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Arab Migration During Early Islam: The Seventh to Eighth Century AD from an Archaeological Perspective

Abstract: The topic of Arab migration during the medieval period has occupied many modern historians. The evidence for migration in chronicles and geographies, however, is quite thin. This article looks at these texts as well as at contemporary "archaeological texts" (inscriptions and papyri documents) and archaeology. Each of these sources provides different information under different limitations which sometimes correlates with another. One main focus of the article is the ability of archaeology to answer – alone – the question about Arab migration. For that purpose, two archaeological models are proposed. One model highlights the link between the material culture of two regions (origin and destination) in two sequent times and its evolvement in the destination. The other model points to continuous links between origin and destination and the evolvement of material culture in the origin. The models are compared to a number of case studies from the early Islamic period (seventh to tenth century AD) in the Levant, Spain, and additional regions. The case studies present innovations which might reflect migrants: irrigation methods, specific forms of architecture, production techniques of portable artifacts, and evidence for a new confession – Islam. While the archaeological records of early Islam are often too limited to answer most of the models' criteria, two case studies seem promising: soapstone pots/bowls and early Muslim burials. Both cases imply the migration of people from the Arabian Peninsula elsewhere in the eighth or even the seventh century.

Keywords: Early Islam, Arab conquests, ancient mosques, Muslim burials, Islamization

This study focuses on the migration of Arabs during the medieval period, of which we learn from historical sources. By "migration" I mean the movement of individuals or groups to other regions followed by long-term settlement. This mobility includes both short and long distances. Moreover, the long-term settlement can be, but is not necessarily, permanent. The term "Arab" is more difficult to define, especially in regard to Arabic identity prior to Islam. Inscriptions in Old Arabic script can be found from the fourth century AD in the Arabian Peninsula and from the fifth century AD in the Levant (i.e., the area from southern Jordan to southern Turkey). However, scholars dispute the degree to which an Arabic script – or inscriptions – can actually represent an Arab ethnic group or group identity (Fisher, 2020, pp. 174–188; Hoyland, 2007, p. 234; Lindstedt, 2018; Webb, 2016, pp. 9, 62–66). In the context of the seventh to the ninth century AD (i.e., the early Islamic period, generally speaking), "Arabs" can be defined much more clearly than before: individuals who spoke Arabic as their primary mother tongue. These people likely identified themselves as "Arabs," as well

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(Cooperson, 2015). I have broadened the "Arab" definition to include people from the Levant, assuming that their writing in Arabic is meaningful. In other words, Arabic script in the Levant and the Arabian Peninsula before the seventh century AD may reflect Arab ethnicity in both regions during the seventh and eighth centuries. According to the Quran and historical texts, Islam spread from Mecca and Medina to other places in the Arabian Peninsula in its early years. This indicates a possible correlation between Muslims and Arabian-Arabs in the early days of Islam.

In short, when I write "Arab migration," I take it to denote, first, movement by Arabs and Muslims from the Levant and the Arabian Peninsula to far-distance destinations (North Africa and Spain, Egypt, or Iraq and central Asia) and their settlement there. As I will discuss later, this means that the Levant and the Arabian Peninsula form the "region of origin" to Muslims and Arabs. Second, I also mean shorter-distance mobility within that domain, such as from the Arabian Peninsula to Syria. The first map (Figure 1) shows the main regions which are discussed in the study, and it locates the possible historical toponyms which are mentioned. All maps in the article are based on recent topography (natural and cultural) and do not attempt to reconstruct the precise geography of the past.

Chronicles and geographies – the main sources historians use to interpret Arab migration – discuss migration insufficiently, as we shall see. Due to the scarce sources, some critical historians turn to archaeology, hoping for a clearer picture provided by the physical evidence. Instead of providing independent explanations, however, Islamic archaeologists tend to rely on historical texts for dating and for additional interpretations. The case of excavated mosques may demonstrate this point: whereas the physical evidence of structures such as in Wāsiṭ and Kūfa in Iraq or Ramla in Israel/Palestine can by their archaeological evidence be dated to a time only as early as the ninth century, these mosques have been assumed to date even earlier, into the seventh or early eighth century. Instead of relying on the archaeological date provided by the physical evidence, the dating of these mosques has been based on texts and on the analogy between toponym and archaeological site (Nol, 2023a).
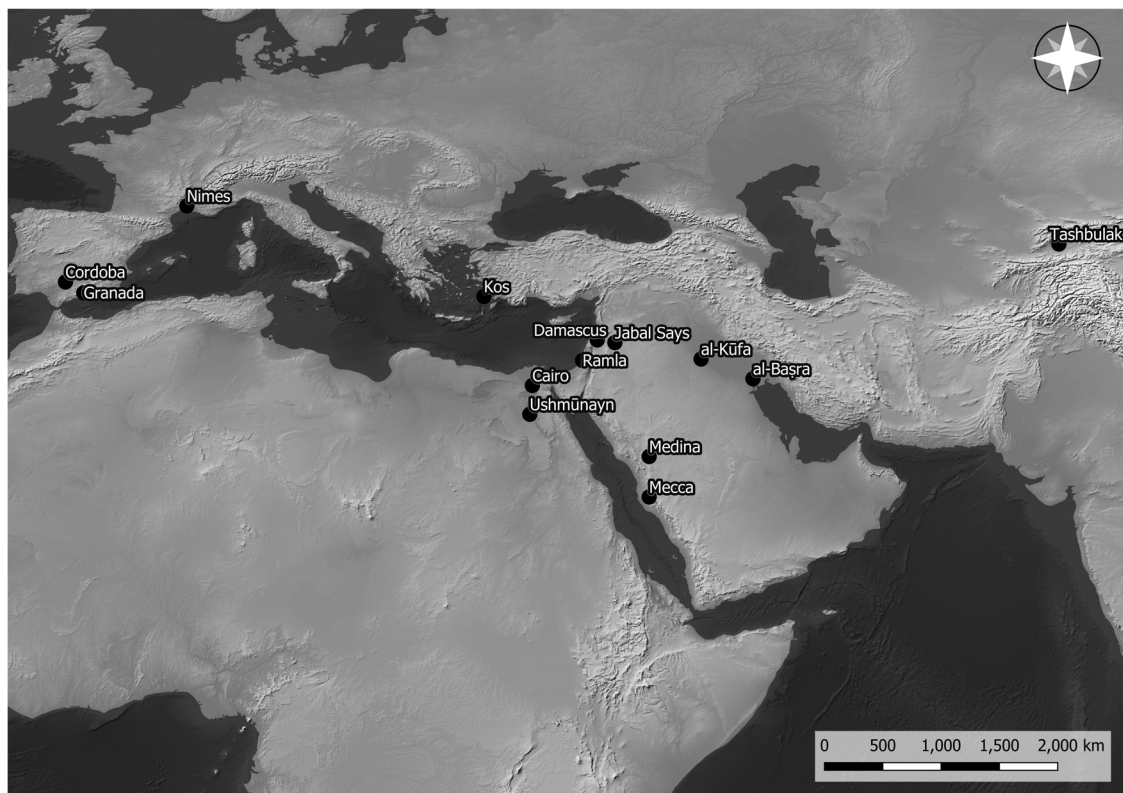

Figure 1: Map of regions and toponyms mentioned in the article.

Another example for the mix of archaeology and historical texts is the site/s of Samarra in Iraq. Parallels of the site pottery are dated to the eighth to tenth century, if not later (e.g., Northedge & Kennet, 1994). Nevertheless, archaeologists often date the site much more narrowly to the mid to late ninth century (e.g., Brown, 2022; Northedge, 2005, pp. 99–100). This is based first on an analogy between the site and the toponym (Surra Man Ra'ā in ninth-century sources and Sāmarrā in later ones). Second, the date relies on historical narratives about the establishment and abandonment of the settlement as the capital of caliphate in the years 836 and 892 AD, respectively. The ninth-century date ignores not only the earlier and later ceramics from the archaeological site but also the numismatic evidence for the toponym. The latter indicates a continuity of the Surra Man Ra'ā mint at least until the year 953, much later than the alleged desertion of the settlement in 892 (Miles, 1954). These two examples, out of many, demonstrate how the archaeology of Islamic periods relies greatly on the same historical sources it should counterbalance, using circular arguments (Nol, 2022a, pp. 10–11).

The main aim of this article is to test whether archaeology – through independent archaeological tools alone – can point to the medieval migration of Arab or of Muslim groups. Its second aim is to advocate the use of different source corpora whenever possible. This, however, should be done with a clear division between the source types. As part of the second aim, I hope to advance the use of both archaeological methods and archaeological theory in Islamic history in general and in discussions about early Islam in particular. For example, the introduction of relevant texts on migration highlights the limitations of this source and emphasizes the need for additional evidence. Moreover, recent archaeological theory on migration and cultural contacts – some influenced by social sciences – could contribute to the interpretation of narratives on people movement in medieval times.

In accordance with these two aims, the article is divided into two main parts. The first part is devoted to textual sources for Arab and Muslim migration. I start with the so-called "narrative sources" in Arabic, i.e., chronicles and geographies, and continue with "archaeological texts," i.e., inscriptions and papyri. The second part of the article opens with sets of premises on migration in the archaeological literature which I summarize into two suggested models. I then introduce several archaeological case studies and compare them to the models. The cases I examine have either been related to migration by scholars or show characteristics which may follow the archaeological premises about migration. The studies derive from the Levant, Spain, and the broad region which I henceforth name "AENAE" (i.e., Central and West Asia, East and North Africa, and southern Europe). They include architecture, production techniques, and religious practices. Even though these are varied in space and in method, all derive from the seventh to ninth century AD – a period which is often hard to better refine archaeologically. Moreover, all examples focus on material culture, that is remains of human activity, including burials.

The study discusses several possible proxies for the migration of Arabs and/or Muslims, as has been suggested by historians and archaeologists. These comprise the evidence of Arabic script, Arab names for individuals or places, Muslim rituals, specific types of material culture, and processes of change in these objects. Nevertheless, these proxies in themselves cannot serve as "proof" for migration. Interpretations about other sorts of contacts between communities (such as trade), adaptation of knowledge and ideology by local societies (such as conversion), or mobility without long-term settlement (such as military campaigns) can only rarely be ruled out. Moreover, I believe that it is still impossible to pinpoint phases in mobility and settlement of Arabs and Muslims during the seventh and eighth centuries, even when we use different sources.

The research highlights additional limits of the archaeological method. It becomes clear that answering the question of Arab migration through archaeology necessitates much more data from many more regions and much better dating than that existing currently. Similar to previous studies (e.g., Fenwick, 2022), I argue that mosques cannot demonstrate the early spread of the Muslim faith or migration by early Muslim believers. On the other hand, the study suggests the important role of specific portable artifacts, in our case soapstone bowls, which may represent, to some extent, short-distance migration from Arabia to Palestine, and the potential of Muslim burial research for understanding the early spread of Muslim confession.

1 History of Conquests and Migration

Historical sources narrate how the Prophet Muhammad and his early followers conquered important areas in Arabia during the 620s AD. After Muhammad's death in 632 his generals, and later on the caliphs, continued the conquests and eventually occupied the whole Arabian Peninsula, Syria, Iraq, Egypt, Iran, and North Africa (e.g., Kennedy, 2007). Whenever a settlement was seized, so the sources tell us, its local leaders could choose whether to announce their surrender (*sulḥan*) and then to make a peace agreement with the conquerors (*amān*). Alternatively, when choosing not to surrender, settlements would be conquered by force (*ʿanwātan*) (Donner, 1981, p. 240; Kennedy, 2007, p. 19). As part of their peace agreement, some historical authors argue, communities agreed to be partly evacuated to enable settlement by the newcomers (Donner, 1981, p. 246). Lands owned by the church or the local authorities were confiscated and divided between the conquerors. Later on, additional lands were granted by the caliphs to their family members or could be purchased by other Muslims (Cahen, 1953, pp. 25–28; Donner, 1981, p. 241; Legendre, 2018).

The migration process of the conquerors is rarely described in the written sources (Donner, 1981, pp. 231, 245). For that reason, modern scholars interpret the notion of seventh-century emigration based on fragments of information and on their own common sense. Fred Donner, for example, uses texts which mention different salary levels as evidence for differentiating between early and later migrants. He argues that the warriors, most of nomad tribal origin, settled immediately after the conquests. Many more settlers, however, were immigrants who belonged to the same Arab tribes as the warriors and followed their relatives. The only question he thinks that the written sources cannot answer is the flow of this migration – either in several waves or as a steady thin stream (Donner, 1981, pp. 231–237). Kennedy emphasizes another interpretation: the conquests were conducted by an army of men and the tribal emigration occurred only later (Kennedy, 2001, p. 4).

The medieval authors provide scarce but valuable information. A twelfth-century historian, Ibn ʿAsākir, describes the army as accompanied by women and horses but excluding donkeys and sheep (Donner, 1981, p. 119). The text can be understood in two ways: as evidence for a direct migration of warriors and their wives, or, based on the absence of livestock, as evidence for a lack of settlement. The historian al-Ṭabarī (died 923) mentions anecdotes which coincide with Donner's interpretation: the assemblage of tribes in the new settlement al-Baṣra in Iraq, as well as the dominance of salary-receivers in the new settlement al-Kūfa in Iraq, first, and of nomads, second (Donner, 1981, p. 232 and endnotes). Other scattered stories in the Arabic sources indicate migration but cannot answer the question about its chronology. The historian Ibn al-Kalbī (died 819) writes about one tribe which left the desert altogether and moved to al-Kūfa (ʿAthamina, 1987, 9, f. 28). Our historian al-Ṭabarī, mentioned above, notes the settlement of an Arabian tribe by the name ʿDra in Jordan (Hasson, 1984, p. 65).

One central type of occupation which modern scholars see as evidence for migration is the establishment of *miṣr*s, a term which often translates as "garrison town" (e.g., Kennedy, 2006, p. 23; Whitcomb, 2009). Modern historians suggest that the *miṣr*s were established in conquered areas in order to avoid assimilation of the newcomers with the native population and to prevent local rebellions (Crone, 1980, pp. 29–30, 1999; 2006, p. 11; Kennedy, 2001, p. 7). Importantly, some historians in the 1970s believed that these settlements were established for the nomad warriors and their families (Ashtor, 1976, pp. 18–19; Stern, 1970, p. 30). Later on, scholars explained the *raison d'être* of *miṣr*s as supplying a base from which militant campaigns could begin (ʿAthamina, 1987, p. 9; Bosworth, 1993). It is well accepted that different tribes settled within these settlements in defined territories, *khiṭṭa*s (e.g., Akbar, 1989; Whitcomb, 2009, p. 248).

Some early sources use the Arabic words "emigration" (*hijra*) or "emigrant" (*muhājir*). However, the meaning of these terms is not as simple as one would wish. In its earliest appearance, emigrants are mentioned several times in the Quran. Regarding the date of the Quran, according to the Muslim tradition, it was revealed to Prophet Muhammad and was edited by the order of the third caliph, ʿUthmān, around the year 650. Some scholars support this date (e.g., von Sivers, 2021). The year 712 AD is the earliest date given for complete manuscripts (Grohmann, 1958, no. 17), making the end of the seventh century and surely the early eighth century a very likely *terminus ante quem*. In the Quran, *muhājir*s are first and foremost "believers" (Lindstedt, 2015, p. 70) who are in many cases mistreated and relate to a holy war (Crone, 1994, pp. 354–355). Some later Muslim traditions focus on holy war as the main meaning of the term, and in fact consider it a synonym to *jihad*, while others present additional messages. First, the word represents the physical move of the early believers from

Mecca to Medina during the time of the Prophet. The counting of Islamic years starts from that presumed day and is thus named "of the Hijra." Second, *hijra* means the physical migration to the *miṣr*s during early Islam. These emigrants, or their successors, enjoyed fiscal benefits and a higher social status than Arabs who chose not to migrate. Third, the term denotes conversion to Islam to some authors: the spiritual transformation from an infidel into a believer. Fourth, it can mean the physical flight from areas ruled by infidels (Crone, 1994. See also ʿAthamina, 1987; Hoyland, 2015, p. 102. Lane, 1893, p. 2879). Nonetheless, Lindstedt (2015) argues that in the seventh century, *muhājir*s was the word used by non-Arabs to define Muslim-Arabs.

