Contribution to the use of marble in Central-Lusitania in Roman times: The stone architectural decoration of Ammaia (São Salvador da Aramenha, Portugal)

Reflexiones sobre el uso de mármol en Lusitania central en época romana: La decoración arquitectónica en piedra de Ammaia (São Salvador da Aramenha, Portugal)

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SUMMARY

This paper reports the results of a quantitative and qualitative study of the imported architectural decorative stone of the Roman town of Ammaia (São Salvador da Aramenha, Portugal), located centrally in the province of Lusitania. All studied ornamental stones were counted, weighed, classified and their provenance was determined.

Six types of stone were used for the architectural decoration at Ammaia: white marble, pink–purple limestone, grey–white marble, two marble breccias and granite. Granite was the most widely used building stone and was used for the production of columns and capitals. Previous studies have established a local source for the Ammaia granite (Taelman et alii in press). The provenance of the remaining ornamental stones is primarily regional (the southern part of the Iberian Peninsula). Only the two marble breccia varieties were imported from the Mediterranean: africano from Teos (Turkey) and breccia di Sciro from the island of Skyros also (Greece). The predominant use of regionally available stones is observed in other Roman towns located in the interior of the Iberian Peninsula, such as Emerita Augusta, Asturica Augusta and Munigua, and results mainly from the geographic location of the sites, remote from any seaport and/or navigable river.

RESUMEN

El presente trabajo presenta los resultados de una valorización cuantitativa y cualitativa de las piedras decorativas arquitectónicas importadas de la ciudad romana lusitana de Ammaia (São Salvador da Aramenha, Portugal). Todas las piedras decorativas estudiadas fueron contadas, pesadas, clasificadas y su procedencia fue determinada.

En la época romana se utilizaron seis tipos de piedra para la decoración arquitectónica de la ciudad de Ammaia: mármol blanco, caliza morada–rosa, mármol blanco y gris, dos brechas compuestas de fragmentos de mármol blanco y granito. El granito fue la piedra de construcción principal en Ammaia. Además, el granito se utilizó para la producción de columnas y capiteles. Estudios previos han establecido una fuente local para el granito de Ammaia (Taelman et alii in press). La procedencia de las otras piedras decorativas es principalmente regional (la parte meridional de la Península Ibérica). Las dos brechas son las únicas importadas y provienen del Mediterráneo: africano de Teos (Turquía) y breccia di Sciro de la isla de Skyros (Grecia). Una situación semejante con la utilización predominante de piedras regionales se puede observar en otras ciudades hispánicas localizadas en el interior de la Península, tal como Emerita Augusta, Asturica Augusta y Munigua. Esta se debe principalmente a su emplazamiento geográfico, distante de un puerto de mar y/o de navegación.

KEY WORDS: Lusitania, Portugal, Ammaia, Roman economy, Roman marble trade, marble provenance.

INTRODUCTION

The Roman culture is particularly known for its impressive architectural realisations. Large-scale building was common in the Roman period; it was even a major feature of this successful culture. These buildings have a high architectural and art historical value, but they also have the ability of informing us on the organisation of the construction industry,
an important part of the Roman economy. For the embellishment of the architecture, high-quality and expensive stones were used that were traded throughout the Mediterranean. These stones were considered an expensive luxury good that symbolised prosperity, wealth and economic power (Fant 1988: 149-150, 1993: 146). As the value of the stone increased and when factors such as aesthetical properties, prestige, fashion and ideology were involved, accessibility and ease of obtaining became less important and more distant sources were exploited. As such, marbles and other ornamental stones were widely traded throughout the Roman world. The total expenditure involved in supplying the many architectural ornamental projects with the necessary stone must have been enormous and these monumental projects must have had an enormous impact on the Roman economy (e.g. DeLaine 1997; therefore Mattingly and Salmon 2001; Pensabene et alii 2012). A study of the marble trading system can there fore offer important information concerning ancient commercial relationships, trade patterns and supply routes.

Since the middle of the eighties of the 20th century, the key focus within this archaeological questionnaire has been on developing new techniques and methods for characterising and determining the provenance of ornamental stones (for a comprehensive overview, see e.g. Lazzarini 2004; Zöldföldi et alii 2008). As a result, scientific data on the provenance of ornamental stones of individual monuments and archaeological objects, like sculpture, are becoming increasingly available. Surprisingly, however, quantitative approaches on the use and distribution of marbles are still rare. A key problem with the study of stone is the frequent spoliation and reuse of the material already in Roman times, but surely in post-Roman times. As for ornamental stone, the highly valued and rare marbles probably the first to be reused. In addition, marble was frequently used as raw material for lime production.

For the Iberian Peninsula, many studies have dealt with the distribution and (archaeological, petrographic and geochemical) characterisation of the ornamental stones from the main Roman exploitation centres (white and coloured marbles), such as the white marbles of Estremoz, Almadén de la Plata, Macael and Sierra de Mijas, and the coloured stones of Antequera, Sintra, Broccatello, Buixcaró, Santa Tecla and Espejon (e.g. Canto 1977-1978; Cisneros 1988, 1989-1990; Lapuente 1995; Lapuente and Turi 1995; Beltrán and Loza 1998; Lapuente 1999; Lapuente et alii 2000; Lapuente and Blanc 2002; Lapuente et alii 2002; Fusco and Manâs Romero 2006; Morbidelli et alii 2007; Álvarez et alii 2009b; Álvarez et alii 2009c; Álvarez et alii 2009d; Domínguez Bella 2009; Mañas Romero and Fusco 2009; Nogales et alii 2009; Ontiveros Ortega 2009; Béltran et alii 2012; Manâs Romero 2012; Rodríguez et alii 2012; Sálan 2012; Taelman et alii 2013a).

