originally hewn from sub-Saharan mines, crossed the Mediterranean Sea from Africa. In the Islamic Mediterranean, the increasing silver inflows laid the foundations for a changeover from monetary systems based on the gold *dinar* to new systems based more if not mainly on the silver coinage.[9] In Europe, the growing gold inflows provided the basis for the so-called «return to gold» or «gold revolution» of the thirteenth century.[10]

To accommodate the flows and process greater quantities of bullion into coin, mints on both sides of the Mediterranean increased manufacturing capacity by

argument that the rationale for the coinage lay in facilitating trans-Mediterranean exchange remains a compelling one.

7 The *bezant,* meanwhile, had its physical manifestation in the gold *hyperpyron* of Byzantine Emperor Alexius I Comnenus (1081-1118, struck from 1092) and his successors. See Grierson 1982, 215–217; DOC IV.1, 41–42; IV.2, 474, 475–476.

8 The Almohad coinage is best approached through Martín *et al.* 2002, but see also Hazard 1952, pp. 64–8, 143–58, 265–71, 325–6; *MEC* 6, pp. 63–4. The quadrangular Almohad half-*dirhem* and its imitations are considered in greater detail below, pp. 326–329, 331.

9 In the Syrian mint of Damascus, the Ayyubid *(al-Ayyūbīyūn)* Caliph al-Nasir I Salah al-Din Yusuf (Saladin, AH 569–589 / 1174–1193 AD) replaced the old, base silver black *dirhem* of his Fatimid *(al-Fāṭimiyya)* predecessors soon after coming to power and introduced a high-quality, full-weight silver *dirhem,* establishing the new coin as the basis of the monetary system there. See Balog 1980, p. 36. On the transition from the gold-based monetary system of the Almoravid caliphate to the silver-based system of the Almohads, see below, pp. 326–327.

10 Lopez 1953; Walker 1983.

simplifying production methods in ways that affected the physical appearance of the coins. This paper describes some of the ways that mints made labour- and time-saving adjustments in production to process greater quantities of bullion. After a closer look at production methods for silver coinage in the mint of Lucca, it examines the changes in production methods employed in Norman and Hohenstaufen Sicily in the manufacture of gold *tarì,* which were exported to Northern Italy. It then considers the changeover in Almohad North Africa from the round *dirhem* coinages of their Almoravid predecessors to the quadrangular half-*dirhem* or *miliarese.* It also notes that mints in Italy (and elsewhere) produced their own *miliaresi,* which were close imitations of the Almohad half-*dirhem* and/or coins of more conventional Western design that were specifically intended for export and therefore, like the Genoese *grosso minore,* struck to metrological standards that allowed them to exchange at par with the half-*dirhem* and/or made them easily calibrated to the half-*dirhem.*

Denari enriciani lucchesi

At the time of the First Crusade (1095/1096–1099), the royal/imperial mint in Lucca was one of only six mints that were regularly active in northern and central Italy, alongside the mints of Pavia and Milan in Lombardy, Verona and Venice in the Veneto, and Susa in the trans-Alpine county of Savoy.[11] Lucca enjoyed a favourable geographical position, less than twenty-five kilometres from the port of Pisa and on the via Francigena, the main network of roads between Rome and Western crossings of the Alps, which made it a focal point of inter-regional communication. Crusaders, merchants, pilgrims and supplicants to the papal court in Rome routinely travelled through Lucca on their journeys between Italy and the North. The coins of Lucca circulated widely in Central Italy, constituted the basis of the monetary system throughout the region and, perhaps most importantly, were current in Rome.

The Lucchese coins *(Fig. 1)* carried the obverse legend +INPERATOR around a large H in the field, which was the first letter of the emperor's name, *Henricus,* though the design of the initial in the field had evolved from the double-T that occupied the field of Lucca's earlier *denari* of Otto I–III (951–1002). The name continued in the reverse legend, +ENRICVS, which girdled the name of the place of issue, L V C A, disposed around a central pellet or centring mark. The typology with the initial H first appeared on the coins of Lucca under Henry II (1004–1024, emp. 1014) and became immobilised under his eponymous successors, Henry III (1039–1056, emp. 1045), Henry IV (1056–1105, emp. 1084) and Henry V (1106–1126, emp. 1111). The typology persisted even beyond 1126 and was still used on

[11] There was also a mint at Rome that struck papal and papal/imperial coinage until the Ottonian period, but output was almost certainly more limited and in any case production ceased during the pontificate of Benedict VII (974–983). See *MEC* 1, pp. 259–266, 560–573 nos. 1030–1084. For the most recent contribution to the study of the so-called *denarii antiquiores* of Rome, see Fusconi 2012.

Lucchese *denari* of the early thirteenth century, despite the appreciable changes that the coins had undergone in terms of style and metrology during the intervening period.

Fig. 1: Lucca, *denari enriciani* (Henry III–V, 1039–1125) (CNG eAuction 231, 14 April 2010, lot 558) (downloaded from https://www.cngcoins.com/Coin.aspx?CoinID=161580, accessed 27 April 2018).

Genoa began to produce its own coins in 1139, with Asti and Piacenza following in 1140, but their coins circulated only to a limited extent in Central Italy. The mint in Pisa became active probably around the same time but the circulation of its coinage in Tuscany and throughout Central Italy is difficult to assess before 1181 because of the likelihood that earlier issues of Pisa were close imitations of the Lucchese *denari* and indistinguishable from them.[12] Ancona and Ravenna began to produce their own coins around 1170, while the mint in Siena became active in 1181 and the mint in Senatorial Rome in 1186. Before the middle decades of the twelfth century, in other words, much of Central Italy depended overwhelmingly on output from the mint of Lucca to satisfy local demand for coined money. In addition, as noted above, both the chronicle evidence and coin finds from the Crusader States suggest that Lucca's *denari* were among the preferred currencies in the region. Strong demand for the coinage of Lucca – locally, regionally and for export to the East – strained the productive capacities of the Lucchese mint to the extent that monetary authorities and mint workers adopted simplified production procedures to process ever greater amounts of silver, focusing specifically on the preparation of the flans.

[12] Matzke 1993, pp. 168–169; Day 2017, pp. 453–457.

Under normal circumstances, mint workers cast refined silver into ingots, hammered the ingots into thin sheets, then cut the sheets into either small circular or quadrangular flans that they painstakingly trimmed to make them round while ensuring that their weights fell within a narrowly prescribed range. In Lucca, however, monetary authorities simplified the cutting and trimming phase to accelerate production in response to the intense demand. Workers trimmed the flans only very roughly to meet the weight requirement and then applied a few judiciously placed hammer blows to each piece to achieve some vague semblance of a circular disk. The kind of angled blows that workers used to round the flans, however imperfectly, often left distinctive markings on the coins that resembled little scales or steps and remained even after the flans were struck into coins, which were neither perfectly quadrangular nor perfectly round.

It remains unclear whether the mint of Lucca adopted simplified production methods for its *denari enriciani* specifically to facilitate outflows of silver to trans-Mediterranean markets. It is equally unclear whether the flows of silver-based Western coins to the Crusader States were largely incidental to Crusader traffic or were driven to some extent by market conditions in the Middle East and matched by correlative outflows of gold. The payments of tributes and ransoms that Fatimid and Ayyubid authorities made to Crusaders, typically in the tens of thousands of dinars, might have gone some distance towards offsetting the influx of Crusader silver.[13] Contemporary observers in Egypt also remarked that gold *dinars* were leaving that country at such a prodigious rate in the later twelfth century that they had become scarce there.[14]

In consequence of the outflows, which probably began before the end of the Fatimid period in 1171 (AH 567), gold stocks in Syria and Egypt indeed appear to have come under strain. The conventional view, based in part on the gradual deterioration of the strict weight standard of the gold *dinar*, is that domestic sources of gold in Egypt were largely exhausted under the Fatimids while the export trade, mainly in textiles, contracted and hoarding increased.[15] More recently, scholars have interpreted the breakdown of the weight standard not as an indication of gold scarcity but as a reflection of greater efficiency in the organisation of coin production; because gold coins were typically weighed for most transactions, it

[13] For discussion of tribute and ransom payments, see Kosto 2003.

[14] E.g. Baajd 2014, pp. 121–122.

[15] Balog 1961, p. 132; Rabie 1972, pp. 169–171, 176. According to Rabie, the main sources of gold in Egypt during the Fatimid period consisted in the Nubian mines at Wadi al-Allaqi above Aswan (about midway between the Nile and the Red Sea port of 'Aydhab), placer deposits around Aswan and Luxor, and treasures from the pharaonic tombs. The Ayyubids nevertheless were still exploiting the Nubian mines and nearby placer deposits to supply the Cairo mint in the early thirteenth century, and the mines at Wadi al-Allaqi evidently were still active around the middle of the century and perhaps until about 1350. By the early thirteenth century, moreover, the Ayyubids were also deriving gold from a new source described as Maghrebi in reference to sub-Saharan gold from the kingdoms of Ghana and Mali that reached the Mediterranean through the Maghreb. See Ehrenkreutz 1953, pp. 426–427; Baadj 2014, pp. 135–137.

was unnecessary for the mint to undertake the effort and expense of striking the coins to a specific weight standard.[16] The decline in the standard of fineness of the gold *dinar* in Egypt under the Ayyubid Sultan Saladin (Salah al-Din, AH 567–589 / 1171–1193) is more difficult to dismiss and almost certainly indicates a temporary shortage of gold. The shortage was due not only to outflows to pay for the ongoing wars against the Crusaders but also to a breakdown in relations between Saladin's Egyptian administration in Cairo and gold-supplying regions in the Eastern Desert. The Cairo mint's gold supply was restored after Saladin's successors adopted a more war-averse approach towards the Crusaders, which reduced the gold outflows, and re-established good relations with mining areas while opening new relations with the more distant gold-mining areas in the kingdoms of Ghana and Mali, either directly across the Libyan Desert or by way of the Maghreb.[17]

In Fatimid Sicily, which probably obtained its gold from sub-Saharan West African sources, there clearly was a gradual decline in the metallic standard of the gold quarter-*dinar* (*ruba'ī* or *tarì*) that evidently began already in the later tenth century and continued unabated until the Norman conquest.[18] By the time that the Normans gained control of Palermo in 1072, the coin was debased from virtually pure under al-Mu'izz (AH 341–365 / 953–975 AD) to about seventy per cent fine under al-Mustansir (AH 427–487 / 1036–1094 AD), the caliph who presided over the loss of the Sicilian Emirate. The Normans and their Hohenstaufen successors continued to strike the diminutive gold coins, retaining the same standard of fineness that prevailed when the Fatimids relinquished control of the island.[19]

The situation in Syria is less clear since the mint at Damascus became active only under the Ayyubids and, except for a gold issue in 1187 (AH 583) to commemorate Saladin's conquest of Jerusalem, struck only in silver. The Ayyubid mint at Damascus began to strike a good-quality, full-weight *dirhem* of 2.90 g in 1175 (AH 571),[20] soon after Saladin's armies wrested control of the city from the Fatimids. In 1187 (AH 583), Saladin introduced a new silver *dirhem* from the mint at Cairo that was intended to replace the so-called «black» *dirhem,* which was conspicuous

[16] Schultz 1998, p. 331.

[17] Ehrenkreutz 1956; Schultz 1998, p. 331; Baadj 2014. The traditional gold-supplying regions in Egypt are indicated above, note 14. For further discussion of the Egyptian mines, see Baadj 2014, pp. 122–126.

[18] Messier 1974, pp. 37–41. Messier does not deal specifically with Fatimid Sicily, but he argues that the traces of copper in Fatimid *dinars* of North Africa indicate that they were struck from sub-Saharan gold, and it is very likely that Sicilian quarter-*dinars* were struck from the same gold.

[19] Fatimid, Norman and Hohenstaufen *tarì* are discussed below, pp. 318–323.

[20] Balog 1980, pp. 36–39. According to Balog, the new Damascene *dirhem* displaced the gold dinar in its time-honoured role as the basis of the monetary system in Syria, though the extent to which the new coinage heralded the advent of a silver standard is debated. The more recent view is that arguments about gold, silver and bi-metallic standards rest on assumptions that such standards must have existed, but these claims need to be revisited. See Schultz 1998, pp. 322–323.

in the written records for Egypt under the later Fatimid caliphs.[21] Called *waraq* or *wariq* in the Arabic sources, black *dirhems* were small, roughly quadrangular coins of variable fabric and weight that contained only about thirty per cent silver or less by the time of the last Fatimid caliph, al-'Adid (AH 555–567 / 1160–1171 AD). The new Cairene *dirhem,* like the Syrian coin, was round with *Nashki* script, but unlike the Damascene *dirhem,* the Egyptian coin was only fifty percent fine.[22] Even so, production of the new *dirhem,* called *Nasiri* after Saladin's moniker, was limited and evidently insufficient to meet demand for a silver-based coinage, since relatively few examples are known. The mint satisfied demand only by the continued production and circulation of the black *dirhem (Fig. 2).*[23] It was only in 1225 (AH 622), during the rule of Sultan al-Kamil Muhammad (AH 615–635 / 1218–1238 AD), that monetary authorities in Cairo ceased production of the black *dirhem* and began to strike a new globular *dirhem* of roughly the same standard of fineness, but the black *dirhem* continued to circulate.[24]

Fig. 2: Ayyubid sultanate, Egypt, Saladin (Salah al-Din, AH 564–589 / 1169–1193 AD), black *dirhem,* 10 mm, 0.79 g (CNG e-auction 241, 29 September 2010, lot 697) (downloaded from https://www.cngcoins.com/Coin.aspx?CoinID=172938, accessed 27 April 2018).

The different varieties of silver coinage in Syria and Egypt almost certainly reflect differences in supply. Syria benefited most from the influx of Crusader silver because the principal objectives of the crusading armies all lay in Syria and its immediate environs. Egypt benefited less because any inflows of silver that reached the Nile Delta would have arrived mostly indirectly. In Syria, the relative abundance of the imported silver provided the basis for production of the good Damascene *dirhem,* while in Egypt, the relative scarcity of silver favoured the continued production and circulation of the base *waraq dirhem,* precluded the production of a full-weight, fine *dirhem,* precipitated Saladin's introduction of his *Nasiri dirhem,* and later led to al-Kamil's introduction of the new globular *dirhem.* In other words, the flow of silver from Western Europe to the Middle East during the period of the early Crusades not only left its mark on the *denari enriciani* of

[21] Balog 1961, pp. 122–130; Schultz 1998, pp. 329, 332. The deterioration of the Egyptian *dirhem* under the later Fatimids is generally attributed to the flight of silver to Europe during the Early Middle Ages, the absence of domestic silver resources and difficulties in maintaining access to traditional sources in Najd (Central Arabia), Khorasan (Central Asia) and the Yemen. See Rabie 1972, pp. 166–167.

[22] Balog 1961; Schultz 1998.

[23] Balog 1961, pp. 129–131; Schultz 1998, pp. 328, 332.

[24] Balog 1961, pp. 123–128; Schultz 1998, pp. 324, 332–333.

Lucca but also affected production patterns in Syria and Egypt. There can be little question that gold flowed away from Egypt during the time of Saladin, perhaps continuing a trend that began under the later Fatimid caliphs, but the extent to which the gold flowed back to Europe is uncertain. Some of it was clearly recycled into Crusader *dinars,* also called *bezants,* which were struck in large numbers, often based on Fatimid models.

Fatimid, Norman and Hohenstaufen tarì of Sicily and South Italy

If the evidence for the flow of gold from Egypt to Europe along the Crusader routes is indistinct, the evidence for a sustained flow from North Africa to Europe by way of Sicily and Southern Italy is much clearer. Written evidence from Southern Italy suggests that Sicilian *tarì,* very probably struck from sub-Saharan West African gold,[25] circulated widely in mainland Southern Italy, especially in Calabria and Campania, providing the basis for a commonly used money of account as well as mainland imitations of Fatimid *tarì* with blundered Kufic epigraphy.[26] The numismatic evidence for the circulation of Fatimid *tarì* on the mainland is less robust and potentially relevant finds are often poorly described, but it is noteworthy that the few known or suspected finds of Fatimid *tarì* are concentrated in Calabria.[27] This supports the view that the coins entered mainland Southern Italy across the straits of Messina and through Calabria in connection with the silk trade.[28] There is no conclusive evidence that the gold coming into mainland Southern Italy continued to flow northwards, at least not at first; the gradual debasement of the Fatimid *tarì,* which becomes discernible in issues in the name of al-Hakim (AH 386–411 / 996–1021 AD), perhaps reflects the fiscal pressures that were building on Fatimids rather than an outflow of gold towards the North.

The fineness of the Fatimid gold *tarì* of Sicily eroded steadily from the time of al-Hakim until al-Mustansir lost control of the island in the later eleventh century, as already noted; the last Fatimid *tarì* of Palermo *(Siqilliyah)* and Agrigento were no

[25] See above, note 17.

[26] The earliest references to Sicilian coins or units of account *(i.e. solidi siculi)* on the mainland date from the later ninth century, when the Aghlabids still controlled Sicily, but these references derive from a narrative source that was compiled only in the early twelfth century. See Federici 1925–1932, II, nos. 82–83. References to *tarì* in contemporary documents are increasingly common after the Fatimid conquest of North Africa and Sicily in 909 (AH 297), sometimes in terms that make it possible to associate the coins with the specific Fatimid rulers in whose names they were struck. Other references to *tarì* describe the coins as Salernitan or Amalfitan, suggesting that they were domestic mainland imitations of the Fatimid coins.

[27] Cicala (CZ): Sorda 1965–1967, for «monete d'oro palermitane, coniate dai califfi»; Nocera Terinese, Pian della Tirena (CZ): Orsi 1916, p. 356, for «alquanti dei noti tareni aurei arabi» [*cf.* also Orsi 1921; Guzzetta 1986, pp. 253–254; Guzzetta 2001, p. 564]; Cirò (KR): Saccocci 2005, p. 147 note 33, for «*tarì* d'oro arabo», but possibly in reference to a Salernitan, Amalfitan or Norman *tarì*; Strongoli-Petalia (KR), for «moneta araba AV» but not otherwise identified.

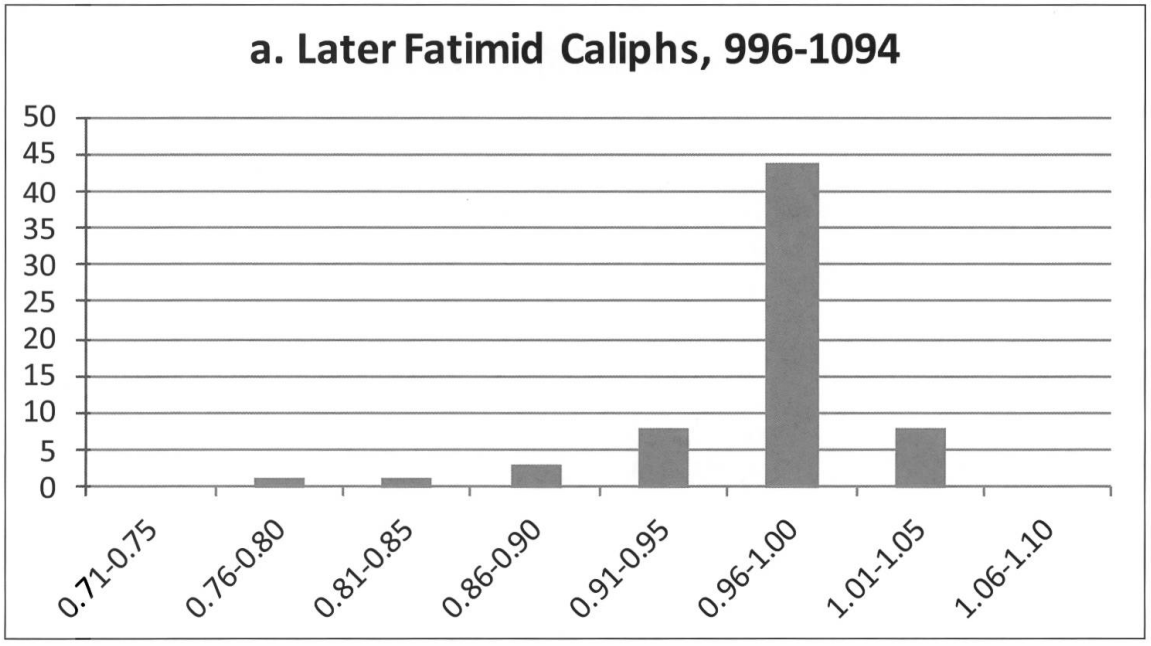
[28] Guzzetta 1986, pp. 277–280.

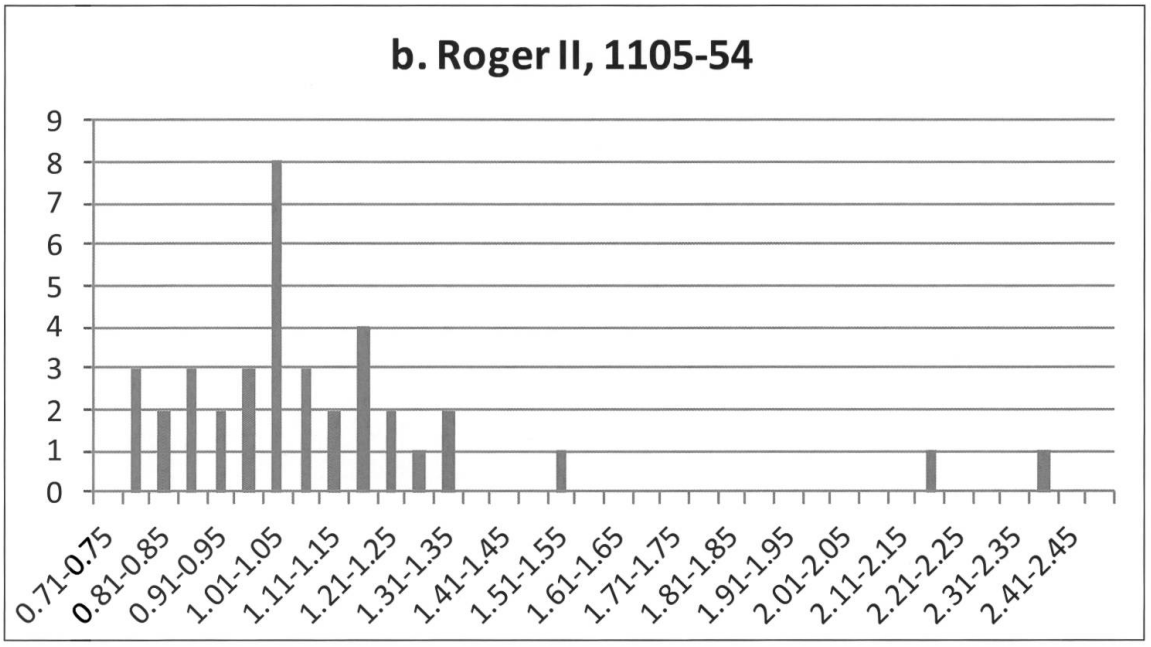
more than about seventy per cent fine *(Table 1).*[29] The debasement was sharpest under al-Mustansir, whose early issues were struck to roughly the same standard as those of his predecessor, al-Zahir, with better examples reaching almost ninety per cent fine, but the standard began to fall after about 1050 (442 AH). Despite the debasement, Fatimid monetary authorities retained the coin's strict weight standard of up to about 1.05 g. After the Norman adventurer Robert Guiscard de Hauteville (d. 1085) seized Palermo at the beginning of 1072 (AH 464), he immediately began to strike Sicilian-style *tarì* with Kufic epigraphy in his own name in the mint at Palermo at the same standard of fineness and weight as the last *tarì* of Palermo and Agrigento in the name of al-Mustansir.

Authority	Rule	No. Ex.	Specific Gravity	Approx. Fineness (%)
Abū Tāhir al-Mansūr	AH 297–322 AD 909–934	2	18.66	97
Abū Tamīm al-Mu`izz	AH 322–334 AD 934–946	10	18.74	97
Abū Mansūr al-`Azīz	AH 334–341 AD 946–953	1	18.77	97
Abū `Alī al-Hākim	AH 341–365 AD 953–975	13	17.29	89
Abu 'l-Hasan al-Zāhir	AH 365–386 AD 975–996	28	17.24	88
Abū Tamīm al-Mustansir	AH 386–411 AD 996–1021	26	16.25	82
Robert Guiscard	AD 1059–1085 (struck from 1072)	2	15.01	71
Roger Borsa	AD 1085–1111	3	15.23	73
Simon	AD 1101–1105	1	14.43	66
Roger II, Count	AD 1105–1130	13	15.05	72
Roger II, King	AD 1130–1154	17	15.00	71
William I	AD 1154–1166	9	15.03	71
William II	AD 1166–1189	13	15.06	72
Tancred	AD 1190–1194	2	15.19	73

Table 1: Fineness of the gold quarter-*dinar (ruba'i* or *tarì)* of Sicily under the Fatimids and Normans, 909–1194. *Source:* the author, based on specific gravity analyses of the coins in the collection of the American Numismatic Society (ANS), New York City, carried out in 1993. *Cf.* Grierson – Oddy 1974; Oddy 1980; Balog *et al.* 1980–1981.

[29] Even the debasement of the *tarì* itself under the later Fatimids was a time-saving measure and simplification of the production process, since refining the gold by salt cementation, according to Pegolotti, typically raised the fineness by no more than two carats per procedure for gold that was less than twenty carats fine and possibly less for gold that was already greater than twenty carats fine. See Pegolotti 1936, p. 333.


a. Later Fatimid Caliphs, 996-1094
50
45
40
35
30
25
20
15
10
5
0
0.71-0.75
0.76-0.80
0.81-0.85
0.86-0.90
0.91-0.95
0.96-1.00
1.01-1.05
1.06-1.10


b. Roger II, 1105-54
9
8
7
6
5
4
3
2
1
0
0.71-0.75
0.81-0.85
0.91-0.95
1.01-1.05
1.11-1.15
1.21-1.25
1.31-1.35
1.41-1.45
1.51-1.55
1.61-1.65
1.71-1.75
1.81-1.85
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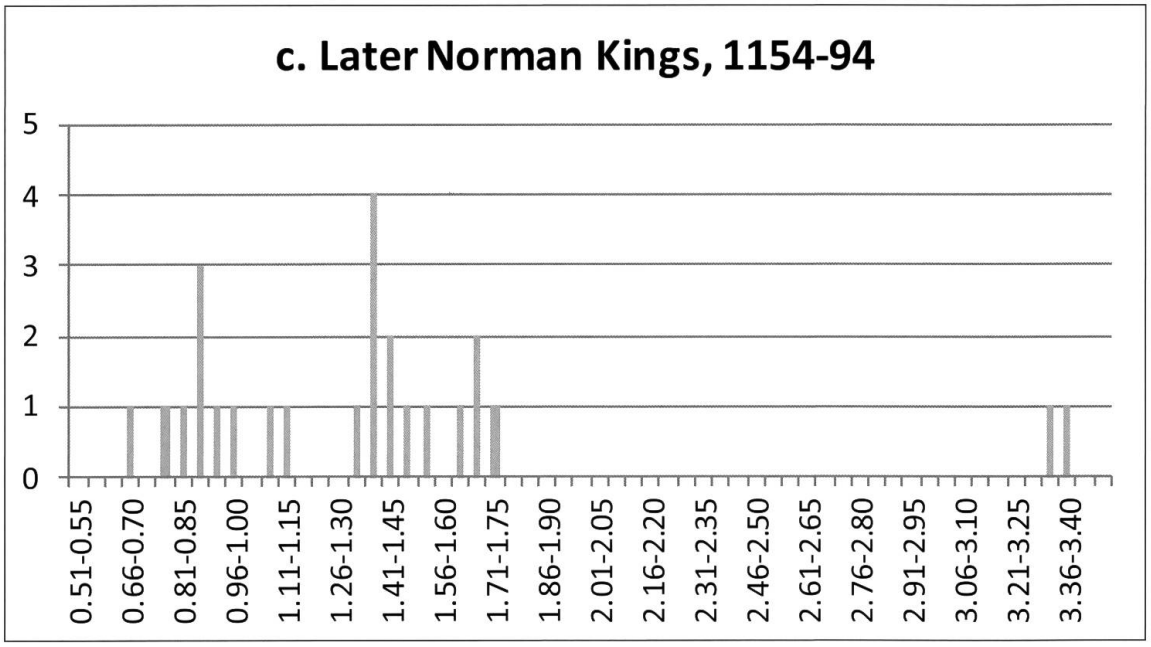
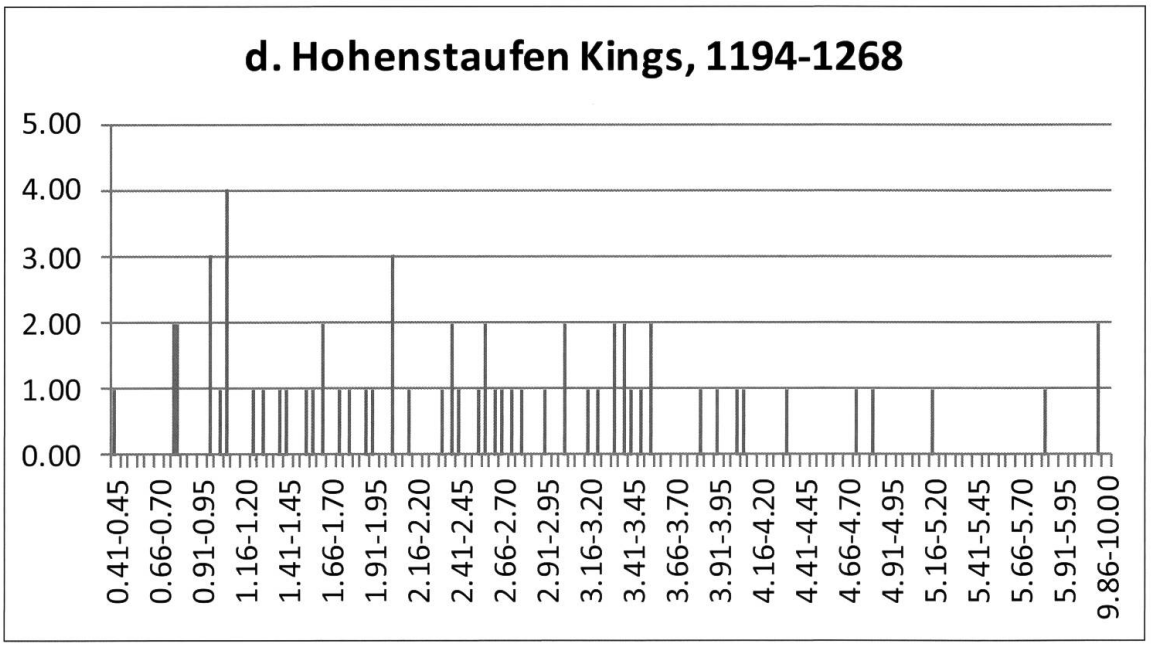
2.11-2.15
2.21-2.25
2.31-2.35
2.41-2.45





