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# Sherds and the City: Pottery Production, Society, and the Changing Urban Fabric of Fustat, Egypt

Alison L. Gascoigne <sup>1</sup> and Peter D. Sheehan<sup>2</sup>

<sup>1</sup>University of Southampton, Southampton, UK; <sup>2</sup>Department of Culture and Tourism, Abu Dhabi, United Arab Emirates

## ABSTRACT

This paper coordinates archaeological information on the changing urban landscape of Egypt's first Islamic-era capital, Fustat, with topographical, social, and economic insights from the Geniza archive and other sources. A focus on the organization of the city's pottery industry provides new insights into the multiple "abandonments" and reoccupations familiar from historical sources, showing how diverse residential areas were turned to industrial use (and back) via adaptable transitional processes.

## ARTICLE HISTORY

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## Fustat: Urban Context and Ceramic Significance



The great city of Fustat—the precursor to Cairo—is located on the eastern bank at the apex of the Nile Delta in Egypt (Figure 1). A settlement here—Babylon of Egypt—is archaeologically attested from as early as the 6th century B.C. and continues, albeit with fluctuations in density and locale, to the present day (Sheehan 2010; Table 1). A series of key events shaped this landscape: the construction in A.D. 107 by Trajan of the Nile-Red Sea canal through the site and its fortification by Diocletian ca. A.D. 300, who built a large fortress to defend the canal entrance; the establishment and embellishment of Fustat itself as a new capital city following the Arab-Muslim conquests in A.D. 641; the destruction of parts of this city in the 'Abbasid conquest of A.D. 750 and subsequent redevelopment; the foundation of new quarters of the capital to the north and east by the 'Abbasid, Tulunid, and Fatimid dynasties, with intermittent crises of security and prosperity leading to the use of large areas of Fustat for industrial purposes from the 13th century A.D. onwards; and, its subsequent and continuing redevelopment from the 17th century A.D.

The archaeological site of Fustat was until recently an evocative but rarely visited area of crumbling ruins northeast of the fortress of Babylon and southeast of the Mosque of 'Amr ibn al-'As in the quarter now referred to as Old Cairo (Figure 2). It is rapidly being lost to rising groundwater and encroachment from the modern city, and a major project has been underway since 2021 that is incorporating most of the area into the Fustat Hills Park. However, the remaining 20 ha, currently managed by the Ministry of Antiquities, only hints at the original scale of the settlement, for at different times the city of Fustat covered much of present-day southern Cairo, extending east to the ancient cemeteries at the foot of the Muqattam cliffs and south beyond the plateau of Istabl 'Antar to the modern area of Dar al-Salaam, near the former Birkat al-Habash (Figures 3, 4). In addition to extensive residential quarters initially set out on tribal lines, Fustat

contained a cosmopolitan mercantile and administrative center and a thriving port occupying a large area along the riverfront. Some parts of this conurbation were never abandoned and continued to be occupied through the post-medieval era to the present, in particular the riverside and parts of the district around Babylon. Much of the site, however, was reduced to ruins at various times and occupied only informally by the late medieval period.

Fustat is well represented in the collections of many western museums through the medium of pottery. Significant quantities of late Medieval glazed vessels and sherds produced in Fustat were retrieved, exported, and collected by these institutions in the late 19th and early 20th centuries A.D. Subsequent study of Fustat's ceramic industries has until relatively recently been based largely on these museum collections, broadly divided between approaches more art-historical than archaeological (e.g. Scanlon 1999; Watson 2004) and archaeometric (e.g. Matin and Ownby 2023; Wolf et al. 2003), with less attention to the wider archaeological context. We therefore have a reasonable understanding of elements of the production of some Fustat ceramics (e.g. style, glaze technology, and composition) but much less of the urban setting of their production and its dynamic and changing location in the landscape. It is this question that we will address here.

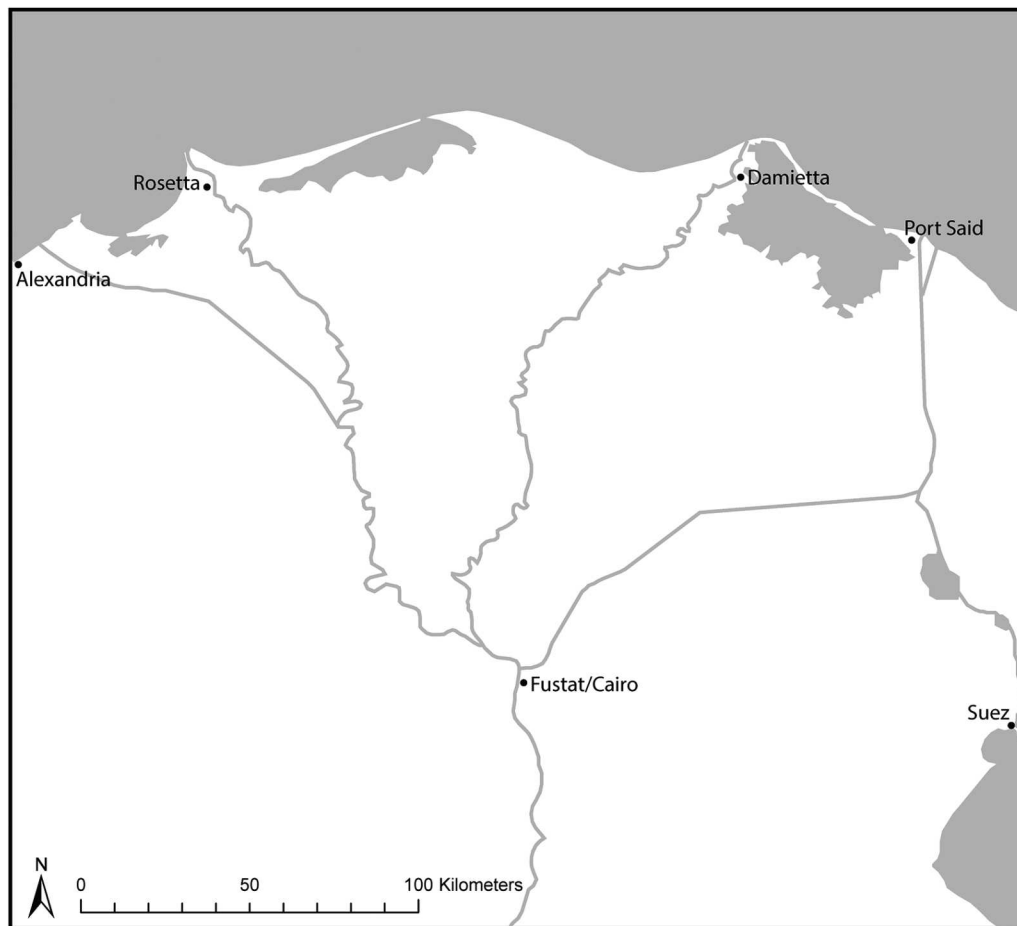
The urban context of ceramic production sites is relevant to other Medieval settlements in the eastern Mediterranean. Excavations in Jerash have revealed the presence of ceramic production dating to the 7th–8th century A.D. in central quarters of the city and in proximity to important civic and religious buildings (Rattenborg and Blanke 2017, 317–318); centrally located production is also attested in 'Abbasid–Fatimid Ramla (Masarwa 2015). However, other sites have provided evidence of externally located industrial suburbs. In Tiberias, a cluster of 10th–11th century A.D. ceramic production sites was identified south of the city (Stern 1995), while in Raqqa, "an extensive extramural industrial and

**CONTACT** Alison L. Gascoigne  A.L.Gascoigne@soton.ac.uk  Department of Archaeology, University of Southampton, Avenue Campus, Highfield, Southampton, SO17 1BF, UK.

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**Figure 1.** The Nile Delta, Egypt (A. L. Gascoigne).

**Table 1.** Summary of the main chronological phases, ruling dynasties, and key events relating to Fustat and the wider region.

Date	Period/Dynasty	Key events in Fustat/Cairo	Related events in Egypt and the region
525–404 B.C.	Persian (Achaemenid) occupation	Foundation of Persian trading post(?) on the eastern bank of the Nile near Memphis	Darius I (521–486 B.C.) cut canal linking Nile to Red Sea
31 B.C. – A.D. 641	Roman, Byzantine	50 B.C.—first mention of Babylon of Egypt A.D. 107—Trajan shifts mouth of Red Sea canal to Babylon and builds harbor at its mouth ca. A.D. 300—Diocletian encloses harbor and entrance to canal in fortress of Babylon	31 B.C.—Battle of Actium A.D. 50—arrival of St. Mark in Alexandria A.D. 619–629—Egypt occupied by Sasanids A.D. 622—beginning of Islamic era A.D. 635—capture of Damascus and Jerusalem
A.D. 641–750	Rashidun, Umayyad	Entrance to Red Sea canal shifted to the north and “camp city” of Fustat built around the nucleus of Babylon and the Mosque of ‘Amr ibn al-‘As; developed further by Umayyad governors	A.D. 641—Arab Conquest of Egypt A.D. 656—Battle of Karbala, defeat of ‘Alids
A.D. 750–868	‘Abbasid	A.D. 750—much of southern and eastern Fustat destroyed during ‘Abbasid conquest of Egypt; foundation of separate military/administrative enclosure of al-‘Askar, north of Fustat	Red Sea canal went out of use
A.D. 868–969	Tulunid, ‘Abbasid, Ikhshid	A.D. 870—foundation of new elite enclosure al-Qata’i’ at northeastern edge of Fustat	Ahmad ibn Tulun formed separate dynasty, but Egypt recaptured by ‘Abbasids in A.D. 905 A.D. 935–969—ruled by Ikhshids as client dynasty
A.D. 969–1169	Fatimid	A.D. 969—conquest of Egypt by Shia Fatimids; foundation of new elite enclosure of al-Qahira (Cairo), northeast of Fustat; influx of new settlers from North Africa A.D. 1060–1090—“Great Disaster” (famine, earthquakes, unrest) A.D. 1168—Crusader invasion of Egypt and “burning of Fustat”	A.D. 1099—capture of Jerusalem by First Crusade
A.D. 1169–1250	Ayyubid	Construction of Cairo citadel and city walls; ca. A.D. 1240—construction of new citadel for mamluks on Rawda Island	A.D. 1187—recapture of Jerusalem
A.D. 1250–1382	Bahri Mamluk	Influx of refugees from the east End of Crusader kingdoms brings European merchants to Cairo	A.D. 1258—Mongols capture Baghdad A.D. 1260—Mongols defeated at ‘Ayn Jalut A.D. 1347—arrival of Black Death
A.D. 1382–1517	Burgi Mamluk	Relative peace and cultural vitality but wealth and power of Egypt gradually declining despite revivals under outstanding individual rulers	A.D. 1400—sack of Damascus by Tamerlane A.D. 1453—fall of Byzantium to Ottomans A.D. 1497—Vasco da Gama circumnavigates Africa
A.D. 1517–1805	Ottoman	Administration by <i>beys</i> (military officers or high-ranking civilians) under nominal control of Ottoman <i>pasha</i> (governor)	A.D. 1798–1801—French invasion of Egypt under Bonaparte
A.D. 1805–1953	Muhammad ‘Alids	Wide range of modernizing measures and new areas of city	A.D. 1869—Suez Canal opened



**Figure 2.** View across the remains of Fustat, looking southwest from the Antiquities Inspectorate buildings, in January 2006 (A. L. Gascoigne).