Two additional types of information about migration during the seventh century derive from the narrative sources. One relates to a series of transfers – i.e., forced migrations – imposed on different communities. Some of the migrants were captives who were brought into Arabia, such as Sogdians from Iran (El-Ali, 1959, p. 253). Others were inhabitants of the Arabian Peninsula who were "transferred," such as the Christians of Najrān (Donner, 1981, p. 236). A related type of information – which comes from additional texts – regards the flight of native populations from Syria and Palestine following the Arab conquests or the former unrest in the area (Keiko, 1991; Levy-Rubin, 2011, p. 168; Theodoropoulos, 2020).

Some geographical sources provide information about the ethnicity or tribal affiliation of different groups in various settlements. This may indicate immigration by Arabs but only at some point in history, not necessarily immediately after the conquests. For example, the geographer and historian al-Yaʿqūbī (died 897) comments how the inhabitants of the city al-Ramla in Palestine are Arab and non-Arab (*al-ʿajam*), and that the people under their protection (sing. *dhimmi*) are Samaritans (al-Yaʿqūbī, 1892, p. 328. See also Calasso, 2021; Cooperson, 2015; Reinfandt, 2020, pp. 231–232). He also lists various tribes from the Arabian Peninsula and the regions in Palestine where they settled (Hasson, 1984, p. 57 and footnotes 6, 7). The author similarly describes the Arab/non-Arab mixture in Iṣbahān in Iran and in cities in Iraq and North Africa. In al-Qayrawān, in today's Tunisia, he specifies it being settled by Quraysh (the tribe of the prophet from Mecca) and others from Arabia (*buṭūn al-ʿarab*). In Zawīla, in today's Libya, the inhabitants come from Khorasan and Iraq (al-Yaʿqūbī, 1892, pp. 345, 348. See Calasso, 2021, pp. 49–51).

A different method employed by historians as evidence for migration by Arabs or others, in Spain mainly, is the use of place names. The Arab sources describe the migration of *berbers*, the indigenous people of Northwest Africa (Berbers or Amazigh), to the Iberian Peninsula (for a critical overview, see Rouighi, 2011). Esquilache mentions how a Berber confederation of tribes gave a canal near Malila that is used today its name: Hawwara. A different example he discusses is names of settlements around Valencia. He claims that although the Arab and/or Berber immigrants gave Latin names to these places, not Arabic or Berber names, the words they used never referred to former hamlets or *villae* but to natural resources, suggesting the non-Roman origin of the settlements (Esquilache, 2021, pp. 145–148). Sitjes presents additional cases in Mallorca, which are related to the Manqūr group (Sitjes, 2021, pp. 33–36).

Finally, scholars consider information which relates to the Muslim faith or Arabic language as evidence for Arab newcomers. In central and northern Europe, the Christianization of the population in the early medieval period is identified through church structures and burials around churches (e.g., Andrén, 2013; Vargha, 2022). Similar methods are employed for Islam, using mosques and burials together with inscriptions of religious messages. Regarding mosques, some narratives tell us about constructing them within or instead of a local sanctuary (Guidetti, 2013; Magnusson, 2017). Another type of information regards the individual conversion of locals. Conversion is expressed mainly by the status of *mawlā* (client) – slaves or native men who converted to Islam and who sometimes reached high political positions (Crone, 1999; 2006, p. 15; Cooperson, 2015; Pipes, 1980; Wensinck & Crone, 1991). Even without the term *mawlā*, Arabic or Muslim private names outside of Syria and the Arabian Peninsula might imply their foreign origin or their conversion (e.g., Bulliet, 1979, pp. 65–69; Legendre, 2018, p. 405).

2 Historiographical Challenges in Writing the History of Arab Migration

The list of historical sources which imply migration in the seventh or eighth century is very rich. Unfortunately, this impression is somewhat misleading. Modern historians who study the first centuries of Islam face a significant

challenge when using most of the above narrative texts: a long gap between alleged events and their earliest certain record in writing. Our earliest sources are ascribed to compilers from the late eighth and mainly from the mid-ninth century onward. Therefore, the texts as we know them were compiled at least 150 or 200 years after the events described in them. This means that even if stories in these texts have a "core of truth," this truth would possibly have been modified during the two centuries with details and names added or reduced, with altered terminology, and with new ideological messages. Moreover, the writing was not necessarily intended to present reality to begin with but to deliver relevant messages to a contemporary audience (Borrut & Cobb, 2010; El-Hibri, 1999, pp. 216–217). Scholars demonstrate, for example, that the issue of surrender vs force had not been written about before the early eighth century, i.e., at least 70–100 years after the conquests. It seems thus likely that the texts represent legal concerns of landholders in the eighth century, perhaps the conquerors' successors, not necessarily the reality of the conquerors themselves (Clarke, 2012, p. 42; Noth, 1973; Shoshan, 2016, pp. 6, 15).

While the earliest texts we possess were compiled two centuries after the events, modern scholars sometimes use even later sources. This choice is understandable: the later the text, the more detailed its descriptions. For example, the Muslim conquest of the Iberian Peninsula is recorded in Arabic texts as early as the ninth century. In these, the events are mentioned in a few lines or paragraphs. Therefore, modern scholars often consider a much more coherent text from the seventeenth century, which describes the events over 60 pages (e.g., Clarke, 2012, p. 24; Safran, 2021). Another example for elaborate descriptions relates to mosques. Mosques are already mentioned by eighth and early ninth-century authors. A current study of mine shows, however, that details about their physicality, such as size, decoration elements, or construction materials, cannot be found in the earliest writing, but only starting in the mid or late ninth century. A little later, in the tenth century, these descriptions have become even more elaborate. In addition, authors from the mid-ninth century list many more toponyms with a mosque than earlier authors.

The increase in details by later Arab authors is explained differently by two "schools" of modern historians. These are, in very rough terms, the optimist and the skeptical (Clarke, 2012, pp. 1–2; Hoyland, 2015, p. 232. See also Donner, 1998, pp. 5–31; Humphreys, 1991, pp. 72–88). According to the first school, the late-medieval authors were better equipped with early sources than early medieval authors. In other words, their descriptions are authentic and true. In contrast, the skeptics – and myself among them – hold that the later the text is, the more it has been modified. With some exceptions, most of the supplemented details resulted from later imagination. Scholars explain the development of the texts in relation to specific contemporary social and political contexts (e.g., Clarke, 2012, pp. 40–44; Shoshan, 2016, p. 15). In other words, in most cases, the descriptions of late-medieval authors are less reliable than earlier ones. The main problem is that the historical "facts" we learn, even the ones I presented earlier, often resulted from a mixture of early and late medieval sources.

The critical reading of historical narratives does not end with chronology. Another difficulty is the city-centric perspective of their authors (Clarke, 2012, pp. 40–44; Heidemann, 2009, p. 493; Legendre, 2018, p. 399; Nol, 2022a, p. 268). This bias distorts any attempt to reconstruct realities outside the metropolis. Therefore, settlement patterns, among them migrations and occupation, cannot be interpreted using narrative sources alone. One example comes from Egypt, where contemporary documents can be employed for comparison. The analogy shows that, contrary to information from the narratives, large estates could indeed be owned by Christian administrative elites, not only by Muslims and the caliph. It seems that Muslims became landlords in Egypt gradually, mainly from the early ninth century onwards (Legendre, 2018, pp. 404, 413).

To summarize, the earliest Arabic texts mention very few elements of migration in the seventh and eighth centuries. The Arab authors write about the establishment of new settlements (the *miṣr*s), about the density of nomads in these spaces, and about forced migration. These texts were compiled at least 150 years after the event and might not represent reality. The more common arguments of modern historians about migration – of tribes or of army families – are only implied in the texts.

3 Archaeological Texts

Unlike the narrative sources, which are late, we possess contemporary textual evidence from the seventh and early eighth century. This includes papyri and inscriptions – both of which I call "archaeological texts."

Relevant published papyri in Arabic come from Egypt. They were found in the refuse piles of several sites such as al-Fayyūm, Ahnās and Ushmūnayn (Sundelin, 2004, p. 15). Many of the earliest published texts in Arabic or in Greek relating to the Arab/Muslim rulers, were written by one governor in 709–714 AD, Qurra ibn Sharīk, and is presented below. Even earlier texts from the years 642/3 were published as well and are relevant to our topic.

Papyri written in Greek clearly mention the word "emigrants" in various contexts. The word they employ, *muagaritun* (Μωαγαριτῶν), or its variations, equals the Arabic *muhājirūn* (meaning *muhājir*s). The earliest references derive from two documents from 642 and 643 (Grohmann, 1932, in Crone, 1994, p. 359; Hoyland, 2015, p. 105; Trombley, 2013, pp. 27–28, 32–33). The later text (PERF 558) is a bilingual tax receipt for 65 sheep (see https://www.islamic-awareness.org/history/islam/papyri/perf558). While in the Arabic section, the author identifies the recipients as "we," the Greek section calls the recipients once "Saracens" (σαραχηνῶν) and on another occasion "*muagaritun* and others who have arrived" (ἄλλοις ἀνερχομένοις). The earlier papyrus (PERF 564), written in Greek only, documents the receipt of 96 horses. In this case, the Arab recipients (at least five names are noted) identify themselves on three occasions as *magaritai* in the document.

Many more relevant texts are derived from the early eighth century. One context is the requirement to provide wheat, wine, and other foodstuff for *muagaritun* (Bell, 1912b, pp. 371–372, doc. 1433; 1928, pp. 7–8, doc. 1449. For the Greek texts see Bell, 1910). This food comes, in some cases, from the granaries of Babylon, in today's Cairo (Bell, 1911b, p. 384, doc. 1404; 1912a, p. 132, doc. 1407). The texts clarify that the mentioned *muagaritun* had household slaves who were provided with allowances from the same sources (Bell, 1912b, p. 369, doc 1433; 1928, p. 5, doc. 1441). Another context is the assignment of *muagaritun* to fleets, side by side with sailors (Bell, 1928, p. 7, doc. 1449). Bell (1910, p. xxxiv) believes them to be land forces and not mariners themselves.

As discussed earlier, modern scholars interpret *muhājir*s differently: as believers, converts, emigrants to Medina or the *miṣr*s, or as warriors. In the mid-seventh century, the term papyri could mean "Muslims" but seems to mainly reflect military men (see Hoyland, 2015, p. 102). Some of the early eighth-century papyri similarly allow the interpretation as members of the military, but, different from the former, point to their households as well. Thus, the eighth-century papyri clearly reflect beneficiaries. This interpretation coincides with some of the Arabic narratives about *muhājir*s and the privileges they enjoyed from their status. It is important to note that providing the *muagaritun* with wine does not necessarily reflect on the (low) level of their "Muslimness." In fact, we know very little about the consumption of alcohol during early Islam. We do know that it was prohibited at least from the ninth century on the one hand, and that it was consumed, on the other (Nol, 2022a, pp. 151–152; 2023b).

Another papyrus (no. 1447), which dates to 685–705 on the basis of the governor's name, is of special interest. This is a long list of people entitled for an allowance, and their affiliations. The text lists women, *mawlā*s and other individuals by name. In addition, it mentions "various *muagaritun*" (or *muagaritun* of various places), starting with the ones of Fusṭāṭ, in today's Cairo. Other individuals are mentioned as coming from "Kor" (κορ), a possible abbreviation for "Quraysh." Some are affiliated with "Anṣār" (Αανζαρ), a name for the first followers of the Prophet who moved with him to Medina (Bell, 1910, pp. 360–368).

This document indicates, first, that emigration took place from Arabia to Egypt before the year 705. In addition, women took part in this migration. The document implies, however, that in the eighth century, these individuals – certainly migrants – were not identified as *muagaritun*; this title was reserved for another group. This interpretation is supported by PERF 558 and the line about *muagaritun* and others. Papyrus 1447 additionally suggests that even people who had migrated from Mecca to Medina with the Prophet were not identified as *muagaritun*, as they had another title (Anṣār). All the above indicates that the term *muhājir*s cannot be understood as "emigrants" *per se*. The meaning of "warriors" – perhaps expanded in the late seventh century to include their households – seems more suitable. In other words, the term is not, in itself, evidence for Arab emigration. However, it may certainly be evidence for the Arab conquests.

The Egyptian papyri provide relevant evidence for the mobility of labor, as well. Sailors, for example, were sent from Egypt to other regions, sometimes as a tax payment (Fahmy, 1950, p. 97). In one papyrus, Qurra asks the addressee about the number of sailors who stayed in Africa (Αφρικη) and the ones that returned to their district (Bell, 1910, pp. 24–25; 1911a, p. 279, doc. 1350). Different documents discuss the expenses over shipments of craftsmen such as carpenters, sawyers, or iron workers to help building, among other projects, the mosques of Damascus in Syria and Jerusalem in Palestine (e.g., Bell, 1911b, p. 374, doc. 1366; 1912b, doc. 1433).

A second type of archaeological text is inscriptions, be they engraved, molded, or painted. "Formal" inscriptions in the seventh and eighth centuries, often created at the instruction of caliphs or governors (Ritter, 2016), mostly for dating purposes, will seldom be used in this study. Much more common in this period are "informal" inscriptions in Arabic ("graffiti") on rocks and on architectural features. In many of these, individuals express their devotion to God and/or the Muslim faith. The relevance of this evidence to the question of Arab migration is discussed later with the introduction of physical remains of mosques and Muslim burials. Most of the graffiti are found in Arabia and the deserts of Israel/Palestine and Jordan (Hoyland, 1997; Lindstedt, 2022; Milwright, 2021). Another early source are tombstone inscriptions (epitaphs) which employ Quranic verses. The earliest examples have been found in Cyprus, Uzbekistan, and Jordan, dated as early as years 649, 676, and 690, respectively (*Thesaurus d'Epigraphie Islamique*, no. 1536, 17873, 53316, http://www.epigraphie-islamique.uliege.be. For later epitaphs from Egypt, see Halevi, 2007, pp. 14–25). This evidence implies the mobility of Arabs, the mobility of other Muslims, or conversion. At any rate, it provides very early evidence for the presence of the Muslim faith outside of Syria and the Arabian Peninsula. This indicates mobility which perhaps relates to the Arab conquests.

Additional inscriptions in Arabic from the early to mid-eighth century provide straightforward evidence for mobility from the Levant. Two texts have been documented on Aegean islands, Kos in Greece and Knidos in Turkey (Christides, 2006, pp. 54–55; Imbert, 2013; *Thesaurus d'Epigraphie Islamique*, no. 30132). The latter mentions the origin of the author from "the people of Palestine" (*ahl Filasṭīn*), circa 900 km removed in a straight line. Other inscriptions of the eighth century derive from Libya and Algeria (Fenwick, 2022, p. 211; *Thesaurus d'Epigraphie Islamique*, no. 29963, 42784). The Algerian text, found at Biskra, mentions the deceased coming from among "the people of Ḥimṣ," Syria. The two Levantine toponyms are repeated in inscriptions of the same time from Saudi Arabia: in al-Aqraʾ and Jabal Ḥismā (*Thesaurus d'Epigraphie Islamique*, no. 54532, 56647). The distance between the approximate location of the toponyms and the find spot of the inscriptions is visualized on the map, as well as the direction of movement (Figure 2). The arrows on the map, however, are

Figure 2: The approximate location of Ḥimṣ and Filasṭīn and find spots of eighth-century inscriptions which bear the two toponyms.

schematic and do not indicate specific routes of movement. Whereas these inscriptions imply mobility during the eighth century, they might also indicate an earlier settlement of migrants who retained the identity of a migrant community.

Both types of inscriptions – formal and informal – use the term *masjid* (mosque) from a very early stage. However, the term does not imply an adjacent structure for prayer and does not necessarily indicate the practice of prayer. In the Quran, the word can be understood as a sanctuary in general (Bloom, 2003). However, the distribution pattern of such inscriptions correlates with the pattern of physical mosques that relate to an excavation project, to be presented shortly, suggesting a possible correlation in their function as well. Inscriptions from the first three centuries of Islam use the terms *masjid* at 15 sites and *mi'dhana* (minaret) at 2 sites (Nol, 2023a). The two words are to be found from 698 to 816 (the first two centuries of Islam) in the western Arabian Peninsula and in Greater Syria (Figure 3). From the year 818 onward, *masjid* spreads also to North Africa and Spain, to Egypt, and to Pakistan (Figure 4). It is not possible to directly relate this evidence to migration. Nonetheless, if it does, it would mean Arabs started migrating from the Arabian Peninsula and Syria only in the ninth century.

To summarize, the contemporary written sources clearly indicate Arab mobility into farther territories. The seventh-century evidence can be interpreted as related to military campaigns, if not to settlement. Inscriptions from the eighth century distinctly show movement of individuals from the Levant to North Africa and the Aegean, which could be additionally interpreted as evidence for migrant identity. Most evidently, the papyri point to an emigration of men and women from Arabia to Egypt before the year 705 AD. Nevertheless, contemporary texts provide us with only very specific and thin contexts, at least geographically.
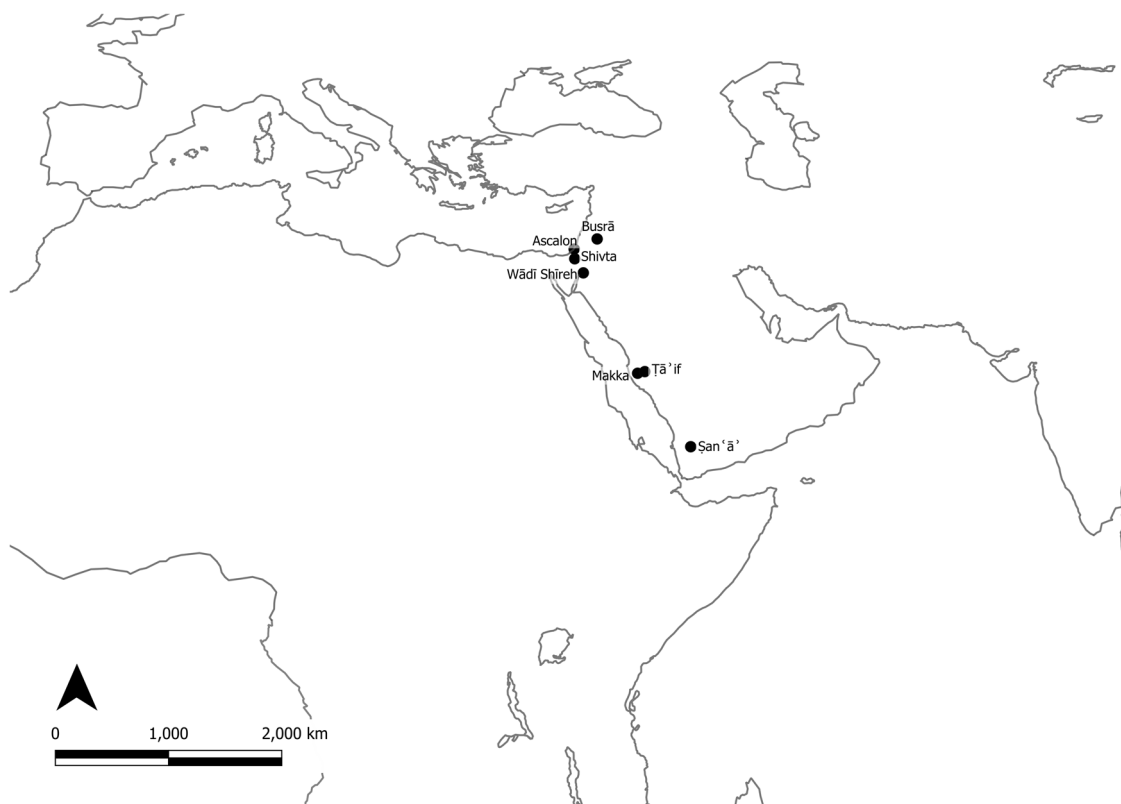

Figure 3: Spatial distribution of inscriptions with relevant mosque terminology, late first and second centuries of Islam (698–816 AD).
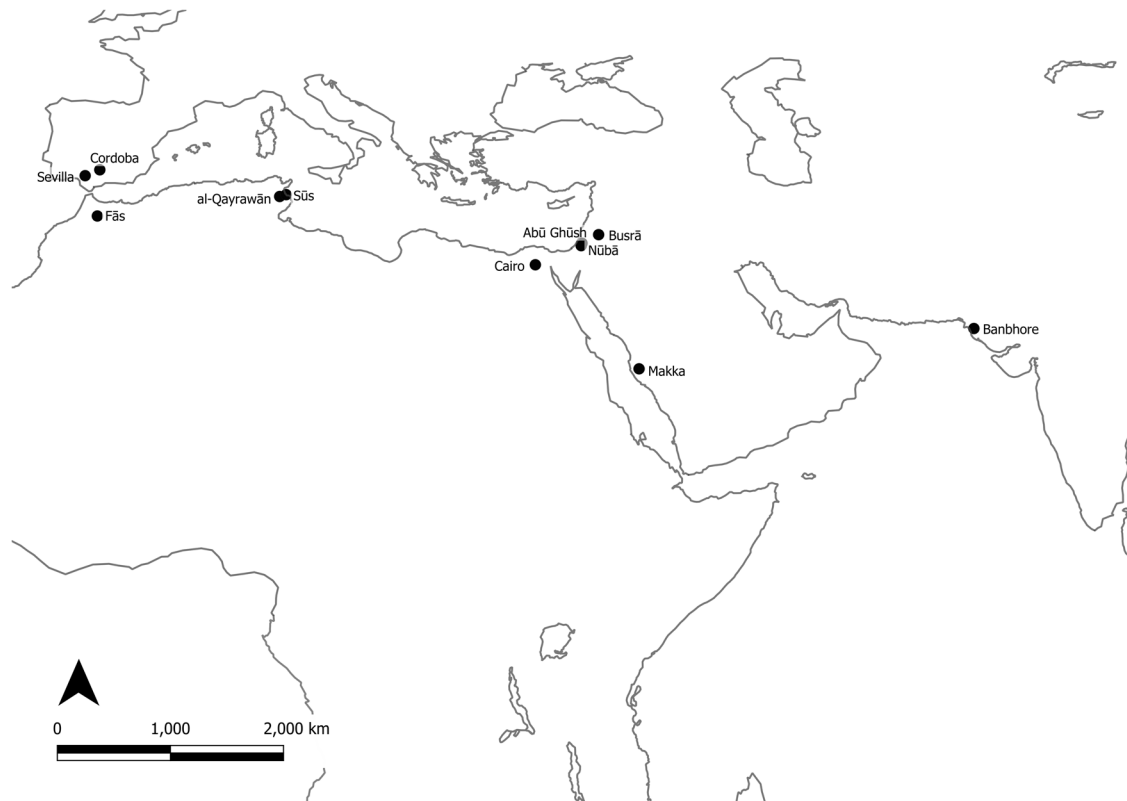
Figure 4: Spatial distribution of inscriptions with relevant mosque terminology, third century of Islam (818–907 AD).

4 Migration in Archaeology

The third source with which we can examine the question of Arab migration – and the main topic of this study – is archaeology. Unlike archaeological texts, archaeology presents a broader geographical scale. Unlike the narrative sources, it provides contemporary evidence of the events. Here I will introduce two sets of premises on migration in archaeology which I transform into two possible models. I will then present a number of case studies from AENAE which might prove to be related to migration and will compare them to the models. In short, the models have first and foremost been designed to assist in identifying Arab and Muslim migration in the archaeological case studies.

Archaeologists in various disciplines, including Islamic archaeology, tend to interpret changes in material culture of specific regions as the result of contacts with other communities (see, e.g., Brittain & Clack, 2022; Frieman, 2021, p. 28; Tolme, 2013). While in some fields, the contacts are perceived through economic lenses, for example, others tend to explain contacts as deriving from migration. Despite criticism from different directions over the years, along with shifting discourses in academia, it seems that some of the main notions and questions on migration in archaeology remain (Furholt, 2018). Two central approaches can be identified: the more traditional "cultural paradigm," and a more critical approach of recent decades. The two approaches differ, first, in the phases they associate with migration. Second, they have developed different explanations for the roles of the place of "origin" as well as the "destination" of migration. As a result, the two approaches differ in their interpretation of specific material evidence or changes in it. Nevertheless, both approaches are optimistic in essence and hold that migration can be identified in the archaeological record.

For some clarification, I define "culture" as a composition of knowledge, meanings, and behaviors of groups in specific contexts which is often communicated through language, symbols, objects, and arts. According to the cultural paradigm, well-defined geographies, well-defined in time, are identified as "cultural areas" through a unique set of material culture. Migrants are, accordingly, well-defined cultural groups

deriving from their own cultural areas and thus having their own unique material culture (see Aldred, 2021, p. 12; Anthony, 1990, p. 896; Frieman, 2021, pp. 124–126; Hakenbeck, 2008; Van Oyen, 2018). New material culture at a site therefore represents new migrants and the site is interpreted as a "destination." If the same material culture is found at another site, preferably from an earlier period than at the destination, the second site is identified as "origin." Aldred (2021, p. 13) adds that, very often, "a straight line is shown between a point of origin and a destination" with only variations in distances. In accordance with this line of thought, it is also argued that the migration process can be a fast event (Carvajal-López, 2021, p. 62).

Archaeologists then tend to interpret the arrival of new migrants as causing a cultural change at the destination. This interpretation makes the process of transition self-explanatory (Carvajal López, in press). One example, on which I will elaborate shortly, is the interpretation of irrigation methods diffused within Spain as caused by a migration of Arabs and Berbers.

Some of the criticism targeting the cultural paradigm has pointed out that migration, including the identities of the people involved, is interpreted as static. Another problem with the paradigm is its sole reliance on migration as a cause of innovation. Clearly, the diffusion of knowledge and ideology comes in various ways, not only through migration, e.g., with trade or other forms of exchange (e.g., Burmeister, 2000, p. 540; Hakenbeck, 2008, p. 17; Van Oyen, 2018). Even more so, cultural change occurs by different mechanisms. Whereas contact between groups can be one motor for an increasing flow of knowledge, some innovations are created independently, without contacts, while others are never adapted (Amati, Munson, Scholnick, & Habiba, 2019; Costin, Earle, Owen, & Russell, 1989; Erb-Satullo, 2020; Frieman, 2013, 2021; Jiménez Puertas & Carvajal López, 2011; Tolme, 2013; Van der Leeuw, 1981, pp. 281–300).

As one alternative for the cultural paradigm, scholars suggest employing an analogy with twentieth-century migrations, studied by the social sciences, along with historical migrations from the seventeenth to the nineteenth century (Anthony, 1990; Burmeister, 2000). Hakenbeck advocates this approach, explaining that "while we cannot simply transpose modern scenarios onto the in origin: pre-industrialised period as if they were universal, we equally cannot assume that migration in the past was limited to the movement of ethnic groups or demographic expansion" (Hakenbeck, 2008, p. 19).

The authors of the alternative theoretical framework suggest several aspects in their case studies which might be relevant to archaeology. One aspect is the identification of phases in the migration process. The first migration phase is either a planned expedition or a more spontaneous journey by "scouts." The scouts do not necessarily settle for a long period in a destination. They could include merchants, craftsmen, missionaries, or warriors (Anthony, 1990, pp. 902–903; Burmeister, 2000, pp. 548–550). After the return of the scouts to their origin, or the use of another channel of communication, the second migration phase comprises settlers. The settlers emigrate directly to their planned destination, an act for which Anthony uses the term "leapfrogging model" (Anthony, 1990, p. 903). Archaeologically, the designated settlement of the second group can be identified by settlement clusters at the destination site which are located far away from the origin.

A second aspect in the alternative theoretical framework of migration is the demographic characteristics of the migrants in each phase. For example, young men are expected to act as scouts, the first phase of migration, whereas entire families could characterize long-term or permanent settlers, the second phase. This aspect can be detected in the archaeological record through the identification of burial demography (Anthony, 1990, p. 905; Burmeister, 2000, p. 550).

A third aspect is the links between origin and destination. The scouts, for example, keep a continuous relation with their place of origin, on their return or earlier. This relation allows for a flow of information from destination to origin which assists future migrants in their decision-making and in preparation. The links between origin and destination are also expressed in the migration of the next generations. These migrants follow the early settlers and move to the same destination as their predecessors, sometimes family relatives (Anthony, 1990, pp. 902–903). Archaeologically, this could mean a cluster of dwellings which comprise similar characteristics at a site. Another archaeological expression of the link between origin and destination could be a continuous flux of artifacts (Burmeister, 2000, p. 549). Barceló argues that communication networks necessitate infrastructure such as routes and ports (Barceló, 2001, p. 299), another easily detected feature in archaeology.

Migrants who returned to their place of origin could be observed through personal goods they imported from the destination they had just left (Anthony, 1990, p. 904). This interpretation stands in contrast to the notion that migrants take personal goods with them from the origin to the destination (Taxel, 2019, p. 233; Taxel & Fantalkin, 2011, p. 94). Burmeister raises another important part of these relations: the impact migration had on the origin area itself – economically, socio-politically, and culturally. On the one hand, leaving the region of origin might hurt the people and property which are left behind. On the other hand, returning migrants might introduce new ideas and new capital. Archaeologically, abandonment or decline of settlement sites might signify migration (Burmeister, 2000, pp. 545, 550). Therefore, changes in artifacts and technological innovations perhaps indicate places of origin, not destinations.

A fourth relevant aspect in the analogies with modern migrations is the cultural characters that migrants develop at the destination. According to Burmeister, there are two social scenarios. In one scenario, migrants adapt to the culture of the destination, at least in the public sphere. This can be seen, for example, in the facade architecture of public structures – as well as of private homes – which is identical to its surroundings (Burmeister, 2000, pp. 541–542; 2017, p. 61). The first scenario can be reflected archaeologically in the recognition of small groups within settlement sites through the interpretation of their private activities. In comparison to other activities at the site, these groups might have a unique set of vessels, unique foodstuff, and a different interior organization of dwellings. These finds should be similar to finds in the origin. According to the other scenario, migrants respond to the culture clash with the destination society by creating a new culture altogether (Burmeister, 2000, p. 546). This could be reflected archaeologically by a small group at the site with a material culture different from both origin and other groups at the destination.

5 Models of Migration in Archaeology

I have summarized the two dominant archaeological premises on migration into two models. The first one is based on the cultural paradigm while the second is based on the alternative theoretical framework. The models have been simplified and exaggerated. They have been designed to examine which of our case studies, if any, could be related to Arab or Muslim migration. The models visualize the place of change, the chronology of change, and the links and direction of influence between origin and destination. In both models, an emphasis is given to a single place of origin and a single destination. In order to offer measurable properties and maintain consistency, I randomly defined these origins and destinations as regions of about 500 km in diameter. This arbitrary definition will be tested and discussed along the article.

According to my simplified solution, the two main elements which should help to identify migration are specific objects or characteristics which can be observed in both origin and destination, and a drastic change in material culture in one of them. Principally, the first model highlights the link between origin and destination in two subsequent timeframes, and cultural changes at the destination. The other model points to continuous links between origin and destination and the cultural changes in the place of origin. As one could expect, periodization constitutes an important element in the identification of cultural changes.

The models present three axes: place (origin and destination), time, and material culture. The time axis is represented by "period x" (the moment of initial migration) in the first model, including its previous and following periods, and by phases (x.1 to x.3) in the second model. Material cultures are represented by "y" or "z," where "y" is the material culture of the origin prior to migration and "z" is a newly emergent material culture in response to migration. Their combination with "a" or "b" denotes small changes over time. In some cases, two distinct types of material culture are expected to be found at the site simultaneously, as represented by the plus symbol (+).

The first model corresponds with the cultural paradigm which expects new material culture at a site to represent migrants. In this model (Figure 5), the migrants brought material culture "y" with them to the destination. Therefore, "y" can be found at the destination during period "x" and earlier at the origin ("before x") but cannot be found previously at the destination. The possible variation in "ya" means that after the migrants left their place of origin, the remaining local material culture changed only slightly. The variation
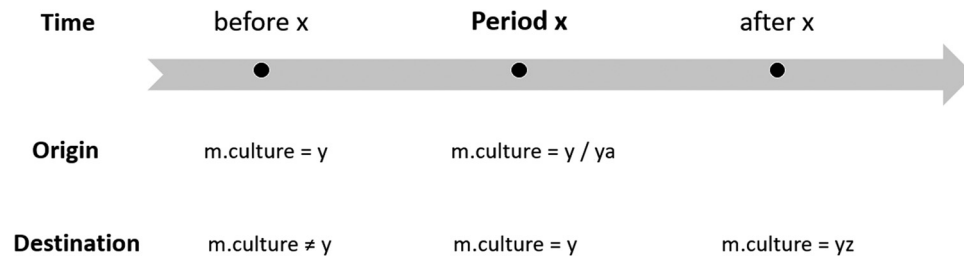
Time	before x	**Period x**	after x
Origin	m.culture = y	m.culture = y / ya	
Destination	m.culture ≠ y	m.culture = y	m.culture = yz

Figure 5: First model for the identification of migration in archaeology.

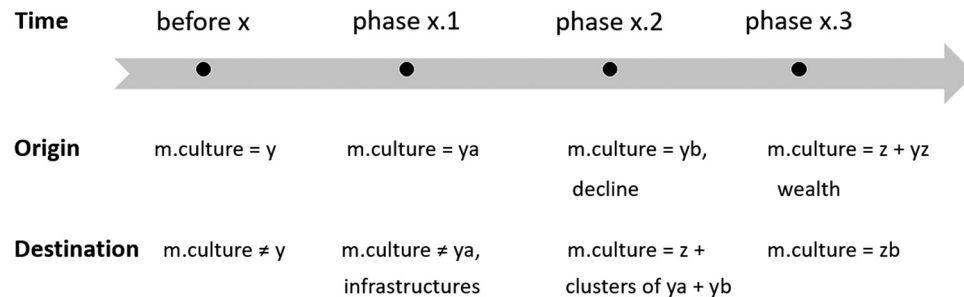| Time	before x	phase x.1	phase x.2	phase x.3
Origin	m.culture = y	m.culture = ya	m.culture = yb, decline	m.culture = z + yz wealth
Destination	m.culture ≠ y	m.culture ≠ ya, infrastructures	m.culture = z + clusters of ya + yb	m.culture = zb

Figure 6: Second model for the identification of migration in archaeology.

"yz" denotes the cultural change which occurred at the destination as a result of migration. Examples could be technological changes in the production of artifacts that were already produced in earlier periods, or conversion to another faith.

The second model follows the alternative theoretical framework and presents several phases of migration (Figure 6). Accordingly, no significant changes occurred in the destination culture during the first phase (x.1), when only "scouts" migrated. One type of material evidence could be infrastructure (e.g., routes) which enables communication channels between origin and destination. In contrast, the second phase, in which "settlers" migrate (x.2), sees several changes. During that time, most of the population at the destination displays culture "z." However, small clusters at the site, which represent the migrant communities, have both cultures "ya" and "yb." Culture "ya" existed at the place of origin in the previous period and was brought by the migrants to the destination. Culture "yb" exists simultaneously in origin and destination, indicating the regular links between the two. Returning migrants, who represent the third phase in the model (x.3) are expected to take culture "z" with them from destination to origin. In addition, they are expected to develop a new culture which combines both cultures of destination and origin ("yz"). The origin, which suffers from decline in phase x.2 due to the migration of some inhabitants, will enjoy wealth on their return in phase x.3. In cases when migrants leave the destination, the destination continues having only its own culture which has changed over time ("zb").

6 Archaeological Case Studies

The following section explores case studies from AENAE. The cases vary in their specific period, in region, and in type. They were selected due to former arguments about their relation to Arab migration, or for their potential as evidence based on their characteristics. The reader may notice the imbalance between the Levant or Spain and other areas in AENAE. Beside my better acquaintance with the former, the archaeological research of Islamic remains beyond Israel/Palestine, Jordan, and Spain is in its infancy. The topics comprise irrigation techniques, the architecture of "Desert Castles," pottery and soapstone vessel production, and religious practices as reflected in burials and mosques.

I have excluded two types of evidence which could potentially be related to migration and/or technological change: glass and coins. Glass production in the Levant had its recipe and raw materials changed in the early ninth century, replacing natron (for alkali) and shells (for calcium) with plant ash, and sand (for silica) with quartz or chert (Henderson, 1985; Henderson, McLoughlin, & McPhail, 2004, p. 454). Whereas this is a significant innovation which should get more scholarly attention, its late date excludes it from our time frame. Regarding Arab coins, Gasc argues for a correlation between their spatial distribution in Spain and places where Arabs settled (Gasc, 2021). Fenwick (2022, p. 208) goes further and suggests that Arabic coins minted in North Africa imply the spread of Islam. However, the minting of coins rather represents administrative operations and coin distribution provides information about economic networks (e.g., Nol, 2022b). Neither, I believe, is conducive towards identifying human agency. In fact, Arabic coins were frequently used in northern Europe during the medieval period among Christian and pagan societies (e.g., Knutson & Ellis, 2021, pp. 9–10).

The relevance of each of the selected case studies to migration is not always obvious and needs examination. This is conducted through a systematic set of categories offered by the theoretical models above. Dates are essential for establishing a timeline for a site and for detecting possible changes in it, such as an eighth-century change which would imply Arab migration at this point in time. For this reason, I place an emphasis on dating the finds. The dates I consider are based on archaeological dating tools, not on chronicles or on analogies with other sources. As a proxy, I consider the Arabian Peninsula and the Levant as places of origin for Arab or Muslim migration during the seventh and eighth centuries. As I will show, most of the cases proved to have too little secure evidence to support questions of migration. Nevertheless, some enable the migration interpretation and at least one case study supplies clear evidence for migration.

6.1 Irrigation Techniques

Archaeological research in AENAE has investigated various techniques for fetching and using water both inside and outside settlements. Some of these techniques are assumed to relate to the diffusion of knowledge or social change. Many techniques, such as wells, proved so successful that they have been employed for millennia with only very nuanced changes (Wilson, 2008). Some of the other water-fetching techniques are more limited chronologically and may assist, at least in theory, in solving questions regarding social transformations. This potential, however, is not always met due to several challenges. One is that for a very long time in most of the region, any sophisticated technology has been considered "Roman" (generally the second century BC to the fourth century AD) or "Late Roman" (fourth to seventh century AD) so that precise dating was not pursued (Fenwick, 2013, p. 10). Another challenge is that even when features are dated, the results are often too broad for any significant typology. One of the solutions, dating water systems according to an analogy with relevant texts (e.g., Gorzalczany, 2011, p. 211; Kirchner, Virgili, & Puy, 2021), prevents the independent and empirical archaeological research we are aiming at. In addition to these challenges, secondary literature often lacks an overview and synthesis of water installations at different sites or in various periods.

One branch of scholars who advocate migration as the motor for cultural change is formed by archaeologists of Islamic periods in Spain. A central argument relates to irrigation in southern Spain as, first, it differs from previously employed dry farming, and second, is linked to Muslims and/or the spread of Islam. Thus, although irrigation solutions were known previous to Islam, it is an accepted assumption that they became widespread during the Islamic period. Their popularity was caused, archaeologists believe, by a migration of Arabs and Berbers (Barceló, 2001, pp. 306–307; Carvajal-López, 2023, pp. 33–34; Esquilache, 2021, p. 131; Kirchner, 2021, p. 12). Beside the chronological factor, scholars show that in northern Spain, a region under Christian authority, irrigation was not used (Jiménez Puertas & Carvajal López, 2011). Similarly, it is claimed that the Christian conquest in the thirteenth century interrupted the "normal evolution" of one such irrigated area "by the destruction of the Andalusi society that had built it" (Esquilache, 2021, p. 149).

This approach suffers from two main flaws. First is the invalid dichotomy between irrigation and dry farming. Dry farming consists of different agricultural practices and methods of water manipulation, and medieval farmers in southern Spain therefore had to use a variety of strategies, often in parallel. The irrigated

areas were located close to the house while other farming methods were used in farther fields and orchards (Retamero, 2021). Superficial irrigation supplemented by rainfall in semi-arid and Mediterranean zones provides more security since watering the field before sowing results in a better yield (Ersten, 2012. See examples from modern Israel in Nol, 2022a, pp. 186–187). Above all, choosing irrigation solutions must fit a series of requirements and "forms of social management associated with different forms of irrigation," such as a labor calendar (Retamero, 2021, p. 176). The motivation for irrigation might therefore be related to risk management and exchange systems, to demographic needs, or to taxation, among others (see Retamero, 2021, pp. 188–189). These issues then reduce the position of irrigation in the hierarchy of water management solutions.

The second flaw relates to the imprecise dating of the distribution of irrigation methods in Spain between the eighth and twelfth century – unknown both archaeologically and historically (e.g., Guinot Rodríguez, 2021, p. 119). Contemporary documents supply only *terminus ante quem* dates, for example of the 1150s for Tortosa or the 1240s for Manacor (Kirchner et al., 2021; Sitjes, 2021). Arguing for an eighth-century process is thus uncertain at best. The lack of dating makes the comparison to our models very difficult. Even more so, since irrigation was known in Spain before the eighth century (e.g., Barceló, 2001, pp. 306–307), the models would not be able to detect the change. Finally, research has not yet provided links with another region which could be identified as either origin or destination. In short, irrigation in Spain cannot be examined through our models.

A different case study, which may be more suitable for our examination, regards *qanat* irrigation in the Levant. The method (originally *qanāt*, sing. *qanā*, a channel in Arabic) includes the following elements. The method includes the following elements (Figure 7): (1) a "mother well" which is dug into the groundwater levels, (2) an underground channel that transfers water from the mother well to an open canal in a slight slope, (3) a series of vertical maintenance shafts dug along the channel, and (4) an open canal which allows water to flow from the channel outlet to the fields (Ahmadi, Nazari Samani, & Malekian, 2010; Avner, 2016; Avni, 2018; El Faiz & Ruf, 2010; Lightfoot, 1997; Porath, 2016).

The origin of the method had been ascribed to Achaemenid Persia in the sixth century BC, and its other appearances have been interpreted as a diffusion of knowledge from there (Charbonnier & Hopper, 2018; Ersten & Morgan, 2021). However, excavations of relevant remains show that the technology developed in different areas and at different times. The question of diffusion vs parallel inventions brings forward different arguments. Some scholars claim that variations in the different cases, and in their construction techniques, precludes it being a single method (Charbonnier & Hopper, 2018; Ersten & Morgan, 2021). Avni (2018) argues, in contrast, that the typology of various *qanats* is strongly related to chronology. Therefore, he suggests that much of the expansion of the *qanats* relates to specific authorities in specific periods – the Umayyads in the seventh to early eighth century.

Qanats have been known in the Levant from Israel/Palestine and Jordan (Figure 8). Their dating is based on the date of excavated or surveyed settlements in their environs. This suggests that the technology entered the
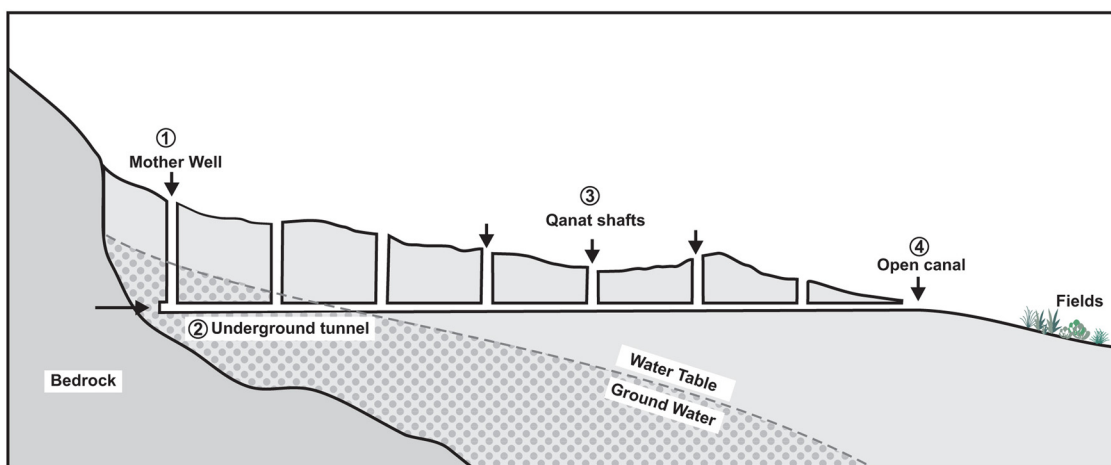

Figure 7: The *qanat* system (drawing: Ron Haran after English, 1968).

Figure 8: *Qanat* shafts near Ma'an (APAAME_20070419_FFR-0136, photography: Francescar Radcliffe, courtesy of APAAME).

Levant either in the Roman period before the fourth century AD (Driessen & Abudanah, 2018, p. 148), during the seventh or early eighth century AD (Avner, 2016, p. 24; Avni, 2018; 2020, p. 117; Porath, 2016), or during the late eighth or early ninth century in the "Abbasid period" (Nol, 2014, 2015). Along with the second scenario, the diffusion of the method in the region has been assigned to the Arab conquests (Avni, 2018). This, however, does not yet resolve the question about the agents of diffusion: Arab migrants or the Islamic "state" (Nol, 2014).

In order to test if the *qanat* technique could ever fit our models, we shall refine some of the suggested interpretations. We would assume that the technique arrived in the Levant (a) in the eighth century and (b) from Iran or areas under Persian influence such as the Arabian Peninsula. This would agree with the first model, in which the migrants brought culture "y" with them to the destination, where it was unknown before. In contrast, the second model necessitates a continuous link between the two regions, which cannot be detected.

