

# MEDIEVAL ARABIC *ṬARSH*: A FORGOTTEN CHAPTER IN THE HISTORY OF PRINTING

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Verses from poems by Abū Dulaf al-Khazrajī (10th cent.) and Ṣafī ad-Dīn al-Ḥillī (14th cent.) suggest that unethical amulet peddlers printed amulets from wooden blocks and cast tin plates to sell to naive buyers who thought they were getting handwritten charms. This is the likely origin of the printed amulets that have been identified in various collections since the 1890s. If the *ṭarsh* described by the poets were indeed printblocks, the verses would serve to date medieval Arabic printing and show its geographical extent. The hitherto unsuspected casting of printblocks from tin, if confirmed by technical examination, would enhance appreciation of medieval Islamic technology. The locus of printing technology among the Banū Sāsān “underworld” possibly explains the lack of broader influence and eventual disappearance of printing.

“Among us, without publicity or boasting, is the engraver of *ṭarsh*”

Abū Dulaf al-Khazrajī (tenth century)

“How many times has my hand written, by *ṭarsh* of tin, Syriac followed by the language of phylacteries”

Ṣafī ad-Dīn al-Ḥillī (fourteenth century)

THE HISTORY OF TECHNOLOGY IS USUALLY ABOUT discovery and invention. Sometimes it is about failure. But there is a middle ground, as well, and it is in this middle ground that the history of medieval Arabic block printing lies.

Judging from palaeography and the eighth-century date of introduction of paper to the Islamic world, Arabic block printing must have begun in the ninth or tenth century.<sup>1</sup> It persisted into, but possibly not beyond, the fourteenth century. It had certainly disappeared without a trace by the beginning of the eighteenth century when the first printing press was established in Istanbul. Hence, with four centuries or more duration, printing certainly was not a techno-

logical failure. Yet it had so little impact on Islamic society that today only a handful of scholars are aware it ever existed, and no definite textual reference to it has been thought to survive.

The thesis proposed here, that the word *ṭarsh* meant “printblock” in the dialect of the medieval Muslim underworld, makes possible for the first time a history of medieval Arabic printing. However, were it not for the preservation of some of the actual prints, which were first identified by the orientalist Josef Karabacek in 1894,<sup>2</sup> this history would still be impossible. For the meaning of the word *ṭarsh* cannot be ascertained without knowledge of and reference to the prints themselves.

The authors of the few previously published articles and notes on medieval Arabic block printing<sup>3</sup> raised important questions about the rise and fall of the technique: Did it come from China, or was it independently invented? Could it have been the source

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<sup>2</sup> J. Karabacek, *Papyrus Erzherzog Rainer. Führer durch die Ausstellung*, Vienna, 1894, pp. 247–50.

<sup>3</sup> After Karabacek, Arabic block printing was discussed in T. F. Carter, *The Invention of Printing in China and its Spread Westward*, New York, 1925; Grohman and Arnold, op. cit.; G. Levi Della Vida, “An Arabic Block Print,” *The Scientific Monthly*, LIX (Dec. 1944), pp. 473–74; P. Lunde, “A Missing Link,” *Aramco World*, XXXII/2 (Mar.–Apr. 1981), pp. 26–27; and M. Krek, “Arabic Block Printing as the Precursor of Printing in Europe: Preliminary Report,” *American Research Center in Egypt Newsletter*, No. 129 (Spring 1985), pp. 12–16.

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<sup>1</sup> Chinese prisoners in Samarqand are said to have taught the Arabs the art of paper making in 704. G. Káldy-Nagy, “Beginnings of the Arabic-Letter Printing in the Muslim World,” in *The Muslim East: Studies in Honour of Julius Germanus*, ed. Káldy-Nagy, Budapest, 1974, p. 201. The palaeographical judgement is that of Adolf Grohman in A. Grohman and T. W. Arnold, *The Islamic Book*, [np], 1929, pp. 26–29.

from which the Europeans adopted woodblock printing in the late fourteenth century? This article will address these questions.

A more interesting question, however, is why so potentially revolutionary a technology had so little impact and disappeared virtually without a trace. Woodblock printing, after all, had a transformative impact on Chinese and Japanese cultures and prompted the invention of the equally important technique of movable-type printing in Korea, Central Asia, and Europe. Subsequently, printing revolutionized every society it encountered, including, after an abortive first experiment in Istanbul between 1729 and 1742, that of the Islamic Middle East.<sup>4</sup> It is indeed puzzling, therefore, that the same show that ran indefinitely, to standing room only audiences, in every other culture opened to a modest run and closed without reviews in the Islamic Middle East.

The indispensable sources for reconstructing the history of medieval Arabic block printing are the extant prints. But the two surviving literary descriptions of *ṭarsh* provide additional technical and social clues. Inasmuch as the secondary literature does not address technical matters, we will begin with a discussion of how the prints may have been produced. This discussion derives primarily from a close examination of the one specimen in the Columbia University Library and of reproductions of others held elsewhere, and from a consideration of the *ṭarsh* texts quoted at the outset of this article and the commentaries on them.

