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Naukratis was an important hub for trade and cross-cultural exchange long before the foundation of Alexandria. Established in the late 7th century BC as a base for Greek and Eastern Mediterranean traders, Naukratis was occupied until at least the 7th century AD, although the later Roman period has remained largely ignored by scholars due to researchers' focus on the earlier 7th and 6th century BC phase of Naukratis as a Greek emporium. During the Ptolemaic and Roman periods Naukratis was one of three Greek *poleis* (city-states) in Egypt and remained an important town and regional centre. Its status as a *polis* is first attested in the 2nd century BC and extended into the Roman period (Möller 2000, 191; Villing et al. 2013). Claudius Ptolemy suggests that the settlement had shrunk in significance and size to that of a town by the late 2nd century AD (Ptolemy, *Geography* 4.5), when the settlement was home to the famous culinary writer Athenaeus, although it retained some status since games continued to be held at Naukratis until at least AD 266 (Lobel and Roberts 1954; *P.Oxy.* XXII 2338).

Under the aegis of the British Museum Research Project, 'Naukratis: The Greeks in Egypt,' staff are currently cataloguing the c. 20,000 artefacts, mostly unpublished, from the site to be presented in an Online Research Catalogue (Villing et al. 2013). This work now takes place in tandem with a British Museum fieldwork project at Naukratis/Kom Geif (Thomas and Villing 2013; Villing et al. 2013; Thomas 2014). Both undertakings have revealed extensive Roman remains and artefacts that can now be used to inform studies on Roman Naukratis. This paper outlines the archaeological evidence for Naukratis in the Roman period, its topography and the character of the material found there over the past 130 years, placing it in context through comparative analysis with finds from the surveys of Alexandria, Mareotis (Blue and Khalil 2011) and the northwestern Nile Delta (Wilson and Grigoropoulos 2009). This provides a useful insight into the contrasting, yet related, fates of these two important and connected 'Greek' cities in Roman Egypt and their surrounding hinterland.

Although the existence of Naukratis had been long known from ancient written sources, the precise location of the site was only identified in 1883 by the young pioneer of Egyptian archaeology, William Flinders Petrie, who rediscovered it near the modern village of Nebira. Excavations by Petrie and his collaborator Ernest Gardner for the Egypt Exploration Fund in 1884–85 and 1885–86, and by David Hogarth under the auspices of the British School at Athens in 1899 and 1903, were followed by those of Coulson and Leonard (1970s–1980s) and more recently Mohammed Aly Hakim for the Supreme Council of Antiquities (2009–11). Nevertheless, some 130 years later, the site remains poorly understood since much of this earlier research remains unpublished (Villing et al. 2013).

The excavations of Petrie, Gardner and, later, Hogarth, were sponsored indirectly by donors (usually museums), who subsequently received objects for their displays. Among the thousands of finds recovered by the early excavations, the majority can be found today in

over 60 museum collections world-wide. The British Museum holds the largest group (7,758). Roman artefacts are scarce, representing under 4% of all Naukratis objects, in part because of the early excavators' research interests in pre-Roman periods. That bias has severely hampered previous research on Roman Naukratis. This is in contrast to the subsequent work of Coulson (1996), Leonard (Leonard 1997; 2001) and the British Museum (Thomas and Villing 2013; Thomas 2014), in which quantities of Roman material were retrieved.

Site topography

Today the ancient harbour town of Naukratis is encircled, and in places covered, by the modern villages of Rashwan, Abu Mishfa, Gebril Abbas, Hassan Kasim, El Baradany and their fields, known collectively as Kom Geif. A large portion of the northwestern quarter of the ancient settlement is currently a large pit, until recently a lake, left by the excavations of the *sebakhin* and archaeologists (Bailey 1999, 218; Leclère 2008, 140). Recent survey and excavations at Naukratis have revealed the extent of the city and elements of its layout, development, palaeo-landscape and the location and character of waterways (Thomas and Villing 2013; Thomas 2014). A programme of topographical (182 hectare RTK GPS) survey, geophysical (15 hectare fluxgate gradiometer) prospection, geological investigation (auger drilling), surface pottery collection and excavation allowed us to reconcile, as closely as is practicable with the accuracy of the methods of the time, all previous fieldwork at the site with real-world coordinates (Thomas and Villing 2013, 86–88, fig. 8).¹ Naukratis was larger than previously thought, more than 60 hectares excluding the cemetery, and magnetometry revealed numerous previously unknown structures of domestic, religious and industrial function as well as the river front (Figs 1–2).

To the west of Naukratis, concealed under fields, lies the now dried-up Canopic river branch and the harbour of Naukratis.² The river was a deep (average c. 3m) and wide (c. 250m) river channel from the 7th century BC to the 7th century AD (Thomas 2014),³ flowing south to north. The auger results and maritime artefacts—fishing hooks and weights, ballast stones, fragments of lead hull sheathing, copper hull tacks and brail rings (Fig. 3)—confirm that the

¹ ArcGIS was used to combine new survey data with Petrie's, Gardner's, Hogarth's, Coulson's and Leonard's and Hakim's plans, sections and photographs alongside aerial photography and satellite images taken in 2011, 2009, 2007, 2004 and 2002 (Fig. 1), as well as to build a topographic model (Thomas 2014). The fieldwork was directed by Ross I. Thomas with the assistance of Alexandra Villing, Penelope Wilson, Marianne Bergeron, Benjamin Pennington, Entesar El Sayed Ashour, Eptisam Nabeel Mahmoud Elbahiye, Doaa Ferieg Ali, Emad Hamdy Mohamed Abou Esmail, Tarik Sayed Ahmed Abdellah and Hani Farouk Abd El-Azeez Shalash, with technical assistance provided by Kris Strutt and Doug Murphy.

² The course of the river (or canal) that passed Naukratis has long been the subject of controversy (Petrie 1886, 2–4, 10; Hogarth, Lorimer and Edgar 1905, 122–23; Bernand 1970, 618–23; Villas 1996, 177–90; Möller 2000, 115–16). Magnetometry traced the path of the river in relation to anthropogenically derived sediments of the harbour, subsequently confirmed by auger cores (Thomas 2014).

³ Pennington 2013. Cores A01-3, A06-7 with reinterpretation of previous work by Gifford in Coulson, Leonard and Wilkie 1982, 75; Leonard 1997, 28 with n. 67; Villas 1996, 163–75; Shaaban El-Awady 2009; Wilson 2010, 116–18, fig. 9.3.