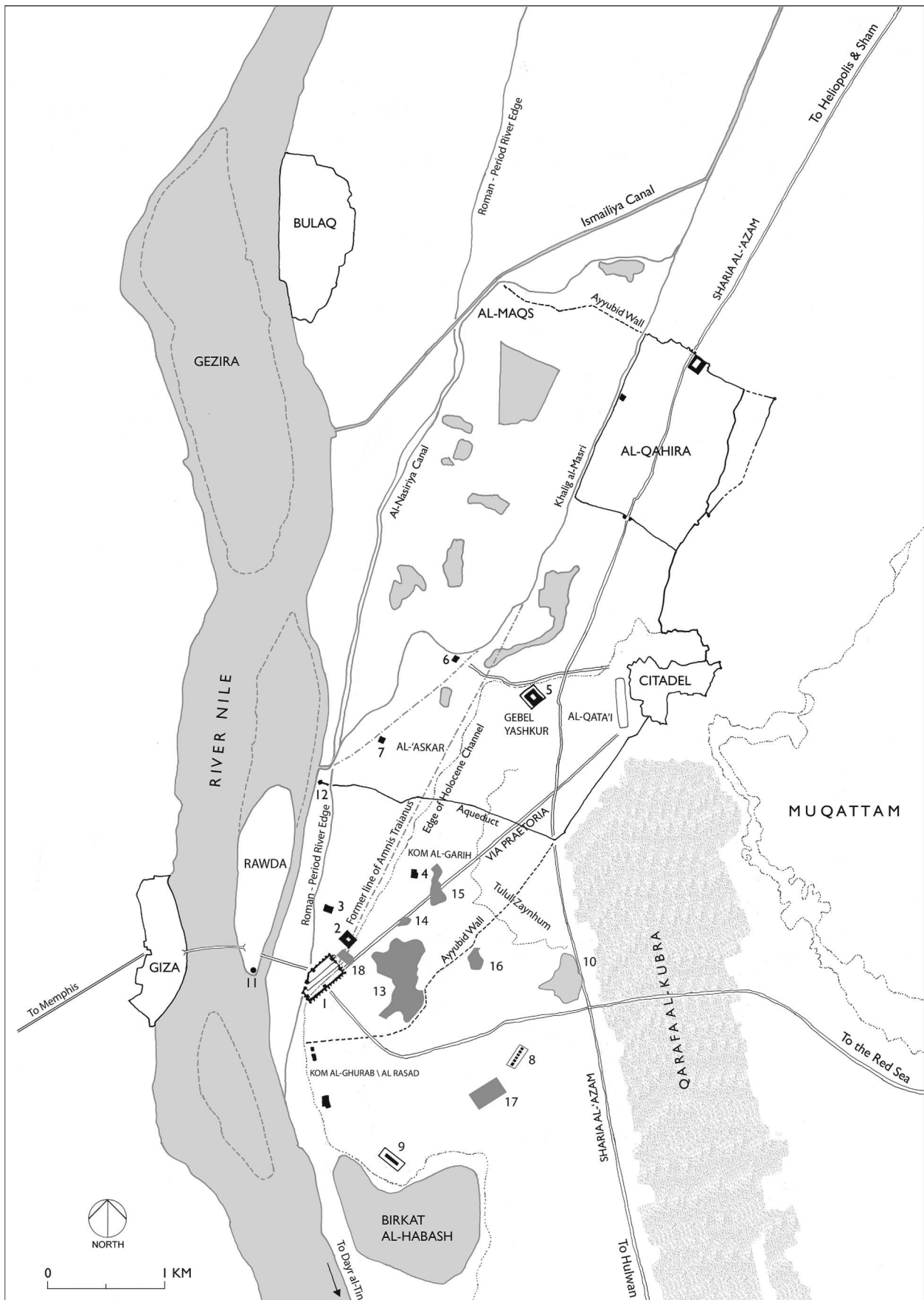
commercial area,” including multiple ceramic kilns, developed in ‘Abbasid times. Henderson and colleagues (2005, 133) note poorly characterized phases of decline, continuity, revival, and abandonment in this suburb between the 8th and 13th centuries A.D., indicating a system in dynamic flux and responding to diverse social, economic, and political pressures. Clearly, urban ceramic industry was differently located and variably expansive across time and space in a manner that is not yet well understood.

Returning to Fustat, an analysis of pottery production thus has great potential to augment understanding not only of the organization of this Medieval industry but also of the character, dynamism, and resilience of the city itself. Fustat clearly produced more than just pottery, but the site is heavily waterlogged with poor preservation; in the case of some industries, we must largely fall back on speculation to inform us as to their material nature. Other forms of production were certainly taking place in the Medieval city, but the signature of ceramic manufacture is highly visible if only through its products, and the scale of pottery-making can be industrial and messy, dominating the landscape.

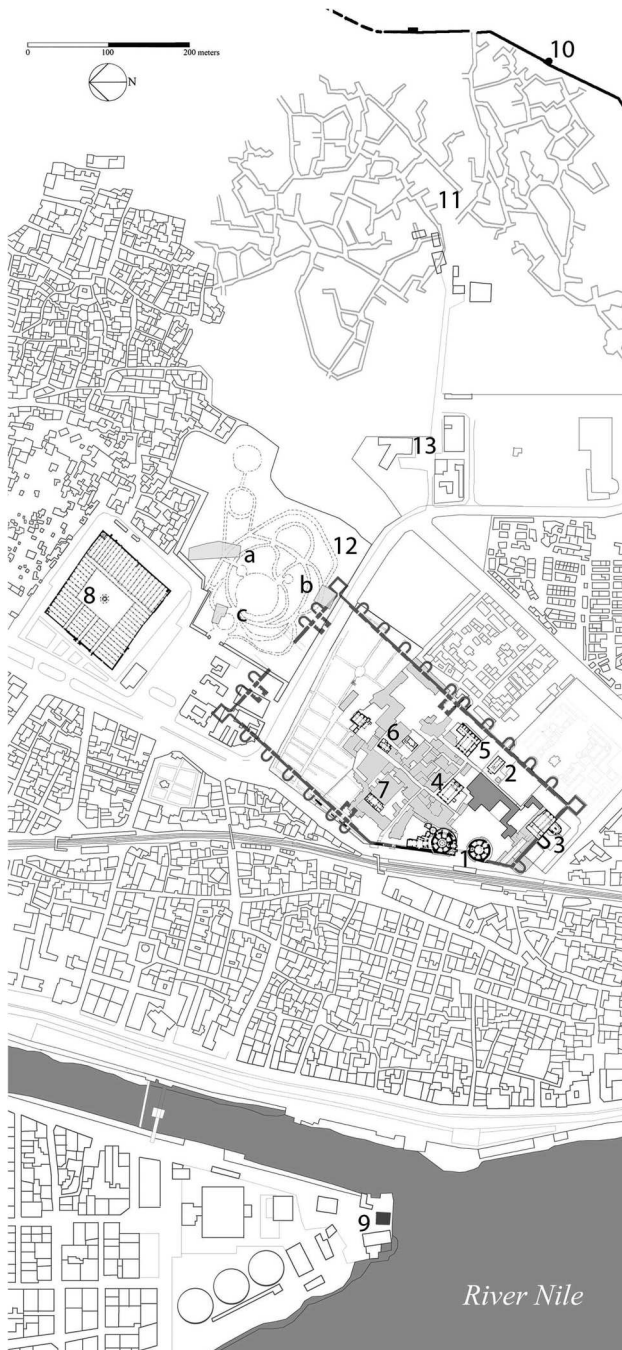
Focusing on evidence for the ceramics industry, then, this paper investigates the processes by which Fustat underwent complex, multi-stage transitions, from a densely occupied, wealthy, early Islamic capital to late Medieval and early modern ruin fields, taking in informal settlement and polluting industry along the way. While the nature of particular parts of the city at various points in this process has been investigated in detail (Denoix 1992; Harrison 2015; Kubiak 1987; Kubiak and Scanlon 1989; Sheehan 2010), less attention has been paid to the social and economic factors that underpinned the repurposing of urban plots and districts. Throughout Cairo’s history, large-scale changes have been manifested by decree, as, for example, with the foundation of the elite administrative enclosures al-‘Askar, al-Qata’i’, and al-Qahira, the 19th century A.D. reformulation of Downtown/Khedeival

Cairo to the north of Fustat (Mitchell 1991, 64–69), and indeed the current Fustat Hills Park project, but significant shifts in urban character have also resulted from informal decision-making by large numbers of independent inhabitants (Sims 2012). As we will demonstrate, both these models were influential during the development of Medieval Fustat but with informal processes of change more strongly manifested: industrial development shows self-organization within a hands-off framework of management, itself largely focused on control of product rather than space.

Available evidence for these complex processes is diverse, multidisciplinary, and challenging. Descriptions of Fustat such as those by Ibn Duqmaq (A.D. 1349–1406) and al-Maqrizi (A.D. 1364–1442) have been revealed as nostalgic, eschatological, and atemporal (Denoix 1996; Rabbat 2000, 24), characteristics obscuring their usefulness as indicators of short-term chronological change in specific locales. The accounts contain elements of confusion: al-Maqrizi, for example, linked one phase of abandonment to the burning of the city during the Crusader invasion in A.D. 1168, but Kubiak (1976) questioned the scale and extent of this destruction, given that many parts of the city were already degraded; he argued that al-Maqrizi conflated the events with the earlier, more destructive burning of Fustat in A.D. 750. The Geniza archive from the Ben Ezra Synagogue in Old Cairo contains many indicators of social and economic processes, but these tend to be specific to individuals or particular properties (Goitein 1967–1988). Most evidence from textual sources is thus difficult to locate precisely within the physical remains of the city. To what extent do the twin approaches of industrial and urban archaeology offer a way forward? Fustat has been the site of multiple excavations over more than a century, important among which are those of George Scanlon and Władysław Kubiak (Kubiak and Scanlon 1980, 1989; Scanlon 1965, 1966, 1967, 1971, 1976, 1979, 1981, 1984a, *inter alia*) and Roland-Pierre Gayraud (Gayraud 1997; Gayraud, Björnesjö, and Denoix 1986;



**Figure 3.** The Fustat-Cairo area, with locations of features discussed in the text: 1) Babylon fortress, the area commonly known as “Old Cairo”; 2) Mosque of ‘Amr; 3) Church of Abu Sayfayn; 4) Tomb of Abu Su’ud; 5) Mosque of Ibn Tulun; 6) Mosque of Sayyida Zeinab; 7) Church of Mar Mina; 8) Saba’ Banaat mausolea; 9) Fort of Istabl ‘Antar; 10) ‘Ayn al-Sira; 11) Nilometer; 12) Fumm al-Khalig; 13) Bahgat’s excavations; 14) Fustat-A; 15) Fustat-B; 16) Fustat-C; 17) Gayraud’s excavations; and, 18) fawakhir site (N. J. Warner/P. Sheehan).



**Figure 4.** Area around the Roman fort of Babylon, with locations of features discussed in the text: 1) Roman riverside towers; 2) Ben Ezra Synagogue; 3) Hanging Church; 4) Abu Serga Church; 5) Church of St. Barbara; 6) Wedding Hall; 7) Convent of St. George; 8) Mosque of 'Amr; 9) Nilometer; 10) Ayyubid wall; 11) Bahgat's excavations; 12) fawakhir gardens: a) Waseda University excavations lead by Sakurai and Kawatoko, b) Old Cairo Archaeology excavations lead by Sheehan, c) Supreme Council of Antiquities excavations lead by Muawad Hassan Hussein; and, 13) Fustat National Ceramics Centre (N. J. Warner/P. Sheehan).

Gayraud, Björnesjö, and Speiser 1994; Gayraud and Peixoto 1993; Gayraud and Treglia 2012; Gayraud and Vallauri 2017; Gayraud et al. 1987, 1991, 1995). More recently, archaeological work undertaken in Old Cairo between 1999 and 2006 as part of the Old Cairo Groundwater Lowering Project investigated deposits obscured by subsequent and modern disturbances, providing truncated sequences typical of complex urban archaeology (Sheehan 2010). This work has transformed our understanding of both the early development of the city and the Medieval urban landscape, particularly when considered in conjunction with information from the abovementioned textual sources, especially the Geniza documents.

In this paper, we will first outline the chronological evidence for ceramic production, indicating major shifts in its location where the evidence allows, drawing on the results of diverse archaeological excavations, including our own. We will then situate the industry into its social and administrative context and discuss the implications for wider urban processes. Ultimately, we aim to introduce greater complexity into narratives around the relationship between industrial activity and urban “decline” and “abandonment,” where areas are given over to new purposes.

### The Fustat Pottery Industries: Locations and Nature of Production

Pottery production was a significant aspect of the repurposing of large areas of Fustat at particular times. The industry flourished there from at least the 9th century A.D. to the present, adapting over time to changing socio-economic and urban contexts. Ceramic workshops were inserted into Fustat's urban fabric in ways that reflect processes of decline vs. prosperity. As we will demonstrate, most industrial infrastructure was constructed in “abandoned” or re-purposed residential or elite areas, albeit ones that might be subsequently reoccupied and re-abandoned. The incorporation of industrial infrastructure into areas combining residential and industrial functions and having a protracted mixed-use character was apparently not common. Characterization of Fustat's ceramic industries through time will facilitate understanding of production but, more importantly, of the long-term cycles of urban decline and regeneration that are a fundamental characteristic of Fustat's history. To support this discussion, Table 2 summarizes the evidence for ceramic manufacture from multiple archaeological interventions at the site. This reveals large-scale shifts from the south towards the north mirroring the development of the city, with social and urban pressures eventually pushing the industry back southwards due to its noxious nature, the growth of huge rubbish mounds generated by the Medieval city, and the availability of space.

### Pottery production prior to ca. A.D. 800

There is no clear evidence for potting in Fustat before the 9th century A.D. Sparse indications from the wider region point to production located—like the Medieval/modern clay sources discussed below—south of the capital: a Roman faience kiln was excavated by Petrie at Memphis (1909, 14–15), while 6th/7th century A.D. pottery workshops with several kilns were identified at the Monastery of Apa Jeremias, Saqqara (Ghaly 1992). 5th/6th century A.D. papyrological evidence supports the riverine transport of jars, and we might speculate that ceramics made their way northwards to the Babylon area by boat (Gallimore 2010, 183).

The Old Cairo riverside was already a major industrial and commercial zone in late Roman and early Islamic times. Much of Fustat's commercial and strategic prominence derived from its function, inherited from Roman and Byzantine rule, as a port and customs point for ships and merchandise from Upper Egypt and the Red Sea, as well as a major crossing point of the Nile from the west bank at Giza via Rawda Island (Sheehan 2012, 103–115). Moreover, proximity to the Nile was of fundamental importance for activities such as delivery of raw materials, water provision, and access to markets. The waterfront's

**Table 2.** Summary of archaeological evidence for ceramic production in Fustat, organized broadly south to north.

Location	Features and products	Date	Source
Istabl 'Antar	Kiln, wasters: small silt bottles, kiln furniture including bar with glaze traces Wasters: water-lifting jars ( <i>qawadi</i> ) Wasters: "Fustat Fatimid Sgraffito" (FFS), polychrome-glazed wares, filtered water jars, kiln furniture Wasters: "imitation celadon"	9th century A.D. Late 9th century A.D. Late 9th–early 11th century A.D. 15th century A.D. and perhaps later	Gayraud and Vallauri 2017, 19, 39–46 Gayraud and Vallauri 2017, 19 Gayraud and Vallauri 2017, 20–21, 30 Gayraud and Treglia 2012
West of Saba' Banaat	Wasters: silt bottles or sphero-conical vessels	Uncertain: 9th–15th century A.D.?	Gayraud and Vallauri 2017, 21
Roman Tower	Kiln, wasters: polychrome-glazed wares (FG12), kiln furniture Wasters: brown-glazed cooking wares (FG10b)	10th century A.D. Uncertain: early modern?	This paper; Sheehan 2010, 103–105 This paper; Sheehan 2010, 103–105
Beneath Church of St. George	Kiln; products unknown	Probably contemporary with Roman tower kiln	This paper; Sheehan 2010, 103–105
Unprovenanced: V&A Museum, London (acquired 1920s, contemporary with Bahgat's excavations)	Wasters: monochrome-glazed wares including FFS and "imitation celadon," blue-on-white, blue/black-on-white, black-on-green, and black-on-turquoise underglaze-painted wares; cream-on-brown slip-trailed/painted wares; blue faience beads	10th–15th century A.D.	A. Gascoigne, personal observation
Bahgat's excavations	FFS tile; wasters (seconds?): lustreware; lustre-glaze tests Waster: unglazed qulla filter Cluster of ca. 20 kilns; kiln furniture (tripods, stands, spacers); wasters: "imitation celadon," underglaze-painted wares, glazed beads	Fatimid Mid-Fatimid— 14th/15th century A.D. 14th century A.D.	Bahgat and Massoul 1930, 21, 27, 93, pl. B, no. 20–21, pl. N, no. 131 Bahgat and Massoul 1930, 89, pl. LIXbis, nos. 122–123 Bahgat 1915; Bahgat and Massoul 1930, 24–29, 31, pl. B
Fustat-C Fawakhir area	Kiln Multiple kilns and workshops producing a wide range of coarse wares	"Islamic" At least 18th century A.D. (probably earlier)–1998	Kubiak and Scanlon 1989, 1–2 Kawatoko 2005, 845–848; Golvin, Thiriot, and Zakariya 1982 (27–40 for forms)
Fustat (unspecified; relating to Scanlon's excavations?)	Wasters: unspecified polychrome-glazed ("Fayyumi") wares	9th–12th centuries A.D.	Scanlon 1993, 295
Fustat-A	Wasters: FFS Large workshop with kilns, clay deposits and infrastructure, producing unspecified glazed wares	10th–12th century A.D. Initially proposed as Fatimid, later re-dated as Mamluk	Scanlon 1967, 75–76 Scanlon 1965, 18–20; Kubiak and Scanlon 1980, 88, n. 46
Fustat-B	Wasters: FFS Multiple workshops and kilns, wasters, glaze/glass production infrastructure producing unspecified glazed wares	10th–12th century A.D. ca. A.D. 1200–1300	Scanlon 1967, 75–76 Scanlon 1966, 100; 1967, 72–79; 1976, 72, 79, n. 20; 1981, 59–61
Fustat-B (debris mounds)	Wasters: underglaze-painted wares and "imitation celadon"	13th–15th century A.D.	Scanlon 1971; 1984b, 118–119

importance to Fustat's commercial activities after the Arab-Islamic conquest is clear from parts of the still-active Late Antique infrastructure in the area, including the Trajanic stepped quay-side, transport links such as a bridge across the Nile, the Red Sea canal (the mouth of which was recut to the north: Sheehan and Gascoigne 2022), and granaries attested by papyrus receipts (Egyptian National Library Inv. No. 126, dated A.D. 706: Grohmann 1952, no. 286, 242–245; P. Vind. 6 474, dated 7th/8th century A.D.: Sijpesteijn 2013, 75).<sup>1</sup> Another papyrus from A.D. 705 mentions an ironworks at Babylon (P. Lond IV 1421: Bell 1910, 242; Dennett 1950, 104). This commercial infrastructure was heavily impacted by the destruction of A.D. 750 (Bruning 2018, 19–20), but both historical and archaeological evidence point to industrial repurposing along the gradually westward-shifting riverside as the precursor and perhaps the stimulus to subsequent recovery in this area. At the Monastery of Abu Sayfayn, for example, originally located on the pre-Islamic riverbank, an abandoned church was used for sugarcane refining in the period prior to its reconstruction in the late 10th century A.D. (Abu Salih 1895, 117).

### Pottery production ca. A.D. 800–1000 (and later): Istabl 'Antar

The earliest direct, well-dated evidence of pottery production comes from Istabl 'Antar, excavated by Roland-Pierre

Gayraud between 1985 and 2005, and confirms the spread of ceramic industries across a wide area in this period. This southern part of Fustat featured an Umayyad mosque and aqueducts, as well as 'Abbasid elite burials (Gayraud, Björnesjö, and Denoix 1986; Gayraud, Björnesjö, and Speiser 1994; Gayraud and Peixoto 1993; Gayraud et al. 1987, 1991, 1995). Some industrial activity was, however, also evidenced: Gayraud excavated a kiln producing small bottles of alluvial clay, constructed within an 'Abbasid mausoleum after it ceased to be an active funerary monument at the start of the 9th century A.D. (Gayraud and Vallauri 2017, 39–46). Further evidence for the production of small bottles or sphero-conical vessels came from excavations directed by Mamdouh al-Said near the Fatimid Saba' Banaat mausolea just north of Istabl 'Antar (Gayraud and Vallauri 2017, 21; P. Sheehan and A. Gascoigne, personal observation). The Istabl 'Antar kiln's products are of standardized size, appearance, and technology. From the same phase came a kiln bar with traces of turquoise glaze, indicating glazed-ware production from the early 9th century A.D., while a pit dated to the end of the 9th century A.D. yielded wasters of water-lifting jars (*qawadi*, sing. *qadus*; Gayraud and Vallauri 2017, 19). The kiln was thoroughly demolished prior to Fatimid reuse of the area, with leveling layers dated to the end of the first half of the 9th century A.D., followed by the construction of a garden with ornamental basin ca. A.D. 973 as

part of a wider renovation of the necropolis. Further turquoise-splashed kiln bars came from levels reshaped during this Fatimid reoccupation at the end of the 10th century A.D. (Gayraud and Vallauri 2017, 19–20). Wasters of “Fustat Fatimid Sgraffito” (FFS) glazed wares (turquoise; green; yellow; and, white splashed with cobalt blue) were also found; these may date to the end of the 10th or start of the 11th century A.D. but here presumably pre-date the Fatimid reoccupation (Gayraud and Vallauri 2017, 20). The same may be true for the extensive evidence of ceramic production from the northern part of the excavations: wasters of cups/bowls like those from the Roman tower (dated to the 10th century A.D.: see below), water jars (*qulal*, sing. *qulla*) with filters, and spouted jugs, all of calcareous clay (calcareous, alluvial, and silicious clays were here in use simultaneously); the associated workshops were thought to lie beneath housing constructed since 1987 (Gayraud and Vallauri 2017, 20–21, 30). Subsequent phases of activity at Istabl ‘Antar indicate ceramic production in the late medieval period: wasters of stacked and fused plain green-glazed (“pseudo-celadon”) bowls perhaps from the 15th century A.D. were found in occupation levels inside the remains of an ‘Abbasid cistern (Gayraud and Treglia 2012). Given the destruction of the upper archaeological layers of Istabl ‘Antar in the 1940s, further evidence of late Medieval and early modern industrial activity has no doubt been obscured (Gayraud and Treglia 2012, 297).

In this part of Fustat, then, a fairly intensive phase of industrial use in the 9th century A.D. was sandwiched between two periods of high-status activity, all prior to the known “abandonments” of the 11th, 12th, and 13th centuries A.D., and the subsequent re-emergence of ceramic production in the 15th century A.D. Industrial infrastructure was constructed in “abandoned” areas, but uncharacteristically (see below), the “abandoned” area was funerary, not residential, in function. The area was subsequently reoccupied for funerary use, then once more abandoned, before being reused industrially. These excavations thus show multiple transitions between high- and lower-status activities, some reflecting elite decision-making, but others no doubt involving elements of grassroots initiative, self-organization, and opportunism.

### **Pottery production ca. A.D. 800–1000: the riverside**

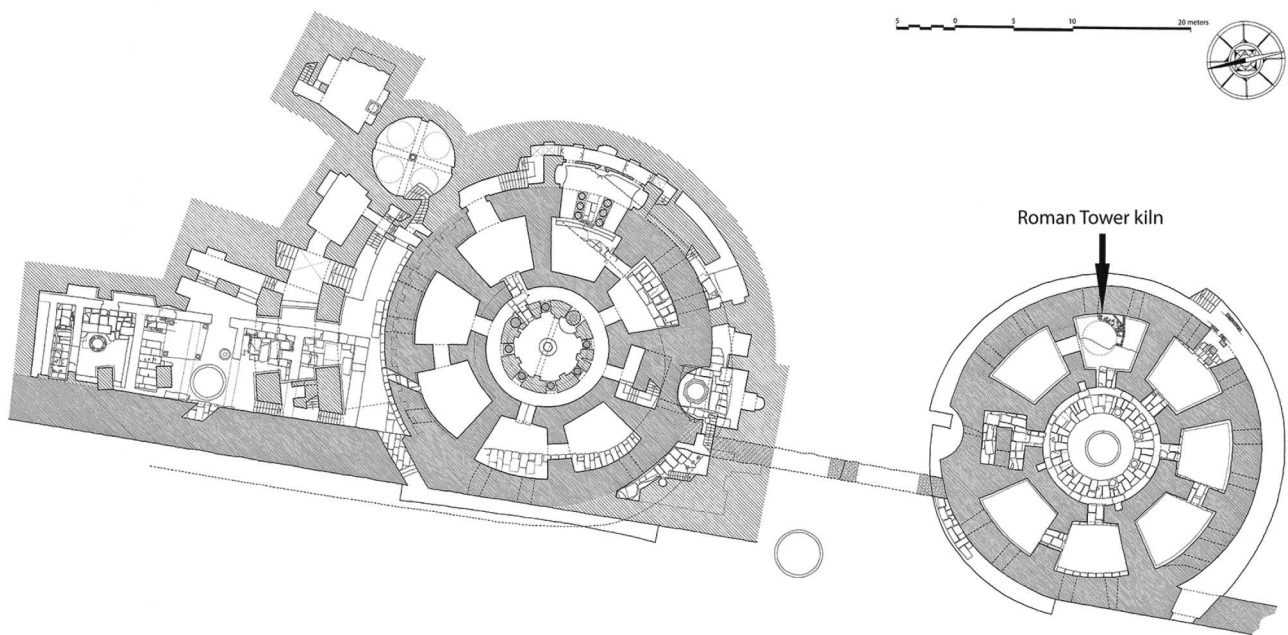
Ceramic production was thus underway in the southern zone of Fustat by the 9th century A.D. at the latest. The waterfront remained important for the development of industry throughout the medieval period and comprised first the existing pre-Islamic riverside zone, consolidated following the blocking of the Trajanic Red Sea canal ca. A.D. 700 (Sheehan 2010, 86), and then new land created by the westward-shifting Nile. The formation of new land west of the fortress may have happened quite quickly and appears to have accelerated between the 10th and mid-14th century A.D., perhaps triggered by the reported destruction during the Fatimid conquest of the pontoon bridge between Babylon and Rawda (Cooper 2014, 187–194; Sheehan 2010, 49, 86, 103). In the later medieval and early modern periods, toponyms (Denoix 1992, 86–91) and cartography (*Description de l'Égypte, État Moderne* I, pl. 16) indicate a mixed commercial, industrial, and residential zone, with activities tied to the Nile (fishing, loading boats, and drawing water). Streets running

between Old Cairo and the riverfront tracked this shift, with the *Description* plan showing a route leading from the river to the heart of the former fortress where an Ottoman *sabil* (public fountain) now stands; it was only with the construction of the Cairo-Hulwan Light Railway (now the Metro) in A.D. 1889 that this relationship was obscured and the link severed.

The Old Cairo Groundwater Lowering Project excavations revealed significant new evidence for ceramic production, well established by the 10th century A.D. and possibly somewhat earlier. This was located in repurposed structures of the riverside Roman fortress, the surviving towers of which were annexed and reused in various ways. This activity, with the evidence from Istabl ‘Antar, probably represents an ‘Abbasid-era industrial zone on the city’s periphery, similar to that at Raqqa (Henderson et al. 2005). This industry thrived and then shifted location following a major urban revival in this part of Fustat around the end of the 10th century A.D., evidenced by both historical sources and excavations at a number of locations that point to the renovation of ruined churches and the conversion of others to synagogues, both trends reflecting the Fatimids’ need for minority support (Sheehan 2010, 92–96). These structures were located within the southern half of the fortress, which, unlike the northern half, had not been annexed for elite purposes under Umayyad rule and which took on its present distinct character as a Christian and Jewish enclave from the Fatimid period onwards. Here, then, an industrial phase preceded revival of the area, similar to the abovementioned sugar refineries in the church at Abu Sayfayn, which was also renovated at this time.

The most important evidence for this riverside industrial zone is a pottery kiln found inside the massive southern round tower of the Roman fortress (one of a pair originally located on the riverfront guarding the entrance to the Red Sea canal) associated with production of polychrome-glazed wares, a type simultaneously produced in Istabl ‘Antar with uncertain evidence for production in central Fustat (discussed below). Gayraud and Vallauri (2017) note the appearance at Istabl ‘Antar of polychrome-glazed wares decorated in green and brown (often loops) over white in pits dated to the second half of the 9th century A.D., while more complex splashed designs and color schemes appeared from the first half of the 10th century A.D. Vessels decorated in radiating lines date from the second half of the 10th–11th centuries A.D., continuing into the 13th century A.D. “sous des formes et des décors appauvris” (Gayraud 1997, 264; Gayraud and Vallauri 2017, 355). These types are distinguished in our corpus, termed FG16 (green and brown/black on white) and FG12 (yellow, green, blue, white, black, splashed, and/or in radiating lines).<sup>2</sup> It thus seems clear that the Roman tower kiln, producing FG12 wares, flourished during the 10th century A.D. (and perhaps just into the 11th century A.D.: an example similar to some of the Roman tower sherds is “[u]n type plus ‘classique’ du XI<sup>e</sup> siècle.” Gayraud 1997, 266–268, fig. 10). The presence of FG12 wasters in the layers beneath the kiln (see below) suggests cycles of activity, including the replacement of derelict kilns with new ones.

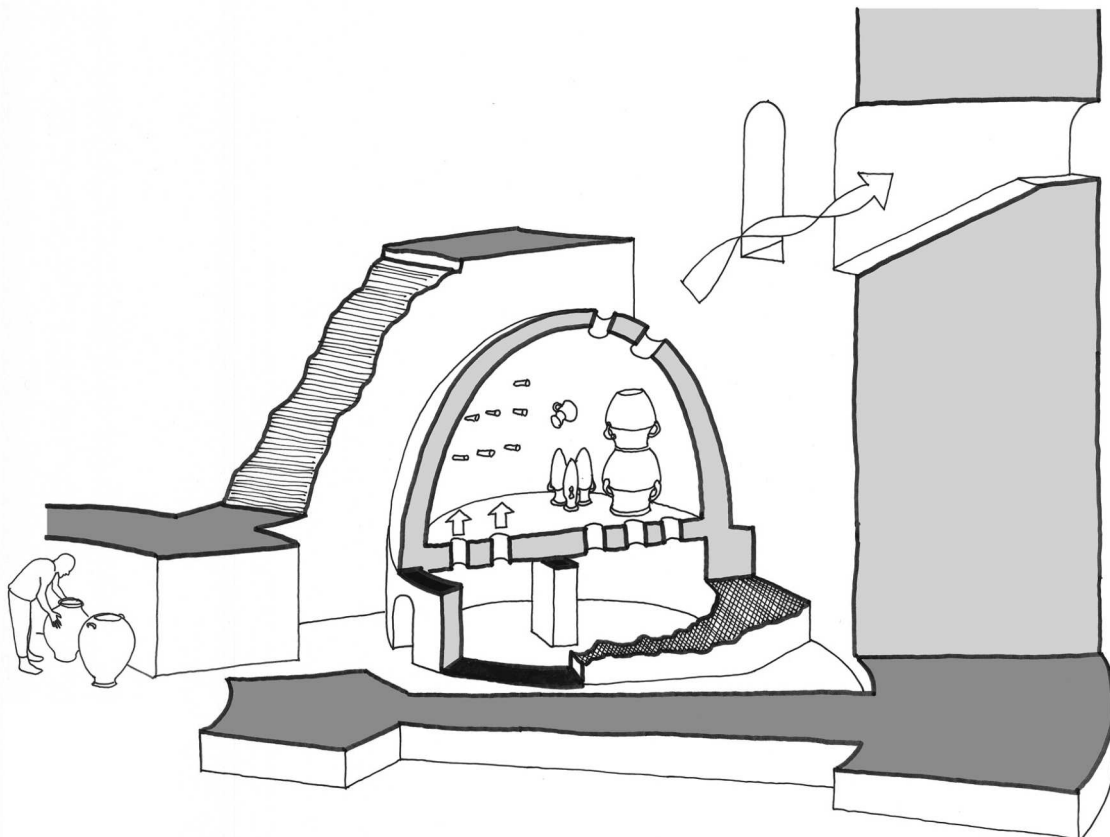
The Roman tower kiln was partly ruined when first noted and further collapsed following groundwater draining and resulting settling of the sherd dumps upon which it was built (Figures 5–7). It was apparently first exposed during restoration work in the early 1980s: it does not appear in



**Figure 5.** The round Roman riverside towers, with the surviving kiln in an eastern room of the southernmost (N. J. Warner/P. Sheehan).

photographs of the tower from the archive of the Comité de Conservation des Monuments de l'Art Arabe taken during excavations in 1948, which show what appears to be a late Medieval or early modern tomb with a stairway overlying the kiln's location.<sup>3</sup> The kiln is a circular fired-brick updraft structure, fitted into one of the trapezoidal ground-floor rooms of the round tower. It comprises an octagonal, probably originally domed, pot chamber with a circular interior (diameter 3.4 m) set over a lower vaulted firing chamber (diameter 1.8 m). Enough of the upper structure originally

survived to show the position of air vents and the presence of an access hatch for arranging pots. The vents were located to draw air via the ground-floor windows of the tower at a time when the ground level outside was considerably lower than at present (ca. 25 masl). The ground level around the kiln (18.7 masl) is 1.3 m above the 17.4 masl of the original Roman period ground level inside the tower, perhaps due to build-up from previous cycles of abandonment, kiln construction, use, and destruction (and deliberate leveling dumps: see below). The kiln's situation shows that the



**Figure 6.** Reconstruction of the kiln (pots illustrative only) (N. J. Warner).



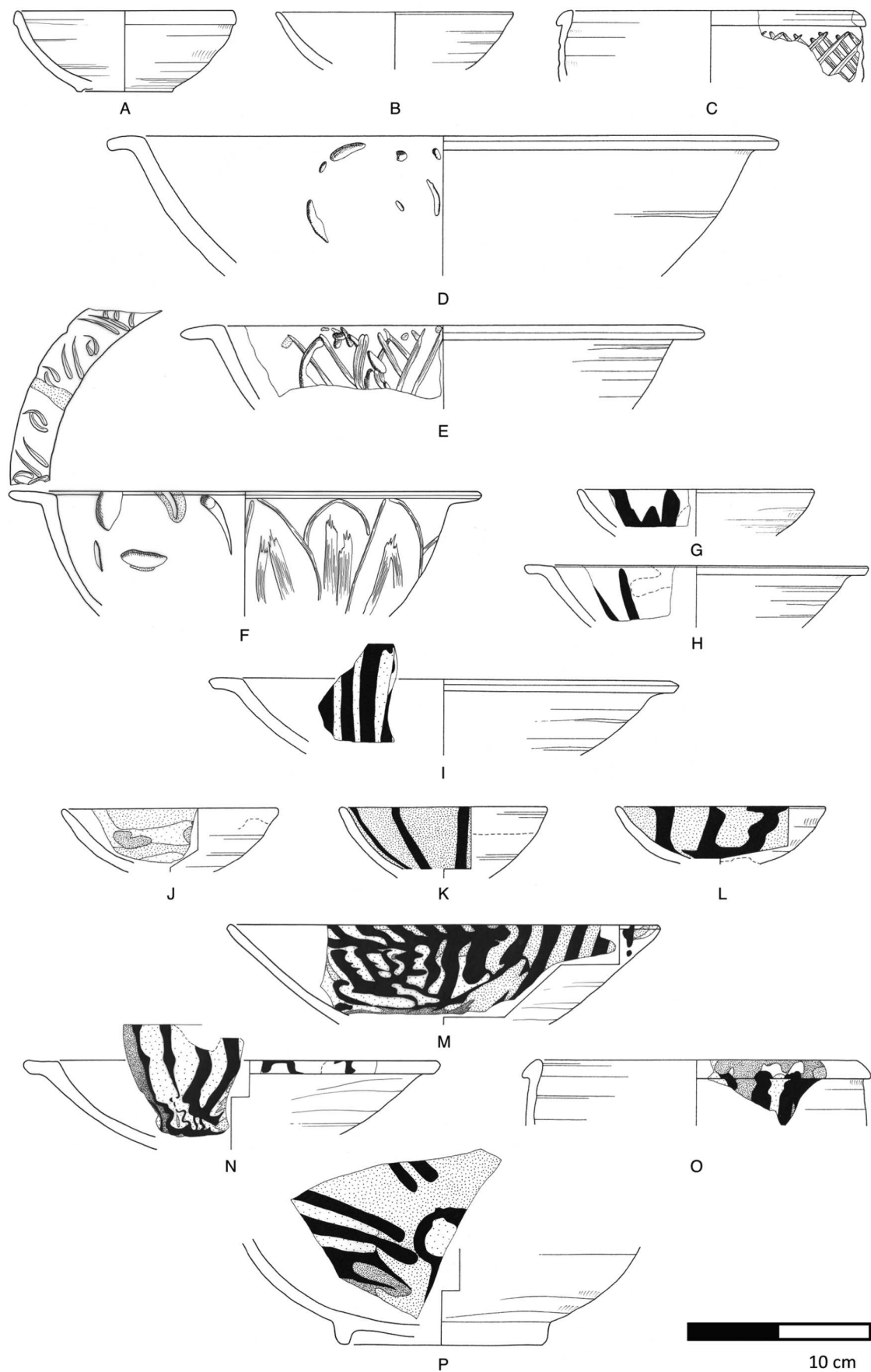
**Figure 7.** The Roman tower kiln. A) In 2001, during drainage works within the tower, prior to the collapse of the floor. B) In 2011, after excavation during preparation of the tower for public access (P. Sheehan).

northernmost wall of its room was still in place at the time of its construction. Most of this wall and a large section of the kiln were subsequently removed, probably concurrently during construction of the abovementioned tomb.

