

Considerations about the Cost of the Polychrome Decoration and the Constructive Materials of the Temple of *Divus Augustus* at *Colonia Patricia*

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The purpose of our contribution is to share some of the main developments and considerations resulting from a critical research work carried out jointly. Our focus of study has been a monumental complex of *Colonia Patricia* (Cordoba, Spain) known as the *forum novum*. It is one of the most relevant places of Córdoba, the capital of the Roman province of *Baetica*. The *forum novum* is a monumental complex located next to the colonial *forum* of the city. It occupied four *insulae* of a former residential area, which were expropriated at the beginning of the Tiberian period.¹ The discovery of several structures in Calle Moreria 5 in 1998 was the starting point of the study and definition of the topography, architecture and function of this public space. The *forum novum* consists of a square² enclosed on three sides by a portico. In the centre, although it is slightly displaced towards the east, a marbled temple was raised. The religious building, located on the axis of the *decumanus maximus*, had 29.6 m (100 roman feet) in width, an approximate length of 45 m and almost 30 m in height (fig. 1).³

The discovery of several fragments of the dedicatory inscription of the temple, as well as the study of the architectural, sculptural and epigraphical program of the *forum novum*, has led us to consider that the temple was dedicated to *Divus Augustus*, while the *forum novum* probably served as the provincial centre of the imperial cult in *Baetica*. It is a colossal complex, which could be compared to other monumental complexes with similar size and functionality, such as the Provincial Forum of *Tarraco*, and the so-called “Provincial Forum” of *Augusta Emerita* (fig. 2). These places share close relations in their proportions and sense.

The amount of preserved architectural materials has led us to undertake a quite accurate restoration of the temple. All the pieces discovered have received a detailed study of their size and proportions that have made it possible to estimate the elevation of the temple. It was a temple with an octastyle front a pycnostyle rhythm, a Corinthian order, with columns that reached 16 m in height.⁴

The study of the architectural pieces discovered has revealed to us that different materials were used in the temple. On one hand, the extensive use of Carrara marble to build the outward of the building has been detected.⁵ On the other hand, it can be highlighted the use of imported stoned materials from the Mediterranean area. Inside the *cella*, we have Teos marble, *cipollino*, *giallo antico* and *pavonazzeto* for the columns that decorated the niches, but also, for the *opus sectile* pavement.⁶ Moreover, the use of regional stones from nearby quarries to the city such as Almadén de la Plata (Seville), Estremoz, Peñaflor (Seville) or Rodadero de los Lobos (Sierra of Cordoba) has been discovered.⁷



Fig. 1: *Colonia Patricia* in the first half of the 2nd century AD (left) and the *forum novum* in the same period. 3D reconstructions made by the Sísifo Research Group (University of Cordoba).

Furthermore, it has been detected in several pieces a patina or a primer, but also a specific treatment known as “a gradina”. As a consequence, we decided to carry out several analyses to determine the existence of remains from the original polychromy on the elements of the temple. Through the use of the *Visible Induced Luminescence digital imaging* technique, it is possible to detect remains of the pigment known as Egyptian Blue.⁸ A synthetic pigment widely used in antiquity to paint sculptures and architectural elements.⁹

The pigment has the property of absorbing radiation and emitting infrared radiation. The technique visualises and detects particles of the pigment that remain invisible to the naked eye, which are captured using a modified camera¹⁰ in an environment of absolute darkness. This technique made the detection of microscopic or submicroscopic traces of this pigment possible, which could appear at its finest (blue colour) or mixed to obtain other colours such as the green (blue + yellow) or purple (blue + red).¹¹ When this technique is applied, the remaining traces of the pigment react and emit several small luminous points. Regarding the use of gilding, the remains of this decorative technique are usually found under the concretions formed in the pieces as time goes by.

The results of the use of this technique were positive because we found some remains of Egyptian blue on the surface of several pieces of the elevation of the temple such as the column shafts, the frieze and the architrave. These remains reveal their mixture with another pigment. In reference to the use of gilding, it has been detected in a capital fragment, but also in an architrave piece. The capital had traces of a kind of reddish clay known as Armenian Bole or *bolus armena*. This kind

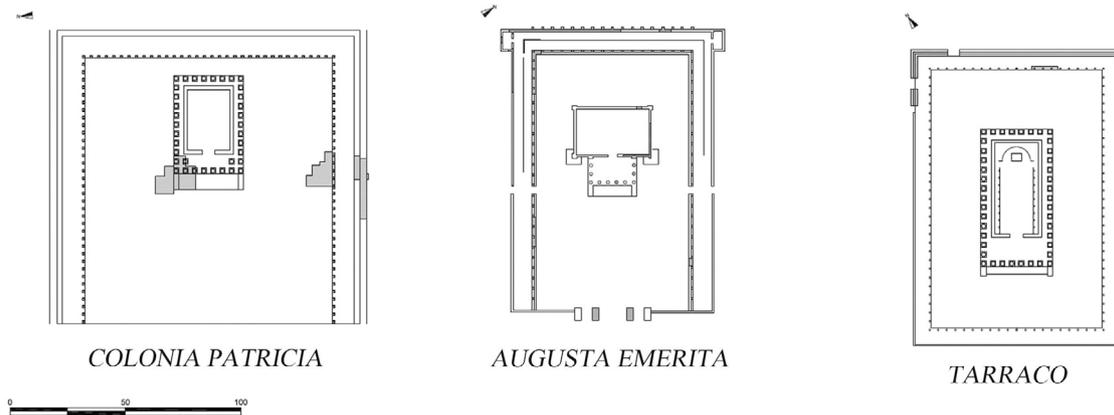


Fig. 2: Comparison of several imperial cult complexes found in *Hispania*.

of reddish clay was used as a preparation ground for gilding and as a technique to provide a warm looking effect to the pieces.¹²

After the hypothetical chromatic reconstruction of the temple, we suggest that the Egyptian Blue pigment was mixed with a type of red pigment, creating the purple colour. Purple is usually associated with wealth and the royalty.¹³ This idea makes sense with the ideological meaning of this building. Moreover, this dark tonality creates a contrast in certain areas of the temple that were intended to be highlighted, such as the astragal, standing out as golden necklace, or the frieze, where the dark background makes easier to read the inscription in *litterae aureae* (fig. 3).¹⁴

As for the polychrome decoration of the temple, the main reliable parallel is the Palatine temple of Apollo in Rome, which has been studied by Stephan Zink and his team. They have carried out several analyses¹⁵ to a set of architectural pieces from the temple such as several capitals, the architrave and the cornice.¹⁶ The study of the capitals revealed traces of a light ochre and a pigment mix of cinnabar and a red bolus, which worked as a preparation ground for gilding. According to Stephan Zink, the temple's colour scheme shows a conspicuous display of both gold and white marble, although other colours were also detected, such as Egyptian blue or red on the cornice. As a result, the largest part of the temple was left untreated in white marble and the colour was used to support specific parts of the architectural design such as the capitals, the architrave, and the cornice.

Regarding the different dyes in antiquity, it goes without saying that the most valued was purple. It was not one colour but rather a wide range of colours obtained from the liquid that could be extracted with a somewhat complex process from two varieties of marine snails: purple (*Murex brandis*) and *buccinum* (*Thais haemastroma*), both native to the Mediterranean coast, and especially, the east coast.¹⁷ The scarce quantity produced by each animal and the beauty of this pigment explains its high value. Moreover, its use was a symbol of a high social status and it was reserved for rulers and high officials.

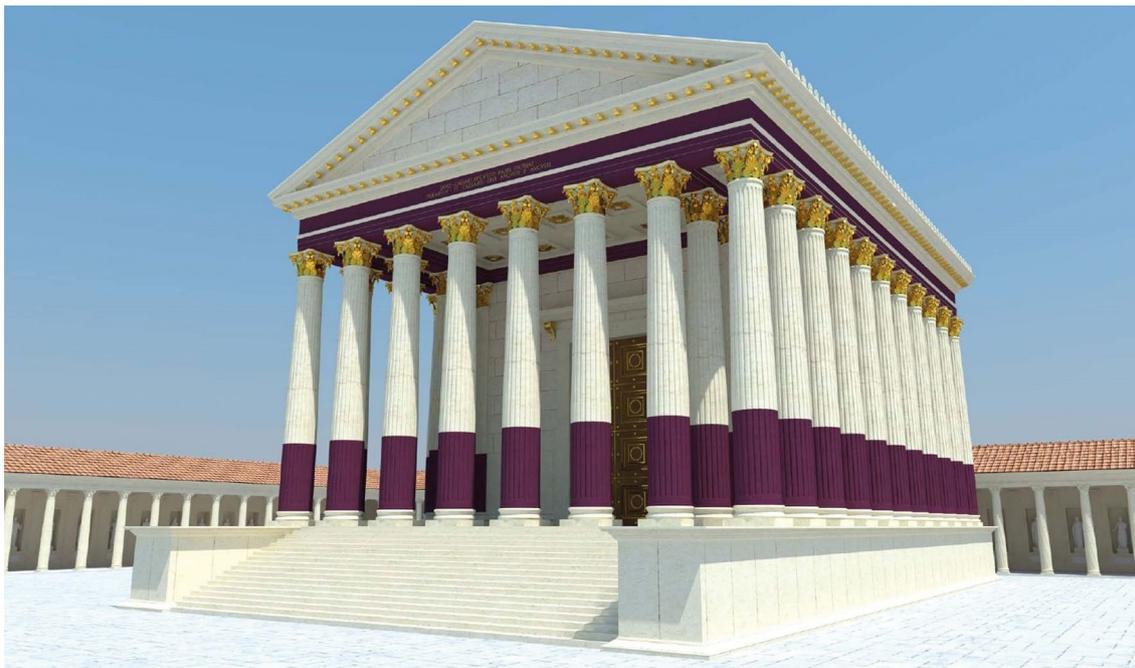


Fig. 3: Colour reconstruction of the temple of *Divus Augustus* at *Colonia Patricia*.

Purple was also a colour associated with the sacred sphere, as shown by numerous literary references from different cultures, which always linked it to temples (Exodus XXXVI, XXXVII, XXXIX).

Purple could also be identified with the figure of the emperor himself in his relation with the imperial power, acquiring the title of “*Divine purple*” and using the term *purpuratus* to designate the legitimate sovereign. The glow of purple and gold also alluded to the sun, linked to the imperial cult through the figure of Apollo and the *Sol Invictus*, a divinity closely linked to Augustus.¹⁸

The high value of purple led to the search for more affordable alternatives to reach this colour-scheme. One solution was the use of substitutive dyes, which have been registered in numerous literary sources (Stockholm papyrus¹⁹, Pliny, Vitruvius, etc.). These substitutive dyes could be made with pigments of mineral, animal or synthetic origin such as Egyptian blue, mixed with some reddish pigment such as *kermes*, common madder, cinna, cinnabar / vermilion (mercury sulphide) or *minium* (lead oxide).²⁰

In the Stockholm papyrus, also known as *Papyrus Graecus Holmiensis*, we can find several recipes to make some dyes, among which the imitation dyes stand out, as it goes with purple. Moreover, there are several recipes to make golden tinctures and yellow varnishes. Finally, both Pliny (Nat. Hist., XXXV, 26 and 45) and Dioscorides (*De Materia Medica*, V-67) mention a series of plants and natural substances from which substitutes of purple were obtained.²¹

Regarding the gilding and metallic colours, the Leyden Papyrus (3rd century AD) is mainly concerned with metallurgy and the production of imitations of gold and silver. In this regard, we have a wide range of archaeological and literary testimonies that show the use of gilding in the monumental architecture. According to Pliny (Nat. Hist., XXXIII, 57), capitals sheathed in bronze were used in the *Porticus Octavia* and the *Pantheon*, while gilt-bronze tiles were used in the temples of Jupiter Capitolinus and Vesta. Another Roman historian, Suetonius (Ner. 31) mentions that several parts of the *domus aurea* were overlaid with gold, hence the name, Golden House. Finally, the archaeological discovery of gilded bronze plates belonging to the stylobate of the *Mars Ultor* temple in Rome²² would confirm these written sources.

Conclusions

In conclusion, regarding the stone materials used in the construction of the Roman temple of *Divus Augustus* of Cordoba, we have noticed that there was a planned program. On the one hand, there are high-cost imported materials from various Mediterranean quarries, which are related to social prestige and the *domus augustea* sphere, as these were the most frequently materials used in the main construction projects of Rome.²³

On the other hand, these stone, imported materials are combined with other materials of regional origin. Among them, we could highlight the use of several materials due to their quality, chromatic characteristics and aesthetic appeal. Such is the case of some stone slabs used in the floor of the *cella* that come from quarries located in the surroundings of Peñaflor (Seville). These stone slabs have also been detected in other monumental public buildings of *Baetica*²⁴, such as the Roman theatre of *Italica*. Moreover, other materials of regional origin could have been used due to the extraordinary similarity with certain Mediterranean *Marmora*.²⁵

In Cordoba, there is another monumