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Contacts, exchange and marble supply in Late Antique Ravenna and the port of Classe

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ABSTRACT

The article focuses on the commercial mechanism in Late Antiquity with special regard paid to the Late Antique *sedes imperii*, Ravenna, and its maritime port of Classe from the point of view of qualitative and quantitative analyses of marble and pottery importation through long-distance trade within the Mediterranean. In the 5th and 6th centuries, Ravenna represented an important political, commercial, and cultural centre, involved in interregional sea trade through its port of Classe, and represented a significant production and redistributive centre. The research is based on archaeological material evidence: the provenance and quantity of imported stone artefacts from the Late Antique complex of S. Severo in Classe, and the provenance of pottery finds from the harbour area of *Podere Chiavichetta* in Classe. The mechanism of commercial exchange of Late Antique Ravenna and Classe with various regions of the Mediterranean is based on the quantitative and qualitative comparison of imported marble and pottery. The question of the *statio marmorum* in the port area of Classe is also discussed on the basis of both the archaeological evidence and a comparison with the stone supply from Rome.

KEYWORDS

Marble supply; pottery; importation; commercial exchange; provenance; *statio marmorum*; Late Antiquity; early Middle Ages; Ravenna; Classe; Rome; Portus.

INTRODUCTION AND HISTORICAL BACKGROUND

Interest in the history and historical monuments of Late Antique Ravenna (**Fig. 1**) remains alive and attracts many scholars as an irresistible and permanent challenge. Despite the centuries of research effort, there are still many unanswered questions and missing pieces in the 'mosaic' of this famous *sedes imperii*, which experienced the period of its greatest development in the age of the transition from Late Antiquity to the Middle Ages.[1] The Late Antique Ravenna art represents a complex in which artistic streams of both the western and eastern parts of

1 In 402, Ravenna became the *sedes imperii* of the West, the seat of the Emperor Honorius who transferred his court there from *Mediolanum*. The decision of Honorius was influenced by several factors, including the city's strategic position near the seaports and a good marine connection (Ward-Perkins even states as one of the reasons as to why the building activity in 5th century Ravenna was not as developed as in Constantinople that it was an 'emergency residence', see Ward-Perkins 2000, 75, note 17), the presence of a military port, and good accessibility along the Adriatic coastline through Adriatic seaports and to Constantinople, the crucial partner of the Ravennate trade and the seat of the Emperor *per Orientem*. However, his decision had also a political motive. Ravenna was a city far from the élites, senatorial and ruling class in Rome: it was a 'disembedded city', as Deliyannis called it (Deliyannis 2010, 1–5, esp. 3, 49) and offered advantages of a certain political autonomy for the emperor. Ravenna thus followed the tradition of other temporary imperial residences, such as Trier, Milan, Nikomedeia, or Thessaloniki, although Rome had never ceased to be the real capital (*caput orbis*) of the empire (cf. Cirelli 2008, 29; Cristo 1975, 17; Deliyannis 2010, 1–5, 48–54; Humphries 2012, 162; see also Herrin 2020).

the Roman Empire joined and influenced each other.[2] Ravenna maintained commercial relationships with distant regions such as North Africa (Tunisia, Egypt), Asia Minor, the Aegean islands, Palestine, Syria, and Constantinople,[3] but also with nearby regions (southern Italy, Sicily, Istria, and Dalmatia), as we can trace through the archaeological evidence based on the importation of pottery, glass artefacts,[4] stone (marble, sandstone, and other lithotypes) material (architectonic elements and decoration), as well as sarcophagi (**Fig. 2**).[5]

The supply of 'marbles'[6] in Ravenna always depended on imports given the total lack of quarries in the vicinity. It is generally assumed that marble artefacts[7] were imported from

2 Given the close relationships of Ravenna with Constantinople, the capital of the East, especially in the 5th and 6th centuries, the Ravennate art was also influenced by the Eastern *koiné*. As Ward-Perkins affirms, 'there is no doubt that by the later 5th century it was Constantinople, not any western centre, that was the style-leader' (Ward-Perkins 2000, 73). It was F. W. Deichmann who supported the hypothesis of close artistic relationships between Ravenna and Constantinople when he found close analogies to the Ravennate columnar sarcophagi (sarcophagus of *Liberius III* and 'a nicchie' sarcophagus), located in the S. Francesco basilica in Ravenna in a fragmentary columnar sarcophagus in the Archaeological Museum in Istanbul. The Istanbul fragment (cat. no. 5639), found in 1959 in the Topkapi Saray, is dated to the 4th century (Firatli 1990, 48) and bears the architectural decoration of a pillar with the composite capital 'a lira' and a shell niche similar to that of the sarcophagus of Liberius III. Deichmann presupposed the close collaboration of Eastern and Ravennate artists as early as at the end of the 4th century and especially in the first half of the 5th century (cf. Deichmann 1969; 1974; 1982a; 1982b; 1995). Close parallels between the Ravennate and Constantinopolitan sculptural art were demonstrated also by G. Bovini (Bovini 1968) or Martinelli (Martinelli 1992, 159–176). Deichmann's contribution was really a turning point because until his discovery, the columnar sarcophagi were primarily considered to be a Western (Ravennate) 'specialty' (cf. Farioli 1977a, 720, note 9). Some years later, M. Lawrence also presented the possibility of a possible microasiatic origin of columnar (niche) sarcophagi (Lawrence 1970).

3 At the end of the 4th century the relations between Constantinople, the eastern centres of Asia Minor and the island of Proconnesos were particularly revived (Kollwitz 1956a; Koch 1998, 439–478). Constantinople became a favourite destination for many artists from the East (Asia Minor), and its artistic production grew rapidly by exporting marble products and sarcophagi to the West, so Constantinople played the role of a mediator of the Eastern art and is often considered as a centre of its distribution in the western regions. Farioli considered the role of Costantinople as a 'filter' of stylistic influences from Asia Minor to the West (Farioli 1983, 205–253). We can find many stylistic and iconographic analogies to Constantinopolitan art of the 5th and 6th centuries on typical relief slabs decorated with circle ornaments (e.g. a typical *trinus* group with two crosses on either side of a round monogram, widespread mainly in the 6th century on *plutei*) or some types of capitals (e.g. 'capitello imposta') in Ravenna.

4 Cirelli 2008, 29–30; Maioli – Stoppioni 1987, 49, 52–53.

5 Many lithotypes extracted during Late Antiquity in quite distant quarries in the Mediterranean basin (Asia Minor, Greece, North Africa), but also in smaller quantities in Spain and north Italy have been identified among stone artefacts from the ecclesiastical complex of San Severo in the vicinity of the port of Classe (Tůmová 2013, 256; Tůmová – Cirelli 2019, 57, fig. 2). After all, the extensive radius of these commercial contacts correlates with what was claimed already in the 1980s by Ward-Perkins in relation to the Proconnesian sarcophagi: 'the importing centre (which was also a workshop) was not Aquileia, but Ravenna' (Ward-Perkins 1980, 329).

6 By the term 'marbles' we mean different types of stone used in Antiquity, as is customary in archaeologically (not at all in geologically) oriented scientific literature. The term 'marbles' is intended, both in ancient sources and in archaeological terminology as well, to refer to all polishable, decorative stones.

7 Ravennate sarcophagi and architectonic elements in Ravennate basilicas such as columns, bases, capitals, ambo or relief slabs of the apse enclosures.

Fig. 1: Location map of the city of Ravenna (Emilia – Romagna, Italy); the red arrow indicates the position of Classe (ancient *Civitas Classis*); Map by Helena Tůmová.

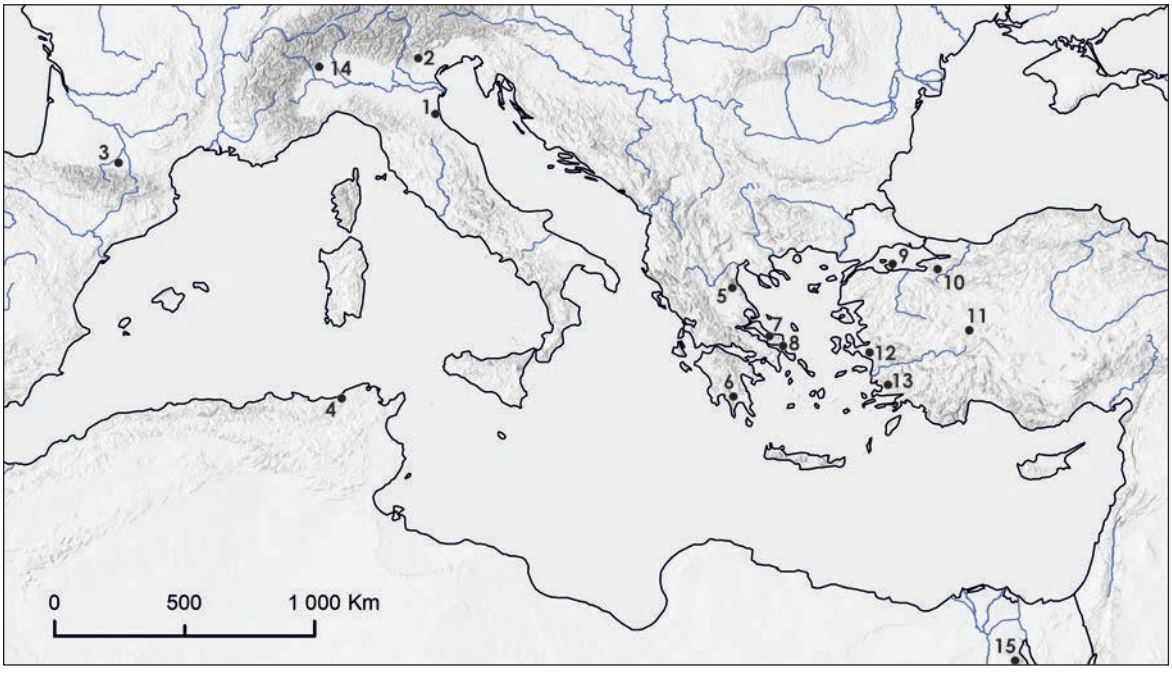


Fig. 2: Map of the provenance of marble and other stones from the basilica of the San Severo site in Classe. 1 – Ravenna, Italy; 2 – Monti Lessini, Verona, Italy; 3 – St. Girons, France; 4 – Chemtou, Tunisia; 5 – Larissa, Thessaly, Greece; 6 – Krokees (Levetsova), Sparta, Greece; 7 – Eretria, Euboea, Greece; 8 – Karystos, Euboea, Greece; 9 – Marmara Adasi (*Prokonnesos*), Turkey; 10 – Vezirhan, Turkey; 11 – Iscehisar, Turkey; 12 – Sigacik (Izmir), Turkey; 13 – Güllük, Turkey; 14 – Lombard Alps, Italy, 15 – Gebel Dokhan, Eastern Desert, Egypt (after Tůmová 2013, 233, fig. 258, basemap: Esri).

the East (esp. Asia Minor, Constantinople) in Late Antiquity. Particularly in the 6th century, during the reign of Justinian and especially before the Gothic War (AD 535–554), many eastern influences, workshops, and materials came to the territory of present-day Italy, starting from Rome to the north Adriatic cities of Ravenna, Grado, and Aquileia.[8] 'Marbles' and their import to Ravenna in Antiquity is still a lively topic.[9]

Craft influences must have reached Ravenna directly from quarry workshops, as their existence is attested in many ancient quarries, the Proconnesian marble (which is considered the most widespread white marble in the Ravenna region, as already mentioned) quarries not excluded.[10] In the Ravennate Christian basilicas, built in the period of the greatest construction development in the 5th and 6th centuries (as shown in **Graph 1**), many architectonic elements were identified that are supposed to be imported from the Proconnesian workshops.[11]

Some marble products, such as sarcophagi (**Fig. 3**),[12] were imported to the Adriatic region as prefabricated ('semi-worked') artefacts, and then finalized *in loco*. The fact that the marble was worked – at least roughly – already in the quarry is nothing new, as we also see in many

8 Many architectural elements in Christian basilicas in the north Adriatic region are supposed to be from the Proconnesian marble (Pensabene – Barsanti 2008, 455–490; for Ravenna see Rizzardi 2016, 192, 196). As can also be seen from the study of the stone (marble) cargos of ancient shipwrecks in the Mediterranean, one of the peak periods of imports of goods from the East was during the 6th century (Russell 2013a, 348, fig. 5). The peak of imports of (presumably Proconnesian) marble also in Ravenna correlates with this tendency (Rizzardi 2016, 192, 196). For an approximate overview of the quantity of imported material (marble), especially on the basis of an estimation according to the preserved architectonic elements and decoration see Harper 1997, 131–148.

9 For an overview see: Baldini *et al.* 2019, 90–97; Porta – Degli Esposti 2019, 98–105.

10 These workshops generally produced mainly prefabricated elements such as sarcophagi and architectonic elements destined for export, and probably also craftsmen travelled together with their products to complete their work at the final destination (cf. Guidobaldi 2002, 1479–1524; Sodini 2002, 129–146; Pensabene – Barsanti 2008, 455–490). The Proconnesian workshops produced mainly architectonical elements such as capitals that were exported to many Mediterranean regions, also to northern Italy. The importance and long productive period of the Proconnesian workshops was conditioned by the lower cost of the Proconnesian marble, compared to other marbles, and by the interruption of the activity of the main quarries in Asia Minor (Aphrodisias, Ephesos) in that period (Kollwitz 1956a).

11 Regarding the provenance of white marbles preserved in the Ravennate basilicas of the 5th and 6th centuries (column shafts, capitals, bases, ambo, relief panels, sarcophagi, wall revetment), their provenance from Proconnesos is often mentioned in the scientific literature or they are identified simply as a 'Greek marble', based on macroscopic studies (cf. Farioli 1969; Martinelli 1968; Zucchini – Bucci 1968). Farioli indicates an attestation of marble importation in Ravenna which is the fragmented slab (*pluteum*) in the National Museum in Ravenna bearing a signature of a Greek, probably Proconnesian, workshop (Farioli 1983). The presence of Proconnesian marble in Ravenna is reported by a Ravennate protohistorian of the first half of the 9th century, Andreas Agnellus, in his *Liber Pontificalis Ecclesiae Ravennatis*. Agnellus mentions Proconnesian marble (*marmor proconnisus*) in his descriptions of Ravennate buildings. Agnellus mentions the marble walls from the Proconnesian marble in the *monasterium*, founded by the Bishop Petrus II during his episcopate in AD 494–520 (LPR L). In the *Liber Pontificalis Ecclesiae Ravennatis* there are other notes relating to the Proconnesian marble, such as the marble columns in the St. Andrew basilica (LPR LXXVI), a marble sarcophagus in the St. James *oratorium* near the basilica Petriana (LPR XXVI). Cf. also Guidobaldi 2002, 1479–1524.

12 As we see on many unfinished sarcophagi in the north Adriatic, for example sarcophagi in the garden of the San Vitale basilica in Ravenna (**Fig. 3**); the sarcophagus of Vibius Protus from the second half of the 3rd century (Maioli – Stoppioni 1987, 29); on numerous architectonic elements (column shafts, for example), left at the quarries (Ward-Perkins 1980, 328), or on marble cargos

examples of abandoned, roughly worked marble elements directly in Mediterranean quarries.[13] This practice presupposes the existence of both production and storage facilities. The importation of prefabricated, partially worked elements facilitated transport and reduced costs.[14] The mobility of both craftsmen and products[15] encouraged local workshops to develop themselves as is apparent in the case of Ravenna where the local production, imitating foreign models, is attested in Late Antiquity.[16] Cassiodorus informs us indirectly of the marble circulation, specifically of a supply of marble sarcophagi in Ravenna in his *Variae Epistulae* (*Letters*) where he mentions a concession of the right of furnishing 'the marble chests' in Ravenna (the question is, if this could also mean their import), granted by the Ostrogothic King Theodoric to a certain Daniel, a marble worker responsible for 'preparing and ornamenting marbles'.[17]

The minimization of transport, production, and purchase costs were undoubtedly one of the decisive factors also for the re-use of construction (stone) material and sarcophagi.[18] Much of the reused material could have been procured from abandoned buildings around Classe and Ravenna: this practice has accompanied the conurbation of Ravenna, Caesarea, and Classe (**Fig. 4**) throughout its whole existence.[19] Many uninhabited, abandoned buildings remained

from ancient shipwrecks (e.g. pre-fabricated sarcophagi from the San Pietro wreck, see Ward-Perkins – Throckmorton 1965, 201–209).

13 Unfinished column shafts had been abandoned *in situ*, for example, in one of the quarries of *cipollino Tenario* in Mianes on the Mani peninsula (Bruno 2002, 22, figs. 6–8); prefabricated architectonic elements were found in many ancient quarries on the island of Proconnesos (Asgari 1978, 467–480; Asgari 1988, 115–125; Asgari 1992, 73–80). Toma considers the main commodity during the Imperial era, which belongs to the category of 'semi-fabricated pieces', to be column shafts (Toma 2018, 167; see also Maischberger 1999, 325–334). J.-P. Adam believes that marble processing and stoneworking took place both at the quarry workshops, at the deposits, and at the construction sites of the final destinations, given the finds of marble elements at various stages of processing, from the phase of rough stoneworking to the final finishing (cf. Adam 1999, 21–87).

14 See Ward-Perkins 1980, 328. The practice of semi-worked pieces was utilised at many quarries and workshops. Attic sarcophagi, for example, were imported as prefabricated and then finalised at the destination. The Proconnesian sarcophagi, were mainly finalised at the local workshop, so they were cost competitive (cf. Ferrari 1966).

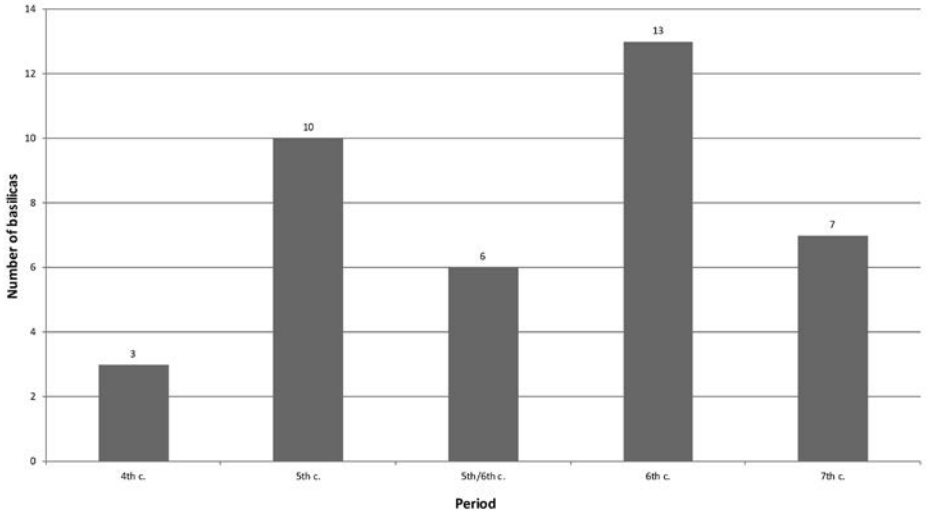
15 The artist mobility allowed for the expansion of local artistic styles and also for the general artistic *koiné*. For an overview and discussion on the mobility of craftsmen ('construction companies' *versus* 'overseas agencies' *versus* 'workshops') see Toma 2018, 182.

16 We can see this phenomenon on the production of Christian sarcophagi and architectural decoration. We can suppose that the local Ravennate production grew significantly from the beginning of the 5th century as a consequence of the transfer of the imperial court in 402 (which also signified the arrival of Imperial and aristocratic investments in the city). It is obvious that also many artists of the imperial workshops came hand in hand with the imperial court (cf. Kollwitz 1956b, 55–59). As is well known from recent archaeological research, also some types of pottery produced in local workshops were imitated on the basis of imported pottery, mainly from the eastern regions (Microasiatic and the Aegean) or from North Africa (Maioli – Stoppioni 1987, 47–54). See also Rizzardi 2016, 191 and Cosentino 2020.

17 Cassiodorus, *Variae* III,19.

18 As a result of the general crisis of the empire in the 3rd century, the practice of reusing sarcophagi had spread from the middle of the 4th century (Maioli – Stoppioni 1987, 29).

19 Cf. Augenti *et al.* 2007b, 257–295; Cirelli 2011, 209–218; Fiorini 2007, 32–34; Tůmová 2013, 254–257. The presence of *spolia* in the Ravennate architecture represents a typical example of a fairly widespread and characterizing phenomenon of the reuse of ancient material in the Late Antique and early Medieval building activity (for a detailed study of the Ravennate *spolia* see Tůmová – Cirelli 2019, 55–78, esp. 60–61, 73).



Graph 1: A bar chart of the Ravennate basilicas constructed from the 4th to the 7th century (according to Cirelli 2007, 314).

Fig. 3: An unfinished, prefabricated sarcophagus destinated to be finalised in accordance to the specific demand of the client relating to the decoration of both sides flanking the central *tabula ansata*, inscriptions and side panels and the back of sarcophagus, now in the garden of the basilica of S. Vitale in Ravenna. Photo by H. Tůmová.

in the area of Classe especially starting from the 8th and 9th centuries,[20] when the city with its port area gradually lost its productive, commercial, and economic prosperity.[21] It is clear that both economic power and demand consequently diminished and potential stocks of stored stone material (marble, prefabricated products) were most likely used.

20 Cf. Laszlovszky 2007, 14.

21 Augenti *et al*. 2007a, 170; Cosentino 2016, 133–149.

Fig. 4: Topographic diagram of the conurbation of Ravenna, Caesarea, and Classe depicting the coastline in Late Antiquity. Map by Enrico Cirelli.

REASSESSMENT OF THE PORT AREA OF CLASSE AND ITS SIGNIFICANCE

The city of Classe (*civitas Classis*) with its inner port was part of the Ravennate conurbation and served also as a hinterland of the Ravennate region and an important commercial and production centre, but was also a different city with its own population and identity.[22] Ravenna with its city-port of *Classis* played an important role in the importation and storage of goods

22 *Civitas Classis* represented an important centre of local – regional and interregional – and long-distance trade, distribution of goods and production until the 7th century (Cirelli 2008, 27–29; for an overview of its urban development see Augenti 2011, 20–42). In the northern part of the *civitas*, where the canal connecting the inner lagoon of the port with the sea flowed, the small island with the productive areas was located (cf. Augenti 2011, 23; Pensabene – Barsanti 2008, 455–490; Farioli 1977a, 717–739; Cirelli 2008, 27–28; for the imperial port of Classe see also Deliyannis 2010, 26–31; description of the port of Classe in Late Antiquity cf. Luciano 2019, 26, 50–52).

and their redistribution to the wider hinterland;[23] and at the same time it made use of the supply capacities of several large rural estates, the so-called *villae rusticae*, such as *villa rustica* in Russi (**Fig. 5**), located about 20 km from Ravenna. This role of Ravenna was strengthened by an artificially constructed canal *Fossa Augusta* that connected the city with the River Po, which represented the connecting, crucial axis throughout the whole province of *Aemilia*.[24] We can classify Classe among the most important ports, which participated in long distance trade in the late ancient Mediterranean, such as Caesarea, Carthage, Constantinople, Ostia and Portus,[25] as well as Marseille.[26] The importance of this city-port can be perceived from the Late Antique mosaic in the main nave of the basilica San Apollinare Nuovo in Ravenna, founded by the Ostrogothic king Theodoric and depicting on one side the *palatium*, and on the opposite wall the famous ships of Classe (**Fig. 6**).