Canopic branch of the Nile was navigable for sea-going ships.⁴ The river bank, modified with phases of man-made terraces, was aligned north–south with adjacent warehouses (Thomas and Villing 2013, 91; Petrie 1886, pl. 41; Petrie Notebook [1884] 6, 17, points 130–32). Auger cores revealed a sequence of hard surfaces made of broken pottery dating from the 7th century BC to the 7th century AD. Ptolemaic and Roman to Byzantine finds were common on the surface, particularly imported transport amphorae of the 5th to early 7th centuries AD (Thomas and Villing 2013, fig. 7, table 1). At some point the Canopic branch became seasonal, then silted up altogether. L. Blue and E. Khalil suggest that the drying up of the Canopic branch, which fed canals to Mareotis, became a problem between the 5th and the 11th century AD, after which the channel became defunct (2011, 9–11). Grain transports each carried from 2 to 160 tons of grain to Alexandria via Naukratis well into the Byzantine period (Sijpesteijn et al. 2011) in order that it could be transferred onto purpose-built ships in Alexandria's deep-water harbour. Thus we can assume that the waterways of Naukratis remained busy with transports and barges (called *polykophon*, *hellenikon*, *zeugmatikon*, *lousorion* and *platypegion*), as well as traditional wood and papyrus rafts used as lighters, fishing boats and ferries, until the site's demise in the 7th century AD. To the east of the settlement, old field systems and narrow canals or ditches were found, although the role of these canals cannot be confirmed until further work is undertaken (Petrie 1886, 10; Thiers 2007; Thomas and Villing 2013, 92–93; Thomas 2014).

The modern villages of Rashwan and Abu Mishfa and their fields cover the northern part of Naukratis, including the town, cemetery, administrative structures and the sanctuaries of the Hellenion and Temple of the Dioskouroi, which continued to be occupied into the Roman period. Archival research confirms that the modern Rashwan and Abu Mishfa were surrounding the ancient cemetery excavated by Petrie and Gardner (Gardner 1888, 11, 21–30; Thomas and Villing 2013, 91; Petrie Journal 1885–86, 98; Petrie Notebook 74), marking the northern limit for the settlement. The large rectangular temenos wall of the Hellenion, recognised partially in the magnetometry (Fig. 1), was identified and partially excavated by Hogarth in 1899 and 1903 (Hogarth, Edgar and Gutch 1898/9; Hogarth, Lorimer and Edgar 1905). More of this structure is located under the fields and road east of Abu Mishfa (Thomas and Villing 2013, 90–91), with its southern limits largely removed in the northeastern part of the lake depression by archaeological and *sebakhin* activity. Magnetometry revealed c. 4m remains of this structure surviving north of Hogarth's excavations, abutted by 14 'tower houses' (Figs 1–2). Although excavations by Hogarth concentrated on the Archaic and Classical Greek periods, clearly later Ptolemaic and Roman remains exist and were observed on the surface of this area (Hogarth, Edgar and Gutch 1898/9, 38; Thomas 2014). Other Greek temples include the Milesian sanctuary of Apollo and the adjoining Samian sanctuary of Hera, a sanctuary of the Dioskouroi and the sanctuary of Aphrodite, where an 'abundance of late Roman pottery' confirms their continuation into the Roman period (Petrie 1886, 13). Nevertheless, 'not a fragment of a column has... been found... as the columns and architraves would be so adaptable to other buildings, it seems as likely an explanation that they were carried off whole in the later Roman period for some structure elsewhere' (Petrie 1886, 14).

⁴ Such as the early 4th century BC c. 14m long, 25tons, 4-man 'Kyrenia' ship that sank off Cyprus in the early 3rd century BC. See Parker 1992, 231; Casson 1994, 109; Steffy 1985.

The recent survey results force us to reconsider the size of Naukratis, which must have exceeded 60 hectares during the city's heyday (Figs 1–2), not 32 hectares as previously thought (for 32ha see Wilson 2011, 186; Bagnall 1993, 53). New features have emerged concerning the layout and architecture of Naukratis that inform our understanding of the status and function of the settlement, which was described as both a *polis* and *emporion* (Herodotus, *History* 2.178–79). Certainly considered a *polis* during the Ptolemaic period (Austin 2004, 1238; Möller 2000, 184–94), Naukratis does not have a *hippodamic*-style layout, as seen in Alexandria or Philadelphia (Müller 2010, 227, 230, 234); instead the irregular non-orthogonal layout, dominated by large *temene*, seems to resemble other (and older) Egyptian Delta towns, such as Sais (Müller 2010, 225; Leclère 2008). Workshops and industry were integrated within the settlement, including kilns and slag heaps ('western slag heap': Petrie 1886, 36, pl. 40; Möller 2000, 152–54; Thomas and Villing 2013; Thomas 2014; Villing et al. 2013). They did not respect the prevailing northerly winds that were taken into account at organised foundations, such as the Macedonian settlement at Athribis (Müller 2010, 234). The majority of the site was populated with densely packed 12–16m-square tower houses (Marouard 2012; Arnold 2003), built in a piecemeal fashion. Each roughly respects the alignment of its neighbours, using all space economically and filling all space not occupied by religious, public, trade and industrial zones; this is typical architecture of the Late Period to Roman period. Excavations and survey confirm that many of these structures were occupied in the Ptolemaic and Roman periods at Naukratis (Leonard 1997, 2001; Thomas 2014; Gardner 1888, 16). This contrasts with the flimsy, irregular mud-brick terraced *insulae* that cover much of the plan of the early northwest quarter published by Petrie (Petrie 1886, pl. 41; see Müller 2010, 250). Hogarth mentioned Roman- to Byzantine-period elite to modest fired-brick and limestone buildings in the east of the site (Hogarth, Edgar and Gutch 1898/9, 41, pl. 2, grids 7b, 8b and 9b), although he failed to investigate them. The excavators found Roman burnt-brick foundations and 'platforms ... on the east of the cleared part of the ancient town' (Gardner 1888, 33), 'a layer of Roman remains, burnt bricks about 3 feet thick' in the southwest and high mounds with a straight cut face along the west (Hogarth, Edgar and Gutch 1898/9, 40). The early excavators dismissed the various Roman-period high mounds because they were not interested in investigating Late Roman material.

The south of Naukratis was dominated by the massive, 298m by 259m (nearly 8 hectares) mud-brick-walled 'Great Temenos',⁵ an Egyptian temple precinct dedicated to Amun-Ra (of Baded (Theban Zeus), his consort Mut, his son Khonsou-Thot and the god Min (Muhs 1994; Leclère 2008, 118, 120, 128–38; Spencer 2011, 40), accessed through a monumental, 107m by 24m pylon built during the reign of Ptolemy II (Petrie 1886, 23–34). The limestone-faced pylon was entered from the monumental quay on the Canopic river (Thomas and Villing 2013, 97)⁶ via the processional way flanked by rams and sphinxes (Petrie 1886, 27; Gardner

⁵ Petrie 1886, 23–34; Hogarth, Lorimer and Edgar 1905, 110–12. The precise location of the temenos has been obscured by ancient and modern construction and farming activity and is the subject of ongoing debate. This is apparently complicated by the surveying errors of Petrie (Spencer 2011; Thomas 2014; Thomas and Villing 2013, 97).