During the last decade, the use of marble in Roman times in the Iberian Peninsula has received great academic attention as well, focusing mainly on some lavishly decorated rural villae, such as Carranque, Cauca and Balazote (e.g. García-Entero and Vidal Álvarez 2007; García-Entero et alii 2009; García-Entero and Vidal Álvarez 2012; Pérez et alii 2012; Sarabia Bautista 2012), and on major urban centres such as Tarraco (Tarragona, Spain), Italica (San-tiponce, Spain), Emerita Augusta (Mérida, Spain), Caesaraugusta (Zaragoza, Spain), Colonia Patricia (Cordoba, Spain), Cartagho Nova (Cartagena, Spain) and Segobriga (Saelices, Spain) (e.g. Cisneros 1997; Mayer and Rodá 1998; Lapuente et alii 1999; Nogales et alii 1999; Cisneros 2000, 2001, 2002; Soler 2003; Cébrian 2004; Cisneros 2004; Cisneros and Martín-Bueno 2006; Álvarez et alii 2009a; Beltrán et alii 2009; Rodríguez Gutiérrez 2009; Soler 2009; Cisneros 2010; Cisneros et alii 2010-2011; Álvarez et alii 2012; Noguera and Madrid Balanza 2012; Pensabene et alii 2012; Soler 2012).

Despite that many studies have been carried out on the exploitation and the use of both local and imported stones, few studies have dealt with the organisation of the trade and movement of these ornamental stones in the Iberian Peninsula, especially in inland regions. This paper presents some new ideas on the trade and mode of distribution of marbles and other ornamental stones in Central-Lusitania during the Roman Imperial period. As a case study, the Roman town of Ammaia (São Salvador da Aramenha, Portugal) is selected. Previous studies have already determined the use and provenance of the town’s white marble and granite (Taelman 2012; Taelman et alii 2013b; Taelman et alii in press). This study focuses on the qualitative and quantitative examination of the white and coloured ornamental stones found in the town. The results for Ammaia are also compared with the results for other towns in the Iberian Peninsula.

HISTORICAL AND ENVIRONMENTAL SETTING

The ancient town of Ammaia is located in the northeastern Alentejo region of Portugal, about 10 km west of the present-day border between Portugal and Spain (São Salvador da Aramenha, municipality of Marvão, district of Portalegre, Portugal) (Fig. 1). In Roman times, Ammaia was part of the province...
of Lusitania, the westernmost province of the Roman World.

Systematic archaeological research at the site began in 1994 and focused essentially on five areas (Fig. 2): (1) the forum temple and parts of the forum portico, (2) a public bath building just south of the forum, (3) the South Gate complex with a monumental square and part of the town wall, (4) a residential area in the southeastern corner of the town (insula 38), and (5) part of the eastern suburban area (Pereira 2005, 2009; Vermeulen and Taelman 2010). Given that only about 4500 m² has been excavated, corresponding to c. 3 % of the town area, the presented overview for Ammaia is only preliminary and still subject to change as archaeological research continues. Nevertheless, it is believed that the presented data provide a good overview for the town since the studied areas include public, monumental and private complexes that were occupied throughout the entire Roman history of the town, i.e. from the 1st century CE to the 4th–5th century CE.

The town was founded probably in late Augustan–Tiberian times. Like many towns in Lusitania, its heyday began around 50 CE and lasted until the end of the 2nd century CE (Quaresma 2010-2011: 98, 2011). During this period, the settlement evolved into a proper urban centre, with several monumental public complexes. The end of the 2nd century CE appears to have been a turning point for Ammaia. Fine-ware imports are relatively scarce (Quaresma 2011) and epigraphic production and building activity virtually ceased. Numismatic evidence, however, suggests a continued occupation of the town at least until the third quarter of the 4th century CE (Ruivo J., personal communication). Between the late 4th and early 5th century CE, the town was gradually abandoned. Economic instability, demographic decline and reduced urban investment are some of the interlinked explanations for this evolution. Sometime in the first half of the 5th century CE, the site was completely deserted and covered by flood and slope deposits (Vermeulen and Taelman 2010: 313).

From a geological point of view, Ammaia and its ancient territory are located on the boundary of the Central–Iberian Zone (CIZ) and the Ossa–Morena Zone (OMZ), two tectonic units of the Hesperian or Iberian Massif, a geotectonic domain that forms the oldest core of the Iberian Peninsula and occupies most of the modern Portuguese territory (Pereira et alii 2010: 523) (Fig. 3). The site itself lies in the core the La Codosera Syncline, an Ordovician to Devonian sedimentary sequence of quartzites, shales, sandstones and some dolomitic limestones that overlies the late Proterozoic rocks of the Schist–Greywacke Complex of the Central-Iberian Zone and that stands from it as the small mountain range of the Serra de São Mamede (Sanderson et alii 1991: 893). Important geological features for the study area are the large syn- to postkinematic granite plutons, such as the Lower Ordovician Carrascal (CG) and Portalegre granites (PG) and the late Hercynian Nisa–Alburquerque Batholith (NAB), that intruded the OMZ, CIZ and the CIZ–OMZ transition zone (Ramirez and Menéndez 1999: 87; Villaseca et alii 2008: 264; Solá et alii 2009: 157,166; Pereira et alii 2010: 523; Solá et alii 2010: 282-284).