Fig. 5: Remains of the *villa rustica* in the archaeological site in Russi, Italy. Photo by H. Tůmová.

As we know from the testimonies of ancient authors and from the archaeological evidence as well, the seaport of Classe was not the only port in the Ravenna region. Andreas Agnellus informs us in his *Liber pontificalis Ecclesiae Ravennatis* about several ports in the conurbation of Ravenna. However, it is not clear whether the author himself faithfully took the information from previous sources, or whether he described the sites as he could see them, even partially,

23 Cf. Guidobaldi 2002, 1479–1524. To understand the mechanisms of redistribution also in the Ravennate area, the hypothesis of S. Keay regarding the storage and redistribution capacities in Portus and Ostia is very interesting: a huge storage capacity in Portus could serve both for supplying the population of Ostia, Rome, and of the hinterland, and for the re-distribution of goods in the hinterland and via shipping in other Mediterranean centres (Keay 2022, 108).

24 Besides this main channel, trade towards the hinterland was mostly done through river routes and canals which also crossed the city of Ravenna.

25 The ancient port of Portus, north of Ostia, has been the subject of archaeological research for many decades. A long-term research initiative 'Portus Project' of the Universtiy of Southampton is currently yielding significant results: for a list of relevant bibliography, see https://www.portusproject.org/outputs/ [cit. 10. 6. 2022]. For studies relating Ostia and Portus see Descoeudres ed. 2001; Keay 2022, 92–113 (for Portus Project esp. 92, 98, 100); Kockel 2001, 1246–1253; Luciano 2019, 13–16; Pensabene 2001, 201–302.

26 Bonifay – Carre – Rigoir 1998; Bonifay 2004. For other Mediterranean ports cf. also Carre – Excoffon 2021.

Fig. 6: Mosaic in the main nave of the San Apollinare Nuovo basilica in Ravenna with a representation of the port of Classe. Photo by H. Tůmová.

in the first half of the 9th century. Agnellus also mentions other 'entrances' and strategic port places located along the coast starting from the River Savio.[27] However, we can assume that these were rather smaller ports, as we know them from Antiquity along the Adriatic coast of present-day Italy. Nevertheless, the important military port of Augustus was most likely located inside Ravenna.[28] This port was established in the Julio–Claudian period as the seat of the imperial fleet (*classis*) and assumed its strategic role in the imperial administration and

27 For example, Agnellus describes the *portus Lionis* and locates it as 'sixth mile from Ravenna' (LPR XX,39: '*…in Porte Lione, ubi postea palatium modicum haedificare iussit in insula, non longe a litore maris, ubi nunc monasterio sanctae Mariae esse videtur, infra balneum, non longe ab Ravenna miliario 6.*'). According to Fabbi and Novara is must have been located on via Popilia, to the north of Ravenna (Fabbi – Novara 2003, 623–630).

28 Its precise location, however, remains uncertain. It could probably have been located at ca. 5 km southeast of the ancient city. However, we must realize that Ravenna was right by the sea in Late Antiquity. Topographical and geomorphological circumstances changed during Late Antiquity and the Middle Ages: subsidence, sediments (alluvial deposits) from rivers, flowing through this area from the Apennines, caused the gradual clogging of the ports and shifting of the coastline. The Late Antique landscape dissapeared (cf. Augenti – Boschi 2013, 4, fig. 3: Traces of the ancient coastal dunes in the modern landscape from aerial survey; see also Maioli – Stoppioni 1987, 21). For the geomorphology of the region see Boschi 2011a, 65–74.

the protection of the north Adriatic Sea.[29] The alimentary and product demand of the imperial fleet also encouraged the economic growth of the Ravennate hinterland based on periodic supplies for the fleet. The supply needs of the city as well as the demand for craft products must have already increased in this period: preserved tombstones (*stelai*) are one of many proofs not only of the proceeding commercial activity, but also of the early establishment of local stone workshops, to which the production of sarcophagi was added in the 2nd century.[30] The port of Augustus must have been partially buried already in the 6th century.[31]

Another port, probably of a commercial nature, was located near the area of Theodoric's mausoleum in Ravenna. This port was soon replaced by a new port (*portus novus*) due to the subsidence effect and its sand clogging.[32] This new port in Classe, destined mostly for commercial exchange and equipped with a large infrastructure of facilities (**Fig. 7**),[33] was fully operational at least until the first half of the 7th century.[34] The construction of the new port in Classe took advantage of the geomorphology of the area, of the existing seaside and 'lagoon' canal system,[35] as evidenced also by the morphology of the sand dunes.[36] The period of maximum development of the industrial and commercial activity of Classe occurred in the 5th and 6th centuries, the greatest economic and production activity can be observed in the 6th century, as shown in **Graphs 2** and **3**.[37] This is confirmed by the greater presence of architectural elements and, in general, by the increasing building activity in Ravenna and its surroundings, by the pottery finds from the port area of *Podere Chiavichetta* and by the amount of preserved sarcophagi. In this period Classe, like the other city-ports of the Adriatic, played an important role in the Justinian policy of re-establishing a central power after the Byzantine reconquest of the Apennine peninsula.[38]

29 It is probable that barracks (*castra*) for the army of the imperial fleet were established in this period in Classe. However, the hypothesis of their location on the site where the palace was later built has not been archaeologically proven (Augenti 2011, 21, n. 19). The port of Ravenna of still questionable location could accommodate up to 250 ships during the reign of the Emperor Augustus. Jordanes, *Getica* XXIX, 150: Jordanes refers in this passage to the testimony of 'Dio' (Cassius Dio). See also Rizzardi 2016, 190 who mentions it as a testimony of Cassius Dio.

30 See Maioli – Stoppioni 1987, 27–28. Especially when we take into account that the fleet had to number hundreds of sailors.

31 Cirelli 2008, 27–29.

32 '*Quo loci veterem civitatem novumque portum media via Caesaris* (...),' Sidonius Apollinaris, *Epistulae* I,5; see also Rizzardi 2016, 190.

33 The port of Classe in the imperial era was created by a wide mouth of about 100 metres, between the current Via Marabina and Fiumi Uniti. The canal divided into two branches leading to the mouth of the *Fossa Augusta* (Maioli – Stoppioni 1987). An archaeological survey of the Late Antique and Byzantine port district (modern *Podere Chiavichetta*, via Marabina) confirmed the presence of background production facilities (in the 5th and 6th centuries mainly for metal, glass and bone production) and storehouses (Boschi 2012, 220; Maioli – Stoppiani 1987, 21). Archaeological excavations of this area began in 1974 (Maioli – Stoppioni 1987, 33–47).

34 The realization of the port facilities is dated to the beginning of the 5th century (Augenti *et al.* 2011, 107). For the dating of the decline of the port cf. Augenti – Boschi 2013, 3 and Boschi 2012, 220.

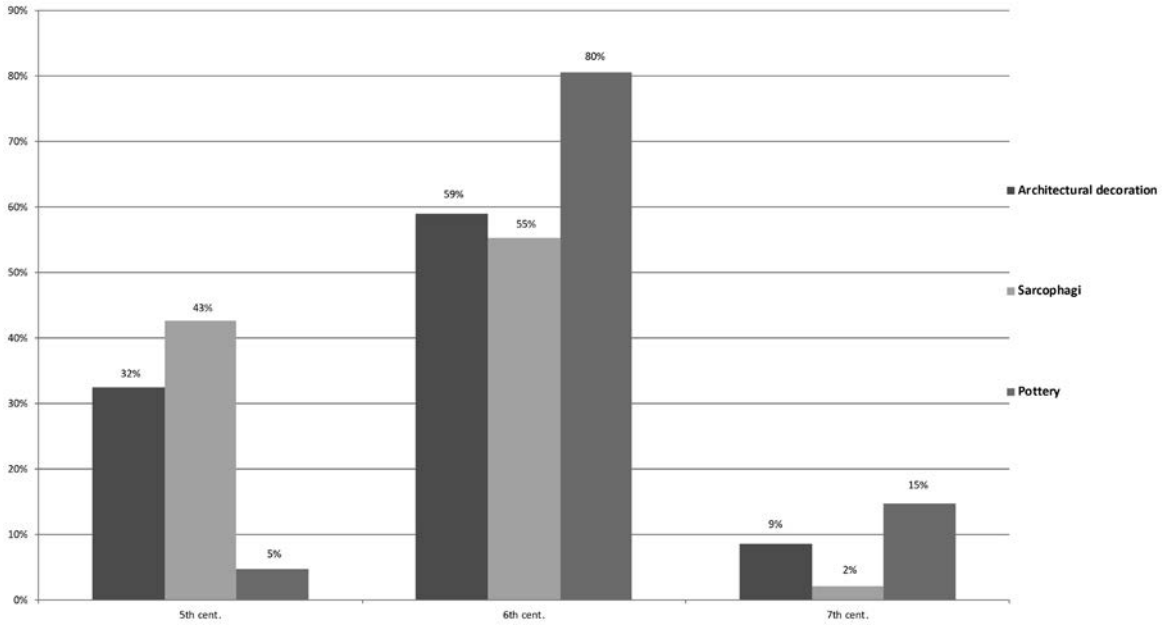
35 So called 'cordone etrusco' and 'imperiale' (Boschi 2012, 245).

36 Boschi 2012, 252, tav. 3. We must consider the whole road and water ways (canals) system in the area in and around the Ravennate conurbation that was created to facilitate mobility and transport between the port and the city and also the modifications of these ways instigated by geomorphological changes of the coastline; see Boschi 2011b, 209–213.