6.2 Desert Castles and Courtyard Structures

The second case study brings forward an architectural form which has been suggested to derive from the Arabian Peninsula and to spread in the Levant: the so-called "Umayyad Palaces" or "Desert Castles." These are monumental structures which consist of a square plan, external towers or buttresses, and at least one court-yard (Figure 9). The title has been given to sites in modern Jordan, Israel/Palestine, Syria, and Iraq, including the most famous examples of Khirbat al-Mafjar, Jabal Says, and Qaṣr al-Ḥayr al-Sharqī. The possible functions that have been suggested for them include palatial residences, agricultural estates, trade stations, a safe space for Muslims, or early urban regional centers (Nol, 2022a, pp. 22–23; Walmsley, 2007, p. 99).

The structures have been dated to the early eighth century and are often attributed to a single ruling family, the Umayyads. Inscriptions are the most reliable dating tool in these contexts – indeed providing dates from the 720s – but these are extremely scarce. Most of the sites certainly continued to be in use into the next centuries and evolved during later periods, as the few excavations have shown (Genequand, 2012, p. 99; Whitcomb, 2016). Although the architectural similarities between many of the Desert Castles imply patronage networks, it is generally agreed that they were not homogeneous artistically or functionally and perhaps should not be defined as a single group (e.g., Genequand, 2006; Hillenbrand, 1981, p. 65; Milwright, 2010, pp. 35–36; Walmsley, 2007, p. 105). Despite various modern terminologies and later dates, these structures
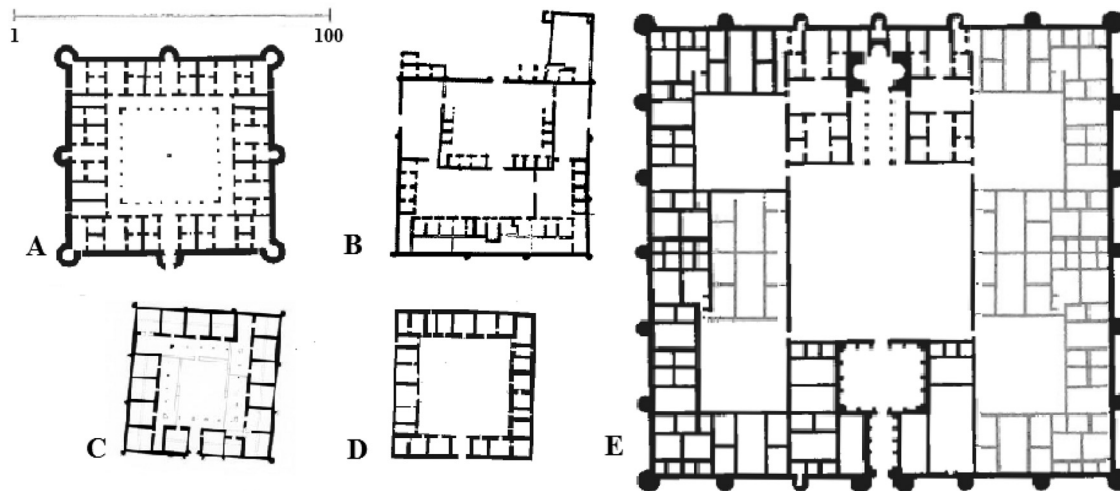
Figure 9: Schematic representation of various types of "Desert Castles" (drawing: Ron Haran). (a) Jabal Says (after Genequand, 2006, Figure 1:1), (b) al-Qaʿ (after Whitcomb, 1996, Figure 2:P), (c) Khān al-Zabīb (after Genequand, 2009, Figure 21: northern structure), (d) Umm al-Walīd (after ibid, Figure 10), and (e) Qaṣr al-Mshattā (after Genequand, 2006, Figure 5b:2).

resemble others in Uzbekistan from the ninth or tenth century, if not a bit earlier (Field & Prostov, 1948, Figure 5; Mirzaakhmedov, 2012) and in the Arabian Peninsula (e.g., Figure 9b), dated to the ninth to tenth century, based on a single excavation (O'Kane, 2014; Whitcomb, 1996. See also Avni, 2014, pp. 202–203; Northedge, 2009). A smaller and simpler variation contains rooms around a courtyard, such as in Maʿan or Ḥumayma in Jordan, which Genequand (2006) entitled *quṣūr* (sing. *qaṣr*, castle or palace) (Figure 9d) and which can also be found at a number of early Islamic sites in southern Israel (Nol, 2014).

A similar style of architecture could be identified at sites of the third to fourth century in Saudi Arabia (Northedge, 2009), one of them being Qaryat al-Faw. The excavated site includes structures which have been interpreted as a market, a palace, and a temple. The possible market is a fortified structure with seven towers, a gate, an internal courtyard structure, and a cistern. The internal rooms are interpreted as shops and resemble rooms in the Desert Castles. The site, published only partially, could be dated generally from the second century BC to the fifth century AD, based on partially published pottery and ^{14}C results. Coins from the site date to the first to early fourth century AD. A foundation inscription in ancient South Arabian script from the temple was dated to the first to fourth century AD whereas the architecture and sculptures have parallels from the first century AD (al-Ansary, 1981, pp. 28–29). Al-Ansary thus advocates the migration scenario, suggesting that Muslims who planned their later cities such as al-Kūfa or al-Fusṭāṭ "were inspired by their own local heritage which they carried with them from the Arabian Peninsula" (ibid, p. 22). Northedge supports this general chronological sequence albeit with different nuances. He believes that al-Faw and similar Arabian sites did not invent the fortified structure but imitated Roman forts on the Arabian frontier. The forts, he argues, were then further developed in the Levant by the Umayyad family during the seventh century (Northedge, 2009, pp. 248–249). In other words, the idea of these forts was migrated either by migrants or by another mechanism initiated by the rulers.

The Desert Castles might roughly fit the chronological scheme of our first model. In that case, the origin would be the Arabian Peninsula and the destination in the seventh century includes the Levant to Iraq. Culture "y" was exported and later developed into culture "yz" with the smaller square-shaped structures. One problem would be that their distribution falls into a region much larger than my pre-defined 500 km. The definition of a single destination is random, however, and therefore cannot pose a strong obstacle for interpreting the Desert Castles as related to migration. The main problem is their stylistic variety as well as their resemblance to architecture in other areas which question their suitability as a single type of material culture to begin with.

6.3 Portable Artifacts: Ceramics and Soapstone

Burmeister suggests that aspects of function and technology in material culture, "free of symbolic meaning," do not change frequently and thus may represent migration best (Burmeister, 2000, p. 553). The following section is devoted to the production techniques of ceramics (in Spain) and to the introduction of soapstone (into the Levant and Egypt). While studies on the two sets of material are limited as yet, the former relates to technological innovation and the latter to the mobility of artifacts.

In southern Spain, pottery production had changed before the tenth century in a number of ways. The innovations included new types of oil lamps, a portable cylindrical oven, tableware, and new decoration techniques in color. All these characteristics and objects are also known from Egypt or the Levant (Carvajal-López, 2021; Salinas, in press). In theory, one could argue for their link to migrants, but many more interpretations are also valid (e.g., a market-related one), especially when a more precise date for the changes is absent.

One study, from seven sites in the region of Granada, offers better dating for eighth and ninth century pottery. It demonstrates three modifications: a change in the clay recipe in the ninth century, an alteration of big storage jars, and developments in *olla* cooking pots (Carvajal-López, 2021). Figure 10 presents changes in the form of *ollas* from the fifth to the eleventh century AD. In the first phase, before the year 800, the volume of the container remained the same, along with its globular profile and even its main production technique on the wheel. However, the height of its neck grew and allowed for a spout, a morphological change which mirrors changes in cooking or in serving. Moreover, the later *olla* types seem to have thinner walls, which might indicate a higher wheel speed. Another characteristic, not shown in the figure, is a new technique for finishing the pot bases – scraping – in addition to the traditional technique of a wire cut. These shifts become clearer in the second phase, 801–925 AD. No other changes could be detected in the second phase (Carvajal-López, in press). It is noteworthy that not all developments could be observed at the Granada sites in parallel (idem, 2021, p. 63; in press). These changes come in contrast to a technological stability in the earlier period, between the fifth and eighth century. Carvajal-López connects them with the arrival of migrants to the region (Carvajal-López, 2021; in press). Our models, however, necessitate more data to relate the changes to farther regions and the aspect of bringing the knowledge ("y" or "z") from elsewhere.

Soapstone vessels make a different case. These objects generally include greyish/greenish softstone types such as steatite, chlorite, or talc (Phillips & Simpson, 2018). The most common artifacts for the eighth to ninth century are "pots" or "bowls," "incense burners," and open "lamps" with a triangular or a star form. The

Olla Type A (c. 400-700 CE)

Olla Type S (c. 711-1011 CE)

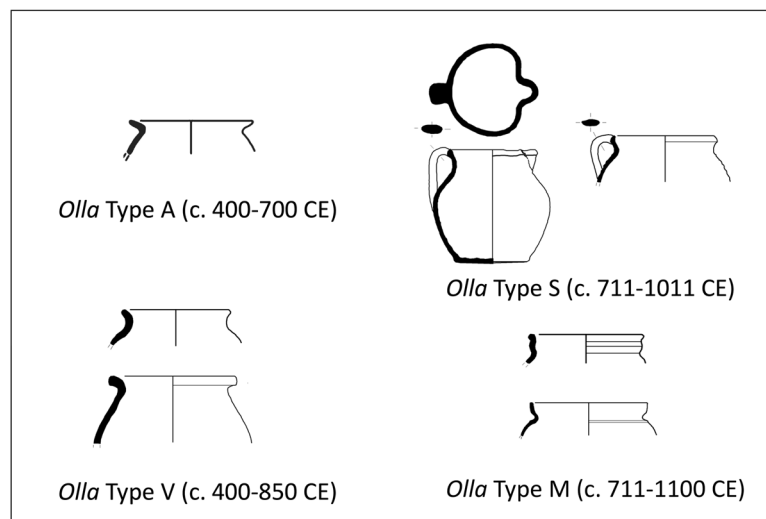*Olla* Type V (c. 400-850 CE)

Olla Type M (c. 711-1100 CE)

Figure 10: Changes in the typology of *olla* cooking pots, Spain (drawings by José Carvajal-López, Miguel Jiménez Puertas, and Angel González Escudero, with permission).

Figure 11: Soapstone "incense burner" from Ramla, Israel (photography: Clara Amit, courtesy of the Israel Antiquity Authority).

incense burner is a small container with four legs and, usually, has a handle (Figure 11). Identical shapes were found in clay objects (Le Maguer, 2011). At the Late-Antique site Qaryat al-Faw, identical vessels were made from limestone, some engraved with South Arabian inscriptions (Al-Ansari, 1981, pp. 72–73). Braziers and lamps were recovered at key medieval sites, including Qaṣr al-Ḥayr al-Sharqī and Fusṭāṭ. In contrast, soapstone bowls are widespread among various sites, with many examples from southern Israel as well as al-Ṭūr in Sinai, Egypt (e.g., Fabian & Gilʿad, 2010; Kawatoko, 2007, pp. 10–11; Nol, 2015, pp. 53–55).

It is generally accepted that the provenances of the soapstone were south-east Arabia and south-east Iran, areas where such vessels had already existed before the eighth century and continued in production and use long after the tenth century (Simpson, 2018, p. 180. See also Le Maguer, 2014; Walmsley, 2000, p. 331). However, petrographic analyses of vessels from southern Israel imply a more local source, such as Sinai or Southern Jordan (Israel, Nahlieli, & Ben-Michael, 1995, p. 10). The common use of the soapstone bowls in southern Israel/ Palestine supports the idea of local production, as well (Nol, 2022a, p. 209).

The locality of bowl production in Israel/Palestine, its clear former use, and the limited region it was found in make it a great candidate for our models. Following the first model, people might have migrated from the Arabian Peninsula to the neighboring desert of Israel/Palestine. They would have brought with them their preference for pots made of soapstone and the techniques for producing these vessels ("y"), exploiting a more local source and creating a "yz" culture. Alternatively, and pursuant to the second model, people might have migrated primarily from southern Israel/Palestine to the Arabian Peninsula. Only with their return to Israel/ Palestine would they have brought with them Arabian knowledge and taste ("z"). Due to the known technology in the Arabian Peninsula prior to Islam, however, the first model gains more support.

6.4 Religious Practices: Mosques and Muslim Burials

One way to detect cultural and social changes in a region is through the religious practices of its inhabitants, such as funeral rituals and prayer. One of my premises was that the earliest Muslims lived in the Arabian

Peninsula and Syria, the "origin." Thus, one of the possible proxies for migration of Arabs during the seventh and eighth centuries would be the spread of Muslim rituals in this period. Above, I have explored the use of the term *masjid* in inscriptions from the eighth and ninth centuries. Other religious texts, such as the use of Quran verses, were not considered here. In this section, the first type of evidence examined is mosques related to an excavation project. The second one is Muslim burials. The relation of both to Islam, or the reasons for their identification as such, are discussed below.

Mosques can be identified archaeologically based on elements that are known from later structures: a *qibla* (a wall oriented to Mecca) and a *miḥrāb* (a round or square niche in the *qibla*). In some cases, the structures comprise a *ṣaḥn* (an open courtyard) and a *riwāq* (a portico around the courtyard). Another common method archaeologists employ is that of identifying a late-medieval mosque or a cathedral and excavating earlier structures below it which might have been mosques too – if not other sanctuaries (Nol, 2023a). The structures considered for analysis here all date from the seventh to the ninth century based on independent dating tools provided by their excavators (Nol, 2021). The dating tools include datable inscriptions, ^{14}C results, coins, pottery, or other identifiable portable artifacts, and index fossils of artistic motifs or construction techniques. The structures are mapped according to centuries. Mosques with a *terminus post quem* or a broad pottery-based date are marked differently from the ones with more certain dates.

