Mamluk metalwork fittings in their artistic and architectural context

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CHAPTER 5

The Industry: Metalworkers and Patronage

INTRODUCTION

The flourishing of the craft of metalwork fittings during the Mamluk period occurred within at least three parameters: the availability of materials, high demand (especially on the part of the Mamluk elite whose orders were related to their building activities), and the necessary technical skills and availability of the craftsmen involved. The contribution of the latter two is made concrete on the objects in the form of inscriptions, which mostly consist of titles glorifying the patron, although occasionally the signature of a craftsman is found. They are, however, devoid of further information concerning the specific role of the patrons or the metalworkers in the production of the object. Fortunately, both chronicles and travellers' accounts provide some insight as to the involvement of both groups in the craft. Information on the provenance of the different types of metals needed in the production process is gained from these selfsame sources in addition to evidence extracted from cargo lists.

The surviving evidence makes it clear that the craft of metalwork fittings went through different periods of development. Throughout the Mamluk period the output is variable, as are such features as the technical quality, the presence of precious metals, and innovations in types or decorative motifs. Moreover, a clear discrepancy can be observed in the quantity of extant fittings between Cairo, on the one hand, and the other centres, on the other hand. Different reasons for this disparity in the material will be discussed after which the characteristics of four different phases in the development of the metalworking industry will be analysed.

In the following pages a picture will be sketched of the different facets of the craft of metalwork fittings that are alluded to above so as to establish the role of those involved and to understand the fluctuation of the craft throughout the Mamluk period.

5.1 MATERIALS

The prolific building activities of the Mamluk elite demanded an equally vast production of metalwork fittings that were for the most part functional and undecorated as the multitudes of plain window grilles of the bosses-and-bars type in Mamluk structures show. To meet this demand, large amounts of especially base metals were required. These base metals were, of course, also in high demand for other industries in the same period. Iron was especially sought after for the manufacture of arms and armour: according to one source the yearly costs of iron for producing arms and coats of mail amounted to 70,000–80,0000 *dīnār*s per year.[1] For striking *fals*-coins and for producing household vessels, copper was required in bulk. Lead was

[1] Qalqashandī (1913–72) III, 477 quotes a secretary of state who served with the early sultans.

needed not only for alloys but also for the covering of roofs and for the interior of reservoirs. Precious metals were, too, in high demand by the state: gold was needed among other things for the purchase of Mamluks, for equipment for the navy and army, and to pay for goods traded with the Far East. For the latter trade, silver was even in higher demand.[2] In what follows, the different kinds of metals used for metalwork fittings are discussed, after which attention will be focused on the sources and mines that were at the Mamluks' disposal. It is important to note that as yet no scientific analysis has been conducted of the different materials used in the production of Mamluk metalwork fittings, so one has to rely on visual distinctions.

Extant Mamluk metalwork fittings show that throughout the Mamluk period a preference for alloys – brass and bronze – can be detected, for these best supplied the desired malleable base as well as the strength needed for objects that were not only decorative but also served a protective function within buildings. Their properties enabled metalworkers to apply a wide variety of techniques such as casting, beating, engraving, and inlaying. The luxurious impact of the bright shine of these yellow metals, which readily suggested gold, was an added asset, something that is also noted in the sources.[3] Until now, no technical treatise has been found in the Mamluk sources to shed light on the technical process involved in making bronze and brass. When base metals are referred to in the Mamluk sources, no differentiation is made between brass and bronze but rather a single Arabic term, *nuḥās aṣfar*, is used that refers to a yellow base metal. Even today, the exact composition of Mamluk fittings made of the alloys brass and bronze is still unknown, as a scientific analysis of the composition of these base metals has yet to be conducted. Although specific proportions are absent, the Mamluk metalworker wanting to create bronze must have mixed both copper and tin, to which lead and zinc could be added to improve the processes of polishing and casting, respectively. A mixture of copper and zinc, complemented with tin and lead in case the metalworker wanted to employ the casting technique, resulted in brass.

Of the four base metals used to compose brass and bronze, only copper was employed not only in amalgams but also as a separate metal for Mamluk fittings. Its softness, in all probability, prevented its use in providing the base of a fitting (although copper doorknockers are known in 11th-century Ganja),[4] but precisely that quality made it very suitable for inlaying, a method attested during the 14th century and the first quarter of the 15th century on doors, doorknockers, and window grilles. This use was also observed both by chroniclers and travellers referring to inlaying with *nuḥās aḥmar*, thus focusing on the red colour of the metal. In contrast to portable objects, kitchen utensils such as dishes and lunch-boxes in particular whose surfaces were often coated with a silver-coloured tin layer, no traces of tin coatings have been found on Mamluk fittings today to suggest such a method was used on them.[5]

In contrast to copper, iron was applied for doors and window grilles because of its strength, making it especially suitable for defensive structures, such as citadels and city gates, and commercial buildings like *khān*s. Its use, however, was not entirely functional, as some decorated Mamluk specimens installed in a

[2] Rogers (1990), 63

[3] Nāṣer-e Khosraw (1986), 27 commented on a brass door in the al-Aqṣā mosque: "Along the wall of the *maqṣūra* toward the courtyard are 15 gateways and ornate doors […] One of these gates in particular is done in such beautifully ornate brass that one would think it was made of gold burnished with silver. It has the name of the caliph Maʾmūn on it and has been sent by him from Baghdad." Ibn Jubayr (1852), 85 described the bands of gilded copper hung on the wall of the Kaʿba in 579/1183 as follows: "When the sun strikes them, such light and brightness shine from them that the beholder conceives them to be gold, dazzling the eyes with their rays." And Ibn Baṭṭūṭa (1853–58) III, 252 warned of this while describing two tent pegs, one of brass and the other tinned while remarking "as if to give the impression that they were of gold and silver, but they were not so and only as we have stated".

[4] For this pair of copper doorknockers from a city gate in Ganja/Kirovabad, dated 455/1063, see Blair (1992), 132–33.

[5] For tinned portable objects, see Allan (1969) and Allan (1971).

religious structure show.[6] References to this use of iron for fittings in both a religious and palatial context are found in European sources at the end of the Mamluk period, though unfortunately these lack descriptions of design or decoration.[7]

There are no Mamluk fittings extant made entirely from precious metals. This does not, however, exclude the possibility that gold and silver plaques once decorated Mamluk doors in the interior of palaces or even within certain religious structures. Ibn Ṣaṣrā, for example, had learned of the former presence of silver and gold doors in the Umayyad Mosque in Damascus, unfortunately omitting any reference to the period in which they were made or to their design.[8] During the late 10th century, the doors in the west wall of this mosque were covered with plates of gilded brass.[9] Silver rings and silver plates on the door of the convent (*al-ribāṭ*) next to the mausoleum of al-Ḥusayn in Cairo were observed by Ibn Baṭṭūṭa.[10] Moreover, there still existed a tradition of silver doors and hangers in the Kaʿba in Mecca in the Mamluk period, as these fittings were not only recorded by pre-Mamluk observers like Nāṣer-e Khosraw and Ibn Jubayr but also by such travellers as Ibn Baṭṭūṭa and by Varthema, the latter writing during the first decade of the 16th century.[11] Ibn Iyās, additionally, also mentioned the presence of golden lamps in the chamber of the mausoleum of the Prophet in Medina in 901/1495–96.[12] The survival of doors with silver facings in early Ottoman Turkey, post-Mamluk Egypt, and Iran makes the existence of a similar earlier tradition plausible.[13] The loss of fittings of precious metals had already begun in the Mamluk period as is attested by their removal and re-use either in a different context or by their being melted down for other purposes. Their dissipation might also have been the result of foreign invasions, since eyewitness reports recorded the collection of precious metals as booty by such conquerors as Tīmūr in the early 15th century and Selīm Khān in 923/1517.[14]

When metalwork doors are mentioned in travellers' accounts and chronicles, writers focus on the metalwork exterior of doors; to the best of my knowledge they do not comment on the wooden support of these doors. This contrasts with endowment deeds, in which descriptions of Mamluk buildings and their exterior and interior decoration are found. There, it was the legal writers who at times explicitly specified the type of wood, even if large parts of the support were disguised by the metalwork facings. Walnut wood (*khashab jūz*) is mentioned in the endowment deed of the *madrasa* and *khānqāh* of Sultan Barqūq as being used both for the window shutters in the façade and for the six doors located in the *sahn*. This wood is the support onto which metal was applied.[15] In the *waqf* of the mausoleum complex of Sultan Qāitbāy in the Qarāfa cemetery in Cairo,

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[6] Among these are the window grilles (cat. nos. 49/1–49/3) originating from the mausoleum of Azdamur min Mazīd in al-Anṣarī (893/1488).

[7] Van Ghistele (1976), 16 and 23, mentions gilt iron grilles in mosques in the vicinity of Cairo and within the palace of Sultan Qāitbāy, which he visited in 886/1482. Fabri (1975), 504, 510 recorded in 887/1483 iron doors in the *madrasa* of Sultan al-Nāṣir Ḥasan and in the palace of Sultan Qāitbāy, respectively, adding to the latter that one had to pass through 12 doors of iron before reaching the sultan.

[8] Ibn Ṣaṣrā (1963) I, 161 and II, 120.

[9] Muqaddasī (1963), 173.

[10] Ibn Baṭṭūṭa (1853–58) I, 75.

[11] The silver door and a golden waterspout were, respectively described by Ibn Baṭṭūṭa (1853–58) I, 309 and I, 312 while Varthema (1863), 40 mentioned only the silver door in Mecca.

[12] Ibn Iyās (1960–92) III, 318, translated by Wiet (1945), 359 recorded the theft of some of these lamps in *Rabīʿ* II 901/18 December 1495–16 January 1496.

[13] For a silver-faced door in the mausoleum of Sayyid Ghāzī, dated 915/1509 in Ottoman Turkey, see Wulzinger (1913), 30–32. For a silver-latticed door in the mausoleum of Jalāl al-Dīn Rūmī in Konya, made in 1006/1597–98 by Ilyās, see Mayer (1959), 50. For the post-Mamluk silver-faced door of the medallion type, originally made for the mausoleum of al-Zaynī in Cairo in 1174/1760–61 but relocated to the Museum of Islamic Art in Cairo, inv. no. 3737, see ʿAbd al-Wahhāb (1953–54), 558, pl. 19. For an exposé on the silver doors of Ardabil and Isfahan of the Safavid period, see Allan (1995).

[14] De Mignanelli's in Fischel (1956), 224, recorded that portable wares from the shops were carried off to Tīmūr's treasury. Precious metals were among the objects taken as booty by Sultan Selīm in 923/1517 after the Ottoman conquest of Cairo. For the latter, see the reference by Ṣiddīqī in Raby & Allan (1982), 36, note 89.

[15] Jaritz (1982), 120, 141–42.

sasim (*sāsim*),[16] teak (*sāj*)[17] and walnut wood (*khashab jūz*)[18] are the types of wood disclosed for doors with metal plaques. This explicit specification is indicative of the high value attached to wood; apparently it was valued because of a dearth in quality wood. It might even be argued that the intention to preserve valuable wood prompted door-makers in an earlier stage to cover entire surfaces or parts thereof with a metal layer to shield the costly support from the devastating effects of the sun.

Irrespective of the type of metals used, the considerable size and number of fittings indicates that substantial amounts of these materials were needed to fulfill the requirements of the builders. Unfortunately, explicit comments on the quantity of metals needed for metal-faced doors or grilles are extremely rare.[19] The exceptional weight, i.e. 400 *qinṭār*s, of the iron grille sent on the order of Sultan Qāitbāy from Cairo to Medina to serve in the mausoleum of the prophet Muḥammad as a *maqṣūra* might well have stimulated the author to record this detail.[20] He added that it was transported on 70 camels. Relative indicators of the large amounts needed in the process of manufacture are the occasional references in the Mamluk sources to prices or weights of portable metalwork objects, which were of course much smaller in size. According to al-Maqrīzī the metal alone used for a non-specified number of silver *dikka*-stands of the trousseau of the market-inspector of Cairo, Qāḍī ʿAlāʾ al-Dīn b. ʿArab, amounted to one hundred thousand pure silver pieces.[21] A golden *qandīl*, donated in 743/1342 to the mausoleum of Sayyida Nafīsa by the mother of Sultan al-Nāṣir Aḥmad celebrating her son's recovery from a disease, weighed about 1.24 kg.[22] And the silver gear for horses was recorded to have equaled as much as 500 *dirham*s in weight.[23] As for the prices of finished metalwork fittings, no records have as yet come to the fore. This is in contrast with other categories of metalwork objects, the value of which is occasionally the focus of attention of Mamluk chroniclers. A clear gradation in the value of girths (*manāṭiq*) with prices ranging from 400 silver *dirham*s for belts intended for lower ranking military people and those for officers costing in between 150 and 300 *dīnār*s gives an insight into the different levels of consumption of the military class.[24] The price of an astrolabe manufactured by the *muwaqqit* of the Umayyad mosque in the first half of the 14th century was 10 *dīnār*s. After his death in 1349 AD the price was doubled.[25] Furthermore, prices of metalwork objects are even more prevalent in marriage contracts, such as gilded plates the costs of which in the middle of the 13th century are recorded as 10 *dīnār*s, with candlesticks varying from 1 to 3.25 *dīnār*s according to their size.[26]