Tables 2a–d.: Weight distributions of Sicilian gold *tarì* under (a) the later Fatimid caliphs, (b) Roger II, (c) the later Norman kings and (d) the Hohenstaufen kings, 996–1268, based on examples in the collection of the ANS.

Robert's successors continued to strike their Sicilian *tarì* to roughly the same standard of fineness, but they soon abandoned the strict weight standard of the Fatimids. Under the early Norman rulers, individual pieces generally weighed between about 0.70 g and 1.50 g, but the range grew wider over time, with individual pieces reaching a maximum weight of more than 2.50 g under the later Normans and as much as 10.00 g under the Hohenstaufens *(Table 2a-d; Fig. 3)*. The weight profile of Norman and Hohenstaufen *tarì* suggests that the coins circulated by weight rather than tale, with each *tarì* of account equivalent to 0.89 g of gold at the *tarì* standard of fineness, which was about seventy per cent fine. The abandonment of the strict weight standard would have simplified production and enabled the mint to increase output for export. Entries in the earliest notarial registers from Genoa indeed suggest that Genoese merchants were regularly involved in commercial transactions with Sicily that involved Sicilian gold already by 1156.[30] Frequent references to Sicilian gold in other early Genoese notarial registers of the later twelfth and early thirteenth centuries confirm that these kinds of transactions were regular and continuous.[31] The documentary evidence from Genoa reflects the flow of sub-Saharan West African gold both through Sicily and directly from North Africa not only to Genoa but almost certainly also to other commercially oriented cities in Northern Italy and Mediterranean Europe.[32]

The intensity of the outflows from Sicily led monetary authorities on the island to simplify the production process for their gold coins even further. In addition to progressively increasing the weight tolerance for their *tarì,* the Norman and Hohenstaufen authorities adopted production methods that visibly affected the physical character of the coins, only marginally at first but more obviously over time. It is not entirely clear what methods the later Fatimids and early Normans employed

[30] Chiaudano – Moresco 1935, I, pp. 59–60 doc. 112, 72–73 doc. 140, 89 doc. 169, 172 doc. 326, 201 doc. 383, 231-232 doc. 435, 345-346 doc. 639, 347 doc. 641, 351 doc. 650; II, 50 doc. 909, 236 doc. 1285, 305 doc. 10.9, 309-310 doc. 18, 314–315 doc. 26.

[31] Chiaudano – Morozzo della Rocca 1938; Chiaudano 1940; Hall *et al.* 1938; Eierman *et al.* 1939; Hall-Cole *et al.* 1939–1940; Krueger *et al.* 1951–1953. See also Casaretto 1928, 112–131; Lopez 1953, 27, 43–46; Felloni 1975, 250–251; Travaini 1991.

[32] In addition to the numerous references to *tarì* in the Genoese records, there are also references to both coined and uncoined gold of African or presumed African provenance. The coined gold consisted in *bisanti massamutini,* in reference to the Almohad *dinar* and/or half-*dinar,* struck mainly in Sijilmasa. For example, see Hall *et al.* 1938, I, p. 150 doc. 378, p. 276 doc. 698, pp. 312–313 doc. 782, pp. 345–346 docs. 860–862; Hall et al. 1938, II, p. 122 doc. 1423, p. 124 doc. 1429, p. 142 doc. 1472, p. 182 doc. 1568, p. 288 doc. 1854; Chiaudano 1940, p. 59 doc. 155, p. 59 doc. 158, p. 71 doc. 192, p. 84 doc. 228; Krueger – Reynolds 1951–1953, I, p. 159 doc. 347; Krueger – Reynolds 1951–1953, II, p. 54 doc. 1029, p. 190 doc. 1369, p. 191 doc. 1371. The uncoined gold consisted above all in ounces of gold based on the system of weights used in either Palermo or Messina; this gold, like the gold for the *tarì,* was probably of African origin. See above, p. 316 and note 18. Other references to *paiolo* gold almost certainly concerned African gold. For example, see Chiaudano – Morozzo della Rocca 1938, p. 145 doc. 370. Gold described as being twenty-one carats fine was probably also *paiolo* gold. See Krueger – Reynolds 1951–1953, I, p. 268 doc. 603, p. 271 doc. 607; Krueger – Reynolds 1951–1953, II, pp. 7–8 doc. 923

to manufacture their *tarì*, but the relatively low standard of the coins – almost seventeen carats or seventy per cent fine – might have made it more difficult to process the gold alloy in the usual manner. Standard procedures would have entailed casting the refined metal into ingots, hammering the ingots into thin sheets or strips, cutting the sheets into small squares and trimming the squares into coin-sized flans, as described above for the Lucchese *denari*. According to Pegolotti, however, gold alloys below twenty carats fine tended to fracture when hammered into foil; the sheets for coins would have been somewhat thicker but still might have been prone to fracture. Pegolotti recommended granulating inferior-quality gold by pouring the molten metal slowly into a vat of cold water so that the gold congealed into small globules no larger than a button.[33] In Pegolotti's recipe, the granulation process was in preparation for further refining the alloy by salt cementation, but in Sicily, almost certainly by the time of William II (1166–1189) if not earlier, moneyers were probably striking *tarì* directly from the granulated globules, thus eliminating all the subsequent steps normally involved in the time-consuming process of preparing the flans.[34] In terms of fabric and aspect, Sicilian tarì increasingly resembled stamped ingots rather than coins, and they often bore fractures around the edges because of production methods and the inferior standard of the gold *(Fig. 4)*.

Fig. 3: Frederick II (1197–1250, emp. 1220), *tarì* (struck before 1220), 8.21 g, diameter not given but lighter *tarì* of this type (less than 5.00 g) are typically 12–14 mm in diameter (Numismatica Ars Classica sale 76, 10 Dec. 2013, lot 106) (downloaded from https://www.acsearch.info/search.html?id=1806214, accessed 8 May 2018)

Almoravid and Almohad North Africa and al-Andalus

As gold was moved through Sicily towards Genoa and other cities in Mediterranean Europe at ever increasing rates, the North African Maghreb became another focus for the trans-shipment of sub-Saharan West African gold from the kingdoms of Ghana and later Mali to southern Europe, especially to Italy. Much of this gold was initially processed into coin in mints at Sijilmasa and several other

[33] Pegolotti 1936, p. 331; Day 2020, p. 303.

[34] Finetti 1987, pp. 32–33. An Arabic manual from early thirteenth-century Ayyubid Cairo similarly describes the procedure involved in the production of «globular» silver coins. See Balog 1955, pp. 201–202; *cf.* Ehrenkreutz 1953, pp. 400–401, which gives a transcription of the Arabic text but not a translation.