The earliest three mosques are dated to the seventh century but are without certain dates: Aqaba in southern Jordan, Nahal La'ana in southern Israel, and al-Yamāmah in Saudi Arabia. I thus have included them with eighth-century mosques. The distribution map of the seventh to eighth century (Figure 12) shows a distinct cluster of mosques in Greater Syria, with 23 mosque sites. The map highlights, in addition, two structures in the Arabian Peninsula and three mosques with only *terminus post quem* dates in Iran, Uzbekistan, and Morocco. In short, by the end of the eighth century, mosques had possibly spread within the Arabian Peninsula and into Syria. A different picture can be drawn for the ninth century, when mosques spread to

Figure 12: Spatial distribution of datable mosques of the eighth century AD.
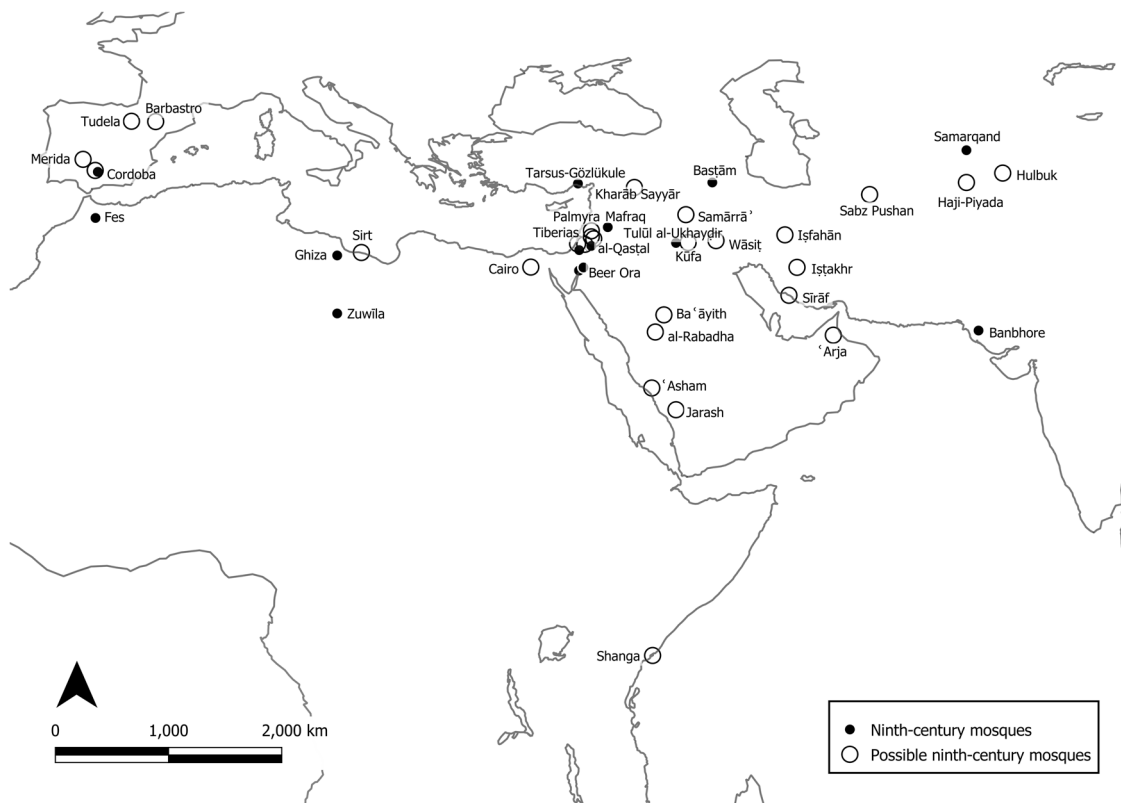
Figure 13: Spatial distribution of datable mosques of the ninth century AD.

present-day Spain, North Africa, Central Asia, and possibly to east Africa, with a total of 43 mosque sites (Figure 13). In other words, Islam spread broadly, but later than our timeframe of the seventh to eighth century.

These two patterns resemble the ones for *masjid* inscriptions (above): a local distribution during the eighth century and a widespread distribution during the ninth century. The conclusion for *masjids* regarding migration repeats, as well: if the pattern represents Arab migration beyond Syria and the Arabian Peninsula, then the process took place in the ninth century. The results for the eighth century do not enable us to use the models on migration since the whole distribution area – Syria and the Arabian Peninsula – is considered to be the "origin." If migration occurred, it happened within the space which I have identified as originally Arab. The spread in the ninth century is beyond our research frame. Even when considering it, however, it shows a broad distribution which answers a great number of continuous destinations. This type of distribution does not suit the models, which are designed to answer a single destination.

A second type of evidence for our question is Muslim burials, a central method for identifying individuals who adhered to the Muslim faith. In the Quran, burials are mentioned indirectly in three verses (Petersen, 2013, p. 242). The earliest relevant texts were written or compiled by ninth and tenth century authors such as Ibn al-Shāfī (died in 820), Ibn Saʿd (died in 845), and al-Ṭabarī. The Arab authors express legal norms on funerary customs in their time, including the construction of low graves, constructing them with a niche in the *qibla* wall, and burying corpses lying on their right and facing Mecca (Halevy, 2007, pp. 91, 188–189, 321). Another source, some suggest authentically earlier, is the poet al-Farazdaq (died ca. 732) who mentioned the Kaʿba (in Mecca) "toward which every grave is turned" (Gorzalczany, 2007, p. 71, followed by Petersen, 2013).

The archaeological evidence from different periods largely supports the ideal of corpses facing Mecca, while the other aspects are more diverse (Simpson, 1995). Skeletons facing Mecca thus can serve as a proxy for locating Muslim burials, at least from the eighth or ninth century onward. After the identification of such burials in early Islamic contexts, our discussion about migration requires the dating of these burials. One case study is a cemetery in Tashbulak, south-eastern Uzbekistan, with approximately 400 graves. Out of 40 skeletons that were examined, three infants and one adult had their face straight up, and 33 were oriented close to

the direction of Mecca (220–300°; Mecca is oriented 242°). The deceased came from both sexes and varied in age. Six of the adults were dated with AMS. The earliest date lay between 680 and 770 (with 95.4% accuracy) and the other five between 760 and 970 AD. The authors suggest them as evidence for an early conversion of the local population (Bullion, Maksudov, Henry, Merkle, & Frachetti, 2022).

A second case study comes from Nimes, France, where 20 medieval to modern burials were found. Three of the burials were identified as Muslim due to the skeleton position: positioned on their right side and facing Mecca. In two of the pits, a niche had been dug into the wall. Samples that were taken from the three burials gave similar ^{14}C dates between 680 and 760 with 95.4% accuracy. The three skeletons were of males. According to some of their characteristics, the authors suggest their African origin and thus their identification as migrants (Gleize et al., 2016). In Pamplona, Spain, a cemetery was found above the Roman bathhouse. In the cemetery, 190 graves were excavated, showing a similar position of skeletons facing Mecca. One skeleton of a male exhibiting signs of violence was dated with ^{14}C to 650 to 770 (Faro Carballa, García-Barberena Unzu, & Unzu Urmeneta, 2007). Finally, in Tell Qarassa in southern Syria, the skeletons of a young male and a young female were excavated from later contexts of a Neolithic cemetery. The two skeletons face Mecca. They were both identically dated with ^{14}C to between 666 and 766 AD, suggesting a close time of death (Srigyan et al., 2022).

All four case studies present a very similar pattern of Muslim burials from the late seventh century at the earliest to the mid-eighth century latest. Their distribution, although sparse, is very broad (Figure 14). Despite the lack of physical evidence for such burials in the Arabian Peninsula, for the purpose of testing the models, I could presume an "origin" based on the historical knowledge of early Islam originating in Arabia, or the "origin" I have defined earlier of the Arabian Peninsula and the Levant. Another challenge which arises is the limited number of burials excavated in most of AENAE. This does not allow for determining whether there are additional Muslim burials between Uzbekistan and the Levant, for example, and thus how broad the distribution was. Still, we might assume that the current burial sites are the main ones in existence and then interpret them as separate destinations. Within these ideal parameters, both models are possible. According to the first

Figure 14: Spatial distribution of Muslim burials dated to 650/680 to 770 AD.

model, Arab migrants brought culture "y" (Islam) with them from the origin (Arabia or Arabian Peninsula and the Levant) to the various destinations during the seventh or eighth century. According to the second model, returning migrants brought culture "z" (Islam) with them from an Islamic destination to their various origins. In the case of Uzbekistan, if the skeletons belong to Uzbeks, they represent local converts, as the excavators have suggested. Locals could have converted to Islam either influenced by Muslim/Arab migrants, or by their migration to an Islamic destination. Importantly, both models overlook the interpretation of converts from elsewhere, as suggested for the African origin of the individuals in France.

7 Arab Migration Through the Archaeological Records: Some Conclusions

Our archaeological inquiries into the AENAE of the seventh to ninth century have provided a variety of case studies for new forms of material culture and evidence for the practice of a new confession. These comprised irrigation solutions and pottery in Spain, the *qanat* irrigation technique, the so-called Desert Castles, and soapstone bowls in the Levant, and mosques and burials in various regions. One of the purposes of this article was to examine if any of the changes could be interpreted in relation to migration. Another purpose was to test the validity and usefulness of two theoretical models I offered to the question of Arab migration. The two main elements I defined as significant for identifying migration were objects or characteristics which can be observed in both the region of origin and of destination, and a change in material culture in one of them. The first model was based on the cultural premise. It highlights the link between origin and destination in two phases and cultural changes at the destination. The other model, based on more recent "alternative" premises on migration, points to continuous links between origin and destination and the cultural changes at the origin.

The archaeological data from early Islamic AENAE proved to be insufficient in most cases. Out of seven selected case studies, three were ineligible for the models and another three required interpretive refinements or assumptions. Data which did not qualify for our models include irrigation solutions in Spain which are not securely dated and, in any case, preceded Islam; pottery in Granada which lacks links to sites elsewhere; mosques which circulate first only in the region of origin and have too broad a distribution later. The *qanats* presented difficulties with dating, with the assumption of having a single earlier provenance, and with proving to be one group, but otherwise would answer the first model. The Desert Castles were similarly difficult to interpret as a single group and their distribution is broader than my arbitrary definition, but otherwise they answer the first model, as well. Regarding Muslim burials, the highly limited data provide no information about an earlier provenance or their real possible distribution. Otherwise, they could answer both models. The only case study which showed sufficient data for our models were the soapstone vessels, suggesting a link between the Arabian Peninsula and southern Israel/Palestine. These links coincide with both models, but the earlier provenance in the Arabian Peninsula favors the first model.

One result which this research indicates, surprisingly for me, is the insignificant role that early Islamic mosques play in understanding migration, conquests, or innovation. Our data present the relatively late spread of both physical mosques and the term *masjid* outside the Arabian Peninsula and the levant, only in the ninth century. The earlier spread of Muslim burials, before 770 AD, supplies a much better proxy for the early spread of Islam. Fenwick indeed suggests that mosques were built as a political message by rulers, mostly "in urban settings," and thus provide only a partial representation of society (Fenwick, 2022, pp. 210, 214).

This research indicates that employing the models necessitates precise dating and a sufficient coverage of broad regions. Without precise dating, some of the data could answer both models – which provide two very different historical interpretations. Whereas the first model is supported by the observation of an earlier provenance – often based on wide ranges of dates, the second model relies on continuous links between regions, which are difficult to detect in the archaeological record. The soapstone case study demonstrates short-distance links, but broader distributions within limited regions – e.g., mosques in the eighth century –

are difficult to detect. Moreover, the size definition for origin/destination regions was random, highlighting random aspects of the models. Clearly, as has been argued by Aldred (2021, p. 13) and demonstrated to some extent on burials in France of possible African Muslims, the models do not accommodate chains of origins or destinations. They are designed to highlight a direct migration from origin to destination or the return-migration from destination to origin. Moreover, the models cannot assist in "proving" migration over other interpretations for the mobility of objects.

I believe that in order to better test the two theoretical models, we should shift the focus of our studies from "innovations" to possible links between sites of different distances. Such links would include any material culture which different sites share. Links between sites would refine our interpretation of past migrations or object mobility to distant destinations as well as to closer ones. Another direction for future archaeological research on migration would be further use of ancient DNA for tracing mobility and social grouping. In AENAE such studies have already been conducted (Bycroft et al., 2019; Srigyan et al., 2022).

Whereas the question about Arab migration cannot be answered yet by archaeology alone, it is possible to consult other early Islamic sources as well as studies of modern migration. Egyptian papyri confirm the migration of men and women from the Arabian Peninsula to Egypt during the seventh century. Likewise, eighth-century Arabic inscriptions suggest either an eighth-century migration or an earlier one from the Levant to the Aegean islands, Libya, and the Arabian Peninsula. Both the narrative sources and the papyri discuss the Arab conquests. Arab warriors can be interpreted as the "scouts" of the migrant communities in different places, as modern migrations suggest. Another characteristic of Arab migration which is noted in the narrative sources is settlement in tribal clusters (*khiṭṭa*s). While this narrative is not confirmed by other sources, it is supported by analogies to modern migrations, where members of migrant communities settle in proximity to one another. In short, our sources indicate the migration of Arabs in the seventh and eighth centuries. Hopefully, new methods in the archaeology of AENAE could provide an independent type of evidence for this question in the near future.

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References

Ahmadi, H., Nazari Samani, A., & Malekian, A. (2010). The qanat: A living history in Iran. In G. Schneier-Madanes & M.-F. Courel (Eds.), *Water and sustainability in arid regions* (pp. 125–138). Dordrecht: Springer. doi: 10.1007/978-90-481-2776-4_8.

Akbar, J. (1989). Khaṭṭa and the territorial structure of early Muslim towns. *Muqarnas*, *6*, 22–32. doi: 10.2307/1602277.

Aldred, O. (2021). *The archaeology of movement*. Abingdon: Routledge.

Amati, V., Munson, J., Scholnick, J., & Habiba. (2019). Applying event history analysis to explain the diffusion of innovations in archae-ological networks. *Journal of Archaeological Science*, *104*, 1–9. doi: 10.1016/j.jas.2019.01.006.

Andrén, A. (2013). The significance of places: The Christianization of Scandinavia from a spatial point of view. *World Archaeology*, *45*, 27–45. doi: 10.1080/00438243.2013.758939.

Al-Ansari, A. R. (1981). *Qaryat al-Fau: A portrait of pre-Islamic civilisation in Saudi Arabia*. Toledo: University of Riyadh.

Anthony, D. W. (1990). Migration in archaeology: The baby and the bathwater. *American anthropologist*, *92*(4), 895–914. doi: 10.1525/aa.1990.92.4.02a00030.

Ashtor, E. (1976). *A social and economic history of the Near East in the Middle Ages*. London: Collins.

ʿAthamina, K. (1987). A'rāb and *muhājirūn* in the environment of *amṣār*. *Studia Islamica*, *66*, 5–25.

Avner, U. (2016). Desert farming in the southern ʿAraba Valley, Israel, 2nd century BCE to 11th century CE. In F. Retamero, I. Schjellerup, & A. Davies (Eds.), *Agricultural and pastoral landscapes in pre-industrial society: Choices, stability and change* (pp. 19–35). Oxford: Oxbow.

Avni, G. (2014). *The Byzantine-Islamic transition in Palestine: An archaeological approach*. Oxford: Oxford University Press.

Avni, G. (2018). Early Islamic irrigated farmsteads and the spread of *qanats* in Eurasia. *Water History*, 10, 313–338. doi: 10.1007/s12685-018-0225-6.

Avni, G. (2020). Terraced fields, irrigation systems and agricultural production in early Islamic Palestine and Jordan: Continuity and innovation. *Journal of Islamic Archaeology*, 7(2), 111–137. doi: 10.1558/jia.17679.

Barceló, M. (2001). Immigration berbère et établissements paysans à Ibiza (902–1235). À la recherche de la logique de la construction d'une nouvelle société. In J.-M. Martin (Ed.), *Castrum 7: Zones côtières littorales dans le monde méditerranéen au Moyen Âge: Défence, peuplement, mise en Valeur* (pp. 291–321). Rome & Madrid: École française de Rome & Casa de Velázquez.

Bell, H. I. (1910). *Greek papyri in the British Museum. Catalogue, with texts. Vol. IV: The Aphrodito papyri*. London: British Museum. https://archive.org/details/greekpapyriinbri04brit.

Bell, H. I. (1911a). Translations of the Greek Aphrodito papyri in the British Museum. *Der Islam*, 2, 269–283. doi: 10.1515/islm.1911.2.1.269.

Bell, H. I. (1911b). Translations of the Greek Aphrodito papyri in the British Museum. *Der Islam*, 2, 372–384. doi: 10.1515/islm.1911.2.1.372.

Bell, H. I. (1912a). Translations of the Greek Aphrodito papyri in the British Museum. *Der Islam*, 3, 132–140. doi: 10.1515/islm.1912.3.1.132.

Bell, H. I. (1912b). Translations of the Greek Aphrodito papyri in the British Museum. *Der Islam*, 3, 369–373. doi: 10.1515/islm.1912.3.1.369.

Bell, H. I. (1928). Translations of the Greek Aphrodito papyri in the British Museum. *Der Islam*, 17, 4–8. doi: 10.1515/islm.1928.17.1.4.