Despite this geological diversity and the abundant availability of excellent building stones, the occurrence of ornamental stones in and around the territory of Roman Ammaia is restricted to four geological units.
Figure 2. Map of the excavated structures and sectors (1: forum area; 2: forum baths; 3: South Gate; 4: insula 38; 5: eastern suburban area) and of the interpretation of the geophysical survey of the Roman site of Ammaia (after Corsi et alii 2012: 138).

around Alter do Chão, Assumar, Elvas and Estremoz (Manupella et alii 1981). The quality of the stones outcropping near Alter do Chão, Assumar and Elvas is insufficient for exploitation. Only near Estremoz (the Estremoz Anticline), high-quality marbles can be found.

METHODOLOGY

All ornamental stones found in Ammaia were counted, weighed and characterised macroscopically. Using macroscopic observations, different lithotypes were identified that were sampled for further petrographic and archaeometric examination, and provenance determination.

Thin section petrographic examination was carried out using a polarising microscope. The observed rock properties were rock type, structure, colour, patterning, veining, texture, the presence of fossils or other distinctive features, the overall grain or crystal size, grain size distribution, maximum grain size, main mineralogy and hardness of the rock. For the coloured marbles, this visual and mineralogic–petrographic inspection generally sufficed to determine their provenance. For the white marbles, standard petrographic observations were combined with strontium isotopic analysis (for an in-depth discussion of the provenance methodology for the Ammaia white marbles, see Taelman et alii 2013a; Taelman et alii 2013b). The results of the mineralogic–petrographic and geochemical study were compared with data from the available archaeological, geomorphological and geological literature of the study area, with data gathered during the extensive geological surveys, and with data available in reference databases for the main types of ornamental stone quarried in the Roman period (see e.g. Gnoli 1988; Borghini 2004 for the coloured ornamental stones).

MARBLE PROVENANCE AND USE IN ROMAN AMMAIA

THE STONE ARCHITECTURAL DECORATION

Six types of stone were used for the architectural decoration at Ammaia: white marble, pink–purple limestone, grey–white marble, two marble breccias and granite. The fragments are almost all parts of wall and floor decoration, i.e. veneer panels and mouldings. Columns and column elements are almost exclusively carved from granite and are characterised by a plain execution, resulting from the specific working properties of granite. Although granite presents excellent structural properties and is extremely suitable as building stone, the material does not allow for easy carving and polishing. As a result, simpler forms of decoration were used and the decorative elements were only executed roughly. Architectural elements such as columns and column elements, but also epigraphic monuments and statuary carved from marble occur only in marginal quantities.

Apart from the granite that was quarried locally (Taelman et alii 2012: 119; Taelman et alii in press), the ornamental stones do not occur in the territory of Ammaia and had to be brought to the town from more distant sources.

During 18 years of archaeological research, 1739 fragments or 3682 kg of white marble, pink–purple limestone, grey–white marble and marble breccia have been recovered in Ammaia (Fig. 4). The white marble clearly forms the principal type. Besides its general predominance, it outstands by far the other ornamental stones in all object categories and in all excavated sectors (Fig. 5). White marble was used for wall and floor revetment, epigraphic monuments and statuary. In some cases, columns and other architectural elements such as plinths, door lintels, panels for coffered ceilings were carved in white marble. Pink–purple limestone objects also occur in considerable quantities and were exclusively used for wall and floor revetment (veneer panels and plinths). Grey–white marble and marble breccia are attested only rarely, and were used solely for veneer.

In essence, the decorative programme in Ammaia was rather sober, with generally only white marble. The forum complex is the most sumptuous of the excavated buildings in terms of quantity and quality of ornamental stones. A prestigious, multi-coloured decorative programme combined five types of ornamental stones. The forum complex is also the area where the highest volume of ornamental stone was recovered so far (34 % of the fragments). White marble is clearly dominant at the forum complex. In addition, a considerable amount of pink–purple limestone can be found; the rest is grey–white marble and marble breccia. Similar polychromatic effects can be found in the frons scaenae of the Emerita Augusta theatre where white marble sculpture and capitals were combined with columns of grey marble and a podium floor of pink–purple limestone panels (Fusco and Manãs Romero 2006; Nogales et alii 2009).

Apart from the forum area, the forum bathhouse yielded a considerable amount of ornamentals stone (32 % of the fragments). Except for five small fragments of grey–white marble, only white marble was found here, including nine in situ preserved wall and...
floor veneer panels of one of the baths’ pools. The excavated area of insula 38, the suburban area east of the town and the South Gate yielded, respectively, 5%, 8% and 13% of the total amount of ornamental stone finds. The remaining 8% are objects of which the exact archaeological provenance is not recorded.

So far, little chronological information is available for the introduction and the use of ornamental stone in Ammaia, mainly because of limited stratigraphic recording of the earlier excavations. While some well-dated objects such as epigraphic monuments and statuary give a rough indication, the situation for the most ornamental stone finds (mainly veneer decoration) is less clear.

The marble epigraphy and the statuary illustrate that ornamental stone, in particular white marble, was introduced in Ammaia at the latest in the Claudian period, not long after the foundation of the town. The earliest evidence for white marble is a commemorative inscription dedicated to the Emperor Claudius (44–45 CE) and a togate statue probably of young Nero (c. 50 CE) (Fig. 6). Other evidence for the early use of marble can be seen in the forum baths, where several pieces of white marble veneer panels were recuperated from an earlier building for the construction of the Flavian bath complex.

The use of ornamental stone was attested particularly in the Flavian and early Antonine period. In this period, the construction of the forum bath complex and the monumentalisation of the South Gate required large volumes of ornamental stone. The peak in the Flavian and early Antonine period is also illustrated by the epigraphic monuments. Most marble inscriptions are dated between the second half of the 1st century CE and the first half of the 2nd century CE.

Finally, the excavations of the residential area of insula 38 indicate that ornamental stone, particularly white marble, was used well into the 4th and even the beginning of the 5th century CE. It needs to be noted
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that many finds of the last occupation phase might have been reused from earlier, abandoned buildings.

PROVENANCE DETERMINATION

WHITE MARBLE

The white marble is fine- to medium-grained and has a satcharoidal texture, making it ideal for high-quality carving. The colour is generally pure white or white with occasional coloured veins or streaks (red, green, brown and grey). The samples analysed are all calcitic, sometimes with a minor presence of dolomite. The non-carbonate fraction always includes quartz (both mono- and polycrystalline) and often muscovite. Opaque minerals, iron oxides and chlorite minerals are identified in small amounts. The samples have a maximum grain size (MGS) between 0.98 mm and 1.82 mm, a heteroblastic texture, and curved to embayed calcite grain boundaries (Fig. 7) (Taelman et alii 2013b: 377).

Comparison of the macroscopic and petrographic properties of the Morro de Samra white marble with marbles from nearby sources (Alter do Chão, Assumar and Elvas) rules out a regional source. Both mineralogical-petrographic and geochemical data of the analysed samples from Morro de Samra were compared with existing data for five Hispanic (Estremoz, Viana do Alentejo, Almadén de la Plata, Almeria and Malaga) and nine Mediterranean (Carrara, Hymettos, Naxos, Paros, Pentelicion, Thasos, Aphrodisias, Dokimeion and Proconnesos) marble sources that are known to have been exploited in ancient times (Fig. 8). Detailed information and analytical results for the petrographic and strontium isotopic analyses of the white marbles from Morro de Samra can be found in Taelman et alii (2013b: 377-380).

The macroscopic, petrographic and geochemical properties of the Morro de Samra white marble eliminate most Mediterranean and Hispanic sources. Because of similar properties for Estremoz, Almadén de la Plata and Pentelic marble, a conclusive attribution of the archaeological marbles remains problematic. Notwithstanding, the analytical results strongly suggest the Estremoz quarries as the most likely source. This hypothesis is further enforced by the geographical proximity of the Estremoz district (only c. 80 km to the south) and the expensive overland transport that

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1 The white marble samples from Morro de Samra were analysed at the Department of Geology and Soil Science and the Department of Analytical Chemistry of Ghent University (Belgium).
was needed for the other marbles to reach Ammaia. Moreover, the high quality of the Estremoz marble, especially the variety found around Borba that can compete with the Carrara marble (Lapuente 1999: 284), and the available exploitation and administration system for the extraction of the marble for Emerita Augusta (Cisneros 2010: 141) certainly appealed the citizens of Ammaia and explains its popularity.
in the town. Nevertheless, imported marbles cannot be excluded for the more prestigious embellishment projects of the town, as has been demonstrated recently by Lapuente et alii (2014: 349) for Emerita Augusta, where white marble sculptures have been attested coming from the Estremoz Anticline, but also from Carrara, Aphrodisias, Paros and possibly also Pentelicon.

**Pink–purple limestone**

The pink–purple limestone is a fine-grained limestone with a micritic texture and a heterogeneous macroscopic appearance. The dominant colour is pink with frequent white streaks and dark-coloured, carbon stylolites. Calcite is determined as the dominant carbonate mineral using dilute 10 % hydrochloric acid and by applying a staining technique for the thin sections using alizarin red S. Quartz is present as accessory mineral. Secondary calcite veins can be observed. No fossils or bioclasts occur in the samples.

Two formations of pink or pink–purple limestone are known to have been exploited in the western part of the Iberian Peninsula, one near Sintra (Portugal) and one near Alconera (Spain).

The Sintra limestone is microcrystalline limestone that is characterised by a pink–purple, orange or yellow colour with abundant fossils and bioclasts (Fusco and Mañas Romero 2006: 26; Coelho 2009: 533; Mañas Romero and Fusco 2009: 513; Mañas Romero 2012).