⁶ Recent construction of a new school building in El Baradany revealed a large north–south running stone wall with stone stairs leading up to it, as reported to us by the local SCA site guard and archaeologists from the SCA

1888, 13–14; Spencer 2011, 35–38, fig. 11; Thomas and Villing 2013, 92; Petrie Journal 1885–86, Griffith Institute, 18–19).

The pylon foundations and superstructure were destroyed by robbing in the Roman period. Petrie describes ‘large limestone buildings, on Roman red-brick foundations’ reusing stone from the temenos area and houses of Roman date near the temenos gateway using a ‘marble inscription, mentioning a temenos’ (Petrie 1886, pl. 31.9) among other objects reused as spolia. Displaced pottery from the Great Temenos area is largely dated from the 6th century BC to the Ptolemaic period, with only a few Roman pieces (Thomas and Villing 2013, 99, table 1; see also Coulson 1996, fields G-S1 and G-S2). The sanctuary must have existed here from at least the 6th century BC and the magnetometry results suggest a suitably complicated plan for such a long-lived structure representing a sequence of builds (Figs 1–2).⁷ Three square casemate structures were immediately to the south and west of the temple, including a putative 21m-square chapel or barque-station and a 59m by 64m store (Figs 1–2; Petrie 1886, 24, 52, pl. 42; Petrie 1886, 52; Spencer 1979; Leclère 2008, 134–37, 512–15; Spencer 2011, 36). The largest casemate building appears to have been converted into private dwellings in the 2nd century AD after the floors of the cellars were raised by infilling with rubble and rubbish. ‘The last point of the history of this building is the erection of a Coptic chapel on the top, some fragments of plastering, with part of a cross done in red paint, having been found there’ (Petrie 1886, 34). More Roman material and structures were found within the 3m-tall ‘South Mound’ by Penelope Wilson and previously by Albert Leonard, where, as at the north, west and south, tower houses had been built against the temenos wall since the Late Period at the edge of the temenos and had subsequently encroached into the temenos area by the Roman period, following the decline of both traditional Greek- and Egyptian-style temples (Griffith 1884–85, Notebook 150, 10–11, areas 13 and 24; Petrie 1886, pl. 42; Hogarth, Lorimer and Edgar 1905, 111; Thomas and Villing 2013, 118, figs 15–17). These houses were visible in the magnetometry and on the surface (Fig. 1). Excavations in the ‘South Mound’ by Leonard in the 1980s revealed largely Ptolemaic structures in Areas 1, 2, 482, 490–92 and 502; and a massive east–west mud-brick (temenos?) wall in Areas 12 and 15 (Leonard 1997, 24; see Thomas and Villing 2013). The excavation of three trenches, excavated by Wilson in 2013, revealed further evidence of a massive (temenos?) east–west wall in this area intersected by a late Ptolemaic to Roman north–south aligned wall built over a pit and rubble. The relationship between the various phases of Ptolemaic and Roman houses and the temenos wall first recognised by Petrie (Petrie 1886, 23–24) represents conflict over the limited space available for building and significant evidence of Roman-period activity. With large sections of the settlement set aside for religious or public buildings, it is likely that only 35 hectares were used for domestic settlement (Thomas 2014). The densely packed tower houses (c. 38 houses per hectare) suggest a population of c. 10,640–12,844 lived at Naukratis during its height (for discussion of population estimates, see Thomas 2014, table 1), although during

office in Damanhour, predicted by Yoyotte 1982–3, 129–36; Leclère 2008, 117.

⁷ At least two phases of a mud-brick and limestone ‘temple’ (Thomas and Villing 2013, 85, 99, 103), a rectangular feature measuring 47m by 35m within a ‘T’ shaped structure 51m by 64m in size. Although the magnetometry suggests significant modifications of the layout of the sacred space, it is not possible at present to speculate in what order these occurred.

the Roman period we are still not certain how much of the settlement remained occupied and how much had fallen into disuse following the site's peak in the Ptolemaic period.

Roman Naukratis

Artefacts dating from the late 1st century BC to the 7th century AD show that Naukratis was continuously occupied during the Roman period. The Naukratis catalogue includes (from all seasons) c. 600 pottery, faience or glass vessel sherds, 92 lamps, c. 160 figurines, 16 sealings, 53 coins and 47 pieces of jewellery that can be assigned to the Roman period with confidence (Figs 4–10). It is clear that much Roman material (mainly pottery) was not collected during the 1884–1903 seasons, so no comparison can be made with the earlier periods which were the focus of that early research. It is also clear that there is a bias towards complete small finds and jewellery from the early Roman period (Figs 4–5). There are, however, large quantities of pottery sherds from the later surveys and excavations that can be used, tentatively, to explain or enrich our understanding of the health and success of the Roman communities, their cultural contacts and influences.

There are a number of artefacts that suggest a concentration of wealth at Naukratis during the 1st century AD. These finds include Roman coins of the mid- to late-1st century AD (Fig. 6); the largest group of silver and gold jewellery known from the site dates to the same period (Fig. 4). The majority of this jewellery came from a single hoard found in the 'south-west of the town, at a high part, lying in the loose dust among the [Roman] houses' (Petrie 1886, 43–44; British Museum GR 1886,0401.1749–65; Cairo Museum JE26781, JE26779–81). This discovery included a fragmentary crown or diadem bearing the name of Tiberius Claudius Artemidorus (GR 1886,0401.1765), with the images of the sun-god Helios, Horus in military costume, Demeter-Isis and Hera(?). It has been variously identified as jewellery, as a priest's crown, as a priest of Augustus's crown and as a victor's crown. It was found with two gold chains, a pendant, an unguent-holder, a gold offering spoon in the form of a shell, gold and silver bells and discs, a mirror with a silver case, two silver uraei in the form of Serapis and Isis from a bracelet, and a pendant in the form of the triad of Osiris, Isis and Horus. The name *Τιβέριος Κλαύδιος Ἀρτεμιδώρος* on the diadem is attested in a number of sources concerning an athlete from Tralleis (in modern Turkey) who was known to have competed in Alexandria. Pausanias records that he failed as a boy at Olympia in AD 67, but in the following year won in Smyrna the boys', teenagers' and men's age categories of the *pankration*. In AD 69 he was Olympic champion. He also had wins in Periodos, Ephesus and Alexandria. Artemidorus dedicated a statue at the harbour spa in Ephesus to Artemis and Emperor Nerva in AD 96–98, by which time he was *Xystarch*, an officer in charge of the gymnasium (Pausanias, 6.14.2–3; Martial, 6.77.3; Moretti 1957, *Olympionikai* 799. R.E. II 1329, no. 17 or 19; Engelmann, Knibbe and Merkelbach 1980, I. Eph. 1124; Habicht 1985, 82–83; Golden 1998; 2004, 40; Weir 2004, 136; Gouw 2009, 34, 123, 126, 383).