Bloom, J. M. (2003). Mosque. In J. Dammen McAuliffe (Ed.), *Encyclopaedia of the Qurʾān* (Vol. III, pp. 426–437). Leiden: Brill.

Borrut, A., & Cobb, P. M. (2010). Introduction: Toward a history of Umayyad legacies. In A. Borrut & P. M. Cobb (Eds.), *Umayyad legacies: Medieval memories from Syria to Spain* (pp. 1–22). Leiden: Brill,

Bosworth, C. E. (1993). Miṣr. In P. Bearman, T. Bianquis, C. E. Bosworth, E. van Donzel, & W. P. Heinrichs (Eds.), *Encyclopaedia of Islam* (2nd ed., Vol. VII, p. 146). Leiden: Brill.

Brittain, M., & Clack, T. (2022). Archaeologies of cultural contact: An introduction. In T. Clack & M. Brittain (Eds.), *Archaeologies of cultural contact: At the Interface* (pp. 1–21). Oxford: Oxford University Press.

Brown, P. J. (2022). The "cup of Pharaoh" from Samarra and the reuse of ancient *spolia* as water features in the medieval Islamic world. *Journal of Islamic archaeology*, 9(1), 59–81. doi: 10.1558/jia.23645.

Bulliet, R. W. (1979). *Conversion to Islam in the medieval period: An essay in quantitative history*. Cambridge: Harvard University Press.

Bullion, E., Maksudov, F., Henry, E. R., Merkle, A., & Frachetti, M. (2022). Community practice and religion at an Early Islamic cemetery in highland Central Asia. *Antiquity*, 96(387), 1–18. doi: 10.15184/aqy.2021.106.

Burmeister, S. (2000). Archaeology and migration: Approaches to an archaeological proof of migration. *Current Anthropology*, 41(4), 539–567. doi: 10.1086/317383.

Burmeister, S. (2017). The archaeology of migration: What can and should it accomplish?. In H. Meller, F. Daim, J. Krause, & R. Risch (Eds.), *Migration und Integration von der Urgeschichte bis zum Mittelalter – Migration and integration from prehistory to the Middle Ages* (pp. 57–68). Halle: Landesmuseums für Vorgeschichte Halle (Saale).

Bycroft, C., Fernandez-Rozadilla, C., Ruiz-Ponte, C., Quintela-García, I., Carracedo, Á., Donnelly, P., & Myers, S. (2019). Patterns of genetic differentiation and the footprints of historical migrations in the Iberian Peninsula. *Nature communications*, 10(551), 1–14. doi: 10.1038/s41467-018-08272-w.

Cahen, C. (1953). L'évolution de l'iqtaʿ du IXe au XIIIe siècle: Contribution à une histoire comparée des sociétés médiévales. *Annales*, 8, 25–52.

Calasso, G. (2021). Constructing the boundary between Mashriq and Maghrib in medieval Muslim sources. In M. Fierro & M. Penelas (Eds.), *The Maghrib in the Mashriq: Knowledge, travel and identity* (pp. 35–78). Berlin: De Greuyter. doi: 10.1515/9783110713305-002.

Carvajal-López, J. C. (2021). After the conquest: Ceramics and migration. In H. Fancy & A. García-Sanjuán (Eds.), *What was the Islamic conquest of Iberia? Understanding the new debate* (pp. 55–73). Abingdon: Routledge.

Carvajal-López, J. C. (2023). *Islamization and archaeology: Religion, culture and new materialism*. London: Bloomsbury.

Carvajal López, J. C. (in press). Islamization and ceramics: Assembling change and con-text. In J. Vroom, I. Simpson, & H. Nol (Eds.), *Material entanglements in the Islamic world: New approaches to Islamic archaeology & ceramics*. Turnhout: Brepols.

Charbonnier, J., & Hopper, K. (2018). The qanāt: A multidisciplinary and diachronic approach to the study of groundwater catchment systems in archaeology. Introduction of the Special Issue 'the qanāt: Archaeology and environment'. *Water history*, 10(1), 3–11. doi: 10.1007/s12685-018-0214-9.

Christides, V. (2006). *The image of Cyprus in the Arabic sources*. Nicosia: Archbishop Makarios III Foundation.

Clarke, N. (2012). *The Muslim conquest of Iberia: Medieval Arabic narratives*. London: Routledge.

Cooperson, M. (2015). 'Arabs' and 'Iranians': The uses of ethnicity in the early Abbasid period. In A. Q. Ahmed, B. Sadeghi, R. G. Hoyland, & A. Silverstein (Eds.), *Islamic cultures, Islamic contexts. Essays in honor of Professor Patricia Crone* (pp. 364–387). Leiden: Brill.

Costin, C., Earle, T., Owen, B., & Russell, G. (1989). The impact of Inca conquest on local technology in the Upper Mantaro Valley, Peru. In S. E. van der Leeuw & R. Torrence (Eds.), *What's new? A closer look at the process of innovation* (pp. 107–139). London: Unwin Hyman.

Crone, P. (1980). *Slaves on horses: The revolution of the Islamic polity*. Cambridge: Cambridge University Press.

Crone, P. (1994). The first-century concept of hiǧra. *Arabica*, 41, 352–387. doi: 10.1163/157005894X00029.

Crone, P. (1999). The early Islamic world. In K. Raaflaub & N. Rosenstein (Eds.), *War and society in the ancient and medieval worlds: Asia, the Mediterranean, Europe, and Mesoamerica* (pp. 309–332). Washington: Harvard University Press.

Crone, P. (2006). Post-colonialism in tenth-century Islam. *Der Islam*, 83, 2–38. doi: 10.1515/ISLAM.2006.002.

Donner, F. M. (1981). *The early Islamic conquests*. Princeton: Princeton University Press.

Donner, F. M. (1998). *Narratives of Islamic origins: The beginning of Islamic historical writing*. Princeton: The Darwin Press.

Driessen, M., & Abudanah, F. (2018). The Udhruh region: A green desert in the hinterland of ancient Petra. In Y. Zhuang & M. Altaweel (Eds.), *Water societies and technologies from the past and present* (pp. 127–156). London: UCL Press.

El-Ali, S. A. (1959). Muslim estates in Hidjaz in the first century A.H. *Journal of the economic and social history of the orient*, *2*(3), 247–261. 10.1163/156852059X00135.

El Faiz, M., & Ruf, T. (2010). An introduction to the khettara in Morocco: Two contrasting cases. In G. Schneier-Madanes & M.-F. Courel (Eds.), *Water and sustainability in arid regions* (pp. 151–163). Dordrecht: Springer. doi: 10.1007/978-90-481-2776-4_10.

El-Hibri, T. (1999). *Reinterpreting Islamic historiography: Hārūn al-Rashīd and the narrative of the ʿAbbāsid caliphate*. Cambridge: Cambridge University Press.

English, P. W. (1968). The origin and spread of qanats in the old world. *Proceedings of the American Philosophical Society*, *112*, 170–181. https://www.jstor.org/stable/986162.

Erb-Satullo, N. L. (2020). Archaeomaterials, innovation, and technological change. *Advances in Archaeomaterials*, *1*, 36–50. doi: 10.1016/j.aia.2020.11.003.

Ersten, M. (2012). Understanding irrigation as a response to climate in the Zerqa Triangle, Jordan – a modelling approach. In R. Matthews & J. Curtis (Eds.), *Proceedings of the 7th international congress on the archaeology of the ancient Near East* (Vol. I, pp. 725–738). Wiesbaden: Harrassowitz Verlag.

Ersten, M. W., & Morgan, R. A. (2021). A drop in the ocean. On writing histories of water resources management. In J. J. Bogardi, J. Gupta, K. D. Wasantha Nandalal, L. Salamé, R. R. P. van Nooijen, N. Kumar, … A. G. Kolechkina (Eds.), *Handbook of water resources management: Discourses, concepts and examples* (pp. 89–103). Cham: Springer. doi: 10.1007/978-3-030-60147-8_4.

Esquilache, F. (2021). Searching for the origin: A new interpretation for the Horta of Valencia in the time of al-Andalus. In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 127–152). Turnhout: Brepols.

Fabian, P., & Gilʿad, Y. (2010). Beʾer Shevaʿ (compound C). *Hadashot arkheologiyot – excavations and surveys in Israel*, *122*. http://www.hadashot-esi.org.il/Report_Detail_Eng.aspx?id=1386&mag_id=117.

Fahmy, A. M. (1950). *Muslim sea-power in the eastern Mediterranean from the seventh to the tenth century A.D.* London: Don Bosco.

Faro Carballa, J. A., García-Barberena Unzu, M., & Unzu Urmeneta, M. (2007). La presencia islámica en Pamplona. In P. Sénac (Ed.), *Villa 2. Villes et campagnes de Tarraconaise et d'al-Andalus (VIe-XIe siècles): La transition* (pp. 97–139). Toulouse: Presses universitaires du Midi. https://books.openedition.org/pumi/25663.

Fenwick, C. (2013). From Africa to Ifrīqiya: Settlement and society in Early Medieval North Africa (650–800). *Al-Masāq*, *25*(1), 9–33. doi: 10.1080/09503110.2013.767008.

Fenwick, C. (2022). Conquest to conversion: The archaeology of religious transformation in Early Medieval North Africa. *Journal of Islamic Archaeology*, *9*(2), 199–225. doi: 10.1558/jia.25866.

Field, H., & Prostov, E. (1948). Recent excavations at Khwarazm. *Ars Islamica*, *13*, 139–148.

Fisher, G. (2020). *Rome, Persia, and Arabia: Shaping the Middle East from Pompey to Muhammad*. London: Routledge.

Frieman, C. J. (2013). Innovation and identity: The language and reality of prehistoric imitation and technological change. In J. J. Card (Ed.), *The archaeology of hybrid material culture* (pp. 318–341). Carbondale: Southern Illinois University Press.

Frieman, C. J. (2021). *An archaeology of innovation: Approaching social and technological change in human society*. Manchester: Manchester University Press.

Furholt, M. (2018). Massive migrations? The impact of recent aDNA studies on our view of third millennium Europe. *European Journal of Archaeology*, *21*(2), 159–191. doi: 10.1017/eaa.2017.43.

Gasc, S. (2021). Numismatic data about the Islamic conquest of the Iberian Peninsula. In H. Fancy & A. García-Sanjuán (Eds.), *What was the Islamic conquest of Iberia? Understanding the new debate* (pp. 74–90). Abingdon: Routledge.

Genequand, D. (2006). Umayyad castles: The shift from late antique military architecture to early Islamic palatial building. In H. Kennedy (Ed.), *Muslim military architecture in Greater Syria* (pp. 3–25). Leiden: Brill.

Genequand, D. (2009). Trois sites Omeyyades de Jordanie centrale: Umm al-Walid, Khan al-Zabib et Qasr al-Mshatta (travaux de la Fondation Max van Berchem 1988–2000). In K. Bartl & A. R. Moaz (Eds.), *Residences, castles, settlements* (pp. 125–151). Rahden: Verlag Marie Leidorf.

Genequand, D. (2012). *Les établissements des élites omeyyades en Palmyrène et au Proche-Orient*. Beirut: IFPO.

Gleize, Y., Mendisco, F., Pemonge, M. H., Hubert, C., Groppi, A., Houix, B., … Breuil, J. Y. (2016). Early medieval Muslim graves in France: first archaeological, anthropological and palaeogenomic evidence. *PLoS One*, *11*(2), e0148583. doi: 10.1371/journal.pone.0148583.

Gorzalczany, A. (2007). The Kefar Saba cemetery and differences in orientation of late Islamic burials from Israel/Palestine. *Levant*, *39*(1), 71–79. doi: 10.1179/lev.2007.39.1.71.

Gorzalczany, A. (2011). The Umayyad aqueduct to Ramla and other finds near Kibbutz Naʾan. *ʿAtiqot*, *68*, 193–219.

Grohmann, A. (1958). The problem of dating early Qurʾāns. *Der Islam*, *33*, 213–231.

Guidetti, M. (2013). The contiguity between churches and mosques in early Islamic Bilād al-Shām. *Bulletin of the School of Oriental and African Studies*, *76*, 229–258. doi: 10.1017/S0041977X13000086.

Guinot Rodríguez, E. (2021). Morphology of irrigated spaces in late medieval Mudejar settlements: The canal of Lorca (Riba-Roja de Turia, Valencia). In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 97–124). Turnhout: Brepols.

Hakenbeck, S. (2008). Migration in archaeology: Are we nearly there yet? *Archaeological Review From Cambridge*, *23*(2), 9–26.

Halevi, L. (2007). *Muhammad's grave: Death rites and the making of Islamic society*. New York: Columbia University Press.

Hasson, I. (1984). The penetration of Arab tribes in Palestine during the first century of the hijra. *Cathedra*, *32*, 54–65 (in Hebrew).

Heidemann, S. (2009). Settlement patterns, economic development and archaeological coin finds in Bilad al-Sham: The case of the Diyar Mudar – the process of transformation from the 6th to the 10th century A.D. In K. Bartl & A. R. Moaz (Eds.), *Residences, castles, settlements* (pp. 493–516). Rahden: Verlag Marie Leidorf.

Henderson, J. (1985). The raw materials of early glass production. *Oxford Journal of Archaeology*, *4*(3), 267–291. doi: 10.1111/j.1468-0092.1985.tb00248.x.

Henderson, J., McLoughlin, S. D., & McPhail, D. S. (2004). Radical changes in Islamic glass technology: Evidence for conservatism and experimentation with new glass recipes from early and middle Islamic Raqqa, Syria. *Archeometry*, *46*(3), 439–468. doi: 10.1111/j.1475-4754.2004.00167.x.

Hillenbrand, R. (1981). Islamic art at the crossroads: East versus west at Mshattā. In A. Daneshvari (Ed.), *Essays in Islamic art and architecture in honor of Katharina Otto-Dorn* (pp. 63–86). Malibu: Undena.

Hoyland, R. (1997). The content and context of early Arabic inscriptions. *Jerusalem studies in Arabic and Islam*, *21*(3), 77–102.

Hoyland, R. (2007). Epigraphy and the emergence of Arab identity. In P. M. Sijpesteijn, L. Sundelin, S. Torallas Tovar, & A. Zomeño (Eds.), *From al-Andalus to Khurasan: Documents from the medieval Muslim world* (pp. 219–242). Leiden: Brill.

Hoyland, R. (2015). *In God's path: The Arab conquests and the creation of an Islamic empire*. Oxford: Oxford University Press.

Humphreys, S. R. (1991). *Islamic history: A framework for inquiry*, revised ed. Princeton: Princeton University Press.

Imbert, F. (2013). Graffiti arabes de Cnide et de Kos: Premières traces épigraphiques de la conquête musulmane en mer Égée. In C. Zuckerman (Ed.), *Constructing the seventh century* (pp. 731–758). Paris: Association des Amis du Centre d'Histoire et Civilisation de Byzance.

Israel, Y., Nahlieli, D., & Ben-Michael, Y. (1995). The Naḥal Shaḥaq site: An early Islamic settlement in the Northern ʿArava. *ʿAtiqot*, *26*, 1–14 (in Hebrew), 113.

Jiménez Puertas, M., & Carvajal López, J. C. (2011). Opciones sociotécnicas de regadío y secano: el caso de la Vega de Granada. In F. Sabaté Curull (Ed.), *Arqueologia medieval. Els espais de secà* (pp. 51–85). Lleida: Pagès Editors. http://hdl.handle.net/10481/22453.

Kawatoko, M. (2007). *Archaeological survey of the Rāya/Al-Ṭūr area on the Sinai Peninsula, Egypt, 2005 and 2006*. Tokyo: The Middle Eastern Culture Center in Japan.