37 Augenti *et al.* 2007a, 167–186.

38 Pensabene – Barsanti 2008, 455–490.

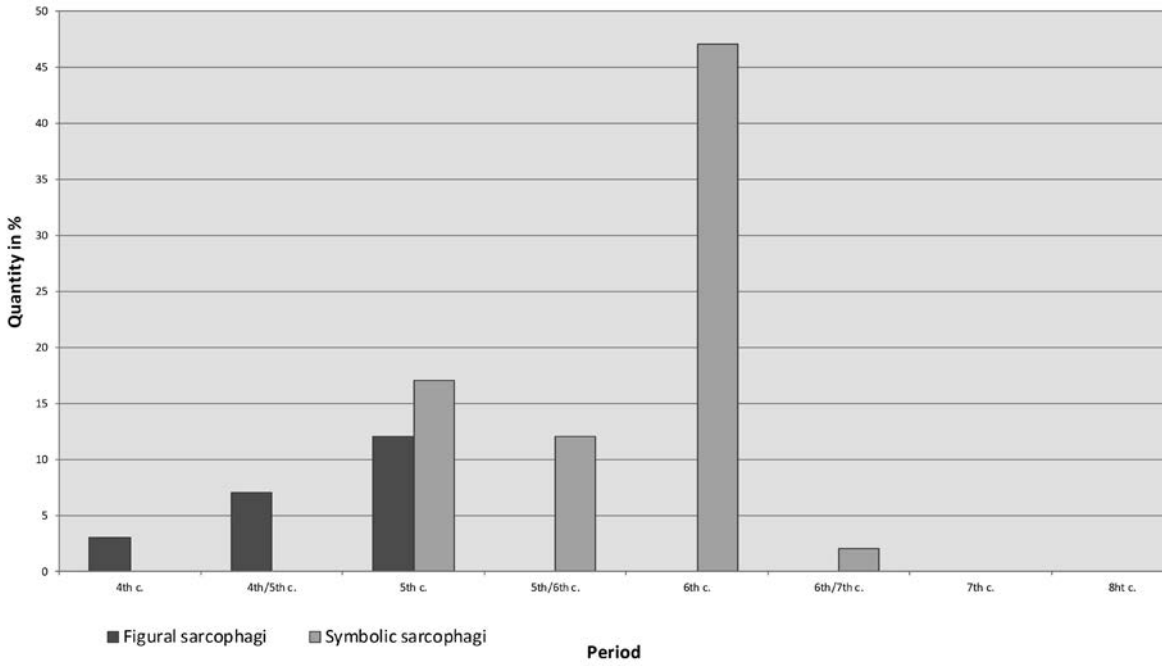
Fig. 7: Port area with warehouses of *Podere Chiavichetta* in Classe after excavations. © Enrico Cirelli.



Graph 2: Comparison of pottery, sarcophagi and architectural decoration from the Ravennate region (Ravenna and Classe) in the period from the 5th to the 7th century. Data from Augenti *et al.* 2007b; Maioli – Stoppioni 1987; Lawrence 1970; Farioli 1969; Martinelli 1968; Zucchini – Bucci 1968; De Francovich 1959.

In the 7th century, which is often defined as a 'Dark Age' of the ancient economy,[39] the process of the progressive decline of the commercial and production activities of Ravenna and Classe began. This was caused by turbulent political and socio-economic changes in the early medieval Mediterranean, and associated with one of the consequences of the decline in overseas routes, namely with the gradual silting-up of the port. The reduction of storage areas and the transformation of the commercial area into a residential area are evident from the second half of the 7th century, when buildings were often constructed using older material from

39 Reynolds 1995.



Graph 3: The ratio of the Ravennate figural and symbolic sarcophagi (both imported and local), expressed as a percentage, plotted by century (data from Bovini 1950; Bovini 1953; De Francovich 1959; Farioli 1969; Farioli 1977b; Chevallier 1961; Kollwitz 1956a; Kollwitz 1956b; Kollwitz – Herdejürgen 1979; Lawrence 1970; Martinelli 1968; Mazzotti 1953; Russo 1968; Zucchini – Bucci 1968; cf. Tůmová 2006, 96–169).

abandoned buildings.[40] The process of the decline of Classe, also including the port area, also negatively influenced the commercial activity of Ravenna.[41] However, in spite of this process of recession, Ravenna continued to be the centre of redistribution, facilitated through the inner canal and river systems.[42]

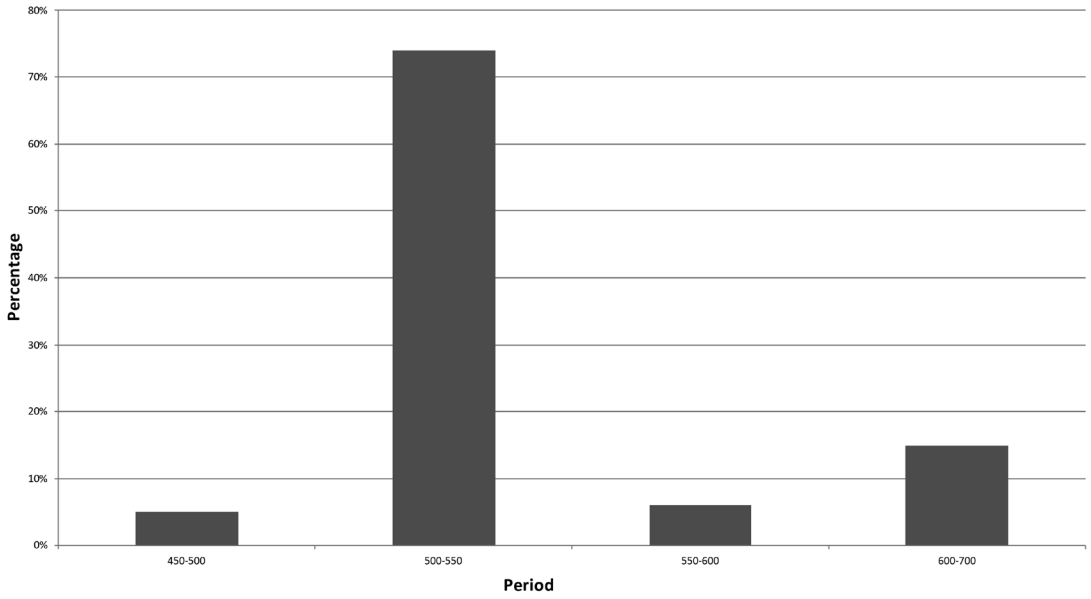
Maintenance of the port became more difficult from the beginning of the 8th century because a continuous process of silting up of the port lagoon and shifting of the seashore began to interfere significantly with the geomorphology of the coast. Following the closure of the waterways, changes in the path of the Po towards the north and shifting of the Adriatic coast caused the protracted economic stagnation of the area and its isolation.[43] The process of decline of the port area of Classe culminated during the 8th century when only small quantities of imported goods were attested in the town of Classe. However, this did not mean the definitive end of its socio-economic, production and commercial activity, as evidenced not only by pottery finds (**Graph 4**), and by a quantity of stone (marble) architectonic elements (**Graph 5**), but also by nu-

40 Augenti – Cirelli 2010, 606–610. For the transformation of the port area and circumstances of decline of *civitas Classis*, see Augenti 2011, 35–42.

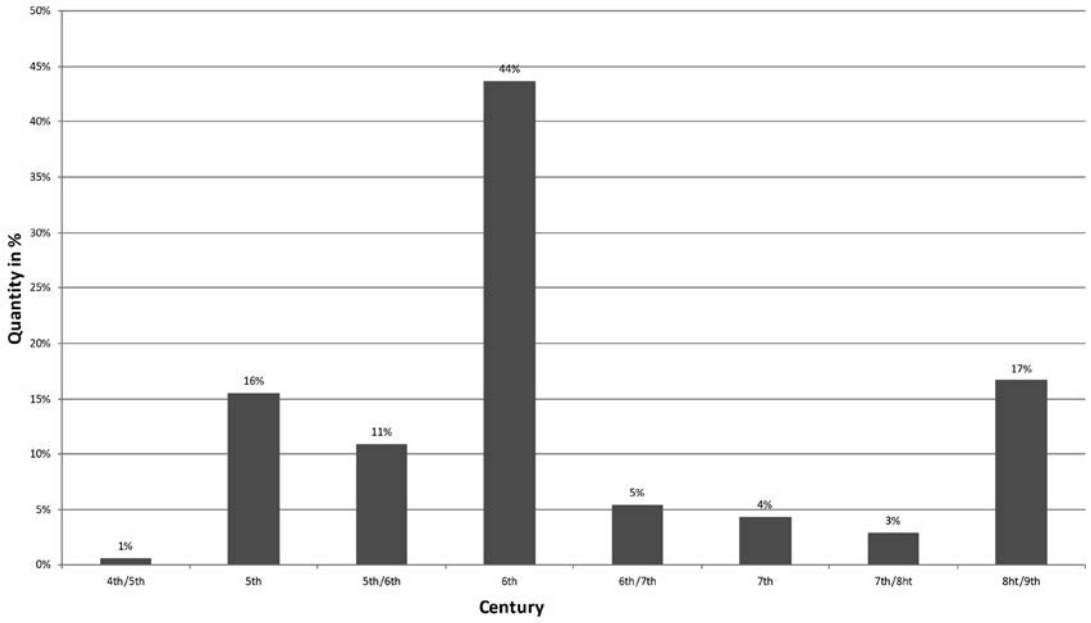
41 The process of the gradual silting-up of the port caused the loss of its commercial importance, this phenomenon went directly hand in hand with the decrease in the use of the port; and 'the donation of the Adriatic marches to the Holy See by Pipin in the middle of the 8th century' signified a loss of its political importance (Cristo 1975, 17). See also Cirelli 2015, 13–20.

42 Cirelli 2008, 51; for Ravenna in the 7th century see also Deliyannis 2010, 277–284; Zanini 1998. For amphorae of Aegean and east Mediterranean provenance, imported to Ravenna also in the 7th century, see Guarnieri *et al*. 2017, 125–126.

43 Cf. Cirelli 2008, 19–28.



Graph 4: Percentage of pottery finds in Classe (*Podere Chiavichetta*) from the 5th to the 7th century, data from Augenti *et al.* 2007b, 257–295.



Graph 5: Percentage of stone (marble) architectonic elements (altars, ambons, *ciboria*, cornices, pilasters, *plutei*, *transennae*, columns, capitals, *pulvini*, various fragments) from the 4th to the 9th century. Data from Farioli 1969; Martinelli 1968; Zucchini – Bucci 1968; cf. Tůmová 2013, 192.

mismatic finds, covering almost continuously the period from the 4th to the 8th centuries.[44] The city of Classe became a 'city of the past' after the conquest of Ravenna by the Lombards in 751.

44 Cirelli *et al.* 2017, 236, see the graph 'Oscillazioni nel quantitativo di anfore tra IV e XI secolo'. Maioli – Stoppioni 1987, 54. After all, this situation fits into the framework of the early medieval

In addition, a strong earthquake before the middle of the 8th century certainly did not contribute to its economic prosperity.[45] From this moment on, the commercial relations of Ravenna with other parts of the Mediterranean were in continuous decline. We find a similar process in another Adriatic port, Ancona, where the port constructions were still functioning in the 7th century, and where the collapse of the port activity could be dated also to the 8th century.[46]

The activities of the port of Classe ceased definitively during the 8th and 9th centuries and Classe lost its economic importance,[47] although some continuous building activity (mostly just the maintenance or renovation of existing basilicas) is attested in Classe until the 12th century. The port of Classe therefore disappeared from the transmarine trade and lost the status which it had assumed in Late Antiquity, as also happened at other major ports, such as Ostia and Portus. It is therefore evident that the majority of stocked 'marbles' must have been imported to Classe before the port's activity declined or ceased. As a consequence of the continuous loss of the economic importance of the port of Classe from the 7th century onwards and the stagnation of the production capacity of its workshops in the 8th and 9th centuries, we can assume that in this period the long-distance trade in marble, as we know it until the end of the 6th century, was no longer a reality.[48]

COMMERCIAL EXCHANGE BASED ON ARCHAEOLOGICAL EVIDENCE

The question is how the commercial mechanism and interregional exchange in marble supply in Ravenna worked and which sites were involved.[49] And the hypothesis is still at stake, namely whether the stone (marble) material was imported in excess of exact orders, and thus stored and further traded from port warehouses (deposits).