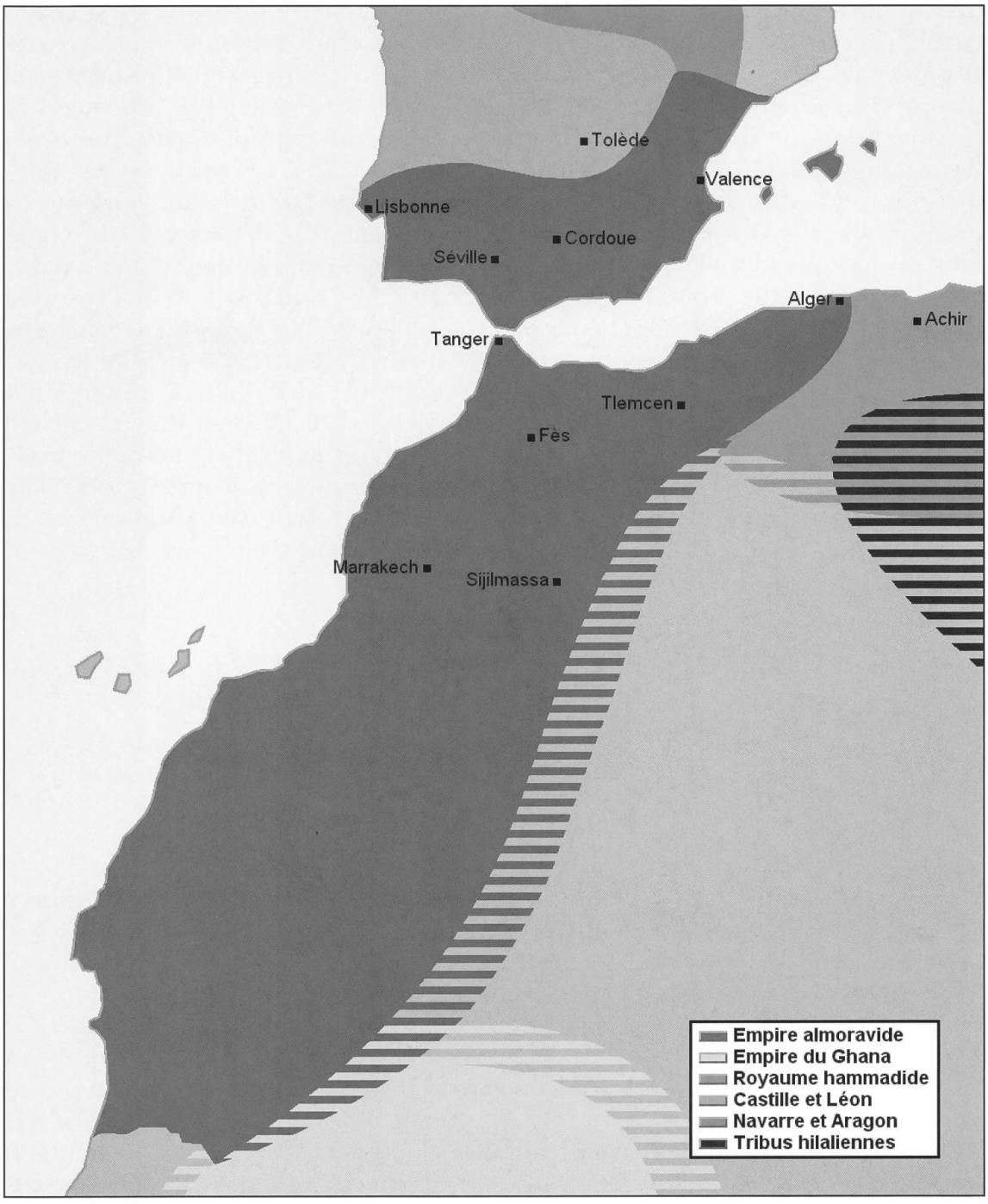


Fig. 4: Almoravid Empire (AH 432–541 / 1040–1147 AD), at its apogee, ca 1120 (downloaded from https://commons.wikimedia.org/wiki/File:Empire_almoravide.PNG, accessed 16 February 2021).

major cities of the Almoravid dynasty (*al-Murābiṭūn,* AH 432–541 / 1040–1147 AD) and Almohad caliphate (*al-Muwaḥḥidūn,* AH 514–667 / 1121–1269 AD). The Almoravid dominions extended along the north-west coast of Africa roughly from

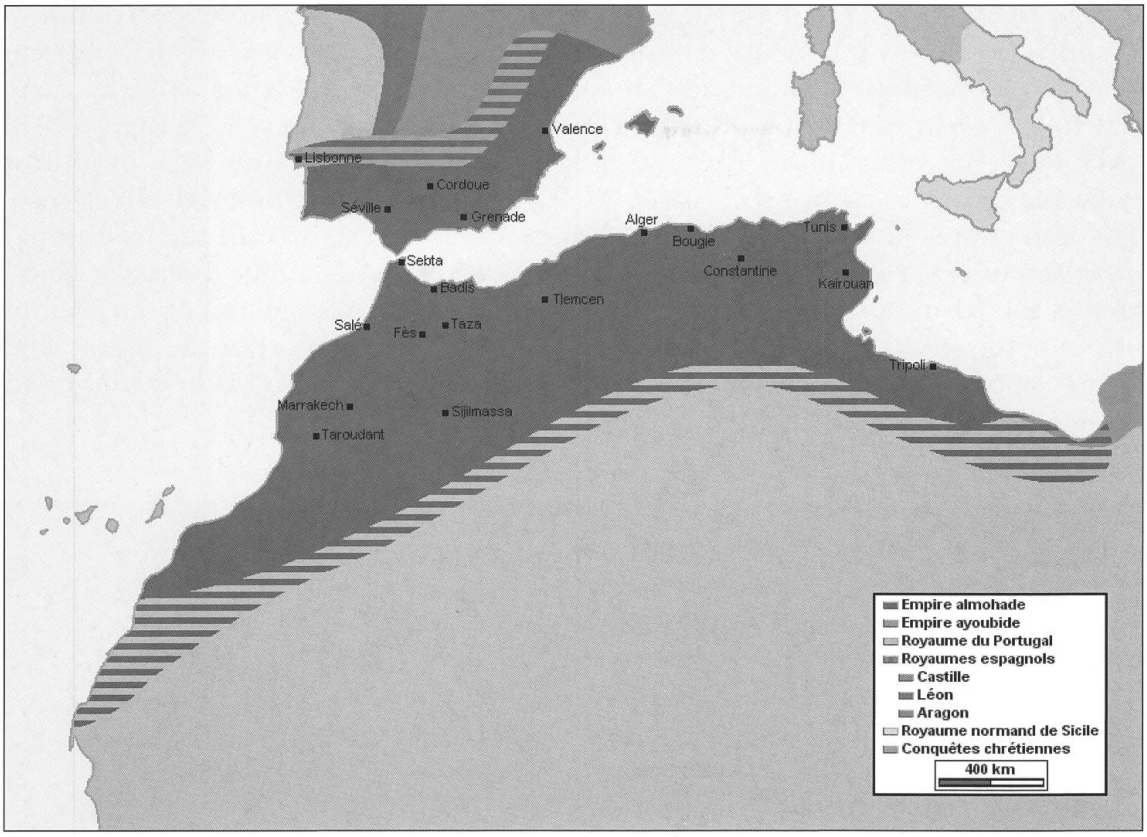


Fig. 5: Almohad Caliphate (AH 514–667 / 1121–1269 AD), at its apogee, *ca* 1200 (downloaded from https://commons.wikimedia.org/wiki/File:Empire_almohade.PNG, accessed 5 March 2018).

the kingdom of Ghana and the modern city of Nouakchott, Mauritania, in the South and West, respectively, to Algiers in the North. The Almohad caliphate was less extensive in the South and West but stretched farther East along the Mediterranean coast to embrace what is now Tunisia and Western Libya. Both the Almoravids and Almohads also controlled al-Andalus across the Mediterranean Sea in Iberia *(Figs. 4–5)*. The production and export of gold through Almoravid and Almohad North Africa evidently had no appreciable effect on the physical character of their gold coinages; the visible changes in the Almohad gold coins were due to other factors, which are discussed below. The outpouring of gold was nevertheless offset by a countervailing influx of European silver, which reached a crescendo during the Almohad period and significantly affected the appearance of the Almohad silver coinage.

The Almoravid gold *dinar,* often described as a *morabotino* or something similar in European sources, was produced in vast quantities in the traditional Umayyad style, with marginal inscriptions around several horizontal lines of script in a circular area or field, and it was based on the *mithqal* of seventy-two barley grains. The epigraphy was Kufic, the maximum weight about 4.20 g and the flan about

25 mm in diameter. There were also fractional issues, but they were less common. The first and most important Almoravid mint for gold coinage in North Africa, owing to its position at the northern convergence of several trans-Saharan caravan routes *(Fig. 6),* was at Sijilmasa, which the Almoravids were working by 1058 (AH 450), but other mints for gold were soon established elsewhere in almost every major city in Almoravid North Africa and al-Andalus. The rich silver coinage, also engraved in Kufic with just a few exceptions, consisted in the traditional *dirhem,* which varied widely in weight but was consistently about the same diameter as the *dinar,* and the new *qirat* of about 0.95 g on average and about 13 mm in diameter, plus the somewhat less common fractional issues of the latter. The only copper coins ostensibly of the Almoravids were imitations of their *dinar* and *dirhem,* almost certainly contemporary forgeries.[35]

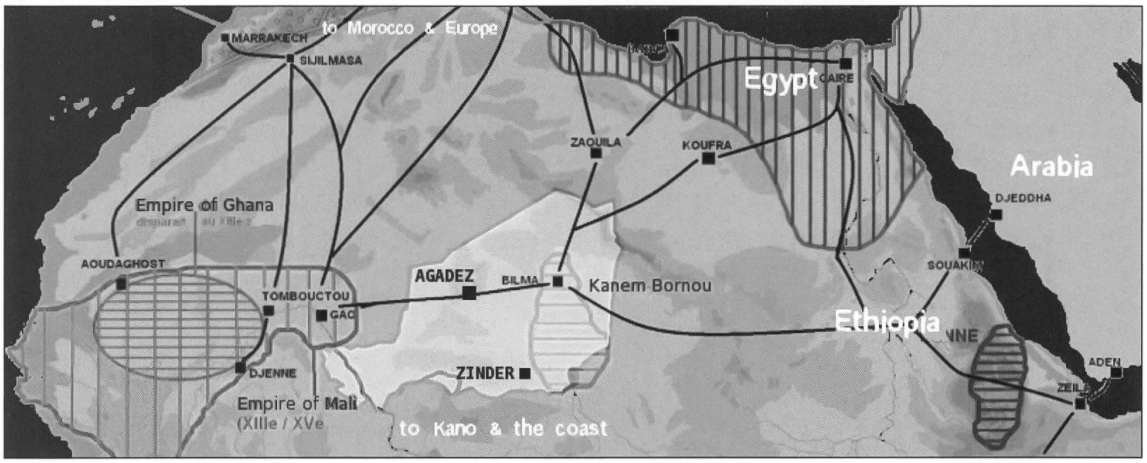


Fig. 6: Trans-Saharan caravan routes, 12th–13th centuries (downloaded from https://commons.wikimedia.org/wiki/File:Niger_saharan_medieval_trade_routes.PNG, accessed 14 March 2018).