Keiko, O. (1991). The expansion of the Muslims and mountain folk of Northern Syria: The Jarājima in the Umayyad period. *Orient*, *27*, 74–94.

Kennedy, H. (2001). *The armies of the caliphs: Military and society in the early Islamic state*. London: Routledge.

Kennedy, H. (2006). From Shahristan to Medina. *Studia Islamica*, *102/103*, 5–34. https://www.jstor.org/stable/20141082.

Kennedy, H. (2007). *The great Arab conquests: How the spread of Islam changed the world we live in*. London: Weidenfeld & Nicholson.

Kirchner, H. (2021). Introduction: Research on irrigation, drainage, dry agriculture, and pastures in al-Andalus. In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 11–28). Turnhout: Brepols.

Kirchner, H., Virgili, A., & Puy, A. (2021). Drainage and irrigation systems in Madīna Ṭarṭūša (Tortosa, Spain) (eighth-twelfth centuries). In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 153–172). Turnhout: Brepols.

Knutson, S. A., & Ellis, C. (2021). 'Conversion' to Islam in early medieval Europe: Historical and archaeological perspectives on Arab and northern Eurasian interactions. *Religions*, *12*(544), 1–21. doi: 10.3390/rel12070544.

Lane, E. W. (1893). *Arabic-English lexicon*, book I part 8, In S. Lane-Poole (Ed.). Edinburgh: Williams and Norgate.

Legendre, M. (2018). Landowners, caliphs and state policy over landholdings in the Egyptian countryside: Theory and practice. In A. Delattre, M. Legendre, & P. Sijpesteijn (Eds.), *Authority and control in the countryside: From Antiquity to Islam in the Mediterranean and Near East (6th–10th century)* (pp. 392–419). Leiden: Brill.

Le Maguer, S. (2011). Typology of incense-burners of the Islamic period. *Proceedings of the Seminar for Arabian Studies*, *41*, 173–183. https://www.jstor.org/stable/41622131.

Le Maguer, S. (2014). The soft stone from Kadhima: Evidence for trade connections and domestic activities. In D. Kennet (Ed.), *Khadhima: Kuwait in the early centuries of Islam* (pp. 51–54). Kuwait: National Council for Culture, Arts and Letters.

Levy-Rubin, M. (2011). Changes in the settlement pattern of Palestine following the Arab conquest. In K. G. Holum & H. Lapin (Eds.), *Shaping the Middle East: Cities in transition* (pp. 155–172). Bethesda, MD: University Press of Maryland.

Lightfoot, D. R. (1997). Qanats in the Levant: Hydraulic technology at the periphery of early empires. *Technology and Culture*, *38*, 432–451. doi: 10.2307/3107129.

Lindstedt, I. (2015). *Muhājirūn* as the name for the first/seventh century Muslims. *Journal of Near Eastern studies*, *74*(1), 67–73. doi: 10.1086/679624.

Lindstedt, I. (2018). Pre-Islamic Arabia and early Islam. In H. Berg (Ed.), *Routledge handbook on early Islam* (pp. 159–176). London: Routledge.

Lindstedt, I. (2022). Religious warfare and martyrdom in Arabic graffiti (70s–110s AH/690s–730s CE). In F. M. Donner & R. Hasselbach-Andee (Eds.), *Scripts and scripture: writing and religion in Arabia circa 500–700 CE* (195–222). Chicago: The Oriental Institute of the University of Chicago.

Magnusson, A. D. (2017). Zoroastrian fire temples and the Islamisation of sacred space in early Islamic Iran. In A. C. S. Peacock (Ed.), *Islamisation: Comparative perspectives from history* (pp. 102–117). Edinburgh: Edinburgh University Press.

Miles, G. C. (1954). The Sāmarrā Mint. *Ars Orientalis*, *1*, 187–191. https://www.jstor.org/stable/4628995.

Milwright, M. (2010). *An introduction to Islamic archaeology*. Edinburgh: Edinburgh University Press.

Milwright, M. (2021). Contextual readings of religious statements in early Islamic inscriptions. In M. Bjerregaard Mortensen, G. Dye, I. W. Oliver, & T. Tesei (Eds.), *The study of Islamic origins: New perspectives and contexts* (pp. 275–296). Berlin: De Gruyter.

Mirzaakhmedov, S. (2012). The ribāṭ-caravanserais from the eastern suburbs of Paykand. Archaeological and historical aspects. *Journal of Inner Asian Art and Architecture*, *7*, 109–124. doi: 10.1484/J.JIAAA.4.2017006.

Nol, H. (2014). Settlement and rule in the eighth-ninth centuries: The Arava as a case study. *Cathedra*, *153*, 7–34 (in Hebrew).

Nol, H. (2015). The fertile desert: Agriculture and copper industry in early Islamic Arava (Arabah). *Palestine Exploration Quarterly*, *147*(1), 49–68. doi: 10.1179/1743130114Y.0000000012.

Nol, H. (Ed.). (2021). Early Islamic mosques database. *Open Context*. doi: 10.6078/M7SB43WC.

Nol, H. (2022a). *Settlement and urbanization in early Islamic Palestine, 7th–11th centuries: Texts and archaeology contrasted*. London: Routledge. doi: 10.4324/9781003176169.

Nol, H. (2022b). Early Islamic copper coins from excavations in the central Levant: An indicator for ancient economy. *Bulletin of the American Schools of Overseas Research*, *387*, 139–169. doi: 10.1086/718891.

Nol, H. (2023a). Early mosques that have never been (found): Literary sources versus physical remains. *Der Islam*, *100*(1), 81–119. doi: 10.1515/islam-2023-0006.

Nol, H. (2023b). Grape juice under the sun: Wine production in Palestine during early Islam. *Jama'a*, *26*, 1–35 (in Hebrew).

Northedge, A. (2005). *The historical topography of Samarra*. London: British School of Archaeology in Iraq & Foundation Max van Berchem.

Northedge, A. (2009). The Umayyad desert castles and pre-Islamic Arabia. In K. Bartl & A. R. Moaz (Eds.), *Residences, castles, settlements* (pp. 243–260). Rahden: Verlag Marie Leidorf.

Northedge, A., & Kennet, D. (1994). The Samarra horizon. In E. Grube (Ed.), *Cobalt and lustre: The first centuries of Islamic pottery* (pp. 21–35). London: The Nasser D. Khalili Collection of Islamic Art.

Noth, A. (1973). Zum Verhältnis von kalifaler Zentralgewalt und Provinzen in umayyadischer Zeit: Die 'Ṣulḥ'-'Anwa'-Traditionen für Ägypten und den Iraq. *Die Welt des Islams*, *14*, 150–162.

O'Kane, B. (2014). Residential architecture of the Darb Zubayda. *Beiträge zur Islamischen Kunst und Archäologie*, *4*, 202–219. doi: 10.29091/9783954906024/015.

Petersen, A. (2013). The archaeology of death and burial in the Islamic world. In S. Tarlow & L. Nilsson Stutz (Eds.), *The Oxford handbook of the archaeology of death and burial* (pp. 241–258). Oxford: Oxford University Press.

Phillips, C. S., & Simpson, S. J. (2018). Introduction. In C. S. Phillips & S. J. Simpson (Eds.), *Softstone: Approaches to the study of chlorite and calcite vessels in the Middle East and Central Asia from prehistory to the present* (pp. 2–54). Oxford: Oxuniprint.

Pipes, D. (1980). Mawlas: Freed slaves and converts in early Islam. *Slavery and Abolition*, *1*(2), 132–177. doi: 10.1080/01440398008574811.

Porath, Y. (2016). Tunnel-well (*qanat*) systems and settlements from the Early Islamic period in the 'Arava. *'Atiqot*, *86*, 1–81 (in Hebrew), 113–116.

Reinfandt, L. (2020). Iranians in 9th century Egypt. In J. Preiser-Kapeller, L. Reinfandt, & Y. Stouraitis (Eds.), *Migration histories of the medieval Afroeurasian transition zone: Aspects of mobility between Africa, Asia and Europe, 300–1500 C.E.* (pp. 225–246). Leiden: Brill.

Retamero, F. (2021). On dry farming in al-Andalus. In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 175–194). Turnhout: Brepols.

Ritter, M. (2016). Umayyad foundation inscriptions and the inscription of al-Walīd from Khirbat al-Minya: Text, usage, visual form. In H.-P. Kuhnen (Ed.), *Khirbat al-Minya: der Umayyadenpalast am See Genezareth* (pp. 59–83). Rahden: Verlag Marie Leidorf.

Rouighi, R. (2011). The Berbers of the Arabs. *Studia Islamica, New Series*, *1*, 67–101. doi: 10.1163/19585705-12341252.

Safran, J. M. (2021). Cultural memories of the conquest of al-Andalus between the ninth and twelfth centuries, C.E. In H. Fancy & A. García-Sanjuán (Eds.), *What was the Islamic conquest of Iberia? Understanding the new debate* (pp. 36–54). Abingdon: Routledge.

Salinas, E. (in press). Entanglements in the Western Islamic lands: Early glazed ceramics of al-Andalus. In J. Vroom, I. Simpson & H. Nol (Eds.), *Material entanglements in the Islamic world: New approaches to Islamic archaeology & ceramics*. Turnhourt: Brepols.

Shoshan, B. (2016). *The Arabic historical tradition and the early Islamic conquests: Folklore, tribal lore, holy war*. London: Routledge.

Simpson, S. J. (1995). Death and burial in the late Islamic Near East: Some insights from archaeology and ethnography. In S. Campbell & A. Green (Eds.), *The archaeology of death in the ancient Near East* (pp. 240–297). Oxford: Oxbow.

Simpson, S. J. (2018). 'Of cooking pots let him choose those made of stone': The manufacture, circulation and function of chlorite cooking pots and other objects in the Middle East and Central Asia during the Sasanian and medieval periods. In C. S. Phillips & S. J. Simpson (Eds.), *Softstone: Approaches to the study of chlorite and calcite vessels in the Middle East and Central Asia from prehistory to the present* (pp. 180–206). Oxford: Oxuniprint.

Sitjes, E. (2021). Agrarian spaces and the network of Andalusi settlements of Manacor (Mallorca). In H. Kirchner & F. Sabaté (Eds.), *Agricultural landscapes of al-Andalus, and the aftermath of the feudal conquest* (pp. 31–63). Turnhout: Brepols.

Srigyan, M., Bolívar, H., Ureña, I., Santana, J., Petersen, A., Iriarte, E., … Valdiosera, C. (2022). Bioarchaeological evidence of one of the earliest Islamic burials in the Levant. *Communications biology*, *5*(554), 1–13. doi: 10.1038/s42003-022-03508-4.

Stern S. M. (1970). The constitution of the Islamic city. In A. H. Hourani & S. M. Stern (Eds.), *The Islamic city* (25–50). Glasgow: University of Pennsylvania Press.

Sundelin, L. (2004). Introduction: Papyrology and the study of early Islamic Egypt. In P. M. Sijpesteijn & L. Sundelin (Eds.), *Papyrology and the history of early Islamic Egypt* (pp. 1–19). Leiden: Brill.

Taxel, I. (2019). Migration to and within Palestine in the early Islamic period: Two archaeological paradigms. In J. Yoo, A. Zerbini, & C. Barron (Eds.), *Migration and migrant identities in the Near East from Antiquity to the Middle Ages* (pp. 222–243). Abingdon: Routledge.

Taxel, I., & Fantalkin, A. (2011). Egyptian coarse ware in early Islamic Palestine, between commerce and migration. *Al-Masāq*, *23*, 77–97. doi: 10.1080/09503110.2011.580627.

Theodoropoulos, P. (2020). The migration of Syrian and Palestinian populations in the 7th century: Movement of individuals and groups in the Mediterranean. In J. Preiser-Kapeller, L. Reinfandt, & Y. Stouraitis (Eds.), *Migration histories of the medieval Afroeurasian transition zone: Aspects of mobility between Africa, Asia and Europe, 300–1500 C.E.* (pp. 261–287). Leiden: Brill.

Tolme, C. (2013). The Châtelperronian: Hybrid culture or independent innovation?. In J. J. Card (Ed.), *The archaeology of hybrid material culture* (pp. 279–294). Carbondale: Southern Illinois University Press.

Trombley, F. R. (2013). Fiscal documents from the Muslim conquest of Egypt: Military supplies and administrative dislocation, ca 639–644. *Revue des Etudes Byzantines*, *71*, 5–38. https://www.persee.fr/doc/rebyz_0766-5598_2013_num_71_1_4989.

Van der Leeuw, S. E. (1981). Information flows, flow structures and the explanation of change in human institutions. In S. E. Van der Leeuw (Ed.), *Archaeological approaches to the study of complexity* (pp. 230–312). Amsterdam: Universiteit van Amsterdam.

Van Oyen, A. (2018). Material culture and mobility: A brief history of archaeological thought. In C. Heitz & R. Stapfer (Eds.), *Mobility and pottery production: archaeological and anthropolical perspectives* (pp. 53–65). Leiden: Sidestone Press.

Vargha, M. (2022). *Modelling Christianization: A geospatial analysis of the archaeological data on the rural church network of Hungary in the 11th–12th centuries*. Oxford: Archaeopress Archaeology.

Von Sivers, P. (2021). Prophecies fulfilled: The Qur'anic Arabs in the early 600s. In M. Bjerregaard Mortensen, G. Dye, I. W. Oliver, & T. Tesei (Eds.), *The study of Islamic origins: New perspectives and contexts* (pp. 231–257). Berlin: De Gruyter.

Walmsley, A. G. (2000). Production, exchange and regional trade in the Islamic east Mediterranean: Old structure, new systems?. In I. L. Hansen & C. Wickham (Eds.), *The long eighth century* (pp. 265–343). Leiden: Brill.

Walmsley, A. G. (2007). *Early Islamic Syria: An archaeological assessment*. Bath: Duckworth.

Webb, P. (2016). *Imagining the Arabs: Arab identity and the rise of Islam*. Edinburgh: Edinburgh University Press.

Wensinck, A. J., & Crone, P. (1991). Mawlā. In P. Bearman, T. Bianquis, C. E. Bosworth, E. van Donzel, & W. P. Heinrichs (Eds.), *Encyclopaedia of Islam*, 2nd ed. (Vol. VI, pp. 874–882). Leiden: Brill.

Whitcomb, D. (1996). The Darb Zubayda as a settlement system in Arabia. *ARAM*, *8*, 25–32.

Whitcomb, D. (2009). From pastoral peasantry to tribal urbanites: Arab tribes and the foundation of the Islamic state in Syria. In J. Szuchman (Ed.), *Nomads, tribes, and the state in the ancient Near East: Cross-disciplinary perspectives* (pp. 241–259). Chicago: The University of Chicago.

Whitcomb, D. (2016). The mosques of Mafjar: a sequence and some implications for understanding Qasr Hisham. In D. Genequand (Ed.), *Proceedings of the 9th international congress on the archaeology of the ancient Near East* (Vol. II, pp. 469–478). Wiesbaden: Harrassowitz Verlag.

Wilson, A. I. (2008). Hydraulic engineering and water supply. In J. P. Oleson (Ed.), *The Oxford handbook of engineering and technology in the classical world* (pp. 285–318). Oxford: Oxford University Press.

Yaʿqūbī. (1892). Kitāb al-Buldān. In M. J. de Goeje (Ed.), *Kitâb al-Buldân, Bibliotheca Geographorum Arabicorum* (Vol. VII, pp. 231–373). Reprint 1967, Leiden: Brill.