Most extant prints are amulets, that is, long, thin strips of paper bearing quotations from the Quran, lists of the names of God, and other religious texts designed to ward off evil. They were rolled and enclosed in metal cylinders worn on chains around the neck. One print of Quranic verses, however, resembles more a book page, with generous margins on all four sides;<sup>5</sup> and another, on a tiny square of parchment, is an amulet that was probably not rolled and encased.<sup>6</sup> The longest extant text seems to be the one at Columbia University (Plate I).<sup>7</sup> It contains 107 lines of writing, 37 on one block and 70 on another, on a single strip of paper 2" by 11 $\frac{3}{8}$ " in size, with Quranic verses in more ornamental calligraphy printed from a

third block on a separate 2" by 5 $\frac{3}{8}$ " piece of paper glued to the top of the longer strip. All of the prints—some 50 in total—have apparently been found in Egypt. A few have been discovered archaeologically in tenth and eleventh century contexts; the rest are of uncertain provenance.<sup>8</sup> No printblocks have been found.

Scholars have assumed that the printblocks were of wood. Yet medieval Muslim die and seal carvers were highly skilled in cutting fine characters into metal and stone, and the coin-shaped glass weights of medieval Egypt, which also bore several lines of writing, were presumably cast in clay molds.

The case for wood rests on several particulars. The prints are fairly large, at least compared with a coin or seal. A 2" by 6" impression seems normal. But the value of the printed amulet was probably quite low. Hence the return would not have been likely to repay the efforts of a skilled die or seal cutter. In addition, metal or other non-wooden printblocks were unknown in China, where some scholars assume the Muslims learned the technique.

Most important technically to the question of the material or materials used is the fact that the lines of writing are normally printed black-on-white. White-on-black letters occur in larger calligraphic designs, often printed from separate blocks. Moreover, the black-on-white writing is often extremely tiny. The 107 printed lines of the Columbia specimen are squeezed 11–12 to the inch, and the thickness of the lines making up each of the thousands of letters is consistently one to two hundredths of an inch!

Tiny letters also appear in relief on coins and sealings, and larger ones appear on glass weights. The producers of these items engraved the letters in reverse into a metal, stone, or clay surface. The process of stamping or casting then caused the gold, silver, copper, glass, clay, etc. to which the design was to be transferred to enter the incised grooves.

To produce inked lines on paper from a printblock in which the letters have been similarly incised, as is done in engravings and etchings, requires a sophisticated understanding of ink and paper as well as a powerful press. The printer inks the block, wipes off excess ink that has not entered the incised lines, and exerts great pressure to force the ink to transfer from the grooves in the block to the paper.

<sup>4</sup> Káldy-Nagy, op. cit.

<sup>5</sup> The specimen is in the Cambridge University Library; Lunde, op. cit., p. 26.

<sup>6</sup> Levi Della Vida, op. cit.

<sup>7</sup> It is in the papyrus collection in Columbia's rare book collection, No. 705b.

<sup>8</sup> See contribution of D. S. Richards to W. Kubiak and G. Scanlon, *Fustat-C: Fustat Expedition, Final Report*, 2 (forthcoming, 1987). I would like to express my gratitude to Prof. Scanlon for guidance in understanding the Fustat materials.



Plate I. Arabic blockprint in Columbia University Library (actual size).

Since some of the surviving amulets show a marked darkening toward the edges of the print, which the even pressure of a press would not produce, and there is no indenting of the edge of the block into the paper, which great pressure would produce, we may assume that the medieval Muslims did not print from engravings.<sup>9</sup> Therefore, the letters must have been raised from the surface of the printblock. In the case of a carved printblock, this requires cutting away the areas that are to remain white. Doing this in metal would have been an impossibly laborious task, and soft substances like clay or stucco would have chipped if one had tried to cut lines as fine as a hundredth of an inch. But for that matter, the fineness of detail seems too great for wood, as well!

But before investigating the problem of detail in detail, we must turn to an analysis of the *ṭarsh* texts because they strongly suggest that at least some of the printblocks were made of cast or molded metal rather than wood.

Abū Dulaf al-Khazrajī was a poet and vagabond who frequented the courts of the tenth century Iranian Buyid princes.<sup>10</sup> He wrote two travel accounts, one of which is totally bogus and the other replete with unlikely details. The quotation concerning *ṭarsh* is a line from his poem enumerating the types of people he counted as members of the Banū Sāsān, a medieval Islamic underworld of beggars, tricksters, and performers with whom he seems to have been quite familiar. Since his poem was filled with the argot of the Banū Sāsān, Abū Dulaf furnished his court patrons with a commentary on obscure words and practices. With the commentary his text reads:

“Among us [the Banū Sāsān], without publicity (*jahr*) or boasting (*kharṭ*), is the engraver of *ṭarsh* [variant in two manuscripts *ṭars*].”