Fine stone sculptures and reliefs of this period were also found. With the exception of a single piece of portraiture in black basalt (Cairo CG27494, dated 1st century BC), the majority represent characters belonging to the family of Serapis-Osiris: his wife and sister

Isis-Hathor (Ashmolean AN1888.257) and their son Harpocrates-Horus and his protector Bes (Fig. 7). There are also a number of representations of Dionysos, such as a bronze plaque (GR 1996,0709.1) depicting a bust of Dionysos (his head deliberately defaced) flanked by Hermes, the eagle of Zeus and the Dioskouroi as stars. A marble relief (Bailey 2007; GR 2005,0919.1) depicts Dionysos with a snake's body supported by an eagle, carrying a cornucopia and a bunch of grapes, and Harpocrates standing above in the top right corner.

Representations of personal piety and magico-medical practice come in the form of terracotta figurines (Fig. 7). Usually mould-made and painted, they depict Egyptian deities, mainly associated with Harpocrates, Isis and Bes, or female beneficent demons associated with fertility, childbirth, health and protection (Bailey 2008; Thomas and Nicholson 2013). A rare link with the imperial cult is represented by a single representation of Hadrian in military costume (Fig. 7); animals and daily life scenes were also found (Villing et al. 2013). In antiquity these figurines would have been purchased, possibly from the temple, for display in private domestic shrines. Although terracotta figures were popular, there is a significant decline in the quality, quantity and variety of the local production of them in Roman Naukratis, compared to the Ptolemaic period that preceded it, a pattern also recognised at Memphis (Thomas and Nicholson 2013). Instead, focus seems to have shifted to other forms of mould-made terracottas, including pottery vessels and lamps (Figs 8–10). Frog lamps, associated with fertility and the inundation festival, continued to be produced locally until the 4th century AD, but by the 7th century AD lamps were decorated solely with Christian iconography (Fig. 9; Bailey 1988; 2008).

Like pottery from the preceding Ptolemaic period, Roman pottery found at Naukratis (Fig. 8), as it was elsewhere in the western Delta (Fig. 11), was largely local, consisting of cooking pots, casseroles, dishes and bowls with a drab red slip. Over the first two centuries AD changes in the form of coarse-ware cooking pottery and the form, decoration and source of tableware pottery followed wider changes in the Roman world concerning the consumption practices, preparation and presentation of food and drink (Thomas 2007, 149–60). There were also changes in the sources of transport amphorae containing wine, oil and fish sauces. Arretine terra sigillatas and Campanian amphorae were imported in the Augustan period and early 1st century AD, until the Vesuvian eruption in AD 79. These were then replaced with eastern copies of terra sigillata from Ephesus and Syria, glazed wares from Asia Minor (Fig. 8) and Egyptian copies of red slipped and barbotine thin-walled wares. Egyptian faience wares (Fig. 8) became increasingly important in the 2nd century AD. During the 3rd and 4th centuries AD, North African and Cypriot/Cilician imports became increasingly more common (Figs 10 and 12); examples include the two stamped Tripolitanian amphorae from the reigns of Septimus Severus to Severus Alexander (Fig. 8). Despite the fact that the *annona* grain tribute effectively subsidised trade with Rome, the archaeological evidence suggests rather limited imports at Naukratis (<20% of all Late Roman pottery from the site; Fig. 12), as was also the case in the Western Delta (<20%; Wilson and Grigoropoulos 2009) and Mareotis (<10%; Tomber and Thomas 2011, 38). Naukratites relied on Egyptian products, such as the fine wine and wine amphorae of Mareotis, which had become a regional and international exporter of wine in the 1st century AD, when Alexandrian amphorae were exported to India, South Arabia and East Africa (Tomber 2008). Occasionally mud, plaster

and ceramic amphora stoppers were preserved. One example with a Latin inscription is an Italian import (Fig. 7); an Egyptian example from the Fayum has a representation of the local goddess Isis-Renenutet (Fig. 7; Thomas 2011a, 23–24).

Roman Naukratis decline?

The assumed Roman-period decline of Naukratis appears to be confirmed when the distribution over time of Naukratis artefacts is plotted on a graph (Fig. 5). Nevertheless, to what extent was this perceived decline specific to Naukratis and does it represent a real decline in population, wealth or both at Roman Naukratis? To answer these questions, the Naukratis material is compared with that from the surveys of a number of related sites in the region, particularly those connected to Naukratis by the Canopic branch of the Nile and a network of canals. Comparative material has been published by the Western Delta Regional Survey (Wilson and Grigoropoulos 2009, c. 460 Roman sherds) and the Lake Mareotis Research Project (Tomber and Thomas 2011, over 4,500 Roman sherds). As the small finds represent the strong collection bias of excavators in 1884–1903, only the pottery from Naukratis is used in this analysis as this includes objects more systematically collected by later missions and is most comparable to that of the other surveys. All analysis is based on sherd count. All dating has been updated to agree with current scholarship. These data show significant changes over time in the production and consumption practices of the inhabitants of Mareotis, Alexandria, Naukratis and the Western and Northern Nile Delta (Fig. 13). They represent changes in the number of individuals consuming, the amount individuals consumed or both. For the period 30 BC–AD 150 there seems to be a growth in settlement in the Western Delta, heading north and east towards the sea (Figs 11 and 13). Meanwhile industrial activity continued in the Mareotis region with wineries and kilns well represented (Blue and Khalil 2011, 299–300). There appears to be some urban decline from the later Ptolemaic period in both Mareotis and Naukratis, but a slight resurgence in the late 1st and early 2nd century AD, perhaps explained by the growth of nearby rural settlements in the region and their effect on the regional economy.

The significant, steady and long decline in the archaeological record that followed, extending from the late 2nd century AD and reaching its lowest point at the end of the 3rd century AD, is apparent at Alexandria, Naukratis, Mareotis and the Western Delta. A series of well-documented historical events may explain a decline in both population and wealth. The Antonine plague of AD 165/6 reduced the Roman Empire's population by c. 10% (Bagnall and Frier 1994, 174–75). In Egypt the plague became endemic, continuing into the 170s, and its effect was particularly dire, reducing the population by over 20% in total (by 33% in the Fayum and by 40% at Karanis), leading to a near-collapse of irrigation agriculture in the Fayum, while prices doubled (Bagnall and Frier 1994, 174–75; Rathbone 1990). In AD 235, half of Oxyrhynchus' houses were still unoccupied (*P.Oslo* III 111, Alston 2002, 258–59). This was followed by the civil wars of AD 192–97 and civil strife. The relative stability of the Severan dynasty (AD 197–235) led to changes to the urban administration, and further administrative changes followed in AD 245, although neither seems to have improved the

situation. Instead crop failure, an economic slump, a loss of faith in coinage, extreme inflation and an increase in the tax burden between AD 240 and 280 may explain the relative scarcity of archaeological material dating to this period (Figs 5 and 13). At Naukratis, there was clearly a significant drop in the consumption of various products, particularly imports. This trend may explain a decline of the temples of Naukratis already seen by the 3rd century AD, when they were unable to prevent the encroachment of domestic houses built on what was previously sacred land. Such encroachment can be seen particularly in the demarcated temenos area of the Temple of Amun-Ra (Thomas 2014; see also Bagnall 1993, 262).

Byzantine Naukratis renewal

Following Diocletian's (AD 284–305) reform of urban and rural governance (magisterial body changes), and the introduction of a low flat tax rate in the early 4th century AD, we start to see recovery by the mid-4th century in Egypt in general (Alston 2002, 259), but also in Naukratis specifically (Fig. 13). Growth was slow during the period of Christian/'pagan' violence of AD 324–480, when a number of wealthy 'pagan' elite families fled Alexandria and presumably Naukratis too (Bagnall 1993, 280–82, 315–19; Alston 2002, 281–92, table 5.6). The earliest attestations of Christianity in Naukratis are in Coptic literature. The martyrdom of Saint Epimachus, a 27-year-old weaver from Pelusium, is said to have occurred during the Great Persecutions of Diocletian on 3rd Hātūr in AD 303 at Naukratis (Rossi 1888, 235; von Lemm 1910, 1461–64, 5th to 6th century Coptic papyri). He declared his Christian faith to a court presided over by the governor Polemius 'on the dried-up river' near Naukratis, where the altars for pagan sacrifices were erected. He and a number of Christians were tortured and executed there (van Esbroeck 1966, 399–442). His body was placed in a convent, possibly in Damirah, but transferred to the chapel of Epimachus in Pelusium during the reign of Constantine, who had the chapel built by Sophronius and Annianus (van Esbroeck 1966; 1967; 1982).

The Christian population of Egypt rose from a little over 20% of the total population in AD 313, to >40% in 324 and >80% in AD 400 (Bagnall 1993, 281). At Naukratis the new-found confidence of the dominant Christian community is represented by the frequent display of Christian symbols, such as the crucifix, chi-rho and prayers on lamps, amphora stoppers and pots of the 5th to 7th centuries AD, replacing 'pagan' devices. The Christian community was served by a bishop. Bishop Isaias is attested in both AD 454 and 459, possibly contemporary with the Christian chapel discovered by Petrie (1886, 34). Naukratis appears on the Greek lists of Hierocles (early 6th century AD), Leo and the Coptic List of Episcopal Sees (Hogarth, Lorimer and Edgar 1905, 110; Timm 1984–92, 4: 1749–54), while Eulogios mentions the monk Tarus coming from 'near Naukratis' in AD 567–76 (Lewis 2011).

The split of eastern and western Roman empires following the founding of Nova Roma in AD 324/330 had a profound effect on Alexandria, and by extension also Naukratis. The rift that followed the death of Theodosius I (AD 395) resulted in the movement of trade away from the west and towards the north. Although some scholars speculate that the founding of Constantinople as the new capital undermined Alexandria's position as

first city in the Greek East (Boardman 1980, 133), the archaeological record suggests that the period immediately following the new capital's founding actually witnessed increased production and consumption in Alexandria and the wider region (Figs 12 and 13), followed by a period of major architectural growth in Alexandria and Marea from AD 450 to 600 (Alston 2002, 317–18, 362). At the same time an expansion in the settlement of the Western and particularly the Northern Delta can be observed (Wilson and Grigoropoulos 2009), as previously unusable swampy areas were drained and farmed for the first time. Meanwhile the low flat tax rate (which had replaced one that was based on productivity) motivated people to move away from the less productive areas (such as the Fayum) to new fertile land in the Nile Delta (Bagnall 1985, 306). Despite the fractionally higher *annona* grain shipments to Byzantium under Justinian (that is, fractionally higher than those supplied to Rome previously or to the Rashidun Caliphate subsequently), estate owners in the 4th–6th centuries AD were diversifying, producing more wine and textiles for export. Improved productivity and enlarged farming areas followed significant investment in irrigation technology such as the saqiya water wheels (Hickey 2007, 292), particularly visible in Mareotis (Tomber and Thomas 2011, 43–44), leading to the vigorous commerce of Marea and Alexandria in the Late Roman period (Bagnall 1993, 108). Estate owners also invested in the production of flax for a linen textile industry that created work for dyers, weavers and traders in Egypt. Almost all cities mentioned in the 4th-century AD papyri have extensive textile, weaving and dyeing industries engaged in export at this time (Bagnall 1993, 83). Egyptian wine amphorae of types LRA5 and LRA7 are exported widely to Carthage and other Roman Mediterranean ports (Peacock and Williams 1986), but also to Byzantium's new Christian allies, the Nubian kingdoms of Dongola and Alwa and the Ethiopian kingdom of Axum, as well as being traded across the Indian Ocean (Tomber 2008).

Late Roman Naukratis and the Nile Delta experienced a significant change in the form and origin of pottery used (Fig. 10), related to major changes in dining practices and consumption patterns at this time. African red slipped tablewares and subsequently Cypriot red slipped tablewares were popular imports during this period (Fig. 12; Hayes 1972; Tomber and Thomas 2011). They were copied in Aswan, Alexandria and the Nile valley. Imported African red slipped fine wares and North African amphorae slowly declined over time, as Cypriot red slipped wares and Cypriot/Cilician amphorae were preferred. Imports from North Africa declined, while those from the Levant, Turkey and Cyprus eclipsed other imports to Egypt (Figs 10, 12 and 13)—the trade evidently piggybacking on the grain tribute to Byzantium, as it had previously with Rome. This situation is particularly clear in Naukratis, Mareotis and Alexandria, where imports accounted for over 50% of all pottery. Despite the well-documented catastrophic effects of the Justinianic plague (AD 541–42), no detrimental effect can be traced on the consumption patterns of Naukratis, Alexandria and the surrounding area (Fig. 13). While this no doubt badly affected Egyptian communities, it appears not to have had as profound an effect as the earlier plague and economic and civil problems of the late 2nd to 3rd centuries AD.