Like other elements of the fortress reused in early Medieval times, the kiln was constructed directly over a ca. 1 m thick (the bottom was at 17.8 masl) ceramic dump, probably brought in to level existing features or to consolidate waterlogged land, providing a solid building surface. A significant proportion of the sherds within this layer came from the common Egyptian silt amphora LRA7, in use to the mid-9th century A.D., many with the corkscrew bases, chaffy fabric, thick walls, and angular shoulders associated with the latest types in Old Cairo (Gascoigne 2007, 166; Peacock and Williams 1986, 204–205, class 52; Riley 1981; Vogt et al. 2002). Also present were Aswan red-slipped fine wares (used until the 10th century A.D.: Gayraud 1997, 263), Aswan ware W12 (9th century A.D.–ca. A.D. 1300: Adams 1986, 557–559; Gayraud and Vallauri 2017, pl. 27, 7803-2, pl. 37, 5624-3), Aswan amphorae (Gascoigne

2007, 167), bag-shaped silt jars (second half of the 7th century–9th century A.D.: Engemann 1992; 2016, 114–115), cream-slipped and brown-striped silt qulal (water jars; 8th–9th century A.D.: Gayraud and Vallauri 2017, pl. 33, 10762-1; Scanlon 1981, 68, fig. 32), and green marl qulal of the late 8th century A.D. onwards (Pyke 2020, 212–214). As noted above, a few FG12 sherds were also present, indicating a relatively close chronology between the dump and the overlying kiln. A date for this assemblage around the 9th century A.D. seems reasonable; the FG12 sherds may indicate deposition towards the later end.

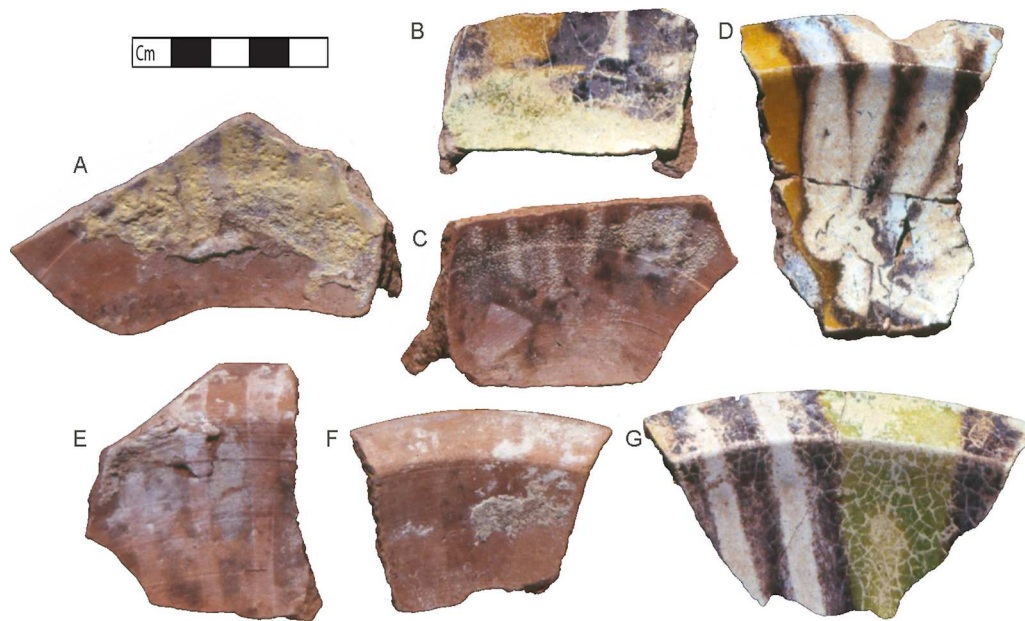
Debris around the kiln walls was largely associated with FG12 production, and many FG12 sherds and wasters, mainly small- to medium-sized bowls, were retrieved; the sheer quantities identify these as the primary product. Our excavations uncovered fragments in various stages of completion, including unglazed “biscuit” wares and vessels coated with fugitive glaze (not refired?) and plain and glazed examples of identical forms (Figures 8, 9; Supplemental Material 1). The products’ formal variability was relatively



**Figure 8.** A selection of polychrome-glazed (FG12) bowls and related forms associated with the Roman tower kiln. A–F) Unglazed biscuit vessels. G–I) Vessels with fugitive glaze. J–P) Glazed vessels (G. Pyke/A. L. Gascoigne).

low, dominated by a small number of open forms, although the striped and streaked glazing manifested in a range of colors and designs. Many biscuit sherds were splashed with glaze dots, often in several colors; some bore marks of ring-bases on

their interior walls and had apparently been used after breaking, in some cases more than once, to support vessels during firing. Also found were two glaze-splashed ceramic kiln batons; other batons came from 9th–10th century A.D.



**Figure 9.** Fragments of polychrome-glazed vessels discarded at various stages of production. D) = Figure 8N, E) = Figure 8I, and F) = Figure 8H. (A. L. Gascoigne).

deposits at Istabl ‘Antar (Gayraud and Vallauri 2017, 19–20). These are paralleled from a 10th century A.D. kiln in Tiberias; from Antioch and in Sirjan, Nishapur, and Merv at about the same date; from 11th/12th century A.D. contexts in Raqqa; and, from late 13th–14th century A.D. Jerusalem (Milwright 2010, 204, fig. 7.3 [6]; Stern 1995, 58). At Nishapur, batons were set in rows into the walls of kilns dated after the first quarter of the 11th century A.D. to the Mongol conquests and were interpreted as supports for vessels during firing (Molinari 1997, fig. 1; Wilkinson 1974, xxxvii–xl, fig. 16). The Roman tower batons were of similar fabric to the FG12 bowls, probably a marl-silt mix (Mason and Keall 1990, 174, “Polychrome glaze wares,” first petrofabric; fabric descriptions in Supplemental Material 1).

How did the Roman tower kiln fit into the urban landscape? Outside the tower, another kiln of similar construction was noted abutting the massive stone wall built between the two round towers of the fortress probably around the end of the 7th century A.D. to block the canal entrance (Sheehan 2010, pl. 23). It is tempting to interpret these features together as representing an industrial zone that developed, probably from the 9th century A.D., on new ground formed by this closure. This is supported by archaeological evidence from shafts sunk in Mari Girgis Street during the Old Cairo Groundwater Lowering Project, which yielded material and structural evidence contemporary with the Roman tower kiln, and is paralleled by the similar processes underway at Istabl ‘Antar.

During the Fatimid-era revival of Old Cairo, other structures of the fortress were reused by different groups, perhaps because of their condition after a long period of abandonment following the destruction of A.D. 750. The South Gate and the northern round tower were converted into the (Coptic) Church of the Virgin (its popular name, the Hanging Church, reflects its relationship to the underlying gate) and the (Greek) Church of St. George, respectively. The earlier patriarchal Coptic church of Abu Serga and the nearby Church of St. Barbara were completely rebuilt ca. A.D. 1050. The Jewish enclave in Old Cairo was a new feature of this Fatimid revival, with the Ben Ezra Synagogue located

in another church ruined in A.D. 750 and abandoned (Sheehan 2010, 92–96). Nor was the southern round tower the only part of the fortress converted to industrial uses: Geniza documents indicate that towers on the eastern wall were used for Jewish-owned workshops into the 12th century A.D., indicating potential continuity of industrial activity through the revival period (Goitein 1999, 47–48).<sup>4</sup> Nonetheless, it is likely that the Abbasid-era industrial zone in Babylon and southern Fustat contracted and substantially relocated from Fatimid times.

In summary, then, the riverside was industrial in character from Late Antiquity, and these activities increased significantly at least from the 9th century A.D., taking advantage of locations still partly derelict or unused after the events of A.D. 750. Renovations of religious and residential structures close to the riverside in Fatimid times probably reduced the intensity of industrial activity in the area, although the Geniza evidence implies that it did not disappear altogether.

#### **Pottery production ca. A.D. 1000–1200: central Fustat**

Evidence for pottery production within central Fustat was uncovered during the excavations of Ali Bahgat, Albert Gabriel, and Felix Massoul, which began after 1912 and continued into the 1920s (Bahgat 1915; Bahgat and Gabriel 1921; Bahgat and Massoul 1930). This evidence was augmented by large-scale excavations undertaken from 1964–1972 by Scanlon and Kubiak in response to housing schemes and rubbish-dumping in the north and east of the site. This pioneering work excavated zones that had been broadly residential between the 9th and 11th centuries A.D., with densely clustered large and medium-sized houses overlain by extensive later rubbish mounds. Scanlon and Kubiak established a complex sequence of activity and clarified the ceramic and artifactual assemblages. These and related excavations (El-Hawary 1933; Mehrez 1972) have been re-evaluated by Matthew Harrison (2014, 2015).

Explicit evidence for ceramic production during this period in central Fustat is minimal. Bahgat and Massoul note numerous wasters of lustreware from their excavations

(1930, 21), but those illustrated are imperfect rather than completely spoiled. The production of FFS may be suggested by Scanlon's reference to archaeological finds of wasters in Fustat-A and Fustat-B (1967, 75–6; 1999, 265; see also Bahgat and Massoul 1930, color plate 4d). Unprovenanced FFS wasters are present in the Victoria and Albert Museum (V&A) (e.g. 398-1887, 398A-1887), while production of FFS tiles is indicated by an unfinished and spoiled example excavated by Bahgat and Massoul (1930, 93, pl. N, fig. 131). Scanlon notes the presence of earlier, polychrome-glazed (“Fayyumi”) wasters in unspecified part(s) of Fustat but does not identify their type(s) (1993, 295); these wasters are not illustrated, but a tendency to apply the term “waster” to sherds with minor aesthetic imperfections might lead us to interpret at least some of the evidence for Fatimid-era ceramic production in central Fustat with caution. Scanlon's preliminary reports do describe industrial workshops of Fatimid/Ayyubid date, but his subsequent revisions of his own chronology (see below) reveal that these are all likely to be later, even where Scanlon did not explicitly revisit their dating. For this period, then, we must conclude that the core of Fustat was largely residential, with minimal if any ceramic production.

#### **Pottery production ca. A.D. 1200–1500: central Fustat**

Excavations in central Fustat uncovered unequivocal evidence for ceramic manufacture in the 13th–15th centuries A.D. Scanlon's excavations in Fustat-A, east of the Mosque of ‘Amr, uncovered a large ceramic manufacturing facility (Scanlon 1965, 18–22). Finds included clay deposits (“buff-ware”), puddling pits, grinding emplacements, a glass kiln and ingots, and a large pottery kiln, apparently updraft. The facility was initially dated to the Ayyubid period, ca. A.D. 1170–1250, on the basis of masonry techniques and associated finds. However, both the function and date of the complex were subsequently reinterpreted, the latter to the Mamluk era (Kubiak and Scanlon 1980, 88, n. 46). The wares produced were not described, other than the presence of clay tripod separators, some still adhering to imperfectly fired sherds; this, with the glass ingots and grinding facilities, indicates production of glazed wares. A large Islamic-era pottery kiln was also present in Fustat-C, but no details of date or wares were reported (Kubiak and Scanlon 1989, 1–2; Scanlon 1982).