The engraver of *ṭarsh* is he who engraves (*yaḥfiru*) molds (*qawālib*, sing. *qālib*) for amulets (*taʿāwīdh*, sing. *taʿwīdh*). People who are illiterate and cannot write buy them from him. The seller keeps back (*ḥafīza*) the design (*naqsh*) which is on it [the *ṭarsh*] so that he exhausts his supply of amulets on the common people (*nās*) and makes them believe that he

wrote them. The mold is called the *ṭarsh* [variant in two manuscripts *ṭars*].”

Prof. C. E. Bosworth has published a superb edition of Abū Dulaf’s poem with a learned and exhaustive commentary and an insightful discussion of its background. However, since he did not recognize that the subject of this verse and commentary was printblocks, he assumed that a *ṭarsh* was a mold for a three-dimensional amulet, presumably figurative with writing on it in relief. His translation of the same passage reads as follows:

“‘And of our number is the one who engraves a pattern for mass-producing amulets, without shaping them individually and without smoothing them down.’

*Ḥāfir aṭ-ṭarsh* [Engraver of *ṭarsh*]. This is the person who hollows out moulds for making amulets, and then ignorant and illiterate people buy them from him. The vendor has kept back the matrix with the pattern engraved in it, and he then sells the amulets to the common people, letting them think that he has written them out individually himself. This mould or pattern is called *aṭ-ṭarsh*.”<sup>11</sup>

The significant differences between Bosworth’s reading and that proposed here are in the verb *ḥafara* and the words *jahr* and *kharṭ*. Bosworth prefers “to hollow out” to our “to engrave,” but both are normal Arabic usages. As for *jahr* and *kharṭ*, Bosworth has translated them as “shaping individually” and “smoothing down” in keeping with his assumption that a *ṭarsh* is a mold for a three-dimensional object. Abū Dulaf glossed neither word, assuming that his audience would understand them.

The verb *jahara* from which *jahr* derives has the primary meaning “to announce publicly.” *Kharāṭa* means “to strip leaves from a branch and make it smooth”; by extension it commonly means “to smooth with a plane, to turn on a lathe, to brag.” It is not clear what either word means in the context of Abū Dulaf’s verse, but two considerations suggest the simpler interpretation proposed here.

First, since Abū Dulaf glossed the phrase “engraver of *ṭarsh*,” he must have assumed that his audience was not too familiar with the technique it denoted. Hence it is unlikely that he would have used two additional descriptive words with technical meanings specific to the *ṭarsh* process without glossing them too.

Secondly, judging from his use of the pronoun “them,” Bosworth seems to understand *jahr* and *kharṭ* to refer to the amulets or the molds rather than to the

<sup>9</sup> Arthur M. Hind, *An Introduction to a History of Woodcut With a Detailed Survey of Work Done in the Fifteenth Century*, Boston, 1935, I, pp. 3–5.

<sup>10</sup> R. W. Bulliet, “Abū Dulaf al-Yanbūʿī,” *Encyclopaedia Iranica*, I, pp. 271–72; C. E. Bosworth, *The Mediaeval Islamic Underworld: The Banū Sāsān in Arabic Society and Literature*, Leiden, 1976, I, pp. 48–79.

<sup>11</sup> Bosworth, op. cit., II, p. 201 (Arabic text p. 18).

engraver, who is the actual subject of the verse. There is no plural word in the verse for the “them” to refer to. A lack of individual smoothing and shaping would, indeed, be the mark of a shoddy charm; though the notion makes less sense in reference to a hollowed-out mold. But in either case, the Arabic words should have a pronominal suffix indicating their transitive meaning. Bosworth has supplied the “them” in his translation. While poetic requirements could have caused the deletion of the suffixes, it seems more reasonable to interpret both words as referring intransitively to the engraver.

One other difference in translation is worth noting. Bosworth’s “ignorant and illiterate,” instead of “who are illiterate and cannot write,” plays down the commentary’s specific emphasis on writing, which is repeated in the final statement that the *ṭarsh*-maker induces common people to believe he *wrote* the amulets himself. If one assumes that the amulets in question were blockprints, lack of an ability to read would have been essential in passing them off as hand-written, for it is obvious to anyone familiar with medieval Arabic handwriting that they were not written by pen. As for the word mold, *qālib* has the basic sense of “reverser.” Interestingly, the earliest French and German words for woodblock carver, *tailleur de molles* and *Formschneider*, include the concept “mold” as well.<sup>12</sup>

Perhaps it is appropriate here to stress that this point-by-point disagreement with Prof. Bosworth is in no way intended to belittle the importance or quality of his work. *The Mediaeval Islamic Underworld* is a major scholarly achievement. Moreover, so few scholars are aware of the existence of medieval Arabic blockprints, all of which have been found in Egypt rather than Abū Dulaf’s Iran, that it is not surprising that Bosworth did not realize the meaning of the passage. His linguistic note on the word *ṭarsh* indicates how close he came to the correct meaning.