How did the Mamluks acquire these metals? During the Mamluk period, the Mamluks were for the most part highly dependant upon imports of metals, as the yield of the mines that were still in use within their territories was deficient to meet the demand. Gold was extracted by huge effort in the desert in the

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[16] Mayer (1938), 6, 7, 10.
[17] Idem (1938), 12.
[18] Idem (1938), 11.
[19] Not all writers remained silent on the weights of fittings, as is shown by Nāṣer-e Khosraw (1986), 126 who relates that each of the doors of al-Mahdīya was of massive iron and weighed 10,000 kg.
[20] Ibn Iyās (1960–92) III, 203. According to Hinz (1955), 24–25, different weights are attributed to a *qinṭār* in Egypt in the Mamluk period, varying from 45, 62, 81.25, to 96.7 kg. When the weight of this grille, i.e. 400 *qinṭār*s, is converted into its metric equivalent, the top and bottom of the range are 38,600 kg and 18,000 kg, respectively. Ashtor (1971), 95, note 4, quoted ʿAbd al-Bāsiṭ b. Khalīl (d. 1514), *Nayl al-ʿamal*, Oxford, Bodleian Library, ms. 803, 812, f. 329v, who even doubled the weight of this grille, mentioning that it weighed 800 *qinṭār* (in between 36,000 and 77,200 kg).
[21] Maqrīzī (1853) II, 105.
[22] Ibn Taghrībirdī (1929–72) X, 81 recorded a weight of 2 *raṭl*s and 7.5 *ūqiya*s for the lamp. According to Hinz (1955), 29 a *raṭl* corresponded to 450 g while one *ūqiya* was one twelfth of a *raṭl* in medieval Cairo.
[23] Maqrīzī (1853) II, 98.
[24] Idem (1853) II, 99.
[25] Ashtor (1969), 353–54, quotes the biography of Shams al-Dīn Abū ʿAbdallāh al-Mizzī (d. 1349 AD), *al-Wāfī bi'l-wafayāt* II, 170. This increase in value might, besides being connected to the maker's fame, be linked to a dearth of craftsmen caused by the Black Death, which had taken so many.
[26] Ashtor (1969), 354.

south of Egypt, according to the 15th century traveller Felix Fabri.[27] This had already been pointed out by Ḥamd-Allāh Mustawfī in 740/1340, who added at the time of writing that the gold mine in the desert between Egypt, Nubia, Abyssinia and the Red Sea yielded good profit.[28] West Sudan was, however, the main source for gold, which came down to Cairo via the Nile.[29] Among the traders was an inter-confessional group of merchants, the Karīmīs, who traded gold not only from West Sudan but also from Ethiopia, although they were principally specialists in the spice trade.[30] In the late 15th century it also arrived via the Venetians and was exported to the Mamluk lands by way of gold coins, gold artefacts, and even gold dust.[31]

For silver, the Mamluks relied on Europe and Central Asia. Ingots and coins produced in Bosnia and Serbia arrived in the Mamluk territories via the Venetians.[32] The presence of merchants from Iraq and Syria in the city of Kumish, where silver mines were located according to Ibn Baṭṭūṭa, suggests a possible line of export of silver between this city and the Mamluk realm.[33] Al-Qalqashandī, too, refers to the exploitation of these mines during the 15th century.[34] Furthermore, Ibn Baṭṭūṭa mentions the presence of silver mines in the mountains of the Russians (*jibāl al-rūs*), from which silver ingots were extracted and used for buying goods.[35] Scientific analysis has proven that the bullion used for minting silver *dirham*s in the Mamluk period came from both Central Asia and European countries, but no such analysis has been conducted for metalwork fittings.[36]

The existence of a copper mine to the west of Aleppo was recorded by Mustawfī Qazwīnī. Its returns were, however, poor.[37] Great quantities of copper bought by the Venetians from Serbia, Bosnia, Hungary, Spain, Austria, Portugal, Central Germany, Flanders and The Netherlands were exported to Egypt and Syria.[38] The mines of Qasṭāmūnī near the shores of the Black Sea also yielded excellent profit.[39]

The presence of iron mines was recorded in the mountain ranges near Beirut, both during the Mamluk period and preceding it. From here it was exported to Egypt, according to Ibn Baṭṭūṭa.[40] Ores were also exploited in Nubia and on the Red Sea coast.[41] Tin came predominantly from Cornwall (England) and Germany via Venetian, Catalan and Genoese traders.[42] According to Ibn Ṣaṣrā, lead was imported from Cyprus.[43] In addition, the Venetians shipped lead to the Levant from Bosnia and Serbia, while the Catalans traded it from England to Egypt and Syria.[44] Another highly sought after commodity needed in large quantities for ships of war and architectural structures was timber. Muslim traders transported it to Egypt

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[27] Fabri (1975), 734. The same author, pp. 143–44, also recorded the existence of ancient gold mines in the desert at Mishmar, located in between Gaza and St. Catharine's monastery, which had passed into disuse when he visited the area.
[28] Mustawfī Qazwīnī (1913–19) I, 201 and II, 192.
[29] Ibn Khaldūn (1958) II, 282; Ashtor (1971), 17.
[30] Ashtor (1983), 73.
[31] Arbel (2004), 43 and Appendix B–I.
[32] Ashtor (1971), 32, 41–42.
[33] Ibn Baṭṭūṭa (1853–58) II, 293, mentioned the silver mines at Kumush, also referred to as Gümüşane (Gümüsh-khāne meaning 'silver house'), which lies over 60 km. south of Trabzon.
[34] Qalqashandī (1913–72) V, 343.
[35] Ibn Baṭṭūṭa (1853–58) II, 414.
[36] Ashtor (1986), 966.
[37] Mustawfī Qazwīnī (1913–19) I, 203 and II, 194–95.
[38] Ashtor (1971), 56–58; Ashtor (1983), 157–58.
[39] Ashtor (1986), 966.
[40] During Mamluk times both Qalqashandī (1913–19) IV, 111 quoted by Gaudefroy Demombynes (1923), 74 and Ibn Baṭṭūṭa (1853–58) I, 133 referred to the availability of iron in the vicinity of Beirut. The former also recorded the presence of pine forests in the same place. Muqaddasī (1963), 227 already mentioned iron mines in the mountains near Beirut before 1000 AD.
[41] Ashtor (1986), 965.
[42] Ashtor (1983), 50, 128, 136, 159.
[43] Ibn Ṣaṣrā (1963) I, 162 and II, 121.
[44] Ashtor (1983), 50, 159–60.

during the middle and second half of the 14th century.[45] It was also brought in from the Greek islands and from Asia Minor.[46]

As the raw material was on the whole provided by the party responsible for ordering an object, it was not uncommon for clients to supervise the process for fear of being robbed by the craftsmen, whether by theft of the metals themselves or by their debasement. Examples of possible misconduct and rules and regulations for proper behaviour on the part of the craftsmen are described in the *ḥisba* literature of the Mamluk period. In the case of gold- and silversmiths, special warnings were issued about the secret addition of non-precious metals to melted gold or silver.[47] This was to be prevented by the weighing of the metals in the presence of the customer before the melting process took place. To make sure that the process was fully observed, it was decreed that the furnace for melting should be well visible. Furthermore, it was stipulated that coppersmiths should not add too much lead to the copper in the melting process as this had a negative effect on the strength of the object that was made.[48] Regulations were also enforced on blacksmiths, who were not allowed to place nails that had been straightened out among new ones, as this could misguide the customer, who might hold them to be new. [49]

5.2 METALWORKERS AND CENTRES OF PRODUCTION

The lives and works of Mamluk metalworkers remain largely a mystery, for they do not figure in the biographical dictionaries. We therefore have to rely on signatures and the occasional references to them in the literary sources to draw a picture of the way that they were organised and the locations in which they worked. In the following pages attention will be focused on the different specialisations that can be distinguished among Mamluk metalworkers to develop an idea about the relationship between the makers of fittings and other metalworkers. Then the locations of workshops in the different centres will be discussed and the question whether these workshops were entirely static will be raised.

5.2.1 *Different specialisations and the organisation of the crafts*

In Mamluk sources different activities and specialisations are distinguished among craftsmen working in base or precious metals. Among those classified as working in brass, bronze, or iron are founders (*al-sabbākūn*[50] or *al-sakkābūn*[51]), blacksmiths (*al-ḥaddādūn*),[52] casters or founders of brass or bronze (*al-ṣaffārūn*)[53] coppersmiths (*al-naḥḥāsūn*),[54] hammerers (*al-ḍarrābūn*),[55] metal-beaters (*al-daqqīyah*),[56] tinners

[45] Ibn Baṭṭūṭa (1853–58) II, 257.
[46] Ashtor (1971), 95; Ashtor (1983), 128.
[47] Ibn al-Ukhuwwa (1960), 47, 145–46.
[48] Idem (1960), 48, 148.
[49] Idem (1960), 48, 148.
[50] Samhūdī (1908) I, 460; the name also recurs on a military decree by Sultan Qānṣūh al-Ghūrī in 914/1508 positioned at the doorway of the tower at the left-hand side of the bridge in the citadel of Aleppo: "[…] all the founders and the blacksmiths […]" ([…] *jamīʿ al-sabbākīn waʾl-ḥaddādīn* [...]".
[51] Qāsimī (1960), 237.
[52] See for example Ibn Ṣaṣrā (1963) I, 55 and II, 35; the *ḥaram* documents in Little (1984), 125, no. 470 and 131, no. 504; Samhūdī (1908) I, 460; Maqrīzī (1853) I, 373; Sibṭ Ibn al-ʿAjamī (1950), 92, 139.
[53] Little (1984), 106, no. 397 and 318–19, no. 20.
[54] Ibn Ṣaṣrā (1963), I, 158 and II, 118.
[55] Goitein (1958) I, 420 note 55.
[56] Ibn al-Ḥimṣī (1999), 252; Behrens-Abouseif (2004), 293.

(*al-qazdīrūn*),[57] and workers in lead (*al-raṣṣāsūn*).[58] The sources also mention those who specialised in decorating, or possibly engraving, the surface of objects (*al-naqqāshūn*); its verb or noun (i.e. *naqasha* or *naqsh*) is sometimes used as the introductory phrase of the signature of Mamluk metalworkers.[59]

Gold- and silversmiths were addressed by one and the same name (*ṣā'ighūn*).[60] Among them quite diverse activities are employed such as the moulding of gold (*wa-nās yaṣūghū*),[61] the manufacture of gold leaves (*daqqa al-dhahab*),[62] the gilding of base metals such as iron with gold or silver (*al-ḥadīd wa-yaṭlīhi bi'l-dhahab aw al-fiḍḍa*),[63] silver applied with enamel (*al-fiḍḍa al-majrāt bi'l-mīnā*),[64] and the drawing of gold thread (*al-khaṭṭ al-zarākīsha*).[65] Precious and base metals were combined by the inlay workers (*al-kuftiyūn* or *ṣunnāᶜ al-kuft*), a highly popular craft in Egypt in Mamluk times.[66]

Besides these distinctions in crafts, Mamluk sources mention the existence of various markets that specialised in certain metalwork products or materials such as the markets of the goldsmiths (*al-ṣāgha al-kabīra*) and the inlayers (*sūq al-kuftiyīn*), the markets of the ring-makers (*al-ḍabābiliyūn*),[67] of the sword-makers (*suyūfīyūn*),[68] and of the lance-makers (*al-rammāḥūn*),[69] the market of coats of mail (*qayṣārīyat al-zarad*),[70] those manufacturing steel blades,[71] the weapons market (*sūq al-silāḥ*)[72] selling, among other things, coats of mail (*al-zaradiyāt*),[73] and those *sūq*s specialising in metal girths (*al-manāṭiq*),[74] spurs (*al-mahāmiz*),[75] and iron cages of lattice work (*qufaisat min ḥadīd*).[76] Besides all these newly manufactured objects, there also existed a market for scrap metal (*sūq al-khurdafūshīya*).[77] Such a subdivision into categories of objects is also found in the Genīza documents, where craftsmen who specialised in certain objects are distinguished. A wide array of specialists such as bell-makers, blacksmiths specialising in horseshoes, cutlers, spoon-makers, needle-makers, makers of mortars, tinkers, etc, are mentioned.[78]

Within all these different categories that were distinguished, we observe that the makers of fittings are not identified as a group of specialists separate from those manufacturing portable objects.[79] As they shared similar techniques and decorative motifs, it might well be that there was no strict divide in workshops

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[57] Goitein (1958) I, 420 note 56.
[58] Idem I, 420, note 57.
[59] Qāsimī (1960), 486–87. This term occurs on a candlestick made in Cairo in 668/1270. See Wiet (1932), 47, pl. 27, no. 1657. Baer (1983), 217–18, discusses the term *naqasha* in more detail. The term *naqqāsh* is also used by makers of Veneto-Saracenic metalwork objects. That it was not exclusive to metalworkers is shown by its use in a signature of the decorator responsible for the *miḥrāb* in the mosque of Qajmās al-Isḥāqī. See Behrens-Abouseif (2005), 151.
[60] Ibn al-Ḥimṣī (1999), 232; Behrens-Abouseif (2004), 288; Maqrīzī (1853) II, 97, 102; Sibṭ Ibn al-ᶜAjamī (1950), 159–60.
[61] Ibn Ṣaṣrā (1963), I, 250 and II, 189.
[62] Goitein (1958) I, 108.
[63] Maqrīzī (1853) II, 98.
[64] Idem II, 98.
[65] Idem II, 94.
[66] Maqrīzī (1853) II, 105 described inlay-work as "and that which is inlaid of objects of brass with gold and silver" (*wa-huwa mā tuṭaᶜᶜim bihi awānī al-nuḥās min al-dhahab wa'l-fiḍḍa*). For a description of the technique of inlaying and a schematic drawing, see Rice (1953:b), 498–99. For more information on the verb *kafata* and the noun *kuft*, see idem (1955), 228–29.
[67] Idem II, 102.
[68] Idem I, 374.
[69] Ibn Ṣaṣrā (1963) I, 181 and II, 138.
[70] Idem I, 156 and II, 117.
[71] Broquière (1892), 60-61 remarked in 1412-13 AD that Damascus was renown in Syria for its sword-making while describing some facets of their manufacture.
[72] Maqrīzī (1853) II, 97.
[73] Idem II, 97.
[74] Idem II, 99.
[75] Idem II, 98.
[76] Idem II, 97.
[77] Idem II, 89.
[78] Goitein (1958) I, 109 and 421, notes 59–64.
[79] Of the different markets, only the market of the ring-makers (*al-dabābiliyūn*) might allude to metalworkers who specialised in the making of a particular kind of fitting. As nothing is said about the design or use of these rings, and as *ḥalaq* is the Arabic term most frequently encountered for doorknockers or doorrings in medieval sources, we cannot take this reference as evidence for a specialisation.

between metalworkers producing fittings or those making portable objects. This is a warning against regarding workshops of metalworkers as monolithic blocs.