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**Figure 8. Sr-isotopic (A) and maximum grain size (B) comparison of the white marble samples analysed from Ammaia with the Hispanic and Mediterranean marbles (Taelman et alii 2013b: 383-384).**
The pink–purple variety of the Alconera limestone is a fine-grained limestone with a heterogeneous and irregular colour pattern. Both intense and lighter pink–purple varieties occur, frequently with light-coloured veins. The presence of recrystallised calcite and slate is not uncommon (Fusco and Mañas Romero 2006: 29; Mañas Romero 2012). Traces of ancient exploitation have only been attested for the intense pink–purple limestone, but both types have been attested in the Roman architecture of Emerita Augusta (Mañas Romero 2012).

On the basis of the available descriptions for the Sintra and Alconera limestones and the absence of bioclasts and fossil remains in the Ammaia samples, the pink–purple limestone artefacts seem to be the lighter pink–purple limestone variety attributed to Alconera in Spain.

**Grey–white marble**

The grey–white marble is a medium-grained marble with sacharoidal texture. The rock is characterised by abundant (dark) grey veins alternating with white-coloured zones, giving the stone a distinctive colour palette. Tests with dilute 10% hydrochloric acid revealed calcite as the dominant carbonate mineral. Regarding structure and texture, the grey–white marble is very similar to the white marble found in Ammaia. Both types differ mainly in the overall grey aspect of the rock and the density of grey veining pattern.

The nearest outcrops of grey–white marble to Ammaia are found in the Estremoz Anticline, about 80 km south of the Roman site. Comparison of the mineralogical–petrographic features of the archaeological samples with samples of grey–white marble taken from the outcrops (see Taelman et alii 2013a) revealed a high degree of resemblance, suggesting the Estremoz Anticline as the source for the grey–white marble from Ammaia.

Grey–white and dark grey marbles from the Estremoz Anticline, commercially known as Azul Lagoa and Ruivina (Casal Moura and Carvalho 2007: 309-311), are part of the upper deposits of the Volcano–Sedimentary Carbonate Complex of the Estremoz Anticline and occur as intercalations in the white marble deposits. In comparison with the high-quality white marbles, these dark varieties are found only in limited quantities around the villages of Pardais and Rio de Moinhos, mainly in the southeastern part of the anticline and along its flanks (Lopes 2003: 154; Henriques et alii 2006: 161-162; Lamberto and Sá Caetano 2009: 478).

**Marble breccia**

The final ornamental stone is a monomict, matrix-supported breccia with poorly sorted clasts of white marble, sometimes with a light pink–red shine. The clasts have a maximum size between 0.4 cm and 8.0 cm, are angular and have sharp and clear boundaries. In some cases, the clasts are clearly sheared. The matrix is compact, fine-grained and dark brown to grey.

Comparing the features of the Ammaia marble breccia with the characteristics published for the main Roman marble breccia’s quarried around the Mediterranean suggests africano from Teos in Turkey and breccia di Sciro (for the breccia’s with sheared clasts) from the Greek island of Skyros as the most likely source.

**Marble Trade in Ammaia and Central-Lusitania**

Ammaia was located centrally in the province of Lusitania, remote from any river- or seaport – the rivers Tagus and Guadiana were largely unnavigable in Roman times. According to the Itinerarium Antonini, three important communication and trade routes cross this part of Central-Lusitania, connecting Emerita Augusta, the capital of the Roman province, with Olisipo (Lisbon, Portugal), the province’s main seaport (de Saa 1956; Alarcão 1988: 56) (Figure 9). The southern route (via XII) passes the marble quarries of the Estremoz Anticline, Ebora (Évora, Portugal), the estuaries of the Sado and Tagus Rivers, where important fish sauce or garum production centres were located, and ends in Olisipo (Carneiro 2009: 49-58; Almeida et alii 2011: 193-194). The northern (via XV) and central route (via XIV) run in the direction of the Tagus River, crossing the southern part of the territory of Ammaia. Both roads continue along the same course probably as far as Ad Septem Aras (Degolados?, Portugal), passing the vicus of Butua (Bótoa, Spain). After Ad Septem Aras, via XIV passes Matusaro (?), Portugal, Abelterium and Aritium Praetorium (Abrantes?, Portugal). Via XV passes Montobriga (near Arronches?, Portugal), Fraximum (?), Portugal and Tubucci (Cazal de Várzea, Portugal). Both roads cross the Tagus River near Scallabis (Santarém, Portugal). The final part of both roads, from Scallabis to Olisipo, follows the same course as the important north–south axis in Lusitania that connected Olisipo with Bracara Augusta (Braga, Portugal) in Hispania Tarraconensis (Carneiro 2009: 58-76; Almeida et alii 2011: 382-383). In addition, a network of secondary roads ensured the communica-
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Between the towns and between the towns and their territory (Fig. 9).