Bahgat and Massoul likewise discovered a 14th century A.D. potters' quarter east of the Mosque of ‘Amr, running southwards from the tomb of Abu al-Su‘ud (Bahgat and Massoul 1930, 28–31). Their excavations yielded around 20 kilns, most poorly preserved (Bahgat 1915, 234, n. 2). The best preserved of these, destroyed during earthworks on Kom al-Garih during the 1980s (Kubiak 1987, 35, 138, n. 17), was an oval 1.65 × 1.5 m updraft kiln. The single hole in the center of the firing-chamber roof would have allowed flames and smoke to come into contact with the pottery, making control of conditions difficult. The excavators found no evidence for the use of saggers or shields, and Bahgat describes typical wasters being damaged on one side due to uneven firing (1915, 235, fig. 2; Bahgat and Massoul 1930, pl. B, 13, 13a). Wasters around the kiln comprised “imitation celadon,” and blue-and-white, black-and-turquoise, and blue/black-and-greenish-white underglaze-painted wares, all with sandy fabrics (Bahgat 1915). Wares were fired in mixed batches, as evidenced by fused pieces (Bahgat 1915,

240), as well as wasters in the V&A.<sup>5</sup> Manufacture of unglazed wares was evidenced only by a waster and an example still adhering to its plaster prototype of decorative mid-Fatimid–14th/15th century A.D. qulla (water jar) filters (Bahgat and Massoul 1930, 89, pl. LIXbis, fig. 122). Bahgat's excavations also uncovered items of kiln furniture, including small clay tripods for separating vessels, and cylindrical clay stands (Bahgat 1915). However, no batons were noted, and the examples discussed above predate Bahgat's kilns by several centuries. Also notable are plaques with glaze tests, including lustre glaze (Bahgat and Massoul 1930, 27, pl. B, figs. 20–21).

Further evidence for the widespread nature of 13th–15th century A.D. ceramic production in Fustat (in addition to that from Istabl ‘Antar, discussed above) came from Scanlon's evaluation of the poorly stratified upper levels of mounds in Fustat-B. Wasters of 13th century A.D. blue/black-and-white and black-and-turquoise underglaze-painted wares were identified, as were abundant wasters of 13th–14th-century A.D. “imitation celadon” (Scanlon 1971, 230; 1984b, 118–119). Blue-and-white underglaze-painted wasters, dated to the 14th–15th centuries A.D., were also abundant (Scanlon 1984b, 118).

Evidence from these large-scale excavations for the existence of areas of mixed residential/industrial use within Fatimid-era central Fustat is thus negligible. But the expansion of ceramic manufacture across the core of the site during the 13th–14th centuries A.D. represents a major shift in land use in favor of industry. It followed periods of decline in the 11th–12th centuries A.D. during which much of the population relocated northwards to other parts of the urban conglomeration, in particular al-Qahira. The nuances of the processes by which this played out from one locality to another cannot be fully established from Bahgat's and Scanlon's excavations, but Geniza documents from other areas of Fustat (discussed below) suggest mechanisms for this gradual process of industrialization from A.D. 1201 (Goitein 1999, 49, 51, 54), with the tipping point concurrent with the departure of wealthier members of the community. We suggest that there was a quantitative difference from around the mid-13th century A.D., with whole areas given over to potteries. The location of so many of the workshops listed by Ibn Duqmaq in central and northern Fustat (discussed below) likewise testify to this northerly shift or spread, notwithstanding the chronological uncertainties of this text.

#### **Pottery production ca. A.D. 1500–2000: central Fustat and the riverside**

The reduction in Cairo's population caused by the Black Death from the mid-14th century A.D. certainly impacted demand for commodities. In the southern parts of the city, stagnation is notable until ca. A.D. 1800, no doubt reflecting complex economic and social trends including Egypt's connectedness within the Ottoman world, of which it formed a part from A.D. 1517, and the shift of riverine activity northwards to Bulaq (Sheehan 2010, 115). We have no explicit evidence for ceramic production at this time, but the subsequent expansion of Cairo's rubbish mounds may have pushed industrial activity, including potting, southwards towards Istabl ‘Antar, where post-Medieval levels were, however, truncated in the archaeological sequence (Gayraud and Vallauri 2017, 8).



**Figure 10.** View of the fawakhir potteries in 1991 (P. Sheehan).

There is both archaeological and historical evidence that the area around the Roman fortress saw increasing industrial activity, including lime kilns, iron foundries, and ceramic production, from the 18th century A.D. onwards, perhaps reflecting a continuation or resurgence of the southern extent of Mamluk-era industry (Sheehan 2010, 115–120). Of specific interest is the former *fawakhir* (potteries) area, also known as al-Qulaliya (Golvin, Thiriôt, and Zakariya 1982, 1), to the south and east of the Mosque of ‘Amr. The area around the mosque had formed the core of the Umayyad capital and was probably the location of important public buildings that did not survive the destruction of A.D. 750. Re-settled in the Fatimid period, it was abandoned and robbed out following the upheavals of the 11th century A.D., then rebuilt and again abandoned ca. A.D. 1300 after the shift of the seat of power from Rawda to the Citadel (Sheehan 2010, 88, 99, 112–115; Sheehan and Gascoigne 2022). Prior to January 1998, the northern and eastern part of the fawakhir site still hosted a large concentration of modern potters’ workshops, covering some 4–5 ha (Golvin, Thiriôt, and Zakariya 1982; Figure 10). The workshops were then bulldozed by the Cairo Governorate and eventually replaced by a public garden, which was completed in 2008 but has now been removed by the ongoing Fustat Hills Park development.

To establish the nature of late Medieval activity in this area, an archaeological evaluation was undertaken by the Old Cairo Archaeological Project in 1999, following 1998 excavations on the site by a team under Mutsuo Kawatoko (Kawatoko 2005, 845–848; Sheehan et al. 2000). The archaeological deposits revealed were complex and disturbed by subsequent, repeated digging for kiln-building into modern times. The evaluation revealed deep dumps of Mamluk-era pottery overlying the sparse, robbed-out remains of buildings (Figure 11). As with similar sites explored within the walls of Babylon, at the Wedding Hall in 2002, and the Convent of St. George in 2004 (Sheehan 2010), this final occupation level appeared to represent the foundations of stone structures forming part of an Ayyubid/early Mamluk redevelopment built over leveled

Fatimid-era brick buildings. Excavations in the western part of the fawakhir site led by Muawad Hassan Hussein in 2002 revealed comparable evidence, uncovering the relatively modern kilns (similar to features exposed by Kawatoko) mapped in the 1970s by Golvin, Thiriôt, and Zakariya (1982), which cut through the substantial remains of earlier, probably Fatimid-era, brick buildings (P. Sheehan, personal observation). No direct evidence for ceramic production came from layers pre-dating the modern kilns. The origins of the modern fawakhir industries, then, should be sought in the period after the final Ayyubid/early Mamluk occupation, post-dating the Mamluk-era dumps.

Beyond this, the date of the first fawakhir workshops is obscure. In the A.D. 1809 *Description de l’Égypte (État Moderne I, pl. 16)*, the area is depicted as a depression surrounded by debris mounds, labelled “Carrières” (quarries), which are probably to be identified as products of the extensive robbing and turning over of the site that continued into the early 20th century A.D. The kilns and potters’ workshops are not shown on the *Description* plan, although the accompanying text references potters in the vicinity of the Church of St. George (i.e. the area around the Roman fortress) and provides a description and drawings of their methods and installations (*Description, État Moderne II, pl. 2*). This might suggest their presence near the mounds of debris around the fortress. The first unequivocal evidence of the fawakhir potteries dates from A.D. 1897, where they are shown on the “Plan Général de la ville du Caire” (1897) of the Ministry of Public Works. An ethnographic study of these potters was undertaken in the late 1970s, when there were 72 kilns on the site, organized into larger/richer and smaller/poorer family-run workshops clustered together, staffed by potters including older children and unrelated employees, and—in a break from centuries of fine wares—producing coarse wares (Golvin, Thiriôt, and Zakariya 1982, 81–86).

Possible traces of the potters at the Church of St. George mentioned in the *Description* were identified around the Roman tower kiln (discussed above) in the form of cooking



**Figure 11.** Excavations in the fawakhir quarter in 1999 (P. Sheehan).

pot wasters of various forms, their interiors thickly coated with dark-brown glaze (Old Cairo ware FG10b; [Figure 12](#)). These came from the uppermost strata in the room, which were disturbed and insecure. This material awaits further study but probably indicates production in relatively recent times.

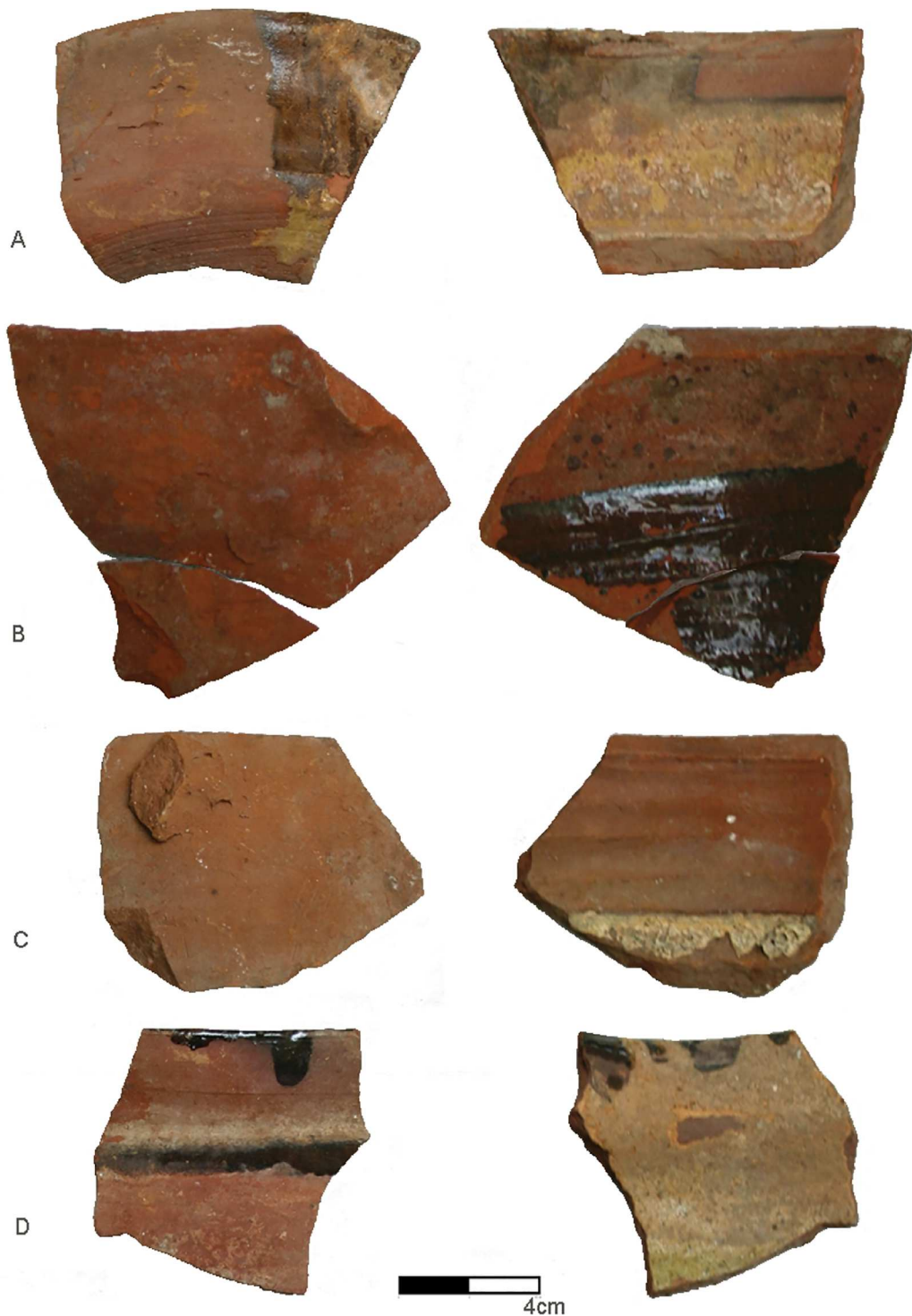
Although the fawakhir potteries were cleared in 1998, the tradition of ceramic production continues on the site at the Fustat National Ceramics Centre, located between Babylon and the Fustat archaeological area ([Abdulfattah 2010](#)). This small institution houses artisans who produce studio pottery, often drawing on Egyptian and wider Islamic ceramic traditions, including those that flourished in Fustat a millennium ago.