Naukratis forgotten

The Naukratis, Mareotis and Western Delta surveys indicate a sudden decline in the 7th century AD following the Rashidun Caliphate invasions of 642 (Fig. 13). The region of Mareotis, Naukratis and Schedia (Blue and Khalil 2011, 27) appears to suffer a severe collapse, with none of these areas producing pottery that can be dated to the early Islamic period. This was not the case in the rural settlements of the Western Delta (Fig. 13; Wilson and Grigoropoulos 2009). While Alexandria continued to be an important city in the early Islamic period, its immediate hinterland shrank alongside the decline of Mareotis and Naukratis. This may be explained by the failure to maintain two major canals, the Schedia and Naukratis canals, which linked these cities with the Canopic branch of the Nile. These canals were crucial, allowing *annona* grain tribute shipments to reach Alexandria from across Egypt, and then travel onwards to Rome or Constantinople. From AD 642 the grain tribute was redirected to the Rashidun Caliphate in order to feed the army and administration in Egypt, and—via the recently re-dug Red Sea canal—ultimately to Mecca and Medina to supply the seat of government and pilgrims on the Hajj (Cooper 2009). Canals required constant maintenance, which was expensive in man-hours. It is likely that the Caliphate redirected canal works to those that suited their goals, such as the Red Sea canal, so that the bread basket of the Mediterranean could become that of the Red Sea. As a result, the canals that had supplied fresh water and enabled large ships to reach Mareotis and the Nile harbour of Alexandria fell into disuse. Many Mareotis settlements became insignificant and were abandoned, as did Naukratis when no longer on an important highway.

While Alexandria replaced Naukratis as the major Greek *emporion* of Egypt and supplier of grain to the Mediterranean, Alexandria relied on a route that passed through Naukratis. The success of Naukratis was closely related to its role in the export of Egyptian grain. Naukratis remained important while it was involved in the shipment of grain to feed the hungry Greek cities of Turkey, Greece and, subsequently, Rome and Constantinople. It was no longer required when this movement shifted east towards Mecca and Medina and there were no returning cargoes. Naukratis was created and declined as a direct result of wider political events; as the Canopic river became more difficult to navigate and the canals fell into disuse, the Naukratites moved on.

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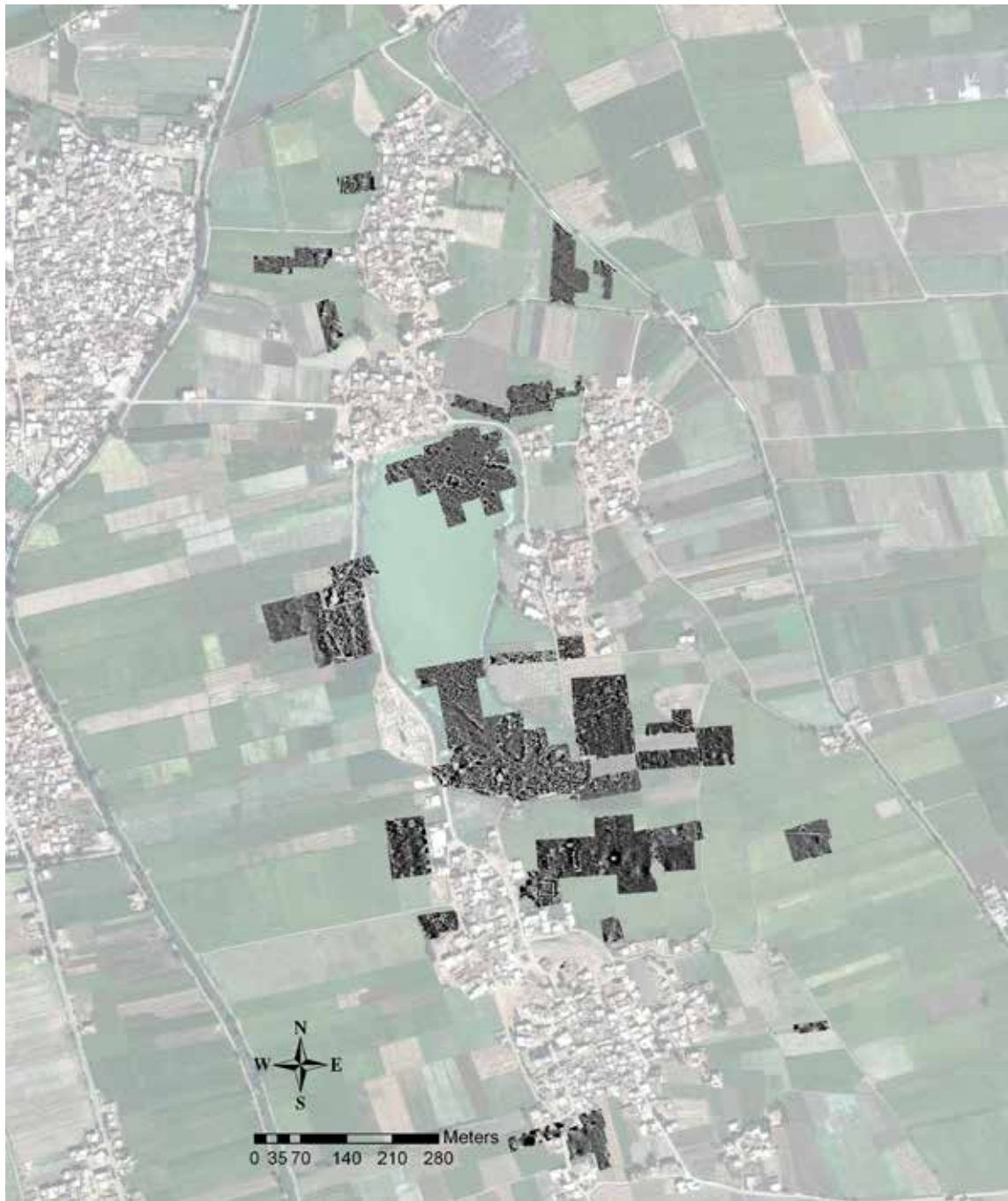


Fig. 1: Magnetometry results from 2011 and 2012 overlain on satellite image of the site (Image © 2013 Google. Satellite image taken on 9 July 2011).