Through this dense network of primary and secondary roads, the white and grey–white marble from Estremoz could reach Ammaia relatively easy after approximately 80 km. It remains, however, uncertain whether the marble was imported directly from the quarries or whether it was first brought to Emerita Augusta, from where it was subsequently redistributed to other towns. Even though there is no explicit evidence as for the legal status of the Estremoz quarries, the location of the quarries in the ager Emeritensis and the importance of the marble for Emerita Augusta seem to suggest that the quarries were municipal property. In this case, the town would not only have been the main consumer for the Estremoz marble, but it might also have functioned as a stockpiling and distribution centre (Cisneros 2010: 147). The presence of many roughed-out and semi-worked blocks, column shafts, sarcophagi and statuary illustrate that the marble objects left the quarries in an unfinished state (Fusco and Mañas Romero 2006: 34-36; Nogales et alii 2009: 438-439). Because of the high demand for sculptural and architectural marble decoration for the monumental architecture of the town, many skilled sculptors and workshops (e.g. C. Aulus and Demetrios) settled in Emerita Augusta (Cisneros 1988: 46; De la Barrera 2000: 197; Creus Luque 2002: 253-254; Fusco and Mañas Romero 2006: 38; Nogales et alii 2009: 441).

Like for the Estremoz marbles, the limestone from Alconera had to be transported overland. The first part of the trajectory would have taken place as far as Emerita Augusta over the so-called Via de la Plata. Transport continued along the northern and central route between Emerita Augusta and Olisipo as far as Butua or as far as the crossroad with the road coming from the Estremoz quarries, somewhere between Crato and Assumar, where a secondary road diverted...
in the direction of Ammaia. The total length of the route amounted to c. 175 km or 205 km, depending on the trajectory chosen (Butua or Crato–Assumar).

For the africano and breccia di Sciro, it is not clear whether the stone reached Ammaia directly from the quarries or whether it was purchased and shipped from the stockpile yards in Rome. Based on inscriptions found on quarried blocks, Fant (1989: 12, 1993: 160-162) suggests a distinction between the trade in coloured ornamental stones and white marbles. While inscriptions on blocks of white marble (e.g. marble from Carrara, Proconessos, Thasos, Carystian and Dokimeion) were related to the internal functioning of the quarry, the inscriptions on blocks in coloured ornamental stones (e.g. africano, portasanta, giallo antico, pavonazzetto, alabastro cotognino and cipollino verde) generally have a purpose for the administration outside of the quarry. Based on these observations, it is suggested that the exploitation of the coloured ornamental stones, which were highly valued in Roman times, was fully organised and monopolised by the Roman state and that the material was brought to Rome after extraction from where it was subsequently shipped to the rest of the Roman world. Pensabene (2004: 44), however, states that the mode of distribution depends on the historical period, whether the stone is for a public or private building, whether the state was involved in the construction or embellishment of the building or not, and on the role of the local elite. Regardless of the mode of distribution for the africano and breccia di Sciro, the material had to be transported partly overseas to Iberian Peninsula and partly overland from the Iberian harbours onwards. The low amount of africano and breccia di Sciro and the small size of the veneer pieces might suggest that the material were probably a surplus from a larger shipment for a nearby town like Emerita Augusta where the material has been attested for the embellishment of, for example, the Portico del Foro of the municipal forum (De la Barrera 2000: 195-197; Cisneros 2002: 96; Nogales et alii 2009: 435-437). It must be realised, however, that this highly-prized stone material might have been spoliated after the abandonment of Ammaia.

Overall, the use of ornamental stone for architectural embellishment in Ammaia was based mainly on regionally available stones: white and grey–white marble from Estremoz and pink–purple limestone from probably Alconera. The forum temple is the only building excavated so far where imported coloured marbles (africano and breccia di Sciro) from the Mediterranean area have been documented.

The polychromatic effect created by applying these different types of coloured ornamental stones in combination with white marble can be considered an imitation of polychromatic veneer decoration observed in many monumental, public buildings (especially fora and theatres) in towns in the western and southern part of the Iberian Peninsula, such as Emerita Augusta, Bilbilis (Calatayud, Spain), Colonia Patrica, Caesaraugusta and Italica. For example, in the theatre and the Portico del Foro of the municipal forum of Emerita Augusta, white marble capitals and grey–white and grey column shafts from the Estremoz Anticline were combined with wall and floor veneer in pink–purple limestone from Alconera, africano, giallo antico, cipollino verde, portasanta and possibly also pavonazzetto. The Portico del Foro of the municipal forum was also adorned with Imperial portraits carved in white marble from Carrara (Lapuente et alii 1999: 112-115; De la Barrera 2000: 149,195-196; Fusco and Mañas Romero 2006: 30; Ayerbe Vélez et alii 2009: 551-553,559-560; Nogales et alii 2009: 435). In addition, some of the white marble cornices of the Portico del Foro of the municipal forum were painted red to imitate rosso antico or marmor Taenarium and to further enhance the polychromatic effect. Similar red-painted white marble cornices have been found in Saguntum (Sagunto, Spain) and Carthago Nova (Cartagena, Spain) (Cisneros 2002: 96-97; Cisneros and Martín-Bueno 2006: 498; Nogales et alii 2009: 436-437), and also at Ammaia. Besides the general purpose of architectural embellishment, the use of this particular scheme of decoration conveyed a propagandistic message for the Imperial cult of the Julio–Claudian emperors (e.g. the theatre and Portico del Foro of the municipal forum in Emerita Augusta). These buildings imitated the decoration of buildings constructed in Rome such as the forum of the Emperor Augustus (Cisneros 2002: 88-93). Even though more sober, the decorative programme for the forum temple of Ammaia probably propagates a similar message promoting the cult of the Julio–Claudian family. The togaed statue of the young prince Nero that was found in Ammaia could be part of a statuary group representing the Gens Augusta that possibly adorned the forum square and added to the propaganda of the Imperial cult (Fig. 6B).