For a more in-depth understanding of the commercial mechanism of marble supply, it is necessary to compare the importation of stone artefacts with other goods imported largely to Ravenna in Late Antiquity, especially with pottery that is well documented for this period and which represents a valuable, relevant comparison as it is a product that has been preserved

and Byzantine Mediterranean, in which it is certainly not possible to talk about the 'end of the economy' in the 7th and 8th centuries (cf. Arthur – Imperiale – Muci 2018, 219–232, figs. 9.5, 9.6).

45 '(...) alla perdita di importanza del bacino portuale di Classe, tra la prima metà del VII e l'VIII secolo, quando come testimoniano le recenti indagini archeologiche i magazzini tardo antichi disposti lungo il porto-canale, iniziano ad essere occupati da abitazioni e da aree funerarie' (Cirelli 2008, 187–188). See also Augenti *et al.* 2007a, 167–186; Augenti – Cirelli 2010, 607). Between 726 and 744 an earthquake also destroyed the basilica *Petriana* in Classe (Augenti 2011, 40), patroned by Galla Placidia and Bishop Petrus in the second quarter of the 5th century.

46 Salvini – Palermo 2017, 159, 182.

47 Augenti *et al.* 2007a, 167–186; Augenti 2011, 18.

48 Although in the course of the 7th and 8th centuries the situation of the Mediterranean seatrade changed dramatically and the port of Classe was experiencing a period of decline, in the Adriatic area the trade exchange did not die. The important role within the interregional trade was taken on – already in the 7th century – by other north Adriatic ports, such as Comacchio, whose commercial importance was underlined by the production of salt (Arthur – Imperiale – Muci 2018, 220; Gelichi 2017, 12; cf. Gelichi – Negrelli 2017) and the city of Venice. For the commercial activity and material evidence in the Venice lagoon see Gelichi *et al.* 2017, 23–101. For maritime and riverine ports and landing places (esp. in Comacchio and Venice lagoon) of the Adriatic in the 7th–10th centuries see Luciano 20196, 67–72.

49 For the commercial exchange in the Late Antique Mediterranean see for example Clayton Fant 1988, 147–158; Laiou – Morrisson 2007; Kingsley 2009, 31–36.

in large quantities and its secondary use was not frequent (than was the case with marble, for example). Long-distance overseas trade of pottery of the north and central Adriatic (e.g. Aquileia, Padova, Marche province) in the period of the Roman Republic was carried out to a modest extent. Only a few wine amphorae of eastern origin were found, coming from Cnidus, Cos, and above all from Rhodes.[50] The increase in oriental imports (oil and wine amphorae) is evident in the second half of the 1st and the first half of the 2nd century (more oriental amphorae from Rhodes, the Aegean, and Cyrenaica; fewer African amphorae).[51] In this period, especially in the 2nd century, Istrian imports of oil amphorae prevail in the north Adriatic basin, but from the 4th century, imports of African oil amphorae prevailed in the Adriatic area.[52] It is therefore possible to notice a significant increase in oriental imports during the Imperial period which persisted even during the Late Antique period.[53] However, most of the pottery (especially wine and oil amphorae, fine tableware) in Late Antiquity was imported to the large centres in the Apennine peninsula from the production centres in North Africa.[54]

The same situation was valid also for Ravenna and Classe where considerable quantities of pottery were imported from the south and east Mediterranean: North Africa, Palestine, Syria, the Aegean, Sicily, southern Italy, Istria, and Dalmatia.[55] The imported pottery, mainly amphorae, represents one of the most significant sources of knowledge of the Ravennate regional and interregional trade and exchange. In this regard, we can rely on the already in-depth analysis of the provenance of pottery (amphorae, fine tableware, *terra sigillata,* lamps) found in Ravenna and the port area of Classe, especially in the commercial district of *Podere Chiavichetta*.[56] More than half (58%) of the whole amount of pottery found in Classe is represented by the fine tableware and *terra sigillata* dated to the 6th century, and 26% of the pottery are amphorae and *spatheia*, mostly from the eastern Mediterranean (Aegean, Palestine, Asia Minor) and North Africa (Bizacena, Tripolitania).[57] In general, for the provenance of pottery finds from *Podere Chiavichetta* in Classe (see **Graph 6**) the production of North Africa predominates (54%), followed by Asia Minor (29%), the western Mediterranean (14%, of which 10% is local production), and Palestine (3%). According to excavation results, up to the middle of

50 Carre – Mattioli Pesavento 2003, 268–285.

51 The importation and provenance of amphorae has been well documented by S. Mazzocchin for ancient *Patavium* (modern Padua) where there are almost no traces of importation from the East in the Late Republican and Early Imperial (Augustan) period (only 0.5%) and the provenance in this period predominates from Italic centres. A certain increase in commercial relations with the East can however be found during the first half of the 1st century AD (8.8% of oriental amphorae), even if Italic containers always prevail. African imports also appear (0.33%) in this period (Mazzocchin 2003, 370–373).

52 Carre – Mattioli Pesavento 2003, 268–285.

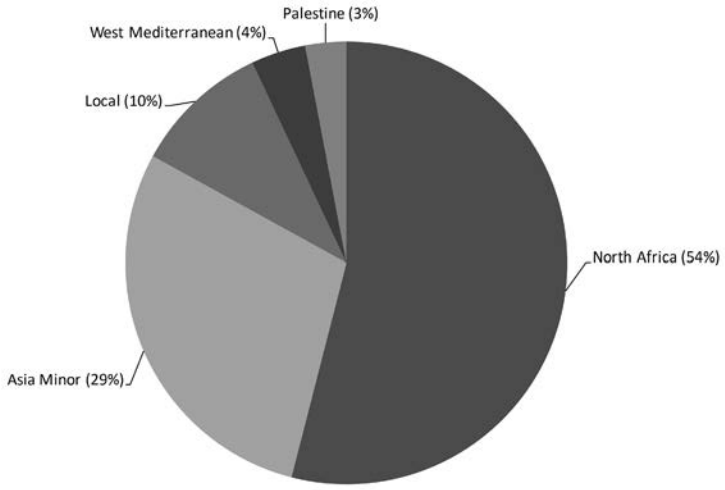
53 Mazzocchin 2003, 370–377. Commercial relationships of the northern Adriatic with the eastern production centres were stronger in the 2nd century: next to North African provenance, the imports of amphorae from the Aegean, Asia Minor, Crete, Cos, and other centres of the eastern Mediterranean are testified (Carre – Mattioli Pesavento 2003, 268–285).

54 Cf. Augenti – Cirelli 2010, 605–615; Panella 1989, 129–141; Panella 1993, 613–697.

55 Augenti – Cirelli 2010, 605–615; Augenti *et al.* 2007a, 167–186.

56 For a detailed overview of the archaeological research in Classe (port and commercial area of *Podere Chiavichetta* included) see Augenti 2012, 45–75. For data on ceramics from Classe see Savini 2011a, 167–180, esp. 178–180.

57 For the provenance of Late Antique ceramics from one of the important Adriatic ports, Ancona, oriented also to the eastern and southern Mediterranean see Salvini – Palermo 2017, 163, 177–181.



Graph 6: Provenance of pottery finds from the port area of *Podere Chiavichetta* in Classe.

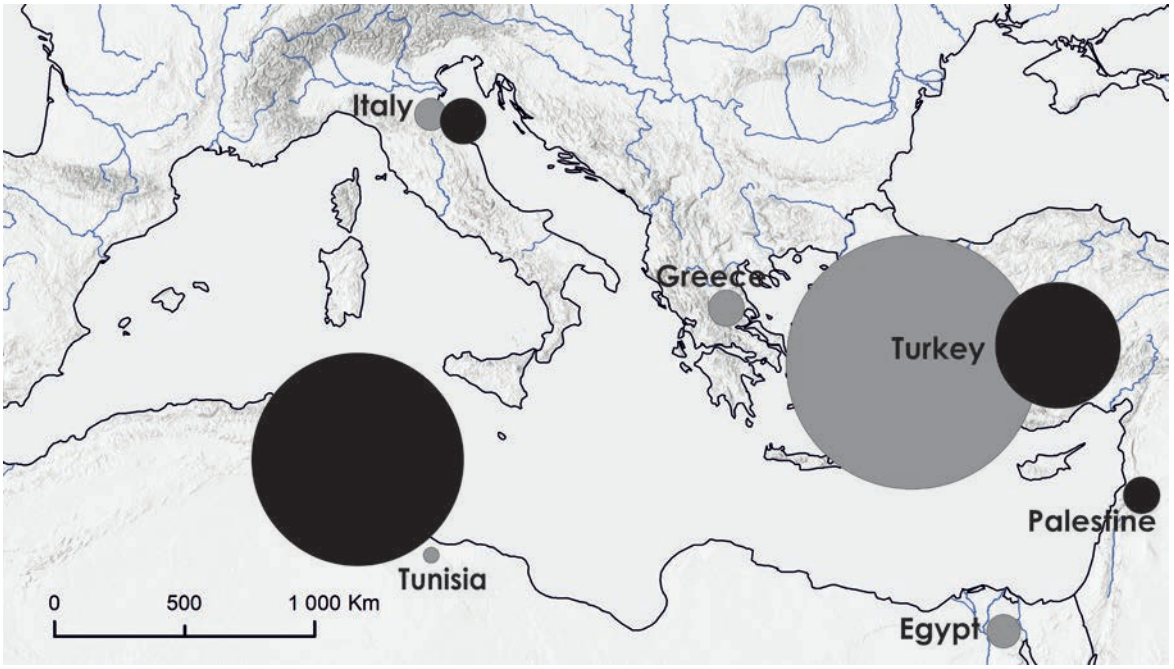


Fig. 8: Comparison of the provenance of pottery found at *Podere Chiavichetta* in Classe (in black) and stone material from the basilica of San Severo site in Classe (in grey). Dimensions of coloured circles correspond to the quantity. After Tůmová 2013, 235, fig. 260; Basemap: Esri.

the 6th century ceramic imports prevailed from the production centres of North Africa, from the middle of the 6th century oriental imports prevailed.[58]
Based on what has been mentioned above we can assume that commercial contacts with many centres of the eastern and central Mediterranean, and North Africa have been maintained

58 Cf. Augenti 2010, 150; Augenti 2011, 26; Cirelli 2014, 541–552; Cirelli 2019, 14–15. Cf. Savini 2011b, esp. 246, graph 5. 4. 3. 6.

through the seaport in Classe.[59] It is highly probable that marbles and other stone artefacts were also transported through the same trade routes.[60] As regards the provenance of marbles and other stone material found at the site of the basilica of San Severo in Classe, dated to the 6th century; an eastern provenance definitely prevails: Asia Minor (mainly the quarries on the western coast of present-day Turkey, and Proconnesos), in second place North Africa (present-day Tunisia and Egypt); followed by Greece, Italy, and southern France. However, no lithotype from the Syrian-Palestinian region was identified within the examined stone material. As we can see from the provenance comparison of pottery finds and stone material, in most cases their origin, and thus also trade routes, almost crossed (**Fig. 8**). A comparison of stone and ceramic artefacts in Classe shows and confirms the hypothesis that the commercial relations of Ravenna in Late Antiquity were focused mainly on the eastern and southern Mediterranean.[61]

MARBLE SUPPLY AND THE QUESTION OF *DEPOSITIO MARMORUM* IN THE PORT OF CLASSE

As already mentioned, the Ravenna region experienced a period of great building activity from the beginning of the 5th century. It would be logical that the demand for marble in Ravenna in this period, both for construction projects in the city and for further trade in the hinterland, required the availability of marble deposits, whether temporary or permanent.[62] The question we have to ask ourselves is the possible existence of a storage ('yards') system of stone (marble) in the Ravennate conurbation, similar to the existence of warehouses which is assumed or documented in other city-ports and in larger coastal cities, often in the vicinity of their ports.[63] Marble warehouses, often attested in the Roman world, presupposed a well-organized and developed system of interregional exchange.[64] They, of course, existed also near the quarries, from where the marble products were further distributed – sometimes via other trans-shipment points – to the final destination.[65] Large marble storage facilities had to

59 Cf. Tůmová 2013, 204–209. For the ceramics network between East and West see Vroom 2017, 285–310, esp. 295–296.

60 Cf. Zanini 1994, 132–134.

61 Tůmová 2013, 269. Cristo 1975, 17: 'Ravenna in the fifth century was thus at once an emporium of Oriental trade like Marseilles in Gaul…'.