Besides the absence of a clear divide in the sources, different examples give evidence of a flexible craft. Some metalworkers mastered a variety of techniques in various materials, while others produced both portable objects and fittings.[80] This is exemplified first of all by Muḥammad b. al-Zayn, who is known to have signed three different objects in a variety of materials and techniques. He applied figural representations in the inlay technique onto a basin and a bowl of brass, using both gold and silver for the embellishment of their surface.[81] Yet his iron grille (cat. no. 12/1) installed in the *madrasa* al-Isʿardīya in Jerusalem was cast and included both cast and engraved inscriptions.[82] If it were not for his signature, nothing in the techniques, types of decoration, designs, or material would have betrayed that a single craftsman was responsible for all of this work, for the inlaid objects and the grille differ very markedly from one another. The name of a second Mamluk metalworker, Zayn al-ʿAbdīn al-Zaradkāsh, who signed several grilles (cat. nos. 45/1 and 47/7) in the late 15th century, poses an intriguing query. Al-Zaradkāsh literally means the drawing of coats of mail, which implies the drawing of iron wires for making coats of mail.[83] Among the offices held by amirs, the zaradkāsh was in charge of the inspection and the distribution of coats of mail and armour.[84] Within the office, a hierarchy was established between *al-Zaradkāsh al-kabīr* and *al-Zaradkāsh al-thānī*.[85] We remain in doubt whether in this specific case Zaradkāsh refers to the craft or to the office. If the former is the case, it exemplifies the flexibility of the craft, in which a single metalworker would work on a variety of objects, i.e. coats of mail and grilles. If it refers to the office, one should conclude that a member of the elite was a very competent metalworker as well. His signature does, however, offer a clue that points in the direction of the office, for his name is concluded with the article '*al-*' – the remainder of the text being hitherto undeciphered – which might allude to the hierarchy established within the office between the senior inspector (*al-Zaradkāsh al-kabīr*) and his second officer (*al-Zaradkāsh al-thānī*).

Finally, the refinement of the applied technique, the style and decorative repertoire on Mamluk fittings themselves sometimes give evidence that craftsmen experienced in producing portable objects were responsible for them, as in the case of the door and the doorknockers installed in the *qibla* wall of the *madrasa* of Sultan al-Nāṣir Ḥasan and the entrance door in the *madrasa* and mausoleum of Amir Mahmūd al-Ustādār (797/1394–95).

There are two non-Mamluk examples indicative of the mastering by a single metalworker of a wide repertoire of materials or techniques. Firstly, there is the treatise by the Artuqid metalworker al-Jazarī, who was responsible for the door and the doorknockers at the palace at Āmid.[86] He shows his mastery of casting, engraving, inlaying, and overlaying applied to several metals: brass or bronze, silver, and iron. An expertise in different materials might have been forced upon metalworkers out of structural necessity, as shown for example in the case of window grilles, where strength was provided by the inner structure of iron while the decorated

[80] This is also observed by Allan & Gilmour (2000), 101, with respect to the craft of steelmaking in Iran in the 15th and 18th centuries, when the signatures on objects indicate that one and the same metalworker was responsible for both armour and fittings such as grilles or metal-faced doors alike.
[81] For a discussion about his most famous work, the Baptistère de Saint Louis, housed in Paris, Musée du Louvre inv. no. LP 56, see Rice (1950); Atıl (1981), 76–77, no. 21; Behrens-Abouseif (1988–89); Ward (1999). For his bowl, see Atıl (1981), 74–75, no. 20.
[82] For a discussion of the applied technique on the grille, see Allan (1996), 207.
[83] According to a study of Iranian crafts in the second half of the last century, a wire drawer, concerned with the drawing of gold and silver wires, was called a *zar-kash* or a sīm-*kash*. See Wulff (1966), 42. He adds that once the manufacture of steel wires had been important for the industry of armour as well, but this had disappeared when chain armour had fallen into disuse.
[84] Martel-Thoumian (1991), 440.
[85] Ibn Iyās (1960–92) V, 134. The same author, idem II, 138, records the career of one amir who, being on good terms with Sultan Barsbāy, was first appointed secretary or pen-box holder (*dawādār*), then *zaradkāsh*, after which he was made governor of Alexandria.
[86] Jazarī (1990), 327–36.

exterior consisted of brass pieces attached to the iron skeleton.[87] Secondly, there is the signature on a pair of doorknockers made of copper for a city gate in Ganja/Kirovabad, whose maker refers to himself as the (black)smith (*al-ḥaddād*).[88]

The mastery of multiple techniques was not necessarily combined in one and the same person. A single workshop could well house different specialists under one roof who might even have worked on the same object. The combined efforts of different craftsmen is obvious on a candlestick, datable to the middle of the 13th century, where *ḥājj* Ismāʿīl was responsible for its making (*ʿamal*) and two others, Muḥammad b. Fattūḥ al-Mawṣilī the inlayer (*al-muṭaʿʿim*) and al-Shujā al-Mawṣilī the decorator (*al-naqqāsh*) decorated or engraved (*naqsh*) it.[89] Such cooperation between different craftsmen is also apparent in a late 20th century workshop located in Damascus where the master craftsman is responsible for making the preliminary drawings for an object, after which several other craftsmen perform special tasks in the working and finishing of the product.[90] A similar division of labour had also been recorded early in the 20th century by Hildburgh, who observed a whole chain of craftsmen working on a single inlaid brass object in Cairo and Damascus, distinguishing a coppersmith, an engraver, and an inlayer.[91]

Lastly, the flexibility of workshops or craftsmen is exemplified by metalworkers who resided in areas where their specific capacities were needed or were willing to move to temporary locations. Al-Maqrīzī notes that specialists such as gilders and inlay-workers were not only based in their own *sūq*s but were also located among, for example, the makers of spurs, as their services were indispensable for ornately decorated items.[92] Another anecdote tells of the *muḥtasib* of Cairo, ʿAlāʾ al-Dīn b. ʿArab, who was sent 100,000 *dirham*s by his fiancée for manufacturing silver stands (*dikka*s) for their trousseau. Al-Maqrīzī then relates that the inspector went out to gather specialists of silver inlay. When they arrived, they started working on the objects.[93]

Irrespective of the monumental size of some of the fittings, they could easily have been produced in small-sized workshops. The manufacture of fittings did not require an unusually large space for the individual components – such as the multiple repetitive geometric plaques of overall star pattern doors, the individual bosses and bars of grilles, and the engraved elongated metal bands of window shutters – were of relatively small size. Only the final composition of a door and the nailing of the plaques on a wooden support of large dimensions demanded more room, but this could have taken place outside if the interior space was not sufficient.[94]

Do the signatures found on Mamluk metalwork fittings perhaps shed more light on possible specialisations or on the organisation of the craft? For one thing, the six signatures that are still extant on

[87] It should be borne in mind, though, that a division of labour might have existed within a single workshop, with metalworkers specialising in different materials and techniques.
[88] Blair (1992), 132.
[89] Wiet (1932), 20, 178; Mayer (1959), 51. Another example is a steel grille, published in Arts (1976), 204, no. 245, made for the shrine of Mashhad, on the order of Shāhrukh b. Tīmūr in the month of Muḥarram 817/1414–15. The inscription distinguishes three different metalworkers, separating the maker from the inlayers: "the work of Master (*ʿamal ustādh*) Shaykh ʿAlī Khūdgar of Bukhārā, the work of master-inlayers (*ʿamal ustādhān kūftgar*) Mawlānā Shams of Tabas and master (*ustādh*) Maḥmūd the inlayer (*kūftgar*)." For other examples of multiple metalworkers signing portable objects, see Mayer (1959), 12.
[90] Kalter (1992), 70.
[91] Hildburgh (1906), 215–16.
[92] Maqrīzī (1853) II, 98.
[93] Idem II, 105.
[94] An analogous practice is described with regard to wooden doors in a record in the Cairo Genīza in Goitein (1958) I, 113 and 423 note 89. It shows that timber doors were prefabricated in the carpenter's shop, not on the building site.

fittings were kept fairly simple.[95] Each of them contains the name of a single metalworker only, exclusive of *nisba*s. Only one of them carries a reference to a specialisation, i.e. the making of coats of mails (*al-zaradkāsh*). Secondly, specialisations are not specifically mentioned, since each signature starts with the generic term 'the work of' (*ʿamal*), one of them even lacking this short introduction. Thirdly, none of them mentions a hierarchical structure among the craftsmen.[96] The only addition some metalworkers allowed themselves was expressing their humility by including the term 'the poor slave' (*al-ʿabd al-faqīr*) or 'the poor' (*al-faqīr*) to their names; its absence on four of the six fittings inclusive of a signature, however, shows this was not the rule. Moreover, the exact opposite also occurred on two grilles where the metalworker repeated his signature 15 and 16 times.[97] This outspoken presence suggests great pride on the part of the craftsman in his work, and perhaps that he was held in high esteem. It can hardly be coincidental that in exactly the same building where one such grille with multiple signatures is found another craftsman, ʿAbd al-Qādir al-Naqqāsh, also signed his name more than once.[98] They might well have stimulated each other in doing so. The presence of multiple signatures is not unique on Mamluk metalwork. In the famous Baptistère de Saint Louis six signatures by the metalworker Muḥammad b. al-Zayn are found.[99]

Two signatures, however, though lacking any ranking order, do reflect on the organisation of the craft, for a family bond is evident, which is the case with the window grilles (cat. nos. 49/1 and 49/2) made for the mausoleum of Azdamur min Mazīd in al-Anṣarī (893/1488).[100] Here Yūsuf b. al-Kamāl and Muḥammad b. al-Kamāl each signed a piece. Further light upon the importance of the family within the organisation of the craft of metalworking is shed by some Arabic and western medieval sources. Sigoli, when visiting Damascus in the year 1384–85 AD described the craft of goldsmithing as a hereditary arrangement that resulted in a highly specialised organisation. "And so of all the trades there are the most perfect and great masters, and truly the order they have among them is a beautiful and noble thing, for if the father is a goldsmith, the sons cannot ever have a trade other than this, and so they go from generation to generation, so that of necessity they must be perfect masters of their arts."[101] Ibn al-Ḥimṣī in 885/1480 also suggests a family business in the manufacture of base-metal fittings when mentioning the *awlād* al-Zuʿayma as the ones responsible for beating the south-western doors of the Umayyad mosque in Damascus that had to be renewed after a fire in 884/1479.[102]

Two anthropological studies on metalworking businesses in Cairo and Damascus during the last decade of the 20th and the first decade of the 21st centuries also show a family-oriented craft.[103] Both give evidence of a hierarchical structure with a manager responsible for acquisition and finances, and a layer of craftsmen to which are added apprentices that start learning the trade at a young age. In the case of Cairo, the

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[95] Muḥammad b. al-Zayn signed the iron grille (cat. no. 12/1) installed in the *madrasa* al-Isʿardīya in Jerusalem; the grille (cat. no. 45/1) in the *sabīl-kuttāb* (884/1479–80) of Sultan Qāitbāy and the grille (cat. no. 47/7) found in the *sabīl-kuttāb* of the mosque of Amir Qajmās al-Isḥāqī (884–86/1479–81) are signed by Zayn al-ʿAbdīn al-Zaradkāsh. Two (cat. nos. 49/1 and 49/2) grilles originally found in the mausoleum of Azdamur min Mazīd in al-Anṣarī (893/1488), contain the names of Yūsuf b. al-Kamāl and Muḥammad b. al-Kamāl.