“The classical lexica give for [the root] *ṭ.r.sh* essentially those meanings connected with deafness . . . but the clue to *ṭarsh* appears under [the root] *ṭ.r.s*. [the variant reading of two manuscripts], for they give *ṭarasa* as ‘to write’ and *ṭirs* as a written document, etc., or a paper which has been effaced and used again, i.e., a palimpsest. . . . Our jargon word . . . thus combines the ideas of something for producing writing and of rubbing into or engraving the surface of the mould. . . . [Fraenkel thought that words from *ṭ.r.s*.]

must be loanwords in Arabic, since they could not be satisfactorily derived from native Arabic words, and had to fall back on the speculation that they were of Egyptian origin.”<sup>13</sup>

The blocks for the extant amulets would obviously be a form of writing. The notion of reuse could refer to the multiple copies printed from the block, but that is not in keeping with the notion of effaced writing. Alternatively, it could mean that the worn blocks were effaced, by smoothing or melting, and used again. In any case, a hollowed-out three-dimensional mold for producing a charm in relief seems quite remote etymologically.

If the *ṭarsh* was effaced and reused, it was probably not made of wood. Wood engravers sometimes put a second carving on the back of a block, but it is much easier to prepare a fresh block of wood than to plane or sand a carved surface and reuse it. This hint that the *ṭarsh* may have been made of something other than wood is corroborated by the verse of Ṣafī ad-Dīn al-Ḥillī, which also comes from a popular poem he composed on the Banū Sāsān.

Ṣafī ad-Dīn, whose work provides the secondary focus of Bosworth’s study, was an Arab from Ḥilla in Iraq who died around 1349.<sup>14</sup> His poetry earned him favor at the courts of the Artuqid princes of northern Iraq and the Mamluk sultans of Cairo. He was more religious and more of a scholar than Abū Dulaf, and Bosworth suggests that his poem reflects a careful study of the beggars’ dialect more than personal experience. But on the matter of *ṭarsh* his information is quite independent of Abū Dulaf’s. Bosworth translates the line as follows:

“And in making moulds for lead in casting amulets and charms (or: in making moulds from tin for turning out amulets and charms?), how often has my hand written on the mould in the script of Syriac and then that of phylactery-writing (sc. in Hebrew)!”<sup>15</sup>

The problematic first part of the verse for which Bosworth gives two versions reads in Arabic *wa bi’ṭ-ṭarsh min al-qaṣḍīr*, which we translate here as “by *ṭarsh* of tin.”

Bosworth observes in his linguistic commentary that *al-qaṣḍīr* means tin in classical and modern Arabic.<sup>16</sup> But the matter is confused by the interlinear commentaries on obscure words that appear in several

<sup>12</sup> Hind, op. cit., I, pp. 79–80.

<sup>13</sup> Bosworth, op. cit., II, p. 249.

<sup>14</sup> Ibid., I, pp. 132–49.

<sup>15</sup> Ibid., II, p. 298 (Arabic text p. 49).

<sup>16</sup> Ibid., II, p. 327.

of the manuscripts of Ṣafī ad-Dīn's poems. The manuscripts are no more than two or three centuries old, but the original commentaries are undoubtedly older.<sup>17</sup> Yet they are probably not of Ṣafī ad-Dīn's own era. The chronology is important because block printing seems to have disappeared by the end of the fourteenth century. Thus the commentators may not have correctly understood the verse if they were living after the period when the prints were being made.

Three manuscripts gloss *bi't-ṭarsh* by *ḍarb al-qālib k'al-kitāba*, "the striking of the mold like [sic] writing"; and *al-qaṣḍīr* is rendered by three manuscripts as "amulets (*ta'āwīdh* or *ʿuwadh*) of lead."<sup>18</sup>

Bosworth is understandably perplexed by these glosses since the metal indicated is clearly tin. "Lead is the obvious metal for the actual castings, but one could imagine that tin could be hammered into a matrix for producing amulets of clay and other plastic substances; I have accordingly indicated both possibilities in the translation of this verse."<sup>19</sup>

The interlinear commentaries on the next verse of the poem, which uses jargon words for two other types of amulets, compound the problem. One word, *jawānī*, is glossed in one manuscript as *hayākil ṣiḡhār wa ʿuwadh raṣāṣ wa wariq*. The grammar is obscure, but this probably means "small figurines and amulets [of] lead and silver." Another gives "small figurines," and a third seems garbled giving "small lead figurines from and silver [sic]." Sellers of figurines (*hayākil*) appear in the glosses of two other verses as well, although none of the words so glossed is otherwise known to refer to figurines.<sup>20</sup>

The most plausible way out of this perplexity is to assume that the glosses were added to the poem at a later period by a commentator who was familiar with peddlers of lead figurines but who was unfamiliar with printed amulets. Thus the only way he could understand the explicit designation of tin *ṭarsh* was to link it to the familiar figurines which he knew to be of lead. The commentary ignores, of course, the explicit reference to writing in the second half of the verse. To the pious illiterate, Syriac and Hebrew texts undoubtedly looked like impressive prophylactics against demons.