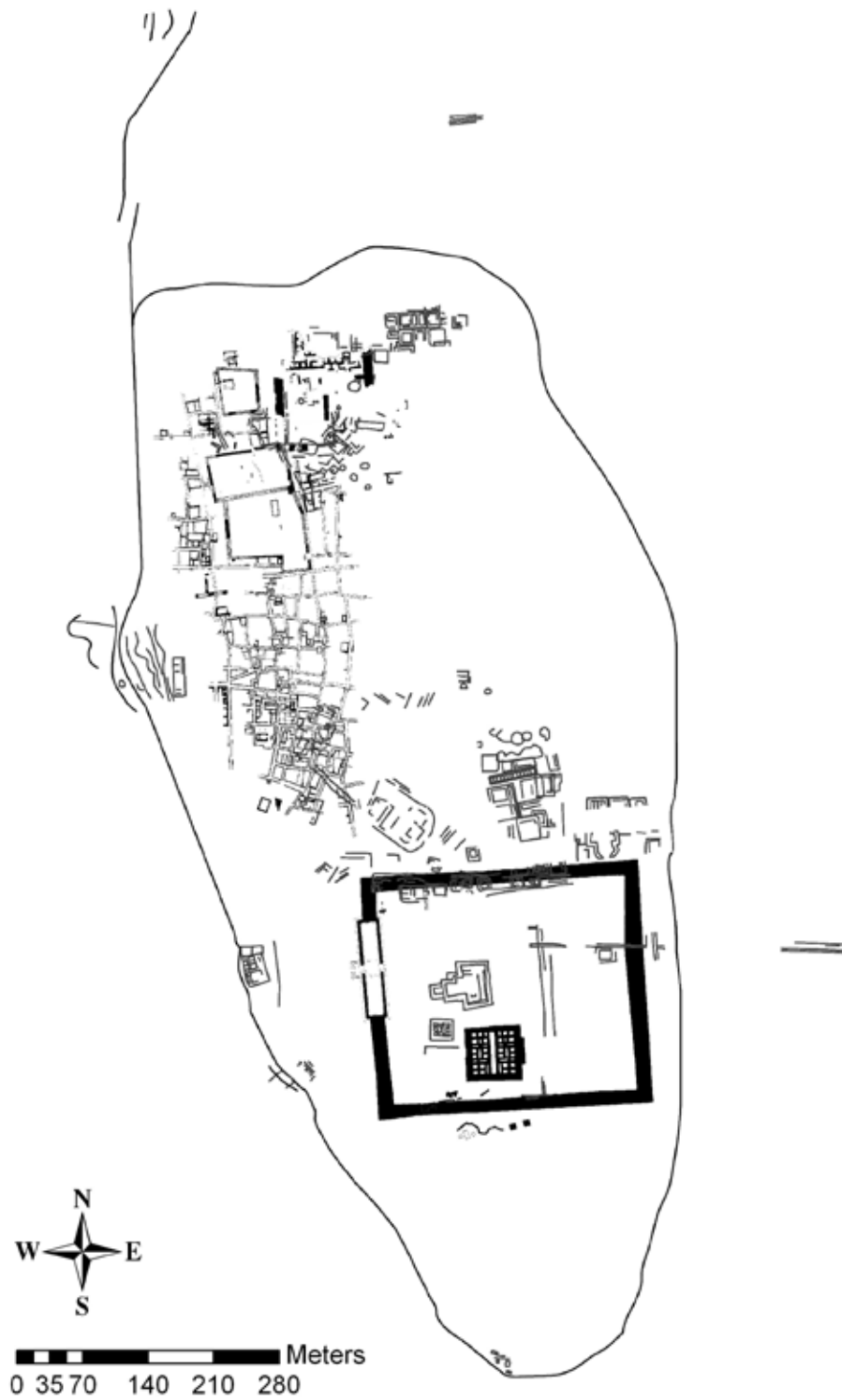


Fig. 2: Preliminary interpretation of magnetometry results (with excavation plans of Petrie, Gardner, Hogarth and Leonard). The limit of the ancient settlement is marked. The Canopic branch of the Nile is to the west.



Fig. 3: Maritime artefacts from Naukratis. Not to scale. From top left, left column: Two horn brail rings: AN1896–1908–E.3677B and AN1896–1908–E.3677A (© Ashmolean Museum, University of Oxford); copper alloy hull sheathing tack: 88.764 (© Museum of Fine Arts, Boston); copper alloy hull sheathing tack with traces of lead and pitch from hull: GR 1886,0401.1733 (© Trustees of the British Museum); lead sheet, possibly once hull sheathing: Eg.Inv.1330 (© Museum of Fine Arts, Boston); anchor from Naukratis (found in construction of El Baradany house in 2012, south Naukratis, photographs, two views, taken by Naukratis team). Right column: Copper alloy fishing hook and netting needle: GR 1888,0601.7 and GR 1888,0601.10 (© Trustees of the British Museum); lead net sinkers: 88.775 and 88.774 (© Museum of Fine Arts, Boston); water-worn (ballast?) stone found by Petrie at Naukratis: GR 2011,5009.315 (© Trustees of the British Museum).



Fig. 4: Roman jewellery hoard found in a house on a highpoint in the southwest of the town. Photographed together, to scale: GR1886,0401.1749–65 (© Trustees of the British Museum).

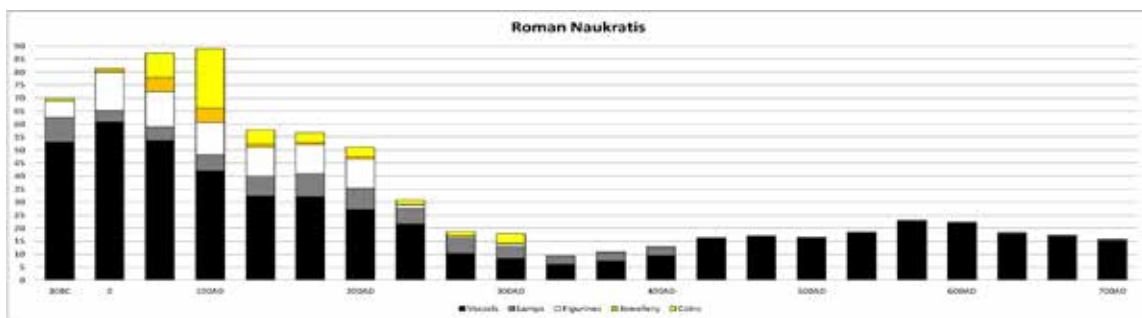


Fig. 5: Distribution over time of all Roman objects from Naukratis.



Fig. 6: Roman coins. Not to scale: 86.834, 86.835, 86.872, 86.858, 86.848, 86.837, 86.838 and 86.869 (© Museum of Fine Arts, Boston).



Fig. 7: Terracottas of Roman period. Not to scale. Terracotta figures: AES 1976,0724.1, GR 1888,0601.96 and GR 1973,0501.35 (© Trustees of the British Museum), 86.449 (© Museum of Fine Arts, Boston), 1965A256 (© Birmingham City Museum and Art Gallery); stoppers: GR 1888,0601.696 and GR 1886,0401.1373 (© Trustees of the British Museum); lamps: RES.86.123 (© Museum of Fine Arts, Boston) and GR 1888,0601.150 (© Trustees of the British Museum).