[96] Terms like 'the master' (*al-muʿallim*), 'the pupil' (*al-tilmīdh*), or 'the slave' or 'hireling' (*al-ghulām*) that are found on portable metalwork objects are absent. For a list of Mamluk craftsmen using the term "the master" (*al-muʿallim*), see Allan (1996), 206–7, and for those using terms lower in the hierarchy, see Rice (1957), 304.

[97] These are the grille (cat. no. 45/1) in the *sabīl-kuttāb* of Sultan Qāitbāy (884/1479–80) and that (cat. no. 47/7) in the *sabīl-kuttāb* of the mosque of Amir Qajmās al-Isḥāqī (884–86/1479–81).

[98] These signatures occur in the interior of the mosque of Amir Qajmās al-Isḥāqī (884–86/1479–81); see ʿAbd al-Wahhāb (1953–54), 555; Behrens-Abouseif (1989), 148; Behrens-Abouseif (2005), 151.

[99] The basin is in Paris, Musée du Louvre, inv. no. LP 16, and is published in Atıl (1981), 74–75, no. 20.

[100] Other examples of family businesses specialising in Islamic metalwork are given by Allan & Gilmour (2000), 95–98, who record the existence of two families working in iron and steel in the Safavid period, and others active in the 20th century.

[101] Sigoli (1948), 182.

[102] Ibn al-Ḥimṣī (1999), 252; Behrens-Abouseif (2004), 293.

[103] For a study of a foundry in Cairo, see Shalev (2002), 25. For a workshop in Damascus specialising in inlay-work, see Kalter (1992), 70.

son of one of the brothers plays the role of apprentice as in the old days. In Damascus, however, the owner no longer knows the craft, but the current chief craftsman learned the craft from the owner's father starting at the age of ten.

5.2.2 *Different centres and their orientation*

As only one of the inscriptions on Mamluk fittings mentions the place of manufacture, we have to rely for the most part on the literary sources to pin down different centres and the locations of the metalworking workshops in them. A variety of references pinpoint metalworking industries in Cairo, Damascus, Aleppo, and Jerusalem. The next question is whether these centres were providing strictly for the local market or whether they had a wider orientation.

'Damascus the Safeguarded' (*dimishq al-maḥrūsa*) is the only place of manufacture mentioned on Mamluk fittings. It is part of an inscription on a pair of doorknockers (cat. no. 24/9) that in addition gives the name of the patron, Sultan al-Nāṣir Ḥasan, and the date (late 761/1360). This information is of great importance for the study of Mamluk metalwork in general. This is, after all, the only 14th-century metalwork object that so far can be ascribed with certainty to Damascus, and thereby provides a starting point for comparative purposes which might lead to a possible attribution of other inlaid objects to Damascus on the basis of identical or comparable designs or decorative motifs. But it also gives evidence of the high quality of metal production in this centre during this time, while nothing of similar technical standard, at least in terms of fittings, has so far been observed in any other Mamluk centre.

Besides this fitting, three other objects are related to Damascus on the basis of their inscriptions. A ewer and a candlestick, both from the second half of the 13th century, mention *dimishq al-maḥrūsa* as the place of manufacture.[104] Besides this, a bronze jug, dated *Jumādā* II 872/6 January to 3 February 1468 carries the signature of a craftsman who alludes to himself with the *nisba* 'dimishqī'.[105]

The location of the pair of doorknockers (cat. no. 24/9) and the door (cat. no. 24/6) to which they are attached and with which they form a visual and technical unity also is significant. Its installation in Cairo gives evidence of the esteem in which the specific workshop or the craft of inlaying in Damascus at large was held, so much that objects of monumental size were ordered there. The city had already acquired the aura of a centre of quality goods during the 13th century, as exemplified by the order from Sultan al-Ashraf Khalīl b. Qalāʾūn in 692/1293 for 100 brass candlesticks inlaid with his titles, in addition to 50 golden and 50 silver ones from Damascus.[106] This appreciation of the skills present in Damascus is also apparent on another contemporary candlestick in the name of Sultan Lājīn which explicitly states it was manufactured in Damascus for the mosque of Ibn Ṭūlūn in Cairo.[107] The techniques for which Damascus was most renowned were those of damascening – used for the arms industry, a technique that falls outside the scope of this study – and that of inlaying. With respect to the latter, the Italian traveller Simone Sigoli, visiting the city in 1384–85 AD, recorded the making of

[104] The ewer, signed by Ḥusayn b. Muḥammad al-Mawṣilī, made in Damascus in 657/1259, Paris, Musée du Louvre, is published in Wiet (1932), 179, no. 73. The candlestick, signed by ʿAlī b. Kasirat al-Mawṣilī made in Damascus in the year 697/1297, Cairo, Museum of Islamic Art, inv. no. 128, is published by Allan (1986), 50.
[105] Mayer (1959), 46.
[106] Maqrīzī (1853), 112. And well before this, Muqaddasī (1963), 219 had stated in the late 10th century that Damascus was known for its bronze objects.
[107] The candlestick, manufactured in 697/1297, is now housed in Cairo, Museum of Islamic Art, inv. no. 128 and is published by Wiet (1932), 7–8, pl. 30 and Allan (1986), 49–50.

large quantities of basins and ewers of "brass which looked like gold on which were put figures and leaves in silver".[108] During the early 15th century, master craftsmen working in a wide variety of materials such as gold, silver, iron, copper, and brass were recorded.[109]

Besides scattered remarks on portable objects and techniques, the sources also mention the location of the different metalwork crafts in the city, which were concentrated in a number of *sūq*s. According to several writers, the gold *sūq*, the market of the coppersmiths and the workshops of the smiths were all centrally located around the Umayyad mosque.[110] Another market of the smiths operated outside the city walls.[111] It should be kept in mind, however, that while these street names imply a geographical concentration of members of a single craft, this did not exclude the occasional shop-owner or craftsman who specialised in another craft.[112] The sources remain silent about palatial workshops, although the Timurids and Ottomans had them.[113] The Mamluks did, however, make special provision in the palace for the mint and workshops servicing the weapons needs of the army. One source, however, refers to a temporary palatial workshop which was set up within the viceregal palace in Damascus, following a huge order from Sultan al-Malik al-Ashraf Shaʿbān in Cairo to his viceroy Baydamur in Damascus in 775/1374 to supply him in the first instance with embroideries, though the scope of the work grew dramatically:

> "He [Baydamur] summoned the craftsmen and brought silver and gold out to them and they worked. The viceregal palace (*dār al-saʿāda*) became a workshop, and there was no room for anyone to place his foot because of the craftsmen; men making brocade, people sewing and others moulding gold, men working with furnaces, people packing, and others weighing [...] There were made also gold needles with pearl heads, silver needles with gold heads for the slave girls [...] 300 camel saddles dressed with gold and silver, 60 stirrups of gold and silver, chains and halters for the camels in a large amount".[114]

In the case of Cairo, moreover, none of the inscriptions on the metalwork fittings there specifically states that they were made in Cairo. The existence of an extensive industry located in Cairo is, however, attested both by the inscriptions on some portable objects that include the name of Cairo as the place of manufacture and by references in the literary sources.[115] Again, no mention is made in the sources as to the existence of workshops which specialised in the production of fittings. However, the technical expertise needed for the

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[108] Sigoli (1948), 60–61.
[109] This was recorded by B. de Mignanelli in his report of Tamerlane's conquest of Damascus in Fischel (1956), 226.
[110] Ibn al-Ḥimṣī (1999), 232; Behrens-Abouseif (2004), 288 located the 'great old goldsmiths' market' (*al-ṣāgha al-kabīra al-ʿaṭīqa*) there. Ibn Baṭṭūṭa (1853–58) I, 206–7 located the market of the coppersmiths along the south wall of the Umayyad mosque; Ibn Jubayr (1852), 270 and (1952), 275–76 had already commented upon the same location in 580/1184, while adding that there was no more beautiful-looking row of shops than this, nor one bigger in length and breadth. According to Ibn Ṣaṣrā (1963) I, 158 and II, 118, the coppersmiths' market burnt down in the year 740/1339 alongside the eastern minaret of the Umayyad mosque. Ibn Ḥabīb (1982) II, 314 lamented the burning of the market of the inlayers in the same year.
[111] According to Ibn Ṣaṣrā (1963) I, 55 and II, 36, the viceroy of Syria ordered the burning of the market of the blacksmiths (*sūq al-ḥaddādīn*) located outside the walls in 791/1389. No reason is given for this action.
[112] Goitein (1958) I, 83, 41, note 8.
[113] For a progress report (*arzadasht*) from a Timurid *kitābkhāna*, see Lentz & Lowry (1989), 364–65. For references to Ottoman goldsmiths appearing on the palace payroll in the 16th century, see Raby & Allan (1982), 19.
[114] Ibn Ṣaṣrā (1963) I, 250–51 and II, 189.
[115] The inscriptions on at least five Mamluk metalwork objects state they were made in Cairo: 1: A candlestick, signed by Muḥammad b. Ḥasan al-Mawṣilī, made in Cairo in 668/1270, Cairo, Museum of Islamic Art, inv. no. 1657, published by Wiet (1932), 47; 2: A ewer, signed by ʿAlī b. Ḥusayn b. Muḥammad al-Mawṣilī, made in Cairo in 674/1275, formerly part of the Gaupil collection, published in Wiet (1932), 20, no. 32; 3: A candlestick, signed by ʿAlī b. Ḥusayn b. Surkhak al-Mawṣilī, made in Cairo in 681/1282, formerly in the Harari Collection, no. 39, published in Wiet (1932), 9; 4: A basin, signed by ʿAlī b. Ḥusayn, made in 684/1285, Paris, Musée du Louvre, published in Rice (1957), 326; 5: A plate, signed by Ḥusayn b. Aḥmad b. Ḥusayn al-Mawṣilī, made in Cairo, no date but manufactured before 721/1321, the year in which its patron, the Rasulid Sultan Malik Muʾayyad Dawūd, died, New York, Metropolitan Museum, published in Wiet (1932), 21, no. 39.

manufacture of fittings was available, since the sources recount the presence of skilled artisans such as casters (*al-sabbākūn*), blacksmiths (*al-ḥaddādūn*), and inlayers (*al-kuftiyūn*). Again, as was the case in Damascus, the inlaying technique was most extensively commented upon, not surprisingly given the great demand for this type of luxury good in combination with the expertise and high costs attached to this technique. According to al-Maqrīzī the technique was applied on household and luxury goods alike, such as stands, cups, plates, lamps, lanterns, vessels, basins, ewers, and perfume burners. He says that he had seen them in such quantities that they could not be counted.[116] The same skill, in combination with gilding and the enamelling of silver, was also employed on horse gear such as bridles, stirrups and spurs.[117]

Of the places where Mamluk metalwork fittings survive, Aleppo is the only one named in the sources for its links with metalworkers who actually produced metalwork fittings. Ibn al-Ḥimṣī mentioned the employment of master metal beaters from Aleppo in 885/1480–81 for the manufacture of doors in the Umayyad mosque in Damascus, to replace those that had been severely damaged during a fire in the preceding year.[118] A general reference to the presence of metalworkers within the city of Aleppo is given by Sibṭ Ibn al-ʿAjamī who records the existence of the street of the smiths (*darb al-ḥaddādīn*)[119] and the gold *sūq* (*sūq al-ṣāgha*)[120] which was situated to the east of the Great Mosque. In the early Ottoman period, the presence of a signature inclusive of the *nisba*s al-ḥalabī and al-shāmī on the engraved metal bands on the door of a mosque in Aleppo prove that this city still produced manufacturers of fittings.[121] In contrast to Aleppo, Jerusalem is neither found as a *nisba* nor stated as the place of manufacture on Mamluk metalwork vessels, let alone fittings. The existence of different types of metalworkers connected to the city is, however, attested by the *ḥaram* documents.[122]

Although as yet no references have been found that refer specifically to the manufacture of metalwork fittings in a specific centre, it still seems logical that fittings were for the most part produced locally. Three reasons are suggested for this. Firstly, the technical skills of the blacksmiths, the coppersmiths, the inlayers, and the gilders must have been sufficient to produce metalwork fittings as well. Furthermore, this type of industry demanded a local market, for the fittings were not only needed in large quantities to keep up with the building activities of the Mamluks but the majority of them lacked any type of decoration, which made it superfluous to order them from afar. Moreover, their local manufacture was simply more practical, as their installation in buildings required orders with specific measurements.

The example of metalworkers from Aleppo working on the doors in the Umayyad mosque in Damascus shows that, although the production must have been mostly local, the industry was not city-bound. The movement of workshops of metalworkers for particular assignments is also attested elsewhere in the sources, for example in the order of Sultan Qāitbāy in 886–87/1481–82 in sending casters and blacksmiths, among builders and other craftsmen, from Cairo to Medina to restore the mosque of the Prophet which had burnt as a result of being struck by lightning.[123] There are also records of craftsmen being moved beyond the borders of the

[116] Maqrīzī (1853) II, 105.
[117] Idem II, 97–98.
[118] Ibn al-Ḥimṣī (1999), 252; Behrens-Abouseif (2004), 293.
[119] Sibṭ Ibn al-ʿAjamī (1950), 139.
[120] Idem, 159.
[121] The metal band nailed onto the door leading to the prayer-room in the mosque al-ʿĀdilīya (962/1555) reads: "Work of the poor slave in inlay-work, Muḥammad b. Muḥammad known as al-shāmī from the quarter Tiyāb. Hoping for forgiveness from God. Work of the one who is poor for God, al-ḥājj Khalīl son of al-ḥājj Yūsuf, the Aleppine (al-ḥalabī), may God forgive him."
[122] See Little (1984), 106 no. 397 and 319 no. 20 for the names of two founders (*al-safīānūn*) and Little (1984), 125 no. 470 and 131 no. 504 for the names of two blacksmiths (*al-ḥaddādūn*).
[123] Samhūdī (1908) I, 460.