Despite the use of predominantly regional stones, the large volume of stone material and its presence in both public and private contexts is an index of the town’s prosperity and wealth. Local elite families no doubt played an important role in the embellishment of the town. Donating marble decoration was a common form of private benefaction in Roman society, and was used for propaganda reasons by wealthy individuals to increase their social and political prestige in the local community (Fant 1988: 149; Cisneros 1997: 199-200;
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While the presence of a considerable amount of ornamental stone suggests that the town and its inhabitants were relatively well off, the low volume and limited range of imported stone is striking and can be explained in that the import of ornamental stones in *Ammaia* was not primarily determined by the economic power of its inhabitants but, rather, by the remote geographical location of the town and the financial burden related to the long-distance overland transport that was required to reach *Ammaia*. The importance of transport also explains the popularity of veneer in *Ammaia*. While fragile and bulky goods, such as columns and statues, involve great technological and practical difficulties for transporting, veneer could be brought to the town as standardised blocks that were sawn up on the construction site (Ward-Perkins 1951: 90; Dodge 1991: 37). This also explains why the local granite remained the preferred raw material for architectural elements like columns and capitals (Taelman et alii 2012: 119; Taelman et alii in press). Importing marble for these heavy and bulky goods must have been a too large financial burden.

A similar situation with mainly regional ornamental stones and only a reduced quantity of ornamental stone from the Mediterranean area can be observed in

| AFR | ALP | ALF | BAR | BNT | BIA | BRC | BRD | BRA | BRD | GAB | GIA | GRS | ON | LUM | MCL | TRG | MOP | OCP | FAV | POR | VIN | SER | ISA | ROA | VEA | Total |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ammaia | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Asturica Augusta | x | | | x | x | | | | | | | | | | | | | | | | x | | | | 5 |
| Biblis | x | x | x | x | x | x | | | | | x | x | x | x | | | | | | | | | | | 11 |
| Caesar Augusta | x | x | x | x | x | x | x | | | | | | | | | | | | | | | | | 10 |
| Carthago Nova | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | 22 |
| Colonia Lepida Celsa | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 12 |
| Colonia Patricia | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | | | | | | | 21 |
| Hispalis | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | 6 |
| Italica | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | | | 15 |
| Emerita Augusta | x | x | x | x | x | | | | | | | | | | | | | | | | | | | | 5 |
| Munigua | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Rubi | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 4 |
| Saguntum | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | | | | | | | 10 |
| Segobriga | x | x | x | | | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | 9 |
| Singilia Barba | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | 6 |
| Tarraco | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x | | | | | | | 16 |
| Tursio | x | x | | | | | | | | | | | | | | | | | | | | | | | | | 5 |

AFR = africano, ALP = alabastro a pecorella, ALF = alabastro fiorito, BAR = Bardiglio, BNT = bianco e nero tigrato, BIA = bigio antico, BRC = breccia corallina, BRD = breccia doria, BRA = breccia di Alessio, BRD = breccia di Sciro, CM = cipollino mandolato, ALE = yellow alabaster from Egypt, FP = fior di pesco, GAB = gabbro, GIA = giallo antico, GRS = greco scritto, ON = lapis onyx, LUM = lunachella carnica, MCL = granite from Mons Claudianus, TRG = Troad granite, MOP = granite from Mons Porphyrites, OCP = occhio di pavone, FAV = pavonazzetto, POR = porfido posso, POV = porfido verde egiziano, SER = serpentino, PSA = portasanta, ROA = rosso antico, VEA = verde antico di Grecia.

**Fig. 10.** Distribution of coloured ornamental stones from the Mediterranean in urban sites in the Iberian Peninsula (after Beltrán Lloris 1990; Cisneros 1997; Mayer and Rodá 1998; Cisneros 2000; De la Barrera 2000; Cisneros 2001, 2002; Gutiérrez Deza 2002-2003; Soler 2003; Cebrian 2004; GISbert Aguilar and Gaspar Raluy 2004; Cisneros and Martín-Bueno 2006; Álvarez et alii 2009a; Amores Carretero et alii 2009; Ayerbe Vélez et alii 2009; Rodríguez Gutiérrez 2009; Schattner and Ovejero Zappino 2009; Soler 2009; Cisneros et alii 2010-2011; Álvarez et alii 2012; Arola et alii 2012; Gutiérrez García-Morén and López Vilar 2012; Pensabene et alii 2012; Soler 2012).
several towns in the interior of the Iberian Peninsula with a remote location far from any seaport or navigable river, such as *Emerita Augusta, Asturica Augusta* (Astorga, Spain) and *Munigua* (Castillo de Mulva, Spain). The difficult accessibility of these sites promotes the exploitation and use of stone from local and regional sources (Cisneros 1997: 202, 2002: 97, 104; Pensabene 2004: 48-49; Fusco and Mañas Romero 2006: 18, 23; Nogales *et alii* 2009: 437; Schattner and Ovejero Zappino 2009; Cisneros *et alii* 2010-2011: 110-111). In *Emerita Augusta*, for example, the Extremadura quarries provided the bulk of the white marbles. Only to a lesser extent, white marbles from Almadén de la Plata, Macael and the Mediterranean, and coloured ornamental stones from the Imperial quarries in the Mediterranean were used (Cisneros 1988: 71, 89, 103; Nogales *et alii* 1999: 339-344; De la Barrera 2000: 195-196; Cisneros 2002: 96; Fusco and Mañas Romero 2006: 18, 21, 30; Ayerbe Vélez *et alii* 2009: 454, 551-553, 560; Mañas Romero and Fusco 2009: 492, 498; Nogales *et alii* 2009: 435). It needs to be noted, however, the most provenance data for the architectural white marbles from these buildings is derived through petrographic observations only. Whereas provenance determination of the architectural white marbles is still preliminary, sculptural white marbles have already been studied in more detail. Most private portraiture was carved in Estremoz marble. For the more important sculptural programmes, such as the Imperial statuary, marble was imported from Carrara, Aphrodisias, Paros and possibly also Pentelic (Lapuente *et alii* 1999: 112-115; Lapuente *et alii* 2000: 1491; Fusco and Mañas Romero 2006: 18; Lapuente *et alii* 2014: 349).