62 A presumption of J. P. Sodini should be mentioned in this context, concerning the presumed use of marble for the furnishing of the basilica in Parenzo, ordered by the Bishop Euphrasius directly from the Ravenna or Classe marble deposits. Based on the opinions of E. Russo and A. Terry (Terry 1986, 147–164), Sodini assumes the existence of such deposits of marble (*statio marmorum*) as an 'organized centre for the collection of imported marble' also in Ravenna or Classe (Sodini 2002, 133–135, note 20, see also Pensabene – Barsanti 2008, 455–490).

63 As Attanasio admits, deposits were always in the capital but probably also in other large cities (Attanasio 2003, 21).

64 Marble deposits assembled marbles imported from quarries. These warehouses often belonged to the imperial *fiscus*, and they had been managed and directed by an imperial official (*redemptor* or *dispensator*) who directed the distribution of marbles (in rough blocks and/or semi-finished pieces), intended for imperial, public (*ratio urbica*) or private demand (Pensabene – Barsanti 2008, 455–490). Cf. also Karagiorgou 2001, 171–187; Ward-Perkins 1980, 325–338; for an overview of the marble supply and extraction in Late Antiquity see Tůmová 2013, 38–51.

65 In some cases the marble was sold locally and delivered directly to the final destination; in the case of more precious varieties, they were often sent to Rome to be sold and then sent to the final

contain enormous quantities of the material.[66] On the other hand, monumental (monolithic) architectonic elements (especially column shafts) e.g., for various Christian basilicas, had to be imported directly 'on request' from the quarry.

In the case of Classe, recent archaeological excavations revealed structures of storage warehouses in its port area.[67] A system of canals and waterways was identified thanks to recent geophysical and aerial surveys based also on a comparison with historical aerial photographs.[68] Also, a main channel connecting the port basin with the Adriatic Sea was discovered by means of the geophysical and geomagnetic surveys as we can observe its visible traces near the port district of *Podere Chiavichetta*, as a result of geomagnetic and geophysical evidence.[69] The recent discovery of archaeological remains in the area of *Podere Chiavichetta* has shown a regular network of port warehouses and production facilities, mainly pottery and glass production,[70] situated along the canal, on its southern side.[71] However, no traces of marble warehouses have been found in this area so far. If we assume the existence of a warehouse (or rather a 'marble yard', as is often mentioned in the scientific literature) for stone/marble products (whether imported or, for example, collected as material for re-use),[72] we should suppose its location to be in the port area of Classe, whereas the *Fossa Augusta* canal, which connected Ravenna with the Po, was already buried within the city by the 4th century, so that all production and storage facilities were concentrated at the port of Classe and along the canal connecting the port to the sea.[73]

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destination (Attanasio 2003, 20–21).

66 Attanasio assumed that even after the reopening of some marble quarries, e.g. that of Carrara at the end of the 12th or at the beginning of the 13th century, the marble deposit in Rome still represented a relevant competitor to the new production of marble (Attanasio 2003, 165–170).

67 Archaeological excavations at the site of the late ancient and Byzantine port area in Classe (modern *Podere Chiavichetta*: 'Quartiere A') began in 1974, but it continued in the following decades, until recently (Maioli – Stoppioni 1987, 40). For an overview of the archaeological activities in Classe see Augenti 2011, 15–20. The archaeological research of the port facilities and of the hinterland is unfortunately aggravated by geomorphological circumstances, such as subsidence; stratigraphy of Late Antique archaeological remains that lie at a depth of about 2.2 m; high groundwater level; unfavourable clay soil aggravating geophysical and magnetic prospection and large changes to the landscape: especially a large diffusion of urbanized areas and intensive agriculture (cf. Augenti – Boschi 2013, 12).

68 Augenti – Boschi 2013, 1–16; Boschi 2012, 220–224.

69 Augenti – Boschi 2013, 12–13, fig. 12. Boschi supposes the channel was about 50 m wide in its widest part inside the port (Boschi 2012, 222, 229, for geomagnetic evidence of the channel see Boschi 2012, 251, tav. 2:29). The average channel width of ca. 50 m is – based on archaeological research – also mentioned in Maioli – Stoppioni 1987, 37.

70 Maioli – Stoppioni 1987, 44–46.

71 Due to a subsidence effect, many port warehouses had to be renovated as early as in Late Antiquity, around the middle of the 6th century (Augenti *et al.* 2011, 108; Boschi 2012, 220). For those series of warehouses along the channel and arranged at least in two rows see also Augenti 2011, 26.

72 Archaeological evidence of ancient shipwrecks testifies to the transport of *spolia* – marbles destined for re-use – in Antiquity and also in the Middle Ages, as we see for example in the cargos from the Salakta shipwreck, where the material (white marble blocks, architectonic elements) dated to 195–220 was transported together with the material from a later period; in the cargo from the Kizilburun 2 shipwreck where marble dated to the 5th–6th centuries was transported together with amphorae dated to the 10th century; or in the cargo from the Şile shipwreck where architectonic elements 'typically dated to the early 2nd c. AD but the sarcophagus is later'. A similar situation occurs in the cargo from the shipwreck in Lixouri (Russell 2013a, 334, 338–339, 341).

73 Maioli – Stoppioni 1987, 30.

Moreover, in the case of re-used stone artefacts (especially of white marble)[74] from a later period, we cannot establish with certainty whether they have been reused as *spolia*[75] coming from ancient abandoned buildings in the vicinity of Ravenna and Classe, or if the stone material (e.g., rough blocks, semi-finished artefacts of marble imported in Late Antiquity) could have been used from a port storehouse, whose hypothetical existence in Ravenna or Classe has not yet been archaeologically proven.[76]

In terms of re-use, especially in the 7th century, due to the progressive decline in overseas trade, it was a common practice to use available material from abandoned buildings and structures in the area. It is therefore obvious that if the stone material (especially marble), stored hypothetically in the port warehouse, was still available at that time, it must certainly have been used as well, as also happened in the case of Rome, where the ancient deposits served as a 'quarry' until the 19th century.[77]

Especially in the Christian Late Antique architecture (*basilicae*) we very often encounter the use of *spolia*, whether for a purely pragmatic reason (as a rough construction material) or implying an ideological message.[78] In the Ravennate Late Antique architecture, we meet both forms of the common use of *spolia* and also the employment of marble *à la demande*.[79] As regards the import of marble *à la demande*, we have extraordinary examples from Ravenna and Classe (**Fig. 9**), particularly architectonic elements (columns, capitals), *ornatus basilicae* (altars, ambons, *cancelli*) or funerary sculpture (sarcophagi).[80] Nevertheless, marble for the Ravennate architecture means a sign of luxury, which suitably complements and at the same time contrasts with the brick buildings representing the intention of a powerful client: imperial or ecclesiastical *fiscus*.[81]

74 As shown by a detailed analysis of the stone artefacts in the basilica at San Severo, metamorphic rocks – marbles – prevail (63%), of which 96% are white marbles (Tůmová 2013, 96).

75 The largest use of white marble in the case of the San Severo complex was found in the 12th–14th centuries (Tůmová 2013, 64).

76 We should consider that the potential marble storage could take place under the open sky, i.e. it did not require a covered space. On the other hand, it had certainly greater space requirements than, e.g., a pottery warehouse.

77 We would like to express our gratitude to prof. Patrizio Pensabene for much precious information regarding the transport of marble in Ostia, Portus, and Rome.

78 Tůmová – Cirelli 2019, 55–78. For various meanings of the employment of re-used materials in Rome see Pensabene 2017, 175–231, esp. 177–178, 189–191.

79 However, based on the importance of the port of Classe and on its indisputable commercial activity linked to marble, the importation of the entire *ornatus basilicae*, worked or partially-worked (prefabricated) marble artefacts such as sarcophagi, columns, bases, etc., its existence is the subject of lively discussion (Cf. Tůmová 2013, 215–235).

80 To name the most significant: huge monolithic column shafts of white-grey marble, 'a farfalla' (or 'a foglie d'acanto mosse dal vento') capitals and bases in the basilica of San Apollinare in Classe; columns, bases and capitals in the basilica of San Vitale, both *basilicae* dating back to the 6th century; homogeneous series of capitals ('a lira') and *pulvini* in the San Giovanni Evangelista basilica, in the *basilica Apostolorum*, in the *cappella palatina* of Theodoric, modern San Apollinare Nuovo; composite capitals 'a foglie d'acanto mosse dal vento' from the *Ecclesia Gothorum* (cf. Rizzardi 2016, 191–197; see also Greenhalgh 2009, 79).

81 In addition, we must distinguish between the mode of transport of 'utility' artefacts, i.e. a well distributed circulation of semiworked pieces, as we have already seen in the example of the Ravennate sarcophagi, and monumental and/or monolithic architectural elements, such as monolith column shafts, huge capitals, stone blocks, destinated for slab cutting and weighing several tonnes and ordered *à la demande*. However, in a similar way, also semiworked smaller (but monolithic) column shafts or capitals were transported, as we can see from examples in the Museum of Marbles in Ostia or from the results of Asgari's masterful research of semiworked architectonic pieces abandoned

Fig. 9: Monolithic marble columns, bases, and capitals 'a foglie d'acanto mosse dal vento' in the basilica of San Apollinare in Classe (Ravenna). Photo by H. Tůmová.

One of the reasons why the existence of the port warehouse for stone artefacts has not yet been archaeologically proven, is the significant practice of re-use (*spoliatio*) of construction material in the Ravennate area, which occurred over many centuries (and to this must be added its logistical isolation in later periods). This makes it virtually impossible to expect (given the total estimated quantity of imported stone/marble artefacts) to find residual blocks of marble or prefabricated shafts, capitals, and bases, as – for example – in the case of Rome or Ostia and Portus.[82] We must also not forget the later interest of Charlemagne in the ancient monuments in Ravenna, especially marble artefacts, and his effort to take as many masterpieces to the centre of his empire of *Regnum Francorum*, Aachen, as possible.[83]

The hypothesis of the existence of a storehouse for marble blocks and stone artefacts in Ravenna or Classe seems to be supported by the toponym of the hypothetical basilica of S. Giovanni (Battista) in Marmorato near the Coriandro port in Ravenna, outside the Anastasia Gate[84] – where one of the warehouses for the storage of stone and marble similar to *statio marmorum* (Marmorata) and other marble yards in Rome could perhaps have been located. However, the question arises as to whether a comparison of the marble circulation mechanism in Ravenna as

in the ancient quarries of Proconnesos (Asgari 1978, 467–480; Asgari 1988, 115–125; Asgari 1992, 73–80). Moreover, some reused artefacts were newly carved, as Pensabene points out in the example of capitals in Roman Christian basilicas, esp. those from the 5th century (Pensabene 2017, 190–191). For the issue of reused artefacts in Late Antiquity and the early Middle Ages in Rome and North Africa see Altekamp *et al.* 2017.