Mamluk realm, as shown by Tīmūr's deportation of the 'official teachers of the arts' from Damascus.[124] De Mignanelli listed among the artisans in that city, craftsmen in gold, silver, iron, copper, and brass.[125] Moreover, the metalworker Muḥammad b. al-Zayn illustrates that there also existed a voluntary and individual movement of craftsmen from one place to another in search of employment, whether invited by a local court or on a private initiative.

Besides mobile craftsmen the movement of fittings is also attested, either by objects or by references to them in literary sources. The evidence shows that the objects moved from Cairo or from Damascus. For Cairo there is only one such instance recorded, i.e. the iron grille that was especially manufactured for the mausoleum of the prophet Muḥammad in Medina in Cairo, as part of a campaign ordered by Sultan Qāitbāy to restore the burnt construction.[126] The evidence for Damascus providing fittings for Cairo is three-fold. First, there is the extant door (cat. no. 24/6) and doorknockers (cat. no. 24/9) made to order in Damascus for the *madrasa* of Sultan al-Nāṣir Ḥasan. Secondly, as already mentioned in Section 4.3, a mass of precious and base metalwork fittings were removed from buildings in Damascus to be sent to Cairo where they were to supplement the building activities in al-Rumaylī of the then Sultan al-Malik al-Ashraf Shaʿbān in the year 775/1374.[127] A shipwreck off the Megadim coast in Israel, excavated from 1969 onwards, also exemplifies the transfer of fittings from Damascus to other places in the Mamluk period, for its cargo contained parts of metal facings for doors, doorknockers, and a block of iron which may have been a sack of nails.[128] The shipment can be dated, as it also contained coins, the latest of which was struck in 807/1404 during the reign of Sultan Faraj b. Barqūq. As all coins were minted in Syria, it seems likely that the ship had set off from Syria and travelled southwards.

5.3 PATRONAGE AND COMMISSIONS

The titles of patrons and their blazons constitute the major part of inscriptions on Mamluk metalwork fittings. Their overwhelming presence – in contrast to the few extant signatures of Mamluk metalworkers – gives evidence of the consciousness of class identity among the ruling elite in Mamluk society. An identical glorification of the high echelons of society marks the decorated base and inlaid metalwork portable objects from the 14th century onwards, as is shown on the numerous surviving vessels, candlesticks, lamps, and inkstands. This is not surprising as it was the very same class which ordered the constructions in which these objects and fittings were used. In the following paragraphs the nature of this patronage will be discussed, and the role of the patrons in the process examined. Did the fact that single patrons were involved in multiple building activities in different cities lead to the dissemination of a court style?

The categories of buildings in which Mamluk metalwork fittings are found are often combinations of religious and charitable constructions, such as mosques, *madrasa*s, and mausoleums combined with *sabīl-kuttābs*. Commercial structures such as *khān*s and domestic buildings constitute a second but much smaller

[124] De Mignanelli in Fischel (1956), 225. The ambassador, Clavijo (1859), 171 recorded in 1404 AD that "from Damascus he [Tīmūr] brought weavers of silk, and men who made bows, glass, and earthenware, so that, of those articles Samarcand produces the best in the world. From Turkey he brought archers, masons, and silversmiths".
[125] De Mignanelli in Fischel (1956), 226.
[126] Ibn Iyās (1960–92) III, 188, 203–4, translated by Wiet (1945), 206, 225–26. The transfer of smaller portable objects made in Cairo or Damascus to the holy places is better known, as shown for example by the dedicatory inscriptions on two candlesticks ordered by Sultan Qāitbāy for the same mausoleum, now housed in Cairo, the Museum of Islamic Art, inv. nos. 4072 and 4297, while three other candlesticks with identical dates are recorded by Wiet (1932), 35, nos. 3–5. Besides this there was the traditional offering of the Kaʿba keys to the Kaʿba by the ruling Mamluk sultan.
[127] Ibn Ṣaṣrā (1963) I, 249–50 and II, 188; Ibn Ṭūlūn (1964), 27; Laoust (1952), 14.
[128] Misch-Brandl (1985), 17 and pls. 34, 37.1, 37.2, 37.3, and 38.

group.[129] Among the elite that ordered the buildings inclusive of these fittings are sultans, amirs, and qāḍīs.[130] These patrons were responsible for the raising of entire buildings of which the metalwork fittings constituted only a small segment, or they instigated restoration projects of structures, which included fittings that needed replacement owing to fire or simply decay. The patrons involved in the latter were especially Mamluk sultans who were responsible for, and took the initiative in, the upkeep and restoration of especially the religious monuments in Mecca, Medina, Jerusalem, and Damascus.[131]

Fittings often carry generic references introducing the patron, such as 'glory to our lord' (*ʿizz li-mawlānā*) and 'there ordered the construction of this blessed door' (*amara bi-inshāʾi hādhā al-bāb al-mubārak*) both present on Mamluk doors in Cairo or 'on the order of' (*bi-ishāra*) as found on the panelled doors (cat. nos. 29/1, 29/2, 31/1 and 31/3) in the Umayyad mosque in Damascus. But what was the actual involvement of the patron in the process of the manufacture of metalwork fittings? On the whole, only a single patron is mentioned on fittings. There is no evidence that any of these patrons, be they sultans or amirs, got involved into the actual designing of an object, although some sultans are known to have meddled in the design and construction of their buildings.[132] Above all, the role of these patrons in the process of the manufacture of metalwork fittings should be understood as that of facilitator. Firstly, by ordering entire structures they provided the context in which the fittings were to be installed. Secondly, they not only provided the financial means for the manufacture of these fittings but, in the case of inlaid metalwork fittings, were responsible as well for the supply of precious metals and in all probability for appointing an overseer of the work to prevent any embezzlement of gold and silver.[133]

The patronage of the metalwork doors in the Umayyad mosque in Damascus presents quite a unique case among all Mamluk metalwork fittings, for the inscriptions on most of its doors contain the names of two people: the name of the sultan during whose reign the restoration was executed and that of the governor or viceroy responsible for its implementation and whose active role is referred to on the doors as 'on the order of' (*bi-ishāra*).[134] This presence of two different names on a single door can be explained by the fact that the restoration of the mosque and the costs thereby incurred was a state affair. The prestige of the Umayyad mosque, and its central position within the city, together explain the urge of the two men ultimately responsible for the work to have both their names eternalized in the metal doors, which accidentally had an extra visibility as the doors were the only carriers of inscriptions on the building's exterior.

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[129] The range of structures ordered by the Mamluk elite is of course much wider, but as no metalwork fittings are found there, they are not included here. For a more complete list, see Fernandes (1997), 107.

[130] The group of patrons is much more diverse, i.e. consisting of viziers, rich merchants, physicians, and Copts, if all Mamluk buildings are taken into consideration. See Fernandes (1997), 116–17.

[131] Examples of this are the replacement of the metalwork door (cat. no. 4/1) of the mausoleum of Ibrāhīm in Hebron (*al-Khalīl*) in 685/1286 on the order of Sultan al-Manṣūr Qalāʾūn; the grille (cat. no. 16/1) and the doors (cat. nos. 29/1, 29/2, 31/1 to 31/4) in the Umayyad mosque in Damascus; and the iron grille ordered by Sultan Qāitbāy in Cairo to be installed in the mausoleum of the Prophet in Medina, as part of a larger restoration campaign necessitated by fire, as reported by Ibn Iyās (1960–92) III, 189, 203–4, translated by Wiet (1945), 206, 225, 226.

[132] For an enumeration of sultans involved in such activities, see Behrens-Abouseif (1995), 304.

[133] Ibn Ṣaṣrā (1963) I, 250 and II, 188 mentions the viceroy Baydamur summoning the craftsmen to the palace where he brought out to them the gold and silver with which they worked. In his manual for the supervision of the markets, Ibn al-Ukhuwwa (1937), 146, states that the customer needs to be present when the metals are weighed and melted in the furnace.

[134] On the Bāb al-Qaṭṭānīn in Jerusalem (cat. no. 17/1), there are also two names found: that of the sultan during whose reign the gate was restored, and that of the governor Tankiz who was responsible for supervising the construction. In the case of restoration inscriptions, the presence of two or even three names was not unheard of in Mamluk times, as is exemplified by the inscription on one of the towers of the city wall of Damascus, which was accomplished under the supervision (*bi-naẓr*) of Aḥmad b. ʿAbd al-Salām, in the days (*fī ayyām*) of al-Nāṣir Muḥammad and on the order of (*bi-ishāra*) the governor Āqqūsh al-Afram. See RCEA (1954) XIV, 58, no. 5291. Much earlier, the presence of two names on a fitting also occurs on copper doorknockers from a city gate in Ganja, made in 455/1063. There, Amir Shāvur b. al-Faḍl ordered the creation (*amara bi-ījād*) of the door under the supervision of (*ʿalā yaday*) qāḍī Abī'l-Faraj Muhammad b. ʿAbd Allāh. According to Blair (1992), 132–33, the judge must have supervised the accounts.

The restoration of several of these doors was also recorded by two Mamluk chroniclers, who reported on the bad state of these fittings and their subsequent renewal.[135] Ibn al-Ḥimṣī gives a vivid account of the role of the patrons involved in the process after the fire of 884/1479 that demolished a great part of the Umayyad mosque, including several of its metal doors.[136] First the reigning sultan, Qāitbāy, ordered the viceroy to make an estimate of the restoration costs. The sultan then allocated a certain sum, in addition to which money was collected from the merchants and other sponsors. The viceroy assumed responsibility for the actual execution, ordering such activities as a search for timber and the demolishment of certain areas that were damaged beyond repair. The work was delegated further which resulted in the appointments of an actual supervisor of the restoration on the spot and a financial trustee. Ibn al-Ḥimṣī explicitly states that the sultan paid for the restoration of the doors.

To what extent did the financial investment of patrons stimulate the development of the craft of metalwork fittings? The *madrasa* of Sultan al-Nāṣir Ḥasan is the best example of how an injection of cash could lead to a sharp increase in the quantity and quality of metalwork fittings. There, the extreme size of the doors in the entrance portal and in the *qibla* wall, the decision to place multiple overall star pattern doors in new locations (the *minbar* and the *qibla īwān*), and the method of using silver and gold inlay to cover the entire surface of a door, although customarily this technique was employed only on small portable objects, are all innovations that are directly related to a large budget. This lavishness is related to the extravagant spending on the entire building, which makes it an unusual enterprise as a whole.[137] However, these innovations remained isolated experiments that had no follow-up in the craft of metalwork fittings. Only the use of multiple metalwork doors in the interior of a religious building was picked up, as shown in the *madrasa* and *khānqāh* of Sultan Barqūq (786–88/1384–86) where both the *sahn* and the façade are decorated with multiple identical metalwork doors and window shutters, respectively.

Since the budget of sultans would normally have exceeded that of the amirs, it might be expected that both the quality and quantity of the fittings would reflect this. On the whole this supposition is confirmed by the metalwork fittings in the structures of Sultan al-Nāṣir Ḥasan and Sultan Barqūq in the 14th century and by those of Sultan Qāitbāy and Sultan al-Ghūrī in the late 15th and early 16th centuries. It was in these buildings that numerous innovations appear for the first time, such as an increase in the various locations for fittings and the use of multiple identical doors in the interior of a building, as well as the introduction of new designs such as that of doors of the medallion type. However, there are a number of examples for which this assumption does not hold true. Firstly, multiple fittings in diverse locations are also found in late 15th century structures commissioned by amirs.[138] Secondly, in the late 15th century a single metalworker, Zayn al-ʿAbdīn al-Zaradkāsh, produced grilles for buildings ordered by a sultan as well as by an amir.[139] This implies that metalworkers were not bound to a particular patron, let alone to a court

[135] Nuʿaymī (1951) II, 403–4; Sauvaire (1896), 219–20 for his account of the renewal of the small side doors in the east and west sides of the Umayyad mosque in 820/1417 and 819/1416, respectively. Ibn al-Ḥimṣī (1999), 252, 255, translated by Behrens-Abouseif (2004), 293–94, recorded the renewal of three doors in the southern *nasr* and the making of the south-western doors in 885/1480. The south-eastern doors were only polished as they had not been damaged during the fire. In 886/1481 the door of Bāb al-Ziyāda was restored and set in place. Unfortunately, all the doors restored in 885–86/1480–81 are now lost. For the destruction of the Bāb al-Barīd in 930/1525, see Munajjid (1949), 8 and Laoust (1952), 177.

[136] Ibn al-Ḥimṣī (1999), 235–39; Behrens-Abouseif (2004), 290–91, 293–94.