Assuming that *ṭarsh* means something from which an amulet is printed, and that it was at least sometimes

a tin plate, let us return to the prints themselves and see whether there is evidence to buttress this assumption. What can a close inspection actually determine about the process that produced them?

First, it appears that the paper was laid flat and the block pressed down upon it. When more than one block was used, they were used one at a time. This is clearly evident from Plate I. The upper block of the main text is very dark and smeared on its right edge. The lower block shows more even pressure. If the blocks had been locked together and imposed simultaneously, they would reflect the same pressure. If each block was imposed separately, the paper must have been laid on a flat surface. Otherwise, if the paper had been pressed onto first one and then the other, it would have obscured the clear view the printer would have needed to make sure the prints did not overlap.

Secondly, blocks were probably made from at least two substances. The ornamental writing on the top portion of the Columbia University specimen is verse 256 of Sura 2 of the Qurʾān written around three or four uncertain words in the middle. The paper it is on is glued to the rest of the amulet. The final words of the verse are in white-on-black around the sides, and in black-on-white in the middle, of an inverted teardrop shape. The middle words are reproduced so badly that they are readable only if one knows the text. Yet the botched letters are at least twice the size of the clear black-on-white letters on the main part of the amulet.

Since the white-on-black ornaments of some other amulets also seem to have been printed from separate blocks, it seems likely that the technique that yielded tiny black-on-white letters with a good deal of precision was not the same as the one that yielded precise, and even artistic white-on-black ornamental letters. Apparently, precise black-on-white letters could not be produced by the latter technique, nor ornamental white-on-black letters by the former.

A print in the Cambridge University Library reproduced in *Aramco World* affords a partial exception to this conclusion.<sup>21</sup> Large, elegant, white calligraphy runs vertically across line after line of tiny horizontal black writing, all designed as a single plate with words artificially divided as needed, and fine lines added, to outline the white letters. But this is not truly white-on-black; it is essentially a fine line print yielding a white-on-white image. It strongly suggests, however,

<sup>17</sup> Ibid., II, pp. 291–94.

<sup>18</sup> Ibid., II, Arabic text p. 71.

<sup>19</sup> Ibid., II, p. 327.

<sup>20</sup> Ibid., II, Arabic text pp. 66, 70–71.

<sup>21</sup> Lunde, op. cit., p. 27.

that the difficulty in producing white-on-black was not the scale of the lettering but the production of large areas of black.

Thirdly, the fine lettering of the long texts must have been incised in recto on a soft medium and then reversed by transfer to a block or plate. That is, the white areas were *not* cut away leaving the black lines in relief. Under high magnification there is no sign of cutting, even on tiny rings. By comparison, early European woodcutters were frequently imprecise in cutting around closely spaced fine lines, and perfect rings were extremely difficult.<sup>22</sup> Yet an amulet in the library of Heidelberg University shows a dozen perfect rings, each .08" in diameter, used to mark the end of Quranic verses. And one has a dot precisely in the center.<sup>23</sup>

In Chinese woodblock printing a calligrapher wrote the text in recto on thin paper. The blockcutter glued the paper upside down to the block and wet it so that the ink showed through in reverse. Then he cut away the white areas leaving the inked characters in relief. Printing converted the verso calligraphy to recto again. By this technique a good calligrapher and a precise woodcutter could produce a beautiful text. But the woodcutter's challenge was the harder. He had to follow the contours of whatever the calligrapher wrote, while the calligrapher's text was constrained only by his awareness of the technical limitations of woodcutting.

Conceivably, the Muslim amulet makers followed the same process. But if so, the calligraphers assumed that the woodcutters were incredibly skilled even though they themselves were often rather slipshod. The Kufic script of the Columbia specimen, for example, is quite mediocre and often barely legible, even under high magnification with the Quranic text at one's side for reference. Occasionally words are even left out of Quranic quotations.<sup>24</sup>

Plates II and III depicting a previously unpublished specimen from the Madina Collection present strong evidence that the *ʿarsh* makers did not follow the Chinese practice. The first and last letters of each line in the middle portion of the print appear to be trimmed so closely that part of each letter is missing. Since the margin of the paper is ample, the trimming must have been done on the block. But no craftsman

<sup>22</sup> For example, Hind, *op. cit.*, I, figs. 40, 48.

<sup>23</sup> Arnold and Grohman, *op. cit.*, pl. 15.

<sup>24</sup> Sura 2:256 in lines 11–15 is missing the word *dhā*, and Sura 10:81 in lines 23–25 is lacking its first three words.