82 Not even the funeral *stelai* of *classiarii* were spared secondary use, so for many of them we have no idea of their original location. Also, many structures in the port district of modern *Podere Chiavichetta*, as evidenced by archaeological research, were demolished and dismantled to the foundations in the 7th and 8th centuries and the material was reused for other constructions (Maioli – Stoppioni 1987, 27, 35).

83 As it was granted to him by the Pope Hadrian I in a letter dated to the year of his visit to Ravenna, 787 (Deliyannis 2003, 173). Agnellus, *LPR* XXXVI, CXIII cf. Tůmová 2013, 252–253.

84 Cirelli 2008, 103. Rizzardi mentions the location of the San Giovanni Battista basilica, consecrated by the Archbishop Maximianus from Pula in front of the *Guarcinorum* gate (modern Porta Serrata) near the San Vitale basilica and denominated *ad Marmorata* (Rizzardi 2016, 199).

sedes imperii with Rome, and its hinterland in Ostia and Portus is relevant.[85] We can refer above all to the case of the ancient harbours of Ostia and especially Portus with its marble deposits[86] from where the marbles were further transported along the Tiber to other marble yards in Rome, in the area called *Marmorata* under the Aventine hill (**Fig. 10**)[87] which was used for the storage of an enormous quantity of marble:[88] Marble (and other stone) reserves were still available here in the 19th century.[89] Cases of reworking of semi-finished but damaged marble elements (e.g. damaged column shafts), destined for different purposes are also known from the *statio marmorum*, as can be seen in the open air Archaeological Museum of Ostia antica (**Fig. 11**).[90]

A detailed overview of warehouses or 'marble yards' in Rome has recently been given by M. Maischberger, who considers various storage places in Rome: among the largest and most important from the early Imperial era was Emporium, southwest of the Aventine (where the greatest quantity of stone material was discovered and where *statio marmorum* was probably located), the zone on *Campus Martius*, where a number of dispersed marbles was found, and the area of the maritime harbour of Portus, in the north of Ostia.[91]

When we consider whether and how the eventual storages for stone (marble) material in Classe and Ravenna could function, we should not neglect the diversity of examples in Rome itself and its surroundings (Portus, Ostia). Firstly, it should be noted that in Rome itself, marble reserves were not concentrated in a single location, but their distribution depended on logistic demands and on the transport of huge marble elements through narrow streets to the construction sites. They were scattered along the banks of the Tiber, with the fact that the largest trans-shipment points included the Emporium (Marmorata) and the zone at *Campus Martius*. Unlike Rome, the warehouse in *Portus* was located on the periphery (where the marble yards were situated in a densely urbanized area):[92] Marble artefacts were found along the

85 We have to ask this question especially with regard to the latest knowledge about the actual (predicted) size of storage capacities in Ostia and Portus that in total encompassed almost 6 hectares (for exact dimensions see Keay 2022, 107). It is also necessary to point out that we are not comparing the conurbation of Ravenna with the city of Rome in quantitative or territorial terms: the Ravennate conurbation, in terms of its surface, should rather be compared with other important Late Antique cities such as *Augusta Treverorum*, Carthage or *Mediolanum* (cf. Augenti 2011, 24–25; Ward-Perkins 2000, 67, fig. 2), but in terms of the functioning of the transport system, redistribution, and marble supply.

86 As was mentioned – though rarely – on the ancient inscriptions (Maischberger 1999, 325).

87 Antique *Marmorata* should be located near the Tiber River, probably where the modern *via Marmorata* passes. Subsequently a marble deposit near the harbour of *Portus* developed (Attanasio 2003, 21). See also Ward-Perkins 1980, 327 who locates the *Marmorata* quarter between the Aventine and Monte Testaccio in Rome.

88 A similar system of storage, stockpiling, and transport from the ports to the marble workshops is generally assumed also in other large distribution and commercial cities and ports in the ancient Mediterranean: Alexandria, Antioch, Athens, Caesarea, Carthage, Ephesus, etc., where in most cases, however, we do not have direct evidence. The deposit similar to that of *Marmorata* in Rome, however, is not attested in the capital of Constantinople (Sodini 2002, 134–135).

89 As they had been studied by Luigi Maria Bruzza in the 19th century (Bruzza 1870; see Attanasio 2003, 21; Pensabene 2007, 389, 392; cf. Tůmová 2013, 58). Corsi described the traces of the ancient warehouse: '(…) presso l'estremità dell'Aventino nel luogo detto la marmorata vi sono ancora le rovine circolari de' magazzini, e gli avanzi della vasta dogana' (Corsi 1833, 30; see also Marchei – Pettinau 1998, 117–128).

90 Pensabene 1998, 333–390.

91 Maischberger 1999, 325, 328. For Ostia, Portus and its *statio marmorum* see Keay 2022, 92–113.

92 Cf. Maischberger 1999, 325–334, esp. 330 where he presents the logical reasons for the establisment of the marble yards in *Portus*, when the capacity of storages at the *Emporium* was probably insufficient due to the increasing marble demand under the reign of Domitian.

Fig. 10: Marble column shafts and semi-worked marble blocks in the supposed *statio marmorum*, now in the open-air museum of Parco archeologico di Ostia antica. Photo by H. Tůmová.

Fig. 11: Method of interventions and repairs of ancient stonemasons into the shafts of the columns left in the *statio marmorum* from the Ostia/Portus area, now in the open-air museum of Parco archeologico di Ostia antica. Photo by H. Tůmová.

southern bank of the Fiumicino canal (the so-called Fossa Traiana), linking the Tiber with the Tyrrhenian Sea, in the north-east part ('Capo due rami') of the Isola sacra.[93]

In this respect, moreover, we must not forget that the way and topography of marble storages in Rome and its 'economic background' (Ostia, Portus) depended on the specific situation of marble supply in each period: in the time of the largest *demande* (early Imperial period, especially from the reign of Domitian on), the marble supply of Rome increased significantly, and it made sense to create an adequate storage capacity for marbles, quarried and traded under the state monopoly.[94] Also the marble yard is considered controlled and managed by the state administration. The quantity and quality of the preserved stone artefacts in the assumed marble yards and supposed workshops in Rome varies so much that it provokes lively debate about the existence itself of these warehouses and *stationes*. So, there are different views on the marble storage system, stockpiling, and 'mass' production in general.[95] The views on the existence of marble yards, or more precisely of the production 'to-stock' (P. Pensabene, J. Ward Perkins)[96] are amended by opinions of persisting quarrying to order also in Late Antiquity.[97] The non-existence of marble yards (e.g. in Ostia or more specifically Portus) is justified as there are only a few marble remains (which are considered 'scraps of damaged pieces') of the volume that had to be imported to Rome. However, as is generally assumed – and as also follows logically – there must have been a place (trans-shipment point) inside the port where the material was stored before it was further transported or trans-shipped to the city or to the hinterland. It is logical that a stonemason's workshop had to operate there, which dealt with the repair of damaged pieces: and those that could no longer be repaired were left in place. We should also assume that certain losses during transport were expected and the material was ordered with a certain margin or rather reserve. Some reasonable synthesis follows from Sahotsky's description, where he believes smaller marble elements ('finishing marbles') employed for revetments or pavements in the construction of the Maxentius basilica in Rome could probably be used from a *depositio* of Emporium, from 'the largest stockpile of marble in Rome', while the eight huge monolith columns had to be delivered *à la demande*, in a specific order.[98] So it seems that – as usual – the truth will be 'somewhere in between'.

In the case of Ravenna, we should consider mostly the situation that occurred from the beginning of the 5th century onwards, when the city became the *sedes imperii*. As we have already seen, the city experienced increased construction activity for two centuries. It is not excluded that the mechanism for marble storage, after it had been unloaded from the ship, was similar to what we encounter in the zone of *Campus Martius* and along the banks of the Tiber in Rome, namely the existence of individual partial places (or temporary warehouses) that best suited

93 Germoni *et al*. 2018, fig. 2, 6 [open access: https://books.openedition.org/efr/3734, cit. 10. 6. 2022].

94 For the situation in Rome and Portus see Maischberger 1999, 330, cit. 334: '…the phenomenon of stockpiling in Rome observed by Ward-Perkins seems to have peaked just a few decades from the end of the first to the middle of the 2nd century AD'. Pensabene considers an increasing demand for precious white marbles and coloured stones or marbles during the Domitian reign and generally in the 2nd century as a reason for the creation of enormous *statio marmorum* and for the establishment of a strict state control system over the marble importation (Pensabene 1998, 338).

95 For further discussion see Bernard 2010, 35–54, esp. 35, n. 1; Toma 2018, 161–191, esp. 161–162.

96 In general, Ward-Perkins assumes the existence of marble yards 'either at the quarries or after shipment', and in this context he specifically mentions the example of Rome (*Marmorata*) and Ostia (Ward-Perkins 1980, 327).

97 Russell 2013b, 207–208.

98 He believes the usage of marbles from warehouses should be explained by the fact that the construction of the basilica had be realized in a very short period of time (Sahotsky 2016, 49).

the logistics of a particular delivery.[99] This assumption of several large or small marble deposits would correspond to the mention of the place of discovery of various 'marbles' that was made by the Ravennate scholar G. Fabri in his 17th century 'guide' to Ravenna: Fabri described a sort of a 'quarry' (it. *cava*) near the canal south of Ravenna, present-day Fiumi Uniti (**Fig. 12**), at the point where the canal bends towards the sea.[100] Based on this, he located the port wharves in this area.[101] If we take into account the archaeologically uncovered port structures, Fabri may not have been far from the truth… Should we attempt to reconstruct the mechanism of marble manipulation in the port, the most likely assumption seems to be the existence of several modest (temporary) deposits along the canals in Classe (like along the Tiber in Rome), connecting the port lagoon in Classe with the sea and with the city of Ravenna, next to which stone workshops could also have been located. The assumption of deposits or trans-shipment points being localised near waterways (ports, piers along canals) is based on an effort to minimize the handling of heavy cargos.[102]

A lively debate is currently taking place not only on the existence of warehouses or rather marble yards, but also on the state in which imported stone and marble material was trans-

Fig. 12: Location of the so-called marble deposit near the Fiumi Uniti canal in via Argine Sinistro Fiumi Uniti, Classe. The arrow indicates the site of marble findings. After Augenti *et al.* 2011, 138, tav. 2, basmap: google.com/maps.

99 Cf. Maischberger 1999, 331–334.

100 '(…) trouarete in distanza di vn quarto di miglio dalla Strada pubblica vna Caua, oue pochi anni sono fú scoperta vna quantità grandissima di Marmi.' Fabri described red and 'dust' (*cineritio*) marbles that were used for revetments in the chapel of the Virgin in the Cathedral and for 'Sponde del Ponte di Porta Adriana'; he also mentioned marbles, that remained 'buried' in this pit (Fabri 1678, 187–188). For the relevant bibliography see Augenti *et al.* 2011, 138.

101 However, he identified this port as *Portus Cesaris* or *Condinianus/Candidius*, so as the port of Augustus (Fabri 1678, 188–189).