[137] Maqrīzī (1853) II, 316 notes that the construction took three years without a day of interruption. Its daily costs were 20,000 *dirhams*, which the writer approximates to 1000 *mithqāls* of gold. According to the chronicler, the sultan is also recorded to have said that he would have stopped the work altogether because of the high costs if not for the people saying that he was not capable of finishing the work.

[138] For example, in the mosque of Amir Qajmās al-Isḥāqī (884–86/1479–81) and the mosque of Amir Azbak al-Yūsufī (900/1494–95).

[139] They are installed in the *sabīl-kuttāb* of Sultan Qāitbāy (884/1479–80), (cat. no. 45/1), and in the *sabīl-kuttāb* of the mosque of Amir Qajmās al-Isḥāqī (884–86/1479–81), (cat. no. 47/7).

workshop, but could produce for whoever was willing to pay the sum stipulated by the craftsman. The same holds true for the recurrence of a particular inlaid border on doors of buildings ordered by both sultans and amirs during the first decades of the 15th century which, in all probability, were produced by a single workshop.[140] Sometimes the quality of a door ordered by an amir was higher than that of a door of identical design and technique that belonged to a building of a contemporary sultan.[141] And finally, sultans held no patent on innovation and unique compositions: the four window grilles (cat. nos. 28/2–28/5) installed in the façade of the *madrasa* and mausoleum of Amir Maḥmūd al-Ustādār (797/1394–95) were surpassed neither in quality nor in sheer abundance in any other building ordered by a sultan. Their high level of execution, their multi-coloured palette with red copper and silver inlay combined with the golden shine of the brass, in addition to their variety were all incorporated to draw in the passer-by, their visibility being further enhanced by their position low in the façade.

One patron, namely Sultan al-Nāṣir Muḥammad, strangely enough remains almost invisible in the development of metalwork fittings, for only one pair of extant doorknockers and a window grille attest to his patronage.[142] This invisibility with respect to metalwork doors and grilles is striking, given his energetic activity in building construction.[143] Besides his patronage of an impressive number of buildings, this sultan is to be credited for reviving the hypostyle mosque in Egypt and for instituting an official *dīwān* for the administration of building projects.[144] And his patronage was already legendary in Mamluk times, as al-Maqrīzī labelled him the most lavish patron of all Mamluk sultans.[145] That the latter was not only referring to constructions is shown by the large number of portable metalwork objects that carry his name and titles.[146] During his reign marked changes in the repertoire of decoration on portable metalwork objects can be detected. The role of epigraphy became more and more dominant and, apart from the allocation of more space to the inscriptions and making it the centrepiece of the design, the metalworkers developed a range of devices such as bold broad horizontal bands, large circles filled with slender radiating inscriptions resembling the rays of the sun, and tripartite roundels echoing the shape of blazons. Simultaneously, scenes depicting court life, like the seated ruler and scenes of war and the hunt, lost their popularity. What remained of figural depictions were circles of ducks. It is structural changes like these that make us wonder if during the patronage of Sultan al-Nāṣir Muḥammad similar developments were introduced on fittings like doors and grilles, and if such intricately executed doors like the one (cat. no. 24/6) in the *qibla* wall of the *madrasa* of Sultan al-Nāṣir Ḥasan, and its doorknockers (cat. no. 24/9) with their circular inscriptions and the tripartite roundels with an inscription on the central tier, already had a forerunner in the time of Sultan al-Nāṣir Muḥammad.

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[140] The identical border bands were used on the interior medallion doors (cat. nos. 32/1 and 32/2) in the mosque of Sultan al-Muʾayyad Shaykh (818–23/1415–20) and on the entrance door (cat. no. 37/1) to the mosque of Amir Jānī Bak al-Ashrafī (830/1427), both situated close to one another in Cairo. A fragment (cat. no. 60) of an identical band is housed in the Keir Collection and is published in Fehérvári (1976), 131 no. 163, pl. 58a.

[141] This is illustrated by the door (cat. no. 3/1) belonging to the complex of Sultan al-Manṣūr Qalāʾūn (683–84/1284–85) and the door (cat. no. 5/1) in the name of Amir Mankūtamur (698/1296) that are based upon the same design. The latter, however, is executed more intricately, which is especially visible in the openwork trefoils and leaves that are emphasized by engraving, thereby enhancing the suggestion of veining and texture. The mastery of the latter artist is especially apparent in the play of light and dark through the creation of different levels of relief.

[142] These are the pair of knockers (cat. no. 8/1) still attached to the entrance door of the *madrasa* al-Nāṣirīya (698–703/1299–1304). The window grille (cat. no. 16/1) was added to the Umayyad mosque in Damascus as part of a restoration.

[143] According to Meinecke (1992) II, V, 535 projects were instigated during his reign, among which were religious, social, domestic, and commercial buildings, as well as projects related to the infrastructure of the Mamluk empire.

[144] Harithy (2000), 223, 226.

[145] Maqrīzī (1934–72) II/2, 537.

[146] For a list of 28 metalwork objects in his name, see Wiet (1931), 27 and 200–6. For additions to this list, see Atıl (1981), 90 note 1. For a hitherto unpublished incense box in the sultan's name, see Allan (1982), 84–85, no. 14.

As already alluded to above, the building and restoration activities of sultans were spread over a wide geographical area. As these activities also included the installation of metalwork fittings, the question arises whether this patronage led to the exchange of designs or even to the dissemination of a court style. As so many objects are lost today, this question can be discussed only in the cases of Sultan al-Manṣūr Qalāʾūn, Sultan al-Muʾayyad Shaykh and Sultan Qāitbāy, for metalwork fittings produced under their patronage still remain in a variety of buildings in different cities. When the extant fittings in Cairo (cat. nos. 3/1 and 3/2) and Hebron (cat. nos. 4/1 and 4/2), commissioned in Sultan al-Manṣūr Qalāʾūn's name in 683–84/1284–85 and 685/1286, respectively, are compared, there is nothing in their design or decoration that points to the possible transfer of a court style.[147] The type which may be termed the overall star pattern door remained exclusive to Cairo, while much less metal was used on the metal bands door in Hebron. Furthermore, the choice of titles on these doors differs considerably. Nor is there an overlap in the design and decoration of the doorknockers in these two buildings. The fittings ordered in the name of al-Muʾayyad Shaykh include five doors, three of which are doors of the panelled type situated in Damascus, while two are of the medallion type and in Cairo.[148] There is no indication whatsoever of any influence going either way as the technique, design and decoration on these doors differ from one another. Moreover, it is important to note that although al-Muʾayyad Shaykh was involved in the production of two doors of the panelled type in the Umayyad mosque which predate the ones in Cairo, no exchange of ideas took place, since neither this type of door nor any of their characteristics were transferred to the doors in Cairo.

The situation differs in the case of Sultan Qāitbāy. Although many metalwork fittings were installed in his name outside Cairo, as is recorded by the sources, extant fittings are found only in Cairo and Jerusalem, the latter being a door of the metal bands type in the *madrasa* al-Ashrafīya (887/1482).[149] The latter features meticulously engraved inscription bands, executed in a new style featuring elongated vertical *hastae* that cross at the top where they interlace into a knotted design. Although this particular imposing execution is unique, it shows clear resemblances with the inscriptions engraved on a number of portable objects for the same ruler where the crossed tops form pincers encircling small flowers.[150] This distinctive ductus of an iconic script with strong royal connotations that immediately identifies an object related to Sultan Qāitbāy – without the necessity of having to read the inscriptions themselves – was something new, its recorded use dating back to 887/1482, the year in which the candlesticks were made for the mausoleum of the prophet in Medina plus the said door in Jerusalem. It seems that the dissemination of this graphic image,

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[147] The extant fittings in Cairo are a door (cat. no. 3/1) and doorpins (cat. no.3/2). Those in Hebron also consist of a door (cat. no. 4/1) and doorknockers(cat. no. 4/2)

[148] As a viceroy he ordered the central door (cat. no. 29/1) in the east wall of the Umayyad mosque of Damascus in 808/1405. His name also occurs on the much smaller southern side door (cat. no. 31/3) in the west wall of the same mosque made in 819/1416, and one in the east wall, datable to 820/1417, both of them ordered in his capacity as sultan. The two doors of the medallion type (cat. nos. 32/1 and 32/2) in Cairo were made between 818/1415 and 823/1420 and were installed in the vestibule of his mosque near Bāb al-Zuwayla.

[149] The known fittings are: doors of the medallion type in his *madrasa* and mausoleum (874–79/1470–74), (cat. no. 41/1) and in his *madrasa* in Qalʿat Kabsh in Cairo (880/1475), (cat. no. 43/1); doors and shutters with metal bands (cat. nos. 41/3–41/5, 41/7–41/13, 41/15–41/19, 41/21, 41/23–41/24) in his *madrasa* and mausoleum (874–79/1470–74) in Cairo and in his *madrasa* in Jerusalem (887/1482), (cat. nos. 49/1–48/2); doors in the Umayyad mosque in Damascus that were restored on his indication in 885–86/1480–81 but that have not survived; a decorated grille (cat. no. 45/1) in his *sabīl-kuttāb* in Cairo (884/1479–80) and a grille for the mausoleum of the Prophet in Medina, as recorded by Ibn Iyās (1960–92) III, 188, 203–4, translated by Wiet (1945) 206, 225, 226; doorknockers on the doors of his *madrasa* and mausoleum (874–79/1470–74), (cat. nos. 41/2, 41/6, 41/14, 41/20, 41/22, and on the entrance door of his *madrasa* in Qalʿat Kabsh in Cairo (880/1475), (cat. no. 43/2); and, according to the description in the *waqf* published by Ibrāhīm (1961), 420, rings of inlaid brass or bronze on the interior doors of the *madrasa* al-Ashrafīya in Jerusalem (887/1482) that have not survived.

[150] The following objects carry this type of inscription: two undated pyramidal lamps, in Cairo, Museum of Islamic Art inv. nos. 383 and 384 and published in Wiet (1931), 33–36, pl. XVI and 36–37, pl. XVII, respectively; two candlesticks, dated 887/1482, and made *waqf* for the mausoleum of the prophet in Medina, in Cairo, Museum of Islamic Art inv. nos. 4072 and 4297 and published in Wiet (1931), 107–9 and pl. XXXIII and 118 with pl. XXXIV, respectively; an undated bowl, in New York, The Metropolitan Museum of Art, inv. no. 91.1.565 and published in Atıl (1981), 102–3. For possible sources of inspiration for this newly developed script, see Newhall (1987), 183–84.

both on portable objects and on a fitting, to Jerusalem and Medina was a deliberate act, perhaps purposely designed by a calligrapher for objects intended for religious monuments outside Cairo to underline the sultan's majestic status. This might explain the absence of this style on Mamluk metalwork fittings in Cairo, but it should also be remembered that the buildings in question were constructed well before 887/1482, the year in which the first surviving occurrence of this script is recorded.[151]

5.4 THE INDUSTRY AND ITS DEVELOPMENT

As has been discussed above and in preceding chapters, the industry of metalwork fittings in general had a predominantly local orientation, being aimed at mass production to meet the demands of the building industry, and was conservative with respect to designs. These qualities, for all their advantages, give a rather static picture of the industry, and this does not match reality. The extant objects show that the craft did go through different phases of development and stagnation in which periods of experimentation and progress alternated with more languid times. In what follows four different phases in the manufacture of fittings will be distinguished and if possible explanations for the changes will be given. These phases can be differentiated only for Cairo as it is only in the first capital city that extant evidence is available in sufficient quantity to validate such a distinction.

Before addressing this topic it is important to discuss the discrepancy in the extant material between Cairo, on the one hand, in which the bulk of the objects is found, and Damascus, Aleppo, Jerusalem, Tripoli, and Hebron, on the other hand, cities which lag far behind in this respect. The disparity can partly be explained by the simple fact that the majority of religious, social, and commercial buildings were commissioned in the first capital where royal patronage was most profound. Moreover, the city of Cairo was exempted from the devastating physical damage inflicted by Crusaders, Mongols, and Timurids, from which Damascus, Aleppo and Jerusalem needed to recover so that money could flow to constructions, some of them extravagant. The numbers almost speak for themselves: a total of 713 new constructions is recorded for Cairo during the Mamluk period, while Damascus and Aleppo are credited with 163 and 130 buildings, respectively.[152] While Cairo suffered the greatest dissipation of Mamluk buildings – both in numbers and in percentage – during and after the Mamluk period, with 223 extant buildings it still outnumbers Damascus and Aleppo, let alone the other centres, by far.[153]

Besides the disparity in the number of extant buildings, the depredations visited especially on Damascus and Aleppo also account for a substantial loss of fittings in these cities during the Mamluk period. Firstly, the fires that were so common a disaster in medieval cities caused the disappearance of many buildings and fittings alike. A vivid description is given by Ibn Ṣaṣrā who quotes Shaykh ʿAlāʾal-Dīn b.