Plate II. Arabic blockprint in the Madina Collection, New York (No. Ca 32, 34.5 cm. × 7.5 cm.).

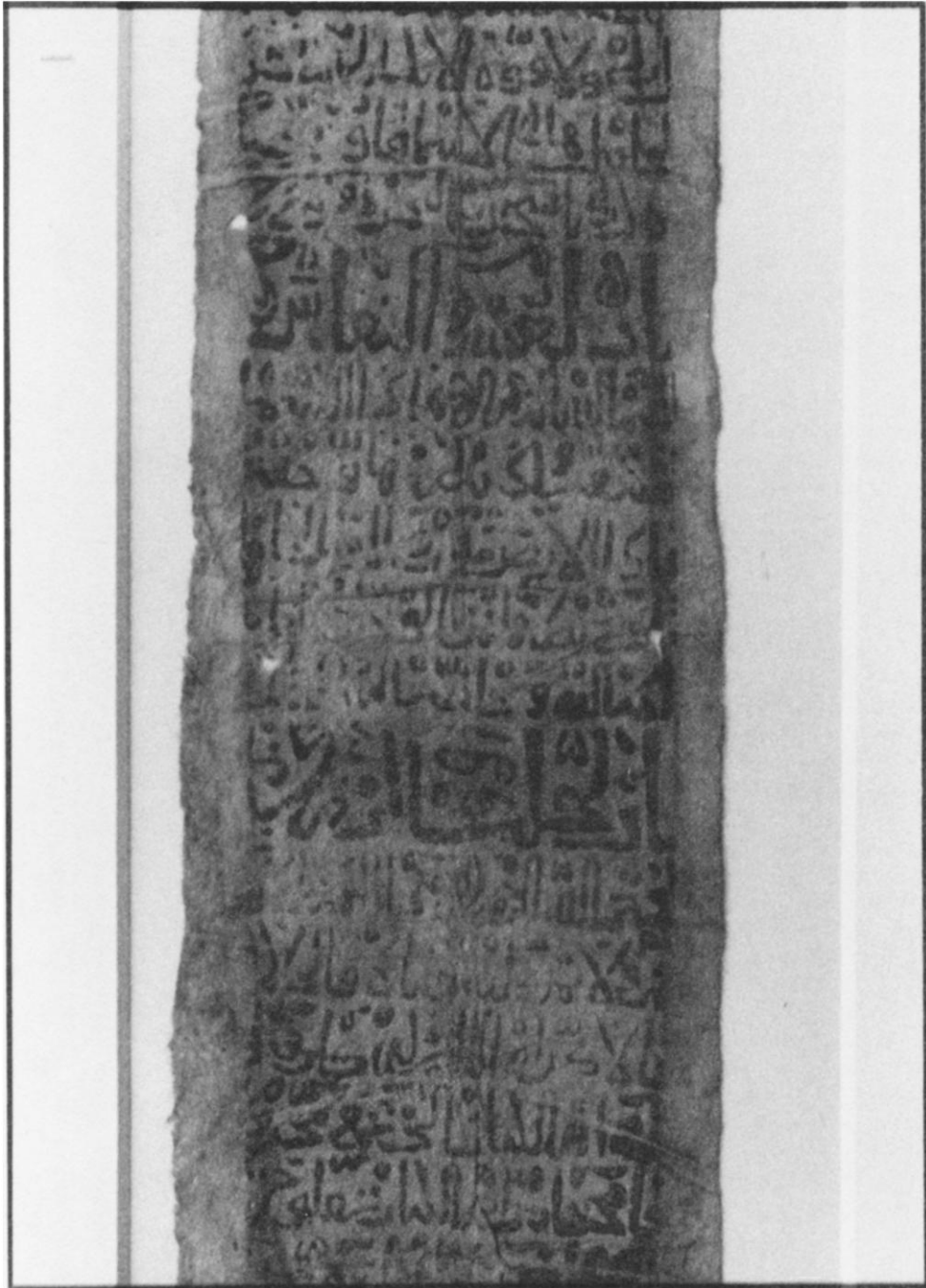


Plate III. Middle portion of blockprint in the Madina Collection, New York (No. Ca 32).



would have seen a wooden block so badly as to cut into the text. The process of putting metal in a mold is a much more plausible source of the defect.

So how was a *ṭarsh* made? We propose the following: The *ṭarsh*-engraver carefully flattened a moist clay tablet, perhaps in some way continuing the practice of the ancient Mesopotamians. With some sort of stylus, using all the writing skill he could muster, he engraved his minute text into the tablet. The depth of the engraving was probably very shallow to minimize gouging out flecks of clay that he would have to brush away. The tablet was then dried hard in the sun or baked.

He may then have taken a thin sheet of tin of the sort itinerant tanners were still purchasing in Iranian bazaars earlier in this century,<sup>25</sup> applied it to the tablet, and pounded the malleable metal to force it into the grooves of the letters. Or more likely he produced his plate by pouring molten tin on the tablet. Whichever technique was used, the resulting plate had to be small so it would not bend too readily, and the tiny letters in low relief on soft metal probably wore down quickly after a fairly small number of impressions. But the tin could be pounded flat, or melted, and used again.