### The Organization of Fustat's Ceramic Industries

Having sketched what we know of the locations of ceramic production from the 8th century A.D. to the present, we will now consider how these industries might have been organized and regulated in order to better understand their relationship with the wider city and its inhabitants. Additional evidence for this comes from Medieval written sources, specifically the Geniza documents and the narrative accounts of Ibn Duqmaq and al-Maqrizi. These indicate that the localized fluctuations in urban prosperity outlined above provided loci for industrial initiatives to meet the growing material needs of the city's increasing population (Fustat's industries were surely stimulated by the expansion of the metropolis of al-Qahira from the 10th–14th centuries A.D.). These loci often took the form of workshops established in areas that were wholly given over to industrial activity, but they could also exist amongst non-industrial neighbors. In the latter case, regulation could address the nuisance of pollution, as evidenced by Geniza documents regarding a 13th century A.D. glass-maker and a perfumer in the vicinity of the Ben Ezra Synagogue and a dyer in an unspecified residential neighborhood, whose activities were curtailed for the comfort of nearby residents ([Ben-Sasson 1994, 208](#); [Goitein 1999, 50–51](#)). The Geniza archive is useful more generally

in elucidating the transitional processes by which workshops occupied empty house-plots. Throughout the “classic” Geniza period (10th–13th centuries A.D.), documents frequently mention ruined structures: gifted, bequeathed, sold, or excluded from sale, rented, used for storage or occupation, neglected, rebuilt, and, when completely empty, sometimes confiscated ([Goitein 1999, 49–54](#)). There was a significant increase in vacant premises after A.D. 1200, by which time the more affluent of the Jewish community had largely moved from Fustat to al-Qahira ([Ben-Sasson 1994, 207–208](#); [Jefferson \[2022, 61–62\]](#) suggests that part of Cairo's Muski quarter was settled by Jews around this time). The impression from the Geniza that Fustat's various industries were organized as multiple individual small-scale enterprises—local, informal partnerships of artisans (like the 20th century A.D. fawakhir potteries, discussed above)—indicates activity that would be adaptable to whatever spaces became available. Workshops could also be inserted into the *qa'at* (halls) of occupied houses ([Goitein 1967–1988, 4:69–70](#)). As part of these transitional processes, potting communities must have interacted with, and been interspersed among, a diverse urban population.

Later Medieval narrative sources elucidate this relationship, as well as the practical organization of workshops, including social, economic, administrative, and regulatory ties to the wider community. Ibn Duqmaq (d. A.D. 1407) wrote a nostalgic topography of Fustat in which he noted the (current or former) locations of a number of ceramic workshops (summarized in [Table 3](#)), most of which can be assigned broadly to areas of the city ([Bahgat and Massoul 1930, 10–12](#); [Milwright 1999, 505](#); see also [Golvin, Thiriout, and Zakariya 1982, xi](#)). Beyond the general area, the exact locations of these facilities remain unclear. Interpretation of Ibn Duqmaq is challenging given the presentation of the city as a *lieu de mémoire* ([Denoix 1996](#); [Rabbat 2000, 24](#)). Nonetheless, his account reinforces the impression from the Geniza documents of multiple, small, independent workshops, some named for an individual (founder, leading potter,



**Figure 12.** A selection of brown-glazed silt (FG10b) cooking pots produced in the vicinity of the Roman tower kiln, exterior (left) and interior (right) views (A. L. Gascoigne).

head of household, owner, or investor?), integrated into the urban fabric of a neighborhood, sometimes close to important public structures and sometimes replacing structures with other functions, including housing. The majority seem to be near the riverside or in areas where residential functions had already given way to industrial/mercantile ones.

Further evidence for the social and technical organization of workshops comes from study of their products, and an examination of Fustat sherds in the V&A indicates the potential of this approach (A. Gascoigne, personal observation, with thanks to Mariam Rosser-Owen; see also Milwright 1999; Walker 2004). Analysis of sherds bearing names or “signatures” indicates variation: few examples of

lustreware were signed, but signatures are common by the time underglaze-painted wares dominate. This correlates with other evidence for changing attitudes to and the status of craftsmen, and organization of production, between the 12th–14th centuries A.D. (Walker 2004). Blue-and-white underglaze-painted pottery appears more commonly signed than contemporary black-and-turquoise underglaze-painted ware (perhaps connected with the signing of Chinese blue-and-white); Mamluk sgraffito is likewise less commonly signed, at least in the Bahri period (Walker 2004, 42–54). This indicates a variety of conceptual approaches to production, and signatures cannot be considered to communicate consistent information across different wares.

**Table 3.** Ceramic-related features mentioned by Ibn Duqmaq (d. A.D. 1407), their urban context, and their suggested locations.

Ibn Duqmaq's feature	Ibn Duqmaq's location	Suggested modern location
The kilns of Ibn Khashana	At the end of the lane of Shabib, in the al-Hamra' quarter	Al-Hamra al-Wusta, i.e. central/northern Fustat, near the aqueduct of al-Ghuri
A street of potters' kilns	In al-Hamra', near <i>midan</i> (square, plaza) Sabra and the bath of Ibn Abi Shuraih	As above
Kilns	Built over the site of a house connected with the "mosque of the horns," next to the bath known as that of the merchants of maize-straw	As above
A potters' quarter	In the neighborhood of the mosque of Ibn al-Khashshab and the church of Mar Mina	As above
An unnamed workshop	On the right-hand side of an exit from Darb Ma'ani towards al-Qahira	As above: Darb Ma'ani was in northern Fustat just south of and running parallel to the aqueduct of al-Ghuri, in an area which is still industrial today (Denoix 1992, 44, 48, pl. 1)
Kilns	On the edge of the Kubbara quarter, close to a gated exit point	As above, near Bab Misr: Denoix 1992, pl. 1
A "market of fishermen and potters"	On the edge of the quarter of the Sultan's sugar factories	Al-Hamra al-Dunia, i.e. central Fustat, near Abu Sayfayn
A lane of potters ( <i>al-ghadariyyin</i> ) (makers of luxury wares? stone-paste manufacturers?)	West of the Mosque of 'Amr	Al-Hamra al-Dunia, i.e. central Fustat
The kilns of Ibn Gurab	Near the hill of the Banu Wa'il and the two gates of al-Qantara, also referred to as a "potters' quarter" at the foot of the hill of Ibn Gurab, near Babylon	Kom al-Ghurab, just south of the Roman fortress, southern Fustat
Kilns	In the vicinity of the mosque of the vegetable sellers and opposite a basin	Location unknown

Diversity of production within a single workshop is indicated by the presence in the V&A of lustreware sherds with both proto-stonepaste and earthenware fabrics bearing the signature *Sa'd* and wasters of different wares produced and fired together. However, the Geniza archive supports some specialization of production, with drainpipes, narrow-necked, spoutless water jugs, and "porcelain-like translucent dishes" (stonepastes?) produced by separate artisans (Goitein 1967–1988, 1:110–111). There is no reason to assume consistent practice by all pottery workshops. A more detailed investigation of Fustat's products has the potential to reveal further significant insights.

Regulations regarding the manufacture of pottery are noted in 14th century A.D. *hisba* (market regulation) manuals: requirements included the use of particular fabrics for vessels of certain form or function; regularizing shape, size, and glazing; and, the use of specific glaze pigments, fuel types, and firing levels (Bahgat and Massoul 1930, 12–14; Milwright 1999, 508; Walker 2004, 35–45). Clearly, the *muhtasib* (market inspector) aspired to as standardized a range of products as possible given the disparate nature of production.

A further question relates to the location of potteries making coarse wares. Gayraud suggests that the needs of a large urban center might increase diversity of production within workshops (1997, 262–263). Walker proposes that the term (*fakhkhurah*) used for workshops by Ibn Duqmaq indicates coarse ware production (2004, 38–39). However, such terms are difficult to define precisely and consistently, and beyond the evidence from Istabl 'Antar and the fawakhir area, coarse ware production is almost entirely archaeologically unreported to date. Unglazed wasters (except biscuit wares) were not found around the kiln excavated within the Roman tower of Babylon, nor are they convincingly noted (although perhaps under-reported?) from other excavations; the numerous ceramic workshops attested archaeologically in Fustat apparently produced glazed wares almost exclusively. Where, then, were the potteries serving Cairo's coarse ware needs? Roger Bagnall argues that, in Late Antiquity, potting was primarily a rural industry, located near clay sources but with limited transportation of clay to urban centers for fine ware production (1993, 84–85, 129). Fuel for

kilns was likewise imported to Fustat from the countryside: Ibn al-Ukhuwa's (d. A.D. 1348) *hisba* manual notes the use of dung (Walker 2004, 41), while large quantities of *halfa* grass were brought to Fustat as a fuel in A.D. 1552–1553 (Michel 2018, 392–393, 410–411). Assuming continuity of practice, coarse wares were presumably shipped to Fustat, as they were in the 18th–20th centuries A.D., when rafts and boats brought jars northwards from Qena and Ballas to markets in Cairo, Damietta, and elsewhere (Cooper 2011). Having said that, the number of small, thrown-off-the-hump, low-fired, disposable silt bowls (used as take-away food containers) recorded during our Old Cairo excavations and in those at the walls of al-Qahira, where they represented ca. 30% of the Mamluk-period assemblage (Monchamp 2018, groupe 250), implies substantial production of coarse wares somewhere nearby—perhaps in the city's immediate hinterland (like Kolkata's modern *bhar* tea-cups, made in a northern riverside suburb of the city: Gustafsson and Mostafa 2016).

Clay-gathering is evidenced in the Fustat area, perhaps organized by dedicated collectors, the product differentiated into grades and sold to potters (Milwright 1999, 508). Al-Maqrizi notes the use of Nile silt, while Abu Salih records the use of yellow clay from an east-bank village called al-'Adawiyya ca. 18 miles south of Old Cairo and, less certainly, from Habash (Birkat al-Habash, near Fustat) for glazed wares (Abu Salih 1895, 131, 136, n. 4, 141; Milwright 1999, 508; Monchamp 2018, 33); al-'Adawiyya's location corresponds to the modern industrial area of Hulwan.<sup>6</sup> Recent Fustat potters acquired raw material from al-Tibin (Golvin, Thiriot, and Zakariya 1982, 6) at the southern limits of the city in the region still known as Dayr al-Tin ("monastery of clay") and shown on the *Description de l'Égypte* plan of Old Cairo in the location of the suburb of al-Maadi (*Etat Moderne I*, pl. 16); when this clay source was first exploited is unknown. Clearly, clay was available outside but close to the city and perhaps within it as well.

Pot vendors were also present. A Geniza document from A.D. 1104 mentions "the shop known for the sale of oil and pots in Fustat at the gate of Qasr ash-Sham', known as the Gate of the Turners" (Worman 1905, 26; see also Goitein

1967–1988, 1:83). This gate is not known from other sources but probably lay on the western side of the fortress, i.e. in the waterfront industrial area of which the Roman tower kiln formed a part.<sup>7</sup> We have already noted Ibn Duqmaq's market of fish and pottery near Abu Sayfayn, surely near the river. The fair sale of pots, as other commodities, was regulated under authority of the muhtasib by designated craftsmen: lists of pot-sellers' obligations feature alongside those of producers in hisba manuals, identifying common scams (Bahgat and Massoul 1930, 12–14; Milwright 1999, 508–509). Injunctions refer to the quality of objects sold, description of the range of quality on offer, buyers viewing purchases to agree a price as seen or duplicates to be of equivalent standard to a specimen, portage, and passing off repaired seconds as undamaged. For uncertain reasons, sellers were required to sell *ghadar* (luxury wares? stonepaste?) vessels fired in large and small kilns separately. Hisba regulations for pottery repair relate to the nature of ingredients in glues. Contravening these injunctions led to public exposure with the object of shame around one's neck (Bahgat and Massoul 1930, 13–14; Milwright 1999, 509).