[151] Besides the dissemination of a royal script, another decorative motif consisting of an arabesque knot is linked to the reign of Sultan Qāitbāy for it is found on a door (cat. no. 41/1) and a window shutter (cat. no. 43/3) in buildings ordered by the sultan in Cairo, on coins, one of which is dated 896/1490–91, and on an undated inlaid bowl which is in Istanbul, Museum of Turkish and Islamic Art, inv. no. 2959 and published in Museum (2002), 192–92. For the coins, see Balog (1964), 350–51, nos. 813–15. As the name of the mint is absent on the coins and the provenance of the bowl is not known, we remain in doubt whether this motif was used in the capital city only or whether it was spread in the provinces as well. Its use on small but highly official documents such as coins does, however, imply the state embraced the motif.

[152] Meinecke (1992) II, pp. VII–VIII. For Jerusalem the total number of newly commissioned constructions in the Mamluk period is 91, while Tripoli and Hebron were endowed with 34 and 13 new buildings, respectively.

[153] Meinecke (1992) II, p. VII lists the following number of extant and vanished buildings. For Cairo, 223 extant and 490 vanished ones; Damascus 57 extant and 106 lost ones; Aleppo 58 extant and 72 vanished ones; Jerusalem 67 extant and 24 vanished ones; Tripoli, 26 extant and 8 vanished ones; for Hebron 6 extant and 7 vanished buildings are listed.

Aybak describing the fire that burnt the mosques of Tankiz and Yalbūghā: "Its marble and copper became cracked and fissured like the folds of liver".[154] The burning of the Umayyad mosque in Damascus – or parts of it – is described numerous times.[155] Here one may cite the loss, and the subsequent renewal, of some of the doors of the Umayyad mosque during the reign of Sultan Qāitbāy, as recalled by Ibn al-Ḥimṣī.[156] Markets of metalwork objects, such as the bazaar of arms and the market of the coppersmiths also fell prey to the disastrous effects of fires. The consequence was not only the loss of life and possessions but also the impoverishment of the merchants.[157]

Secondly, Damascus and Aleppo suffered tremendously from the attacks and seizure of these cities by the Mongols and Timurids. During the siege of Ghazān in 699–700/1299–1300 entire neighbourhoods of Damascus were damaged and plundered, as related by al-Dhahabī, an eyewitness of the events. He tells of the plundering of the al-Ṣāliḥīya quarter, the removal of windows, and the subsequent breaking and scorching of possessions.[158] Fires were set in numerous religious buildings and again the markets were affected as fines were imposed on them as tribute for the Mongols.[159] The same author also describes the removal of fittings, like doors, pieces of marble, and windows, which were carried away and offered for sale at low prices.[160] Ibn Shihna relates that this plundering was not only instigated by the Mongols: after the Mongols had left Aleppo it was Sultan Baybars who ordered the detachment of iron plaques and nails from the Bāb al-Qinnisrīn in Aleppo to be taken to Damascus and Egypt.[161] Metalwork fittings, too, might well have been among the objects taken on the orders of Tīmūr as booty from the shops and workshops in Damascus to be carried off to Samarqand in addition to the official teachers of the arts.[162] For Aleppo, the situation might even have been worse, as the recurring Mongol invasions of Aleppo in 1260, 1262, 1280, 1299, and 1312, and the ensuing insecurity put a halt to urban development until the first half of the 14th century.[163]

Besides these devastating raids from external enemies, Damascus and Aleppo also had to cope with internal upheavals and strife, which again caused deep distress and severe damage. Both government troops and the population were responsible for looting the viceregal palace in Damascus in 791/1389, from which everything was taken.[164] In the same paragraph Ibn Ṣaṣrā notes that the houses of amirs fell victim to this chaos, for they were plundered of money and furnishings. According to the same author, some houses in Damascus were stripped thoroughly: "They pulled the lattices off doors, took nails from the ceiling and the woodwork". By ordering the deliberate removal of metalwork fittings from the viceregal palace in Damascus to benefit his own buildings activities in Cairo, Sultan al-Malik al-Ashraf Shaʿbān encouraged the stripping of buildings that were still in use.

Finally, a severe loss of objects, which befell all cities, is also caused by their re-use in times of economic dearth, when both base and precious metals were in such demand that objects were melted down for the purpose of striking coins, something which must have affected all cities. In 839/1435 people in Cairo

[154] Ibn Ṣaṣrā (1963) I, 118 and II, 84.
[155] Idem I, 155–57; II, 117.
[156] Ibn al-Ḥimṣī (1999), 252, 255; Behrens-Abouseif (2004), 293–94.
[157] Ibn Ṣaṣrā (1963) I, 155, 158; II, 117–18.
[158] Dhahabī (1948), 369.
[159] Idem, 371. Upon the market of the lance-makers 100,000 *dirham*s was imposed.
[160] Idem, 375.
[161] Ibn Shihna (1933), 33.
[162] Mignanelli in Fischel (1956), 219, 229. According to Clavijo (1859), 160, a huge metalwork door was recorded to have been carried off by Tīmūr from Bursa to Samarqand.
[163] Sauvaget (1941) I, 156, 159–60.
[164] Ibn Ṣaṣrā (1963) I, 23 and II, 13.

were even "prevented from making vessels and instruments of silver, and this was carried off to the mint to strike *dirham*s".[165] Even inlaid objects were not spared during moments of distress, for according to al-Maqrīzī the level of poverty during the first decades of the 15th century was such that it prompted people to pick the thin layers of precious metals from inlaid bronze and brass vessels to sell them for lucrative prices.[166]

Despite all the depredations, it is worthwhile to compare the decorated metalwork fittings still extant in Damascus, Aleppo, and Jerusalem with the survival rate of buildings in these cities in general. Almost all fittings extant in Damascus are part of the restoration of the Umayyad mosque. Most of these doors were renewed in the early 15th century, just years after Tīmūr's troops had plundered Damascus. The metal sheets that face the wooden supports are somewhat thin, especially when compared to the much thicker plaques that were attached to the central door in the west wall that was restored in the early Ottoman period. Irrespective of their thinness the metalworkers did not economise on the quantity of plaques, for they cover the entire surface of the door. This deliberate choice for an overall covering, despite the availability of much cheaper models for doors that required far less material irrespective of the poverty and chaotic circumstances after the sack of Damascus, shows the patrons' awareness of their role in the maintenance of one of the most significant Islamic monuments.

In Aleppo, the few extant fittings, the majority of which date to the late 15th century, reflect the actual increase in building activities that had already started earlier in the 15th century.[167] Its profitable trade with Venice, exporting its own produce such as cotton and pistachio nuts, acting as a transit mart for silk from Persia, and being the point of departure or arrival for the great caravan routes to the East, brought wealth and activity to the city. This resulted in an intensification of construction, with a considerable increase in the number of commercial buildings.[168] For Jerusalem, too, the fittings are a reflection of significant building activity; most of the small group of extant decorated metalwork fittings are found in buildings belonging to the Baḥrī era, a period in which more activity in construction took place in Jerusalem than in other periods of Mamluk rule.[169]

Although we should be aware of the severe loss of doors, grilles, and knockers even in Cairo, the number of extant fittings in the capital city is sufficient at least to distinguish four broad phases in the development of the craft of fittings throughout the Mamluk period. Before discussing each phase shortly, it is important to take note of one further impediment in the identification of periods of rise and decline. For the time being, at least, it is impossible to pinpoint the exact time of the introduction and development of certain types or styles of fittings. This is exemplified by the doors of medallion type in which the time lapse of almost one century between the earliest specimen in the late 13th century and the rise of this type during the late 14th century (when they re-appear for the first time in a staggering number of six identical copies in a

[165] Maqrīzī (1972) IV, part 2, 977.
[166] Maqrīzī (1853) II, 105.
[167] Although the city of Aleppo and its constructions were dealt with extensively by two 15th -century writers, i.e. Sibṭ Ibn al-ʿAjamī and Ibn Shihna, explicit references to metalwork fittings are found only sporadically in these sources. Both do, however, mention the iron gates of the citadel, with Sibṭ Ibn al-ʿAjamī even referring to their make: "three of iron and two of forged iron (*ḥadīd muḥaddad*). See Ibn Shihna (1933), 42–43 and Sibṭ Ibn al-ʿAjamī (1950), 161.
[168] Meinecke (1992) II, p. VII records 47 buildings during the Baḥrī period and 81 new constructions during the Burjī period. Of the 11 *khān*s that were built, nine were constructed in the 15th century, and seven of these were built during the reigns of Sultan Qāitbāy and al-Ghūrī.
[169] Meinecke (1992) II, p. VII, counts 58 new constructions in the Baḥrī period to 23 in the Burjī period. Burgoyne & Richards (1987), 69, count 68 buildings in the Baḥrī period to 18 buildings in the Burjī period.

single building) is not easy to understand.[170] The tracing of traditions is further complicated by photographs of fittings the authenticity of which cannot be checked because their whereabouts are unknown but whose attributions suggest that certain traditions were more widespread than is suggested by the extant specimens. This can be illustrated by photographs and drawings of four doors that are identical to the overall inlaid door (788/1386) installed at the entrance of the *madrasa* and *khānqāh* of Sultan Barqūq, but that are attributed to the reigns of Sultan al-Manṣūr Qalāʾūn and Sultan al-Nāṣir Ḥasan, respectively.[171] The confusion is made worse because the authenticity of the door currently in Sultan Barqūq's building has been questioned by a number of scholars.[172] If the doors attributed to Sultan al-Manṣūr Qalāʾūn prove to be genuine, it would push the introduction of the overall use of inlay on doors of the overall star pattern type back to the end of the 13th century, so that it would coincide with the rise of inlaid portable objects in Cairo. It would also show that this particular model was in use for more than a century and that it was deemed so successful that it was copied many times. On the other hand, if the authenticity of the doors attributed to Sultan al-Nāṣir Ḥasan could be proven, it could be argued that this patron was responsible for instigating even more experiments than he is held responsible for now. The third theory, in which all doors prove to be authentic would show the success of a model reinvigorated several times in a time frame of only one century. Only once the whereabouts of these doors becomes known, and access is granted to allow a proper study, will it be possible to answer this query properly.

Notwithstanding the gaps caused by the loss of fittings and the start of certain traditions, four different stages can be distinguished in the industry of Mamluk fittings. Broadly speaking, the first stage entails an entire century, from the beginning of the Baḥrī period up to the second reign of Sultan al-Nāṣir Ḥasan (755–62/1354–61). This period sees the formation of a Mamluk style for fittings. On the one hand, a strong reliance upon older models, whether executed in metalwork or in a variety of other materials, is apparent. This is for example obvious in the continued production of doors of the overall star pattern type and hangers of the holes-and-bosses type. Within the former, a search for symmetry and an increased desire for legible messages positioned in oblong bands already shows the beginning of the Mamluk aesthetic. On the other hand, this period also features experiments in design and technique which show the gradual definition of a clear Mamluk style. A predilection for a decorated surface in general and for inscriptions in particular is visible on the grilles of the bosses-and-bars type. Radial inscriptions are introduced on the suspension disks of doorknockers. And there is the first occurrence of grilles based on star patterns. On a technical level, metalworkers experiment with the qualities of the inlaying technique. Some of these

[170] The earliest door of the medallion type is the one made for Amir Sunqur al-Ṭawīl (before 699/1299–1300), now housed in Cairo Museum of Islamic Art inv. no. 2389. The second occurrence of this type is the set installed in the *madrasa* and *khānqāh* of Sultan Barqūq (788/1386).

[171] Both Muḥammad (1986), 341, pls. 58a–c and Bourgoin (1873), pl. 79, attribute it to the former ruler whereas both Migeon (1907) II, 197, 232, pl. 170, and Cairo (n.d.), pl. 118, attribute the door to Sultan al-Nāṣir Ḥasan. Only in the case of Muhammad (1986), pl. 58b and Migeon (1907), pl. 170, are the names of the respective sultans legible. Instead of titles, Bourgoin drew repetitive meaningless words in the rectangular bands, whereas the inscription bands in Cairo (n.d.), pl. 118 cannot be verified as they were cropped from the photograph. Only Migeon gave the whereabouts of the door, i.e. the Museum of Islamic Art in Cairo. Regrettably its presence there today cannot be confirmed for in March 2003 access to the museum's storerooms was unfortunately denied. The existence of a number of metal-plated doors piled up in the storerooms was acknowledged but owing to their excessive weight it is impossible to move them. So its authenticity remains unconfirmed.

[172] See Rogers (1976), 313 note 3, who stated that there was one other door in a private collection in Beirut in the seventies that has pretensions to be the original. In a private communication, Prof. Rogers told me that at the time it was in the possession of Ibrahim Beyhum. Fehérvári in Rajab (1994) 153–54 claims that the door currently in Kuwait, the Tareq Rajab Museum, is genuine. Much earlier, in 1893, Van Berchem (1903) I, 304–5, no. 197, had seen for sale in the market a door, damaged and much restored, faced with metal revetments, some of which carried the name of Sultan Barqūq, inclusive of two metal bands with the titles of the sultan and the date Rabīʿ I 788/10 April to 9 May 1386. This he attributed to the *madrasa* and *khānqāh* of Sultan Barqūq. Thus there seem to be at least three doors in existence with a claim to being part of the original furnishings of Barqūq's *khānqāh and madrasa.* It is quite unclear whether the door Van Berchem saw is identical with that in the Lebanese private collection. It cannot refer to the Tareq Rajab door, since that is in excellent condition (not surprisingly, if it was made for the Chicago World Fair) whereas Van Berchem noted that the door he saw was decrepit.

experiments were once-only attempts that remained highly individual and did not have a lasting effect on the industry by igniting a new fashion. They show, however, the metalworker's inclination to widen the scope of his craft, a desire stimulated less by the influx of money from a patron but more by the wish to leave a personal signature through the creation of an outstanding individual work of art. During this period the scope of the craft was still somewhat restricted, which is reflected not only in the limited number of fittings in a building but also in the locations selected for metalwork fittings, the installation of which was restricted to the façade.

In the second period, from the second reign of Sultan al-Nāṣir Ḥasan until the end of the 14th century, the craft of fittings matures and the Mamluk style is more clearly defined. Not only is the quantity of fittings installed in a single building increased but also the reciprocal effects of installing identical doors or grilles in a single space is capitalised on for the creation of visual unity and rhythm. In addition, the locations in which the fittings are positioned becomes more varied, i.e. the entrance portal, the façade, vestibules leading to the *sahn* of the building, and the *sahn* itself. Another remarkable feature of this stage is the sustained use of inlay on different sorts of fittings which were used both in the façade and in the interior.[173] The initial picture of an all-over exuberance should, however, be adjusted somewhat, for the removal of a huge quantity of fittings from Damascus to support the building activities of Sultan al-Malik al-Ashraf Shaʿbān in 775/1374 must have been related to financial problems or sheer laziness.

The increase in the quantity of metalwork fittings in a given monument coincided with, and was perhaps the reason for, the creation of different types of fittings introduced during this period, such as the medallion type and the window shutter with inscription bands. It is remarkable that these new types are characterised by a reduced use of metal so that the underlying wood becomes partly visible. This aesthetic seems to have been deliberate. New types were welcomed for the sake of variety, but when used in large quantities the advantage of decreasing the costs of manufacture, and the amount of metal applied to them, might well have been welcomed by the patrons. The success of the new medallion type was such that within a few years doors with this design were placed in the most conspicuous position of a building, i.e. in the entrance portal, where they replaced doors of the overall star pattern type. At first the novelty of the design might well have inspired this choice, but its popularity, especially during the first half of the 15th century, might also be linked to the pressing economic situation.

Allan has argued that a shortage of metal, especially of silver and copper, was the major factor in the decline of the metalworking industry from the period of Barqūq onwards, a decline he claims is based on the quantity, the quality of execution, and the dearth in silver inlay.[174] The industry did indeed go through a crisis, as will be seen below, but the evidence that bears on fittings shows that this was not yet the case in the late 14th century. Right up to the end, not only is there a considerable output of, and an inclusion of silver inlay, in fittings, but also the standard of execution remains high. It is curious that this exuberance in Mamluk fittings is noticeable after the Black Death had taken a severe toll on the population of the Mamluk empire, Cairo included, in 748–49/1347–48. This outbreak does not, of course, stand on its own but is related to the increased building activity after the plague, which has been explained as being related to private initiatives such as bequests of the victims of the plague and the use of inherited wealth by survivors

[173] Earlier specimens with inlay are extant but these should be understood as singular occurrences, such as the use of copper inlay both on the entrance door to the *khānqāh* of Baybars al-Jāshankīr (707–9/1307–10) and on the star revetments of the door in the mosque of Amir Alṭunbughā al-Māridānī (738–40/1338–40), and the use of silver inlay on the grille of al-Malik al-Muẓaffar Ḥājjī (747–48/1346–47).
[174] Allan (1984), 88–89, 91–92.

for constructions.[175] In addition, the accumulated wealth of the state, owing to the confiscation of property of those who died of the plague also stimulated the building boom and the lavishness of its fittings. Strangely enough, a decline in the artistic quality of metalwork fittings owing to the death of craftsmen as a result of the Black Death cannot be observed in this period.

This picture of an industry full of activity, with metalworkers experimenting and money flowing, and thus fostering the development and proliferation of metalwork fittings, changed dramatically during the first decades of the 15th century. Firstly, the quantity of metalwork fittings installed in a single building diminishes, and the locations in which fittings are installed are curtailed as well. When multiple doors are installed, preference is given to those containing less metal.[176] Secondly, irrespective of the continuing use of a variety of fittings in Cairo, the metalworkers seem to embroider on themes that had already achieved definitive form in the 14th century. The period of experimentation has come to a close and although the quality of execution is sometimes still high, archaism sets in. And thirdly, although the inlaying technique was still occasionally employed, the few extant specimens show that its employment was not only erratic but that its application was sparse.[177] Its use during this period, however frugal, is remarkable for there are no inlaid portable objects extant from this period. A dearth in the craft of inlaying is observed, too, by al-Maqrīzī for these decades, as he mentions that only a small number of the inlayers remained in their craft and the once so popular use of inlaid metals had become rare.[178] The occasional employment of silver inlay on metal fittings in this period irrespective of the need for precious metals elsewhere might well be explained by archaism. In addition, the high visibility of these fittings in public religious buildings might also have stimulated patrons to encourage the use of silver, simply to impress their opulence upon the beholder. All in all, however, this phase is characterised by conservatism and a decline in the quantity, technical quality, and size of metalwork fittings, something that can also be observed in the architecture of the period and in portable metalwork objects.[179] This decline does not stand on its own but is part of a wider pattern of economic dwindling and the downfall of formerly successful industries like that of textiles.[180] This economic decline, in combination with factional strife among leading Mamluks and in addition to instability and poverty, had a negative impact on the patronage of the arts and architecture in general.[181]

During the period starting with the reign of Sultan Qāitbāy and ending with Sultan al-Ghūrī's era, the industry of metalwork fittings flourishes one more time. This is apparent in the quantity of fittings and their locations: their number in a single building exceeds those of the preceding period by far, while simultaneously the locations in which the doors especially are installed are again much more varied. There is room for experimentation with ornament again, such as the augmentation of the decorative qualities of

[175] Dols (1977), 266.
[176] The mosque of Sultan al-Mu'ayyad Shaykh (818–23/1415–20) still continued the tradition of multiple variable fittings, housing a door of the overall star pattern type (cat. no. 24/1) at the entrance and multiple medallion doors (cat. nos. 32/1 and 32/2) in the interior. Its entrance door was, however, taken from the *madrasa* of Sultan al-Nāṣir Ḥasan. If multiple decorated fittings are present, the use of metal is restricted, as can be seen in the *madrasa* of Sultan al-Ashraf Barsbāy (826–27/1423–24), where a medallion door (cat. no. 35/1) is set at the entrance while simple doors with metal bands (cat. nos. 35/3 and 35/5) were installed in the interior.
[177] It is found on the two medallion doors (cat. nos. 32/1 and 32/2) in the vestibule of the mosque of Sultan al-Mu'ayyad Shaykh (818–23/1415–20), and on the entrance door (cat. no. 37/1) to the mosque of Amir Jānī Bak al-Ashrafī (830/1427).
[178] Maqrīzī (1853) II, 105. According to the same author, pp. 98–99, the use of gold and silver in general became rare too: during the reign of Sultan al-Mu'ayyad Shaykh the annual distribution of gold and silver girths to the amirs had become a rare event, though it had been customary up to the reign of Sultan Faraj b. Barqūq. The use of gold and silver saddles became uncommon also after the devastating famine in 806/1403.
[179] For the architecture, see Meinecke (1992) I, 153–55. For the decline both in quality and quantity of portable objects, see Allan (1984), 86.
[180] Both Dolls (1977), 265, and Ashtor (1981), 270, 273, explain the downfall of the textile industry as being due to the dearth of skilled labourers and the technological stagnation of the industry.
[181] Holt (1991), 324.

grilles of the bosses-and-bars type with the addition of trefoils, gratings, and openwork bulbs.[182] Occasionally, too, traditions are revived that had disappeared in the preceding period. The re-introduction of the overall star pattern door in the buildings of Sultan al-Ghūrī should be understood as a deliberate choice to revive the aesthetic common during the heyday of the Baḥrī period.[183] There is room for further experimentation apparent in the blending of styles, as exemplified by the mixture of the design of the overall star pattern type and that of the medallion type.[184] The spirit of this time is expressed in the increased presence of signatures. And although specimens are not extant, there is written evidence of the revival of the inlaying technique on doorknockers, something that can also be observed on portable objects made during Qāitbāy's reign.[185]

The flowering of the craft of metalwork fittings is linked closely to the lavish patronage of architecture during this time. First, there is a clear rise in building activities during the reign of Sultan Qāitbāy and al-Ghūrī.[186] But a marked change in the architecture is also apparent in the increased proliferation of ornament and the high technical standard of execution. Innovative features such as the addition of floral motifs in marble intarsia, a medium that had hitherto been dominated by geometry, give evidence of a creative spirit.[187] In portable metalwork objects a similar attitude of reinvention and innovation is visible.[188] The high level of technique and the clarity of design, especially during the reign of Sultan Qāitbāy, gives evidence of a renewed interest in this field. As was the case for fittings, again a blending of traditional and innovative features is apparent, as well as the addition of characteristic decorative elements, such as knotted arabesques and the majestic-looking *thulth* featuring pincer heads.

The blooming of the craft of fittings in this late Mamluk period is part of a Zeitgeist in which the arts and crafts could thrive again. This development should be understood by the personal interest of these two rulers in architecture and the arts and their willingness – and capacity – to invest in it. By doing so, they stimulated others to invest on a more lavish level as well.

CONCLUSION

Both metalworkers and patrons can be held responsible for moving the craft of metalwork fittings on to a new plane. The role played by the patrons was that of facilitator: they ordered and provided the financial means to build or restore buildings in which the metalwork fittings were installed. The input of money resulted not only in an increase in the quantity of metalwork doors, grilles, and doorknockers but also had an effect on their technical execution itself. Moreover, it created the necessary basis for realising costly experiments with precious metals. By dispatching groups of metalworkers to other cities for restoration

[182] This is visible on the grilles (cat. nos. 49/1 and 49/2) in the mausoleum of Azdamur min Mazīd in al-Anṣarī (893/1488), now in Istanbul, Museum of Turkish and Islamic Art, inv. no. 359 and simpler ones (cat. nos. 50/3 and 50/4) installed in Cairo, the mosque of Amir Azbak al-Yūsufī (900/1494–95). On the grilles in al-Anṣarī the use of gold reappears, something that had not been found for over a century.
[183] Such a quotation was also not uncommon earlier in the Mamluk period, as Meinecke (1985), 170 shows for Sultan Barqūq in whose *madrasa* the *qibla* wall of the *madrasa* of Sultan al-Manṣūr Qalā'ūn was quoted.
[184] On the entrance door in the *madrasa* of Abū Bakr b. Muzhir (884/1479–80).
[185] For a reference to rings of inlaid brass or bronze, found in the *waqf* of the *madrasa* of Sultan Qāitbāy in Jerusalem, see Ibrāhīm (1961), 420. For a bowl in the name of Sultan Qāitbāy, lavishly inlaid with gold and silver, now in Istanbul, the Museum of Turkish and Islamic Art, inv. no. 2959, see Museum (2002), 192–93.
[186] Meinecke (1992) II, p. VI, records 230 newly built constructions and 107 restoration projects for buildings for these two sultans.
[187] For the introduction of floral motifs, see Meinecke (1992) I, 178. Newhall (1987), 165 observed the creative freedom of artisans during Sultan Qāitbāy's reign.
[188] For a discussion of these reinventions and innovations, see Newhall (1987), 182–96.

purposes and by ordering fittings made in one centre to be installed in another, such as the huge pair of inlaid doors that were made in Damascus but installed in the *qibla* wall of the *madrasa* of Sultan Ḥasan in Cairo, they added movement to an otherwise local craft. With respect to the metalworkers, they began experimenting with techniques and designs, sometimes rather bold ones, and thus distinguished themselves from their contemporary metalworking colleagues in Egypt and Syria.

There is no evidence in the literary sources studied so far that suggests that the manufacture of fittings was a separate, specialised *métier* within the craft of metalworking. The objects themselves reveal, indeed, a connection between fittings and portable objects. Not only is there an overlap in patronage, but correspondences in techniques and decorative motifs, in addition to the existence of a metalworker like Muḥammad b. al-Zayn who signed objects in both categories, sustain this link. Sometimes then, a single person might produce a variety of objects. But it seems more likely that the exchange of ideas was facilitated by metalworkers producing various objects, both portable and fitted, in one and the same workshop. All in all, the direction of influence was undoubtedly from the craft of portable objects where most innovations were first introduced and developed, to that of fittings. The more conservative approach to the craft of fittings, which did not, however, exclude experimentation, can be explained by the public context, in which traditional designs were nursed. It also partly explains why some traditions, such as the use of silver inlay at the end of the 14th and beginning of the 15th century, continued on fittings when this had already been abandoned on portable objects.

The loss of objects hinders the study of metalwork fittings severely, especially in Damascus, Jerusalem, and Aleppo, where the number of extant objects is far too few and scattered to permit any analysis of the broader picture of the industries there during the Mamluk period. Only for Cairo has it proved to be possible to distinguish four broad phases, two of which are indicative of a flowering of the craft, one in the second half of the 14th century and one in the second half of the 15th century. This blooming is linked closely to the willingness, and capacity, of individual patrons to invest lavishly.