The coinages of the Almohads, in both gold and silver, quickly evolved into forms that were utterly distinct from those of their Almoravid predecessors. From about 1145 (AH 540), the Almohads began to produce a new type of gold *dinar* that was larger and heavier than its Almoravid counterpart, had inscriptions in cursive Naskhī instead of the traditional Kufic script and was characterised by a square area on a circular flan, dividing the margin into four segments. The inscriptions also underwent modification, with the caliph's name, title, genealogy and epithet gradually crowding out Koranic phrases, the date and often the mint. There was also a half-*dinar,* which was more common. The centrepiece of the Almohad silver coinage was the half-*dirhem,* which also had inscriptions in the Naskhī script. Some early issues of the half-*dirhem* were round, but the coinage quickly evolved into its characteristic form. From about 1145 (AH 540), the half-*dirhem* was struck

[35] Hazard 1952, pp. 59–64; Messier 1974, pp. 35–36.

almost invariably on a quadrangular flan (or onto a sheet subsequently cut into quadrangular coins), and often lacked references to the issuing authority, date and even the mint. It was produced in vast quantities in North Africa and al-Andalus, and it was widely imitated in Christian Europe. Like the Almoravids, the Almohads also struck a *qirat* and half-*qirat* but not any of the lesser fractions, and once again, there was evidently no official copper coinage, only imitation *dinars* and *dirhems* in copper. The Almohads further distinguished their coinage from that of the Almoravids by focusing production of their main gold and silver coinages on the half-denominations. The innovations of the Almohads took hold, spread and then persisted long after the caliphate had given way to successor dynasties.

The Almohads continued and intensified the Almoravid policy of centralising the production of gold coinage at Sijilmasa but decentralised the production of silver coinage, favouring mints in cities that were either on or near North Africa's Mediterranean coast. The differing approaches to the manufacture of gold and silver coinage depended upon the differing supply chains for the two metals. As already noted above, gold from sub-Saharan West Africa came into the caliphate along trans-Saharan caravan routes that either converged on Sijilmasa, where much of it was converted into coin, or continued directly to port cities on the Mediterranean coast for export to Europe *(Fig. 6)*. By contrast, silver came into the caliphate by sea from Europe and was converted into coin for the most part in the port cities where it arrived or in nearby mints.

The Almohad gold *dinar* had an average weight of about 4.50 g and was 30 mm in diameter, the half-*dinar* about 2.25 g and 20 mm, and the quarter-*dinar* of about 1.15 g and 15 mm. For the Almohads, in contrast to the Almoravids, the half-*dinar* – called the *massamutina, mazmudina* or something similar – was the cornerstone of the gold coinage. Contemporary Christians regarded this half-denomination as a lightweight *dinar* and the larger coin as a double-*dinar,* thus giving rise to the Castilian *dobla,* which was struck at the same standard as the Almohad *dinar.*[36] The distinctive weight profile of the Almohad coinage was based on a different understanding of the *mithqal.* Whereas the Almoravids based their coinage on the canonical mithqal of seventy-two grains, the Almohads based their coinage on an exceptional mithqal of eighty-four grains. Consequently, in accordance with Islamic law, the Almohads needed to make their coinage visibly distinct from the Almoravid coinage.[37] The Naskhī script and square area were evidently sufficient to satisfy this requisite for the gold coinage and, at least initially, also for the silver coinage, but mints for silver throughout the caliphate very soon appear to have adopted a further mark of distinction for the *dirhem,* namely the quadrangular flan.

[36] *MEC* 6, pp. 63, 294–295.

[37] Ariza Armada 1995, pp. 72–74; Fontenla Ballesta 1997, pp. 447–462; Fontenla Ballesta 2000, pp. 53–59; Fierro 2006, pp. 457–476 esp. 472–473; repr. in Fiero 2012; Bennison 2016, p. 217.

Fig. 7: Almohad Caliphate (North Africa), half-*dirhem* (CNG eAuction 314, 6 Nov. 2013, lot 561) (downloaded from https://www.cngcoins.com/Coin.aspx?CoinID=245497, accessed 27 April 2018).

The quadrangular Almohad half-*dirhem (Fig. 7),* with a diameter or width of 13–19 mm, reached a maximum weight of about 1.60 g but had an average weight of only a little more than 1.40 g.[38] Imitations were generally – though not invariably – struck to a lower standard. The lack of issuing authority and date in the legends of most examples of the Almohad coin has inhibited a full understanding of the development of the coin's weight profile over time. Further research is needed, but the fact that the average weight of the Almohad half-*dirhem* was significantly lower than the maximum weight is perhaps suggestive of a gradual decline in the standard weight in the later twelfth century.

The argument at hand nevertheless focuses on the rationale behind the Almohad's changeover to the quadrangular form for their half-*dirhem*. In recent years, opinion has gravitated towards regarding the Almohads' adoption of the square flan for their silver coins as a further means by which to distinguish them from those of the Almoravids. This raises the question as to why the Naskhī script and square area were enough to differentiate the Almohad gold coinage from that of the Almoravids but, according to this view, not the silver coinage. It is difficult to fathom why any further mark of differentiation would have been necessary. The idea that the new quadrangular form of the Almohad silver coinage hinged upon the politics of differentiation fails to address this fundamental question. It also takes inadequate account of more practical exigencies that might have underpinned the changeover. Discussion has sometimes allowed for the possibility that the square form of the Almohad silver coinage arose from purely practical considerations, though without pursuing this line of reasoning with sufficient vigour or reflecting adequately on the broader economic and monetary context.

The changeover to the square flan for the silver coinage was very likely borne out of practical considerations, which the broader context throws into sharp relief. By about the middle of the twelfth century, the flow of silver from Europe to the Crusader states was sufficient to support Levantine production of European-style billon *deniers* in mints at Tripoli, Jerusalem and Antioch. From 1175 (AH 571), it

[38] Hazard 1952, p. 327.

also provided the basis for Saladin's revival of the good-quality full-weight *dirhem* at Damascus, as already noted above. Meanwhile, outflows of silver from Europe were beginning to follow other trajectories farther west towards trans-Mediterranean port cities of the Almoravid and Almohad empires. Exactly when these flows began is unclear, but acts recorded in the earliest surviving Genoese notarial registers show that Genoese merchants were routinely trading with the Barbary coast already by 1155.[39] The relevant documents are mostly partnership contracts for commercial ventures in North Africa without reference to specific merchandise, but they suggest that trade between Genoa and North African port cities such as Tunis and Béjaïa was well-established by about the middle of the twelfth century. The fifteen-year peace that a Genoese embassy negotiated with the Almohad caliph in Morocco in 1161 evidently renewed or formalised pre-existing trading arrangements.[40]

Genoese notarial registers from the later twelfth and early thirteenth centuries show that the city's trans-Mediterranean trade not only continued but intensified over the succeeding decades, with relevant transactions often settled either partly or wholly in *bisanti de mijarexis* (i.e. *bezants* of *miliaresi*).[41] Some of the contracts refer to silver *bezants,*[42] which suggests that the transactions were settled in silver specie or bullion, presumably domestic, and some of these indicate that the bezants were duty-free *(mundos ab omni dricto),*[43] which perhaps suggests that the transactions were settled in foreign currency or bullion. The domestic silver currency would have been mainly the Almohad half-*dirhem* while foreign silver currency would have consisted principally if not exclusively in coins of European manufacture.

It is impossible to quantify the volumes of silver that were coming into North African ports from Europe in the later twelfth and early thirteenth centuries, but the most likely scenario is that inflows were becoming sufficiently intense already around 1150 that they threatened to overwhelm the capacity of Almohad mints to process all the metal. Monetary authorities responded by streamlining production procedures and simplifying the preparation of the flans to increase capacity. Mint workers hammered the refined silver into thin sheets or strips and then typically cut the sheets into small squares, as described above in relation to the *denari* of Lucca. Under the Almohads, however, workers completely abandoned the painstaking process of trimming the square pieces into circular disks before striking them. The only trimming would have been to bring the weight of any heavy pieces to within the accepted weight tolerance for the denomination.

[39] Chiaudano – Morresco 1935, I, p. 17 doc. 32 (for trade with Tunis, 5 September 1155), p. 32 doc. 59 (for trade with Béjaïa, 16 April 1156), and *passim.*

[40] Belgrano 1890, I, p. 62; Abulafia 2010.

[41] For example, Hall *et al.* 1938, I, p. 35 doc. 85, and passim. The bezants of *miliaresi* are sometimes described as Almohad (i.e. *mussimutuni*). See Hall *et al.* 1938, p. 150 doc. 378, and passim. On bezants of *miliaresi,* see also above, pp. 311–312.

[42] Hall *et al.* 1938, p. 318 doc. 793.