Larger white-on-black blocks were probably cut from wood. One can only speculate as to the reason tin was not used for them too, but a likely guess is that the ink used did not adhere evenly to the large tin surface of the black areas. The question of ink, of course, cannot be addressed directly without scientific examination.<sup>26</sup>

The tin plate hypothesis takes into account the available evidence and also explains why the original printblocks, presumably so much more durable than the prints themselves, have not survived. A *ṭarsh* was indeed a writing made to be effaced and used again, just as its etymology indicates.

The linking of the prints and the *ṭarsh* texts through this hypothesis also locates medieval Arabic block printing in time and space and helps explain the apparent lack of impact of this remarkable technological development. Geographically, the prints are found in Egypt, where conditions for paper preservation are ideal, and the poems referring to them were written in Iran and either Iraq or Egypt.

In time, the tenth century *terminus ab quo* proposed by previous investigators on the basis of palaeography and the archaeological stratification of finds fits well with Abū Dulaf al-Khazrajī's period of activity. And the fourteenth century *terminus ad quem*, which Karabacek proposed on the weak premise that none of the manuscripts in the collection his specimens came from was dated later, fits with the career of Saḫī ad-Dīn al-Hillī. A more cogent reason for regarding the fourteenth century as the end of the era of Arabic printing, however, is that European observers never noticed it in the Middle East once they had developed printing themselves, and the memory had faded entirely by the time the first Arabic books were printed in Europe in the late fifteenth century, and the first press established in the Muslim world in the early eighteenth.

The question of the lack of impact of Arabic block printing cannot be divorced from the questions of origins and consequences. Printing in Arabic appears in the Middle East within a century or so of becoming well established in China. Moreover, medieval Arabic chronicles confirm that the craft of paper making came to the Middle East from China by way of Central Asia, and one print was found in the excavation of the medieval Egyptian Red Sea port of al-Quṣair al-Qadīm where wares imported from China have also been discovered.<sup>27</sup>

Nevertheless, it seems more likely that Arabic block printing was an independent invention. Many prints of Buddhist texts in various Turkic languages have been discovered in Central Asia, but they date from the thirteenth century and show a familiarity with wooden movable types that would have been applicable to Arabic texts.<sup>28</sup> In addition, the writing is not as minute as that of the Arabic prints.

The specialized underworld use of printing, which was so unfamiliar to his dignified contemporaries that Abū Dulaf had to gloss the crucial word, also points away from China. Chinese crafts were highly admired, and Chinese products much sought after. Iranian potters, for example, sold thousands of imitations of the splash-painted sgraffiato ware of the T'ang Dynasty because genuine T'ang pieces were so rare and expensive, but enormously appealing to Iranian consumers.

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for woodblock printing in China; Frank B. Wiborg, *Printing Ink: A History*, New York, 1926, p. 87.

<sup>27</sup> Krek, *op. cit.*, pp. 13, 15.

<sup>28</sup> Pp. 20–21 of typescript of work in progress generously made available to me by Prof. Tsuen-hsui Tsien of the University of Chicago.

<sup>25</sup> On the tinner's craft see H. E. Wulff, *The Traditional Crafts of Persia*, Cambridge, Mass., 1966, p. 31.

<sup>26</sup> Even though medieval Muslim inks were water-based, it is not impossible that oil-based ink was also used as it was

It seems unlikely, therefore, that Muslim amulet hawkers could have learned about and adopted a distinctive Chinese technology without it coming to the general awareness of educated Muslims. In China, after all, printing was used for the most respectable texts, and emperors were known to sponsor special projects.

And finally, the Chinese did not print from molded or cast metal plates, though they were expert at casting bronze vessels decorated with calligraphy in relief.

The mediocre aesthetic quality of many of the Arabic prints fits better the world of itinerant tanners, rogue scribes like Abū Dulaf himself, and confidence men willing to take advantage of the piety of the gullible masses than it does the refined world of princely courts and religious scholarship. And this low social level also accounts for the insulation of this extraordinary technology from the rest of society. People of dignity did not know about *ṭarsh* and were certainly not inclined to apply the technology of their inferiors to their own lofty writings.

The only indication that printing may occasionally have caught on for purposes other than amulets comes from Muslim Spain in the tenth century. The Caliph ʿAbd ar-Raḥmān an-Nāṣir (reigned 912–961) appointed the son of a Sicilian slave to a series of high posts including the vizirate. The official's biography relates that "he used to be unique in the governorships. For official documents were written in his palace. Then he sent them for printing (*ṭabʿ*), and they were printed and sent back to him. Then they were sent [reading *ṭabʿathu* for *yabʿathu*] to the governors, and they acted according to his will (*ʿalā yadaihi*)."<sup>29</sup>

The critical root *ṭ.b.ʿ*, taken here to connote "printing," normally means "pressing." The editor of the text remarks in a note that he believes it refers to sending documents out to receive an official seal, although there are other words that are commonly used to designate official sealing. Other scholars have interpreted it to mean "print" but have drawn no particular conclusions from the passage.<sup>30</sup> Whatever the word means, the vizier's practice was obviously not generally adopted.