102 Cf. Russell 2018, 237–263, esp. 241. We must also not forget that ship transportation (especially of such heavy cargos) was significantly cheaper than overland transportation.

ported (semi/partially-worked or prefabricated pieces *versus* finished artefacts). Not only the study of marble finds *in situ* in the yards, but also the archaeological evidence of stone cargos from shipwrecks in the Mediterranean basin contributes to understanding the system of marble circulation, although the shipwrecks with stone cargos are not particularly common compared to the total amount of ancient shipwrecks known to date.[103] As can be seen from Russell's evidence of stone cargos from various shipwrecks all around the Mediterranean basin,[104] both roughly worked blocks, semi-worked and finished stone (marble) artefacts were transported throughout the reference period, from the 2nd century BC to the 10th century AD, as shown in **Graphs 7** and **8**.[105] All types of stone artefact processing (roughly worked blocks, semi-worked, and finished artefacts) are present in the entire monitored period (**Graph 7**) with the peak of incidence in the 1st–2nd centuries AD; and then in Late Antiquity, specifically in the 5th–7th centuries, when we can observe the peak of the construction and commercial activity also in the Ravenna conurbation.[106] Roughly worked blocks of stone (marble) were transported the most (52%), then semi-worked artefacts, such as sarcophagi or column shafts (33%), and the least represented group (15%) are finished artefacts (**Graph 8**).

The fact that marble was also worked in the 'storages', after they were unloaded at the port, seems to be proven by numerous finds of marble and other stone residues after working, as we can see from the huge quantity of debris found near the banks of the Tiber and in the area of modern *Ponte Sublicio* in Rome (where an undisturbed stratigraphy from the 2nd century BC to the 4th century AD was identified), in the area near *Porticus Aemilia*, and in the capital's surroundings (modern Via Redipuglia in the north of the Isola Sacra in Portus).[107] As a result of the research of stone material from the San Severo complex in Classe, debris from cutting or – possibly – damaged slabs were mostly used for *opera sectilia*: the majority of worked artefacts are represented by revetment slabs and tiles, used for wall and floor *opera sectilia* (41% of worked artefacts).[108] Also the existence of local stone workshops next to construction sites was therefore related to the system of final processing, finalization and installation of architectural elements.[109]

103 Especially A. J. Parker and B. Russell deal with the catalogization and research of ancient shipwrecks with stone (marble) cargos (Parker 1992; Russell 2013a, 331–361). Russell states only 3.5% of the shipwrecks with stone cargos of the total shipwrecks known up to 2013 (Russell 2013a, 331). For nautical archaeology and study of shipwrecks in Italy see Beltrame ed. 2000; esp. Beltrame 2000, 7–9; Beltrame – Antonelli 2022, 578–596; Gianfrotta – Maniscalco 2002; Medas 2000, 42–48; Pelagatti – Gianfrotta 1993; 1997; 2002.

104 Russell 2013a, 331–361.

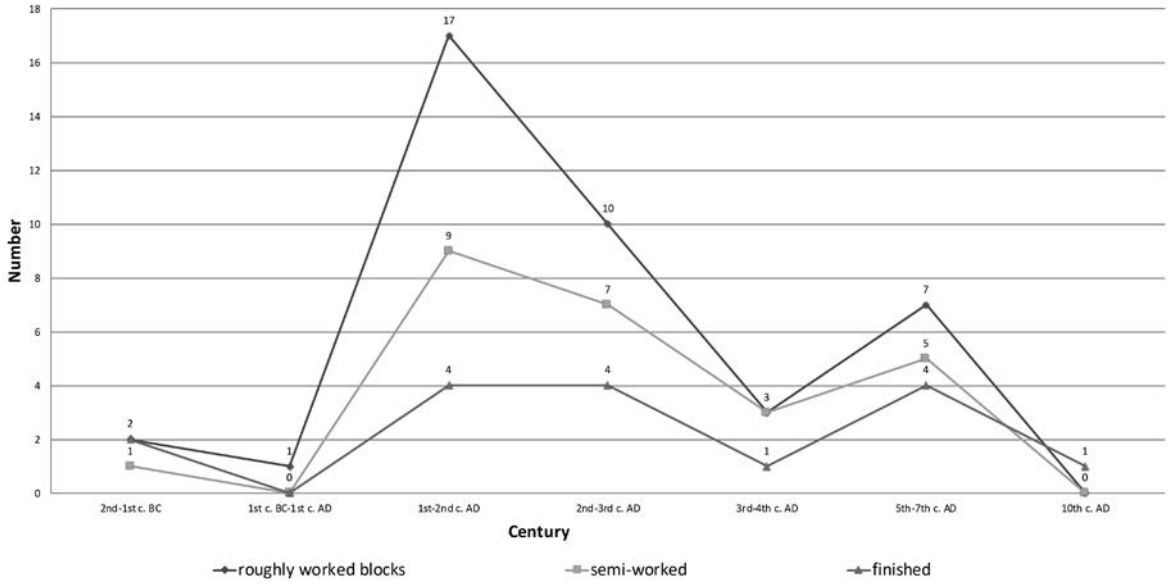
105 However, it is always necessary to distinguish stone cargos of rough blocks, semi- or partially worked or finished elements from ballast which is highly fragmentary (Russell 2013a, 343).

106 Cf. Augenti 2011, 18.

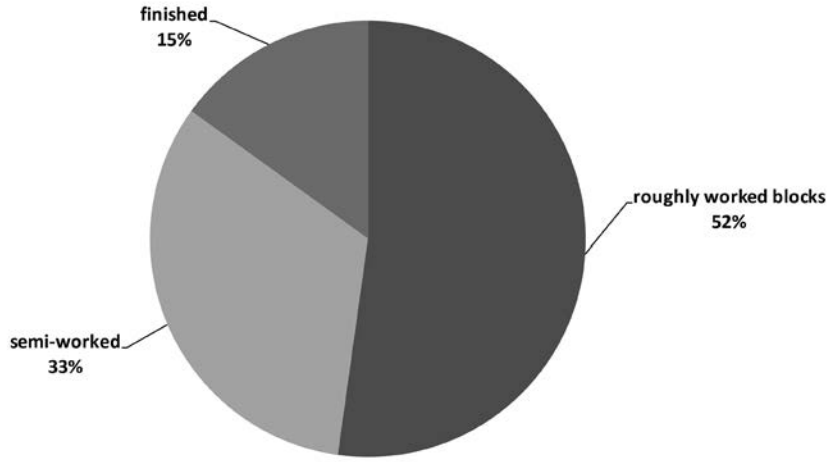
107 Maischberger 1999, 325–328, 330. A recent archaeological survey revealed structural remains 'potentially associated with the *Fossa Traiana* and the *Statio Marmorum*,' (Germoni *et al.* 2018). For location of *statio marmorum* see Keay 2022, 100.

108 The majority of the material used for the San Severo revetment slabs and *opera sectilia* was identified as marble (85%), especially white marble (Tůmová 2013, 69).

109 Such as marble revetment slabs or tiles. As we know, the cutting of marble/stone revetment slabs was highly efficient with a minimization of scraps and residue. We know from a recent study of a revetment cladding from cipollino verde in a Roman town house in Ephesos in the 2nd century AD that there was a minimum of material loss when cutting the slabs and that mechanical saw cutting with a water mill was highly efficient (i.e. there was almost no damage to the slabs): 'The sawing and polishing process was surprisingly efficient: only 5% of the slabs broke during the polishing process or in post-polishing transport, and none during sawing', Passchier *et al.* 2021, 1–7, cit. 6.



Graph 7: Diagram of the quantity of transported stone (marble) blocks in different periods, divided into (i) roughly worked blocks, (ii) semi-worked (e.g. sarcophagi, column shafts), and (iii) finished artefacts (e.g. sculpture) and artefacts in the period from the 2nd century BC to the 10th century AD. The data are given by century, the number of cases concerns shipwrecks and the type of their cargos, not individually found stone elements (data according to Russell 2013, 332–341).



Graph 8: Division of the types of working of stone (marble) transported artefacts: 52% of roughly worked blocks, 33% of semi-worked artefacts (e.g. sarcophagi, column shafts), and 15% of finished artefacts (e.g. sculpture) artefacts in the period from the 2nd century BC to the 10th century AD. The percentage of cases concerns shipwrecks and the type/types of their cargo, not individual found stone elements (data according to Russell 2013, 332–341).

CONCLUSION

As we can see, the city of Ravenna with its maritime port in Classe represented one of the destinations of long-distance trade routes in Late Antiquity, especially after AD 402 when Ravenna became the *sedes imperii* of the Western Roman Empire. Considerable supplies of building materials had to be delivered to the conurbation of Ravenna, Caesarea, and Classe for the construction and decoration of many Christian basilicas and secular buildings on the order of the Imperial and later Royal (Ostrogothic) court as well, if we take into account in particular that there is no quarry for stone, especially marble, in its immediate vicinity. As we have seen in comparison with imported pottery, Ravenna through its port in Classe maintained trade contacts with many sites in the eastern Mediterranean and North Africa. It is probable that marble supplies also travelled on similar routes, as – which is well known – the cargo was often combined from various goods.

Although in the 5th and 6th centuries Rome still remained the capital (*caput*), the administrative and political centre was *de facto* Ravenna: it is clear that, in terms of supplying the city and its hinterland, we can conceptually and organizationally (not quantitatively) compare it to Rome, Ostia and Portus. Although opinions differ on the existence of marble deposits in Rome, Ostia and Portus, the organization of the transport of marble blocks, prefabricated or semi-finished architectural elements (column shafts, bases, capitals) implies the need for a trans-shipment facility (Portus, Ostia) and a subsequent deposit (*statio marmorum* in Rome), albeit only temporary in the case of the port of Classe.

The analysis of the architectural decoration in the Ravennate basilicas – and from the San Severo site as well – shows that the available material (*spolia*) from earlier, abandoned buildings was also widely used. However, 'tailor-made' orders, deliveries – as we can see – are no exception. It is evident that the cargo for such contracts had to be deposited in port docks, albeit e.g. in the open air, however near the access route: probably in the northern part of the port district with the warehouse facilities of Classe, near the canal connecting the sea with the port lagoon; from where it was then transported to the final destination in the construction site where the stonemasons worked it completely and placed it *in situ*.

The analysis of the sarcophagi of the Ravenna circuit clearly shows that under the influence of imported specimens, an independent stonemasonry school (workshop) was established in Ravenna: in the case of non-monumental stone sculpture such as sarcophagi or *stelai* it is possible to assume the existence of minor storage facilities, but still a warehouse as in the case of other stored goods (oil, glass, wine, pottery – as it was archaeologically proven in the commercial zone of modern *Podere Chiavichetta* in Classe), from which it was possible to draw even at a time when ships could not arrive in Ravenna, i.e. in Classe, (e.g. a period of *mare clausum* or politically unstable times in which the sea-trade was suppressed). Although the marble deposit in Classe has not yet been archaeologically proven, its existence within the commercial background of the port of Classe is very likely. The most probable seems to be the presumption of the existence of a trans-shipment yard in the commercial zone (at the main canal) in Classe, where there could have been smaller stonemason's workshops and from which the monumental architectural decoration (construction elements) in particular was transported to the building sites where they were finalized and installed. It should also be taken into account that if any material (marble) remained in the assumed warehouse even after the end of the long-distance trade activity, it was certainly employed – similarly to stone material stripped from abandoned buildings – in the Early Middle Ages.

Nevertheless, the systematic determination of the provenance of stone artefacts, especially white marbles, using archaeometric methods, seems to be an essential necessity for further research of the Ravennate commercial relations in Late Antiquity.

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