[43] *Ibid.,* I, p. 38 doc. 92, and *passim.*

European miliaresi

The intensity of trans-Mediterranean silver flows affected coin production not only within the Almohad caliphate but also in Mediterranean Europe, where mints struck silver coins to weight standards that were apparently calibrated to the Almohad half-*dirhem* to facilitate straightforward accounting and exchange in trans-Mediterranean trade. Examples include not only the Genoese *grosso minore* in the weight of the *miliarese* but also the so-called *grosso primitivo* of Ancona and even the French *gros tournois*. Ancona's *grosso primitivo,* which appeared by 1249, generally weighed no more than about 1.45 g and less than 1.35 g on average *(Fig. 8),*[44] while the earliest French *gros tournois,* introduced in 1266, had an ideal or maximum weight of about 4.25 g and an average circulating weight of about 4.20 g *(Fig. 9),* which perhaps suggests that it was calibrated to the average weight of the Almohad half-*dirhem* at 3:1.[45]

Fig. 8: Ancona, Commune (before 1250), *grosso primitivo,* 1.38 g, [18–19 mm] (Numismatica Ars Classica sale 90, 14 May 2016, lot 1) (downloaded from https://www.acsearch.info/search.html?id=3086753, accessed 8 May 2018)

Fig. 9: France, Philip IV (1285–1314), *gros tournois* with round O, 4.04 g, [25–26 mm] (CNG sale 99, 13 May 2015, lot 993, ex Michael Joffre coll.) (downloaded from https://www.cngcoins.com/Coin.aspx?CoinID=282942, accessed 5 April 2018).

[44] Day 2008, pp. 112–113.
[45] Lafaurie 1951, pp. 23–24, no. 198.

Meanwhile, mints in Mediterranean Europe, roughly from Valencia to Pisa, were evidently striking imitations of the square Almohad half-*dirhem* with Naskhī or pseudo-Naskhī epigraphy, presumably to facilitate the flows. References to *miliaresi* occur in at least two documents of Tyrrhenian Italy from around the middle of the thirteenth century. In 1243, Emperor Frederick II (1212/1217–1250, emp. 1220) granted the Florentine merchant Bencivenne di Ugolino a two-year contract to manage the silver mines at Montieri in the Volterrano and to strike *miliaresi* in the same way as those of the mint at Pisa *(ad modum et forman que in sicha Pisarum servatur).*[46] Ten years later, Count Giacomo de' Fieschi di Lavagna promised to honour a grant that his father, Obizzino de' Fieschi, had made earlier to Rumfredo Bramanzoni da Siena and Guglielmo Leccacorvo, which allowed the men to strike *miliaresi* in the Ligurian town of Savignone in the same way and to the same standard as those of Genoa, as long as the men obtained permission to do so from Genoese authorities.[47] It is unclear precisely what these *miliaresi* were, but their proliferation in Southern France soon attracted the attention of Pope Clement IV (1265–1268), who in 1266 ordered the bishop of Maguelone to cease production of *monete miliaresi.* He prohibited the coins because they were struck without papal or royal sanction and, significantly, carried the name of the prophet Mohammed *(cum titulo Mahometi).*[48]

A complete modern survey of the *miliarese* in Mediterranean Europe in all its aspects remains far beyond the scope of this brief study, but Matzke's suggestion that Genoa struck its *grosso minore* to facilitate accounting and exchange in the city's trans-Mediterranean trade highlights the lacuna. It is sufficient here to enumerate some of the necessary components of any further research. It will need to take account of European silver *grosso* coinages of about 1.40 g as well as any fractions and/or multiples thereof introduced from about 1200 at least until the fall of the Almohad caliphate in 1269. Ideally, it should include a representative catalogue of half-*dirhem* imitations, classified to the extent possible into discrete groups according to the physical characteristics of the coins, especially in terms of style, metrology and fabric. It will also need to revisit documentary references to *miliaresi* from across Mediterranean Europe to determine what exactly they connote. Finally, it will need to situate all the material within the context of trans-Mediterranean commercial exchange. These are tasks for the future. For the present, it is enough to note that the *miliaresi* in all their forms constitute further examples of the ways in which trans-Mediterranean bullion flows affected coin production and coin production techniques across the Mediterranean basin.

[46] Huillard-Bréholles 1860, VI pt 1, 138–139; Lisini 1909, pp. 269–270.
[47] Lopez 1956, 155-156 doc. 101; *MEC* 12, 361.
[48] Jesse 1924, p. 58; Potthast 1874–1875, II, p. 667 reg. 19812.

Abstract

Throughout the Middle Ages, changes in the direction and intensity of gold and silver bullion flows across the Mediterranean Sea sometimes caused sharp surges of bullion inflows that strained the production capacity in mints, prompting them to simplify production techniques to increase output while also encouraging changes in monetary policy. By the later eleventh century, silver began to flow out of Europe towards the Middle East at a prodigious rate while gold began to pour into Europe from North Africa, provoking changes in production methods across a range of mints that were reflected in the physical appearance of the coinage. The countervailing flows of gold and silver intensified in the twelfth century, giving rise to the virtually globular gold coins of Norman and Hohenstaufen Southern Italy that dispensed entirely with conventional methods for the preparation of the flans. They also gave rise to the quadrangular silver coinage of the Almohads in North Africa, which eliminated the time-consuming task of trimming the flans into circular disks. These labour-saving innovations led to the accretion of gold in the coffers of several commercially oriented Northern Italian cities that provided the basis for the so-called «return to gold» or «gold revolution» in the West in the thirteenth century.

Riassunto

Durante il Medioevo, i cambiamenti nella direzione e nell'intensità dei flussi di buglione d'oro e d'argento attraverso il Mar Mediterraneo hanno messo talvolta a dura prova la capacità produttiva delle zecche tanto da costringerne la semplificazione delle tecniche di produzione per aumentarne il prodotto ed al contempo incoraggiando alcuni cambiamenti nella politica monetaria. Entro la fine dell'undicesimo secolo, l'argento iniziò ad affluire dall'Europa verso il Medio Oriente ad un ritmo prodigioso mentre l'oro iniziò a riversarsi in Europa dall'Africa settentrionale provocando cambiamenti nei metodi di produzione per una serie di zecche che è possibile riscontrare nell'aspetto fisico della moneta. Nel dodicesimo secolo i flussi compensativi dell'oro e dell'argento si intensificarono, abbandonando i metodi convenzionali nella preparazione dei tondelli e dando origine alle monete d'oro di forma quasi globulare dei Normanni e degli Svevi della Sicilia e dell'Italia meridionale. Questi stessi flussi diedero origine anche alla monetazione quadrangolare di argento degli Almohadi in Nord Africa, che eliminò il processo lento di tagliare i quadrelli in dischi circolari. Le suddette innovazioni portarono all'accrescimento dell'oro nelle casse di alcune città dell'Italia settentrionali fornendo le basi per il cosiddetto «ritorno all'oro» o «rivoluzione dell'oro» in Occidente nel tredicesimo secolo.

Résumé

Au Moyen Âge, les changements de direction et d'intensité des flux monétaires d'or et d'argent à travers la mer Méditerranée ont parfois ébranlé la production des pièces. Ils ont joué un rôle dans la simplification des techniques de production, tout en initiant certains changements de politique monétaire. À la fin du XI[e] siècle, l'argent commence à circuler de l'Europe vers le Moyen-Orient à un rythme élevé alors que l'or afflue en Europe depuis l'Afrique du Nord, provoquant des changements dans les méthodes de production d'un certain nombre de frappes et qui se reflètent dans l'apparence de certaines pièces. Au XII[e] siècle, les flux d'or et d'argent s'intensifient. Certains types monétaires sont créés comme les pièces d'or presque globulaires des Normands et des Hohenstaufen d'Italie méridionale par exemple, qui ne font plus appel à la méthode conventionnelle de préparation des flancs, ou encore le monnayage quadrangulaire en argent des Almohades d'Afrique du Nord, où le lent processus de découpe des flancs carrés en disques circulaires est aussi abandonné. Les innovations susmentionnées ont conduit à l'augmentation de l'or dans les coffres de certaines villes du nord de l'Italie, fournissant la base du soi-disant «retour à l'or» ou «révolution de l'or» en Occident au XIII[e] siècle.

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Bibliography

Abulafia 2010	D. Abulafia, Christian merchants in the Almohad cities, Journal of Medieval Iberian Studies 2, 2, 2010, pp. 251–257.
Ariza Armada 1995	A. Ariza Armada, Monedas cuadradas, Historia 16, año 20, 227, 1995, pp. 72–74.
Ariza Armada 2014	A. Ariza Armada, El millarés: revisión historiográfica, Hécate: Revista Numismática 1, 2014, pp. 98–114.
Attman 1981	A. Attman, The bullion flow between Europe and the East, 1000–1750 (Göteborg 1981).
D'Aguilers 1866	R. D'Aguilers, Canonici Podiensis, Historia Francorum qui ceperunt Iherusalem, in: Fr. P. G. Guizot (ed.), Recueil des historiens des croisades: historiens occidentaux, vol. 3 (Paris 1866), pp. 235–309.
Baadj 2014	A. Baadj, The Political context of the Egyptian gold crisis during the reign of Saladin, International Journal of African Historical Studies 47, 1, 2014, pp. 121–138.
Baldassarri 2010	M. Baldassarri, Zecca e monete del Comune di Pisa dalle origini alla Seconda Repubblica, XII secolo – 1406 (Ghezzano 2010).
Baldassarri – Ricci 2013	M. Baldassarri – D. Ricci, I grossi d'argento e la monetazione di Genova tra Due e Trecento: nuovi dati ed osservazioni per vecchi problemi, QTNAC 42, 2013, pp. 275–300.
Balog 1953	P. Balog, Notes on ancient and medieval minting technique, NC, 6th ser., 15, 45, 1955, pp. 195–202.
Balog 1961	P. Balog, History of the *dirhem* in Egypt from the Fatimid conquest until the collapse of the Mamluk empire, RN, ser. 6, 3, 1961, pp. 109–146.
Balog 1980	P. Balog, The Coinage of the Ayyubids (London 1980).
Balog *et al.* 1980–1981	P. Balog *et al.*, Nuovi contributi sul contenuto aureo e sulla tipologia del tari, Annali dell'Istituto italiano di numismatica 27–28, 1980–1981, pp. 155–184.
Belgrano – Imperiale di Sant'Angelo 1901	L. T. Belgrano – C. Imperiale di Sant'Angelo (eds.), Gli annali genovesi di Caffaro ed i suoi continuatori (Fonti per la storia d'Italia) (Genoa 1901).