Fig. 8: Roman pottery. Not to scale. Asia Minor glazed cup (two views): RES.87.223 (© Museum of Fine Arts, Boston); Egyptian faience bowl: Eg.Inv.3577.20 (© Museum of Fine Arts, Boston); Aswan barbotine ware: AN1888.185 (© Ashmolean Museum, University of Oxford) and 88.894 (© Museum of Fine Arts, Boston); Italian terra sigillata: GR 2011,5009.27, 1888,0601.688 and 1888,0601.690 (© Trustees of the British Museum). Tripolitanian amphorae: GR 1886,0401.1703 and 1955,0920.91 (© Trustees of the British Museum); Egyptian jug: NCM 1888–35 (© Nottingham City Museums and Galleries); Alexandrian amphora and Egyptian unguentaria: H2745, H920 and H3621 (© Bristol Museums, Galleries and Archives).



Fig. 9: Terracottas of Byzantine period. Not to scale. Stoppers: BEP 1989,0501.3 and 1888,0712.43 (© Trustees of the British Museum) and eulogia vessel (two views): BEP 1910,0222.249 (© Trustees of the British Museum). Frog lamp: 1987.382 (© McLean Museum and Art Gallery, Greenock/Inverclyde Council); Byzantine lamp: Object E181 (© courtesy of the Penn Museum, University of Pennsylvania Museum of Archaeology and Anthropology).



Fig. 10: Byzantine pottery from Naukratis. Not to scale. 5th to 7th century AD Abu Mina marl wares: HARGM10054 and HARGM9765 (© Mercer Art Gallery, Harrogate Museums & Arts, Harrogate). Phocaean Red Slip: 697.58 (© Bonn, Akademisches Kunstmuseum) and African Red Slip: GR 1888,0601.689, GR 2011,5009.106 and 2011,5009.102 (© Trustees of the British Museum). Late Roman 1 Cilician amphora and Late Roman 5 Egyptian amphora from 2011 field season (Thomas and Villing 2013, fig. 7, top right).



Fig. 11: Map of the Northwestern Nile Delta. Naukratis (red), sites discovered by the surveys in Mareotis (Blue and Khalil 2011) are in dark (north) and light (south) blue, and the Northwestern Nile Delta survey in light (west) and dark (north) green (Wilson and Grigoropoulos 2009). Sites overlain on satellite image of the Nile Delta (Image © 2013 Google. Satellite image taken on 9 July 2011).

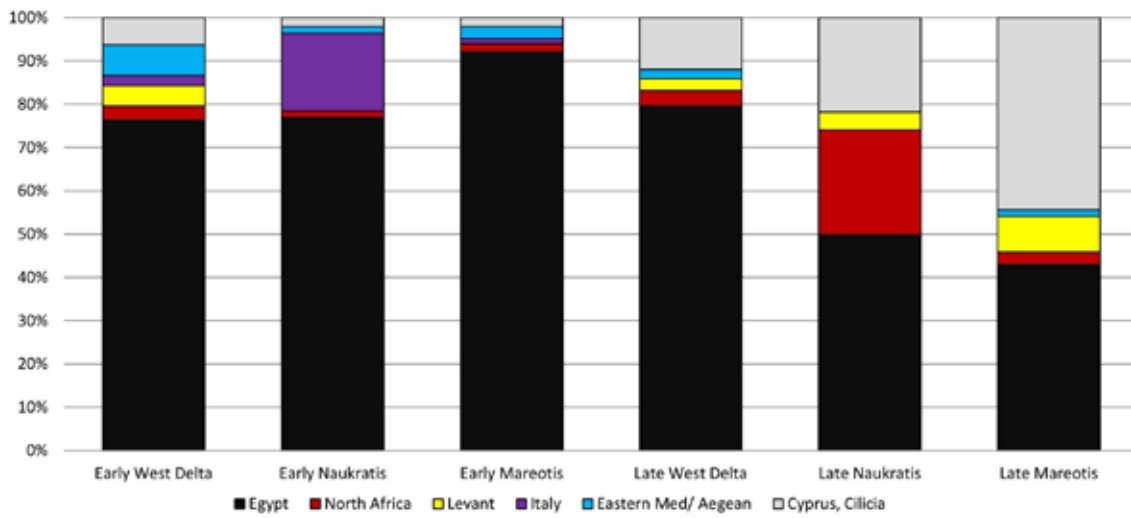


Fig. 12: Graph showing the origin of Early Roman and Late Roman pottery in Alexandria, Naukratis and the Western Nile Delta, based on Naukratis data and that from surveys (Blue and Khalil 2011; Wilson and Grigoropoulos 2009).

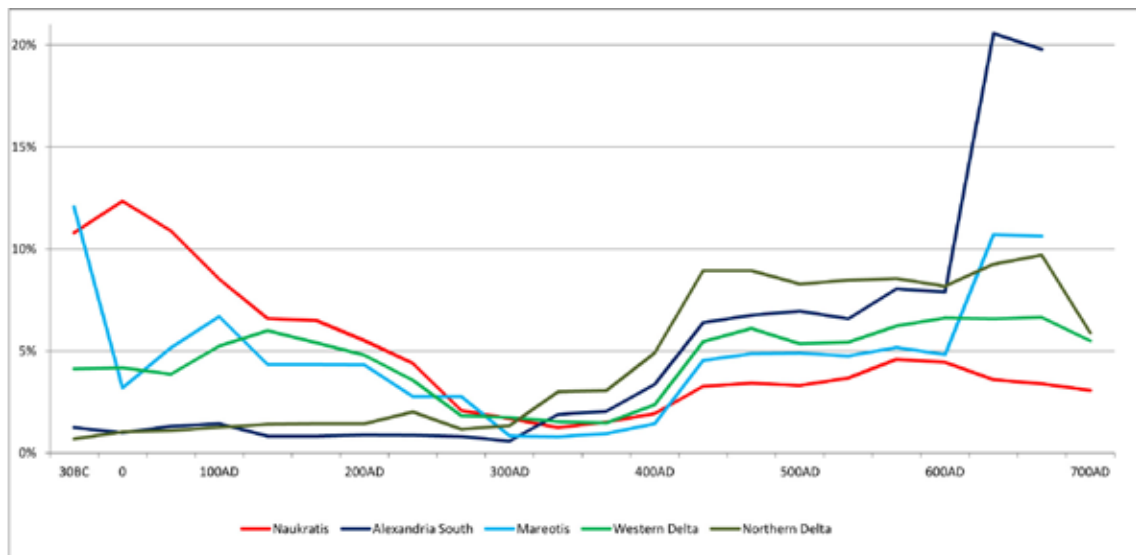


Fig. 13: Graph showing the distribution of Roman pottery (in 1/3 of century increments) for each period as a percentage of all Roman pottery from each site. Naukratis (red), Alexandria (dark blue), Mareotis (light blue), Western Delta (green) and Nile Delta survey (green).