Unlike the towns situated in the interior of the Iberian Peninsula (e.g.* Ammaia, Emerita Augusta, Asturica Augusta and Munigua*), the towns along the Mediterranean coast or close to navigable rivers such as the Guadalquivir or the Ebro (e.g.* Caesaraugusta, Carthago Nova and Tarraco*) have a much wider range of imported ornamental stones (Cisneros 2001: 157, 165, 2004: 367; Nogales *et alii* 2009: 437). A notable exception is the urban site of Segobriga where, despite its location in inner Iberia, a large quantity and a large diversity of imported Mediterranean marbles have been detected, including bardiglio from Carrara, cipollino verde, giallo antico, occhio di pavone, pavonazzetto, portasanta, porfido rosso, rosso antico and serpentino (Cebrían 2004: Álvarez *et alii* 2009a; Pensabene *et alii* 2012) (Fig. 10). Similarly, the inner Iberian rural Balazote villa and the late Roman villae of Carranque, Cauca and Noheda display an extremely rich stone decoration. Especially the site of Carranque is unique from the point of view of stone decoration. With over thirty marmora employed, the site has one of the richest assemblages of Mediterranean marbles in the Iberian Peninsula (García-Entero and Vidal Álvarez 2007; García-Entero *et alii* 2009; García-Entero and Vidal Álvarez 2012; Pérez *et alii* 2012; Sarabia Bautista 2012).

**CONCLUSIONS**

Apart from a local granite that was used for columns and capittles, five types of ornamental stone were used for embellishing the architecture at *Ammaia*. White marble with occasional coloured veins clearly formed the most important ornamental stone, followed by pink–purple limestone and, in minor quantities, also grey–white marble and marble breccia. Overall, the decorative programme at *Ammaia* was rather sober with generally only white marble. The studied fragments show that for the forum complex and, to a lesser extent, for the South Gate, a polychromatic effect was created by applying different types of ornamental stones.

Macroscopic, petrographic and geochemical analyses have illustrated that most ornamental stones used for embellishing the architecture in *Ammaia* were obtained from formations in the western part of the Iberian Peninsula. White and grey–white marble were quarried from the Extremadura Anticline (Portugal), located about 80 km to the south. Pink–purple limestone seems to originate from the Alconera quarries (Spain), located about 55 km south of *Emerita Augusta*, in the ancient Roman province of Baetica. The only imported stone from the Mediterranean area thus far observed was africano from Teos in Turkey and breccia di Sciro from Skyros in Greece.

The situation regarding the import and use of ornamental stone in *Ammaia* is comparable with that of several other towns in the interior of the Iberian Peninsula. Similar decoration schemes with mainly regional stones can be observed, for example, in *Emerita Augusta, Asturica Augusta and Munigua*. Even though the general nature of the polychromatic decoration is comparable to that of other towns on the Iberian Peninsula, the range of imported stones in *Ammaia* is far more reduced with only low quantities of africano and breccia di Sciro as Mediterranean import.

Despite the predominance of regional ornamental stones, the ubiquitous use and the presence in both public and private contexts illustrates the prosperity and wealth of the town and its inhabitants. While the presence of a considerable amount of ornamental stone suggests that the town and its inhabitant were relatively well-off, the low volume and limited range
of imported stone is striking and could be explained by the fact that the import of ornamental stones in Ammaia was not primarily determined by the economic power of its inhabitants but, rather, by the remote geographical location of the town and the financial burden related to the long-distance overland transport that was required to reach Ammaia.

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At the end of the 2nd century BC, Roman soldiers followers of Caesar Augustus began the conquest of Lusitania, which in the course of the 1st century BC was already part of the Roman Province of Hispania Citerior. The Roman presence had a significant impact on the local societies, leading to the incorporation of Lusitania into the Roman Empire.

The text describes the different aspects of this historical period, including the conquest of Lusitania, the Romanization process, and the influence of Roman culture on the local populations. It also mentions the role of military campaigns and the establishment of Roman military and civil settlements in the region.

The text highlights the importance of archaeological research in understanding the history of Lusitania and the Roman Empire's impact on the region. It emphasizes the need for continued research to uncover new insights into this fascinating period of history.
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