Did the Muslims of Spain, who were in regular contact with Egypt, pick up the technology of printing and try it out in a place where it was not tainted by association with amulet peddlers? Further discoveries are needed to answer the question. If they did, however, then some of the numerous Italian traders in Egyptian ports may have done the same.

Many authors have discussed the possible origins of European printing.<sup>31</sup> The most popular hypotheses have been independent invention and borrowing from China, but neither has been verified. In the absence of substantial scholarship on Arabic block printing, no one has given serious consideration to the possibility of technological borrowing from the Arab world. The chronology proposed here indicates that European printing probably did begin before the practice was abandoned in the Muslim world, but there is as yet no way of verifying that the former drew in some way upon the latter.

One possible line of investigation might be the early history of tarot cards. Playing cards were popular on both sides of the Mediterranean and, on the European side, were among the earliest printed artifacts.<sup>32</sup> The earliest known Muslim cards, a fragment from the twelfth century and a nearly complete deck from the fifteenth century, are hand-painted.<sup>33</sup> Their size and shape are similar to the block dimensions of the amulets, however, and one surviving fragment of an Arabic print simply bears an arabesque decoration<sup>34</sup> while another has a picture of a devil that would be not inappropriate on a playing card.<sup>35</sup> Tarot cards, originally called *tarocchi* in Italian, are of special interest because of legends that they were introduced by gypsies, an "underworld" population that reached medieval Europe from the Middle East, and because the source of their name is unknown. Could the word *tarot* or *tarocco* have originally come from *ṭarsh* or *ṭars*?

Leaving this unanswerable question unanswered, we will turn to our final problem: Why did the *ṭarsh* disappear? Suggestions advanced to explain the later Muslim resistance to the printing press, such as that there were effective Muslim prohibitions on

<sup>29</sup> Ibn al-Abbār, *Al-ḥulla al-saiyarāʿ*, ed. H. Monès, Cairo, 1963, p. 253.

<sup>30</sup> Káldy-Nagy, op. cit., p. 201; P. Hitti, *History of the Arabs*, London, 1964 (8th ed.), p. 564. Plate IV, an unpublished specimen from the Madina Collection, may, judging from its calligraphic style, be of Spanish rather than Egyptian provenance.

<sup>31</sup> See works listed in note 3.

<sup>32</sup> Tsien, op. cit., pp. 26–27; Hind, op. cit., I, pp. 80, 84–89.

<sup>33</sup> L. A. Mayer, *Mamluk Playing Cards*, Leiden, 1971.

<sup>34</sup> Arnold and Grohman, op. cit., pl. 29.

<sup>35</sup> Bishr Farès, "Figures magiques," in *Aus der Welt der islamischen Kunst. Festschrift für Ernst Kühnel*, Berlin, 1959, p. 155. I am indebted to Dr. M. Krek for bringing this print to my attention.



Plate IV. Arabic blockprint in the Madina Collection, New York (No. Ca 31, 14.2 cm. × 11.2 cm.).

reproducing sacred texts or that there was resistance from a threatened scribal elite, are clearly inapplicable.<sup>36</sup> Printing lasted too long and was too bound up with religious texts for the former explanation to make any sense, and its encapsulation in the underworld social environment of the Banū Sāsān vitiates the latter.

*Ṭarsh* surely disappeared because of developments in the popular religious culture of Islam. And the popular religious development that swept the Islamic world with increasing force from the thirteenth century onward was organized Sufism. Did the Sufi *murshids* with their followings of disciples and admirers take action to curtail the shady religious practices of the Banū Sāsān? Most likely they did, because the more popular Sufis were competing for the attention and

support of the same social strata, and the Sufis had a religious cachet that surely gave them the upper hand.

Sufis wrote amulets and performed similar religious services for the common people; but unlike the Banū Sāsān, if they engaged in improper practices, they risked losing their followers. Moreover, within Sufism saintliness was deemed to lie in the *baraka*, or holy aura, of the Sufi's person, and by extension of his family, tomb, personal belongings, and, of course, writing. *Ṭarsh* peddlers had little to gain from writing out each amulet personally, but for the Sufis the personal act of writing holy words was part of a wider religious claim. It is not only understandable that the Sufis would have suppressed *ṭarsh*-making, but it would be remarkable if they had not. Unfortunately, in so doing they caused one of the most ingenious medieval Muslim technologies to disappear almost without a trace.

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<sup>36</sup> Káldy-Nagy, *op. cit.*, pp. 202-5.