Bennison 2016 — A. K. Bennison, The Almoravid and Almohad Empires (Edinburgh 2016).

Blancard 1876 — L. Blancard, Le millarès: étude sur une monnaie du XIII^{eme} siècle imitée par les Chrétiens pour les besoins de leur commerce en pays maure (Marseille 1868–77), pp. 480–493.

Bompaire – Teboulbi 2012 — M. Bompaire – A. Teboulbi, Le millarès au XIII^{e} siècle, in: O. Caporossi – B. Traimond (eds.), La Fabrique du faux monétaire: du Moyen Âge à nos jours, new edn [online] (Toulouse 2012), pp. 183–201.

Cahen 1981 — C. Cahen, Monetary circulation in Egypt at the time of the Crusades and the reform of al-Kamil, in: A. L. Udovitch (ed.), The Islamic Middle East, 700–1900 (Princeton 1971), pp. 315–333.

Chiaudano 1940 — M. Chiaudano (ed.), Oberto Scriba de Mercato (1186) (Genoa 1940).

Chiaudano – Moresco 1935 — M. Chiaudano – M. Moresco (eds.), Il cartolare di Giovanni Scriba, 2 vols. (Rome 1935).

Chiaudano – Morozzo della Rocca 1938 — M. Chiaudano – R. Morozzo della Rocca (eds.), Oberto Scriba de Mercato (1190) (Genoa 1938).

Day 1978 — J. Day, The great bullion famine of the fifteenth century, Past & Present 79, 1978, pp. 3–54.

Day 2008 — W. R. Day, Jr, Prima del grosso agontano: considerazioni sul primo secolo della monetazione medievale di Ancona, 1170–1280 circa, in: M. Asolati – G. Gorini (eds), Atti del IV° Congresso internazionale di numismatica e storia monetale (Padua 2008), pp. 113–140.

Day 2017 — W. R. Day, Jr, Before the Libro della Zecca: money and coinage in Florence in the 12th and 13th centuries, Part II (Silver and gold trade coinages), Archivio Storico Italiano 176, 2017, pp. 431-484.

Day 2020 — W. R. Day, Jr, Coin production techniques in the mint of Florence, c. 1350, RIN 121, 2020, pp. 295-318.

Ehrenkreutz 1953 — A. S. Ehrenkreutz, Extracts from the technical manual on the Ayyubid mint in Cairo, Bulletin of the School of Oriental and African Studies 15, 1953, pp. 423–447.

EHRENKREUTZ 1956	A. S. EHRENKREUTZ, The crisis of the dinar in the Egypt of Salah al-Din, Journal of the American Oriental Society 76, 1956, pp. 178–184.
FEDERICI 192–1938	V. FEDERICI (ed.), Chronicon Vulternense del Monaco Giovanni, 3 vols. (Rome 1925–1938).
FIERRO 2006	M. FIERRO, Sobre monedas de época Almohade, Al-Qanṭara 27, no. 2, 2006, pp. 457–476; repr. in FIERRO 2012.
FIERRO 2012	M. FIERRO, The Almohad Revolution: politics and religion in the Islamic West during the twelfth-thirteenth centuries (Farnham 2012).
FINETTI 1987	A. FINETTI, Numismatica e tecnologia: produzione e valutazione della moneta nelle società del passato (Rome 1987).
FONTENLA BALLESTA 1997	S. FONTENLA BALLESTA, Numismática y propaganda almohade, Al-Qanṭara 18, no. 2, 1997, pp. 447–462.
FONTENLA BALLESTA 2000	S. FONTENLA BALLESTA, Las primeras acuñaciones almohades, Numisma, año 50, 244, 2000, pp. 53–59.
FUSCONI 2012	G. FUSCONI, Gli Antiquiores romani: le monete coniate dalla zecca di Roma da Adriano I (772–795) a Benedetto VII (975–983) (Pavia 2012).
GRIERSON 1982	Ph. GRIERSON, Byzantine coins (Berkeley 1982).
GRIERSON – ODDY 1974	Ph. GRIERSON – W. A. ODDY, Le titre du tari sicilien du milieu du XI[e] siècle à 1278, RN, ser. 6, 16, 1974, pp. 123–134.
HALL *et al.* 1938	M. W. HALL *et al.* (eds.), Guglielmo Cassinese (1190–1192), 2 vols. (Genoa 1938).
HALL-COLE *et al.* 1939–1940	M. W. HALL-COLE *et al.* (eds.), Giovanni di Guiberto (1200–1211), 2 vols. (Genoa 1939–1940).
HAZARD 1952	H. W. HAZARD, The Numismatic History of late medieval North Africa (New York 1952).
HUILLARD-BRÉHOLLES 1860	J.L.A.HUILLIARD-BRÉHOLLES, Historia diplomatica Friderici Secundi, 6/1 (Paris 1860).
JESSE 1924	W. JESSE (ed.), Quellenbuch zur Münz- und Geldgeschichte des Mittelalters (Halle a. d. Saale 1924).

Kool 2013 — R. Kool, The Circulation and use of coins in the Latin Kingdom of Jerusalem, 1099–1291 CE (PhD Dissertation), (Jerusalem, Hebrew University, 2013).

Krueger–Reynolds 1951–1953 — H. G. Krueger – R. L. Reynolds (eds.), Lanfranco (1202–1226), 3 vols (Genoa 1951–1953).

Lafaurie 1951 — J. Lafaurie, Les monnaies des rois de France, vol. 1: Hugh Capet à Louis XII (Paris 1951).

Lane Poole 1873 — S. E. Lane Poole, On the coins of the Muwaḥḥids in the British Museum, NC, new ser., 13, 1873, pp. 147–170.

Lisini 1909 — A. Lisini, La zecca e le monete di Volterra, Casole e Berignone, RIN 22, 2/3, 1909, pp. 253-302, 439-467.

Lopez 1953 — R. S. Lopez, Settecento anni fa: il ritorno all'oro nell' Occidente duecentesco, Rivista Storica Italiana 65, 1953, pp. 19–55, 161–198.

Lopez 1956 — R. S. Lopez, Back to gold, 1252, Economic History Review, n.s., 9, 1956, pp. 219–240.

Martín *et al.* 2002 — M. V. Martín *et al.*, El mensaje de las monedas almohades: numismática, traducción y pensamiento islámico (Cuenca 2002).

Matzke 1993a — M. Matzke, Der Denar von Lucca als Kreuzfahrermünze, SM 43/170, 1993, pp. 36–44.

Matzke 1993b — M. Matzke, Vom Ottolinus zum Grossus: Münzprägung in der Toskana vom 10. bis zum 13. Jahrhundert, SNR 72, 1993, pp. 135–192.

MEC 1 — P. Grierson – M. Blackburn, Medieval European Coinage, vol. 1: The Early Middle Ages (5th–10th centuries) (Cambridge 1986).

MEC 6 — M. Crusafont *et al.*, Medieval European Coinage, vol. 6: The Iberian Peninsula (Cambridge 2013).

MEC 12 — W. R. Day, Jr *et al.*, Medieval European Coinage, vol. 12: Italy (I) Northern Italy (Cambridge 2016).

MEC 14 — P. Grierson – L. Travaini, Medieval European Coinage, vol. 14: Italy (III) South Italy, Sicily, Sardinia (Cambridge 1994).

METCALF 1968–1969	D. M. METCALF, Coins of Lucca, Valence and Antioch: some new hoards and stray finds from the time of the Crusades, HBN 22–23 (1968–1969), pp. 443–470.
METCALF 1995	D. M. METCALF, Coinage of the Crusades and the Latin East in the Ashmolean Museum Oxford (London 1995).
ODDY 1980	W. A. ODDY, The gold contents of Fatimid coins, in: D. M. Metcalf – W. A. Oddy (ed.), Metallurgy in Numismatics, vol. 1 (London 1980), pp. 99–118
ORSI 1916	P. ORSI, Nocera Tirinese: Ricerche al Piano della Tirena sede dell'antica Nuceria, Notizia degli scavi di antichità 13, 1916, pp. 335–362.
POTTHAST 1874	A. POTTHAST (ed.), Regesta Pontificum Romanorum inde ab a. post Christum natum MCXCVIII ad a. MCCCIV, 2 vols. (Berlin 1874–1875).
RABIE 1972	H. RABIE, The Financial system of Egypt, AH 564–741 / 1169–1341 AD (London 1972).
SACCOCCI 2010	A. SACCOCCI, L'introduzione dei grossi agli inizi del XIII secolo e la massicia esportazione di argento dall'Europa occidentale ai territori islamici: una semplice coincidenza?, in: Br. CALLAGHER – A. D'OTTONE (ed.), The 2nd Simone Assemani Symposium on Islamic coins (Trieste 2010), pp. 127–164.
SCHULTZ 1998	W. SCHULTZ, The monetary history of Egypt, 642–1517, in: C. F. PETRY (ed), The Cambridge History of Egypt (Cambridge 1998), pp. 318–338.
SPUFFORD 1988	P. SPUFFORD, Money and its use in Medieval Europe (Cambridge 1988).
WALKER 1983	T. WALKER, The Italian gold revolution of 1252: shifting currents in the pan-Mediterranean flow of gold, in: J.F. RICHARDS (ed), Precious Metals in the Later Medieval and Early Modern Worlds (Durham, North Carolina, 1983), pp. 29–52.
WATSON 1967	A. M. WATSON, Back to gold – and silver, Economic History Review, 2nd ser., 20, 1967, pp. 1–34.