Taken together, these sources indicate that fine wares were supplied to Cairene consumers by multiple workshops and commercial outlets of complex organization, with diverse economic and regulatory connections, located in proximity to landmarks and spaces of current or recent urban importance, with an embedded population of skilled workers, sellers, and purchasers. It is clear that Fustat's "marginal" potteries were much more closely embedded into a lively and populous urban fabric than has often been assumed.

### Conclusions: Fustat's "Marginal" Industries

The principal excavator of Fustat, George Scanlon, wrote that "[t]he Old City (Misr Qadimah or Misr al-Fustat) was partially destroyed and for all practical purposes abandoned after the conflagration of November 1168" (1982, 230). The term "abandonment," with its implications of straightforward depopulation abruptly or over time, obscures the complexity of processes at play in Fustat, and we should more productively consider the urban re-purposing of the city, often specifically for practical purposes. As we have seen, Fustat saw multiple traumatic or more gradual episodes of "abandonment" alternating with periods of intense activity and growth, which played out differently in different parts of the city (Sheehan 2010, 79–115). One of the most important recent changes in our understanding relates to the nature of the abandonment of Fustat's southern quarters, the two most significant episodes of which appear to have been occasioned first by the 'Abbasid conquest of A.D. 750 and then by the economic and social upheavals of Fatimid rule in the second half of the 11th century A.D. (Kubiak 1976; Sheehan 2010; Sheehan and Gascoigne 2022). These abandonments were real enough. The 'Abbasid conquest was marked by violent destruction that left much of the city in ruins, while the abandonment of Fustat at the end of the Fatimid period was effectively marked by an A.D. 1072 edict allowing people from nearby al-Qahira to remove building material from derelict structures in Fustat, suggesting a more gradual process of decline was already well under way (Denoix 1992, 54). In both cases, though, abandonment was neither total nor permanent. The new 'Abbasid foundation of al-'Askar to the north of Fustat was

soon subsumed into the surviving core of the city. Equally, at least some of Fustat continued to function after the Fatimid period as an important commercial depot, with newly constructed residences of high-ranking notables located in proximity to the Ayyubid and Bahri Mamluk citadel on Rawda Island, as evidenced by our excavations in Old Cairo and at the former potteries (fawakhir) site (Sheehan 2010, 83, 105–112). This supports similar conclusions based on textual evidence (Denoix 1992; Petry [1997, 274] even states that "Fustāt quite obviously made a full recovery during the Ayyubid and Mamluk periods"). Settlement also continued in much of the area of the Roman fortress, an important enclave of Christian and Jewish minorities under Fatimid rule, and along the riverfront, expanding with the later Medieval shift of the Nile westwards and surviving the decline of the Late Antique and early Islamic port in favor first of Fatimid al-Maqs and then Mamluk Bulaq (Cooper 2014, 187–194). It may thus be that only the areas towards the southern and eastern edges of first Umayyad and then Fatimid Fustat were ever truly "abandoned," although in the latter case even some of these ruins were subsequently enclosed in the largely symbolic southern section of the early 13th century A.D. Ayyubid city wall (Kemp et al. 2004, 282–283). From the end of the 13th century A.D., the combined effects of famine, economic troubles, and severe outbreaks of plague again led to depopulation and a shrinking and repurposing of the metropolis, from which it struggled to recover until well into Ottoman times (Borsch 2005). It is therefore clear that cycles of boom and bust in the Medieval city were more complex and local than previous discussions of the phenomenon have tended to recognize.

Re-purposing of "abandoned" areas took various forms. Fustat experienced a range of processes including rural immigration, informal occupation, rubbish-dumping, and unwanted effects from industrial activities (for modern parallels, see Sims 2012). The construction of workshops and industrial installations for pottery production servicing the greater urban conglomeration indicates the continuation of urban life in these areas, albeit in different form. The concept of "urban persistence," it has been argued, has been neglected in favor of processes of collapse; persistence is not a static state, though, and dynamic change within cities, such as that investigated here, can itself be part of a process to sustain resilience (Crawford et al. 2023).

Clearly, the relationship between industry and urban prosperity is complex. Pottery production in Fustat was constant from at least the 9th century A.D. to the present, with frequent changes in scale and shifts in location; we lack extensive evidence for where ceramic workshops were located at particular times, although informed speculation based on the archaeological record is possible. Fustat, and later Cairo, developed as a series of linked urban districts, each shaped by the existing forms of a physical and populated landscape; each incarnation of the city required numerous pots. Polluting industries clearly made use of peripheral areas to some extent. Prevailing breezes from the north meant that noxious industries (tanning, potting, quarrying, and lime-burning, all of which continued to some extent into modern times) could take place downwind of al-Qahira's residential areas. The collection and sorting of the city's garbage is another modern activity with ancient roots: archaeological evidence from Istabl 'Antar shows

that this southern edge of the city was used by garbage collectors in the wake of the ruptures following first the 'Abbasid conquest and again at the beginning of the 12th century A.D. (Gayraud et al. 1991, 61, 71). The plateaux at the southern and eastern edges of the city also aided industry: several ruined windmills ascribed to the Napoleonic Armée d'Égypte (Gayraud et al. 1991, 72) still survive on the ridge of Kom al-Ghurab/al-Rasad in an area controlled today by the military. Mills and millers are likewise mentioned by Ibn Duqmaq and al-Maqrizi and in 12th–13th century A.D. Geniza documents, where they are located in the district of Musasa/Mamsusa, identified with al-Rasad, a part of Fustat with a strong Jewish presence located east of Babylon and accessed from the Jewish quarter within the fortress via a gate in its wall (Denoix 1992, 88; Worman 1995, 31). The separation of residential and industrial areas within Medieval Fustat was, though, less clear-cut than later Medieval legal models of idealized urban zoning, which place industry on the periphery and downwind of core urban centers, imply (O'Meara 2009, 8; Raymond 1990, 1998). The waterfront areas were key; parallels exist with Medieval (and modern) Fez, where tanneries are centrally located in the old city, on the river banks (Brunschvig 1947, 146–149; Burckhardt 1980, 168; thanks to Bethany Walker for this observation). We have already noted above the diversity of parallels in cities such as Raqqa, Jerash, Tiberias, and Ramla.

A number of factors might underlie the shifting of potters around the urban landscape: the gradual creep of rubbish mounds, tipping points in the “abandonment” of residential areas, changes in demand for products, or limits of government interference and taxation. At least some of the industrial activities described above may have been related to the re-use of by-products from the vast rubbish dumps of Tilul Zaynhum and 'Ayn al-Sira that grew up close to the later Medieval city. These rubbish mounds have remained a significant feature of Cairo's topography even down to their current rebranding as the Fustat Hills, and their dynamic growth during the city's major expansion between the 10th and 14th centuries A.D. doubtless caused periodic shifts in the location of related industrial activities. From the later Mamluk period, turning over the site for building debris and organic-rich material to be used as fertilizer became an economically important activity. The site of Istabl 'Antar yielded evidence of this, and the truncation it caused to later Medieval deposits, in the form of docketts, probably early 20th century A.D. in date, permitting mining of a certain quantity of material (Gayraud, Björnesjö, and Denoix 1986, 12). Patterns of rubbish disposal and retrieval can thus themselves be considered as drivers of urban change—beyond the creation of rubbish mounds themselves—the importance of which has been overlooked.

The evidence presented above indicates the close proximity of ceramics workshops in various areas of Fustat to residential and ceremonial sites and emphasizes the continued importance of the waterfront in the city's industrial growth. Industry in Fustat throughout Medieval and early modern times was clearly reflexive and responsive, adapting to social and political events and cycles of growth and decline. Our study thus serves to reinforce the complex, changing nature of urban settlement in which limitations of space mean that “abandonment,” if it happens at all, is usually of limited duration before new land uses are found, whether informal or more regenerative.

## Endnotes

1. Certain features, including the presence of granaries, apparently had striking longevity: see for example the *Description de l'Égypte (État Moderne I*, pl. 16) marking the “greniers de Joseph” and the wheat (*qamh*) markets on the late 18th century A.D. riverfront.
2. Scanlon (1993) dates “Fayyumi” wares to ca. A.D. 850–1150, while they are recorded as appearing “in and after the 9th century” at Raya (Shindo 2009, 32). An earlier appearance is proposed by Engemann for Abu Mina (1990; 2016, 13): FG16 types in the first half of the 8th century A.D. and FG12 types from the start of the 9th century A.D., with radiating-line decoration emerging in the first half of the 9th century A.D.; also Bailey, who dates production of “Fayyumi ware” from the later 8th century A.D. (1991, 205). Watson, like Scanlon, suggests that the tradition continued as late as the 12th century A.D. (2004, 167).
3. The unnumbered photographs, dating from 1948–early 1950s, are in the Ministry of Tourism and Antiquities archive; they show excavations following removal of houses from the northern part of the tower that preceded the construction of a new gate to the Coptic Museum.
4. Goitein (1967–1988, 1:412, n. 20, vol. 2, 422) records the use of a tower adjoining the “Synagogue of the Iraqians” (between the Ben Ezra Synagogue and the Hanging Church: Ben-Sasson 1994, fig. 7.1) by a perfumer, who paid 6 ¾ dinars' rent for 2 years during A.D. 1180–1184.
5. See C.229-1923 (fused proto-stonepaste sherds of black-and-turquoise underglaze-painted ware, pale green monochrome-glazed ware, and blue-and-white underglaze-painted ware), C.1317-1921 (fused proto-stonepaste sherds of monochrome-glazed ware in green-blue and dark blue and blue-and-white underglaze-painted ware), C.1322-1921 (two fused pieces with very different clay fabrics but similar olive green glaze), C.1018-1921 (fused proto-stonepaste underglaze-painted sherds in black-and-turquoise and blue-and-white), C.1258-1921 (fused proto-stonepaste underglaze-painted wares in blue-, black-and-white, and black-and-turquoise), and C.1316-1921 (fused sherds of monochrome green and black wares).
6. Abu Salih (1895, 131) notes the use of clay from al-'Adawiyya following a description of the Habash area, linked through land ownership by al-Mustansir's vizier, Abu al-Faraj. He continues, “[a]t Al-'Adawiyah are the quarries of yellow clay, of which the [pots called] *khazaf* are made; and they are to the north, on the estate of the vizier Abu 'l-Faraj al-Maghribi” (1895, 141); by implication, there may have been clay quarries on Abu al-Faraj's land in Habash, but the evidence is hardly explicit.
7. This was perhaps an alternative name for one of the two gates through the fortress's western side, named by al-Maqrizi as Bab al-Hadid and Bab al-Sham (Monneret de Villard 1924, 81–90).

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## Geolocation Information.

The center of the Fort of Babylon is around 30°00'23.80"N, 31°13'51.00"E.

## Notes on Contributors

*Alison L. Gascoigne* (Ph.D. 2002, University of Cambridge) is Professor of Archaeology at the University of Southampton, UK. Her research interests focus on the Late Antique and early Islamic archaeology of Egypt, including Fustat, the Kharga oasis, the Aswan region, and Tell

Tinnis, on which she published *The Island City of Tinnis* (2020). She has also worked at and published on the sites of Jam and the Bala Hissar, Kabul in Afghanistan.

**Peter D. Sheehan** (M.A. 1998, University of York) is an archaeologist and Head of Historic Buildings and Landscapes with the Department of Culture & Tourism, Abu Dhabi. He has a particular interest in historic building preservation, site formation processes, and the development of cultural landscapes and has published widely on his work in and around the Roman fortress of Babylon in Old Cairo and the historic oasis landscape of the World Heritage Site of Al Ain in the UAE.

## ORCID

Alison L. Gascoigne  <http://orcid.org/0000-0003-2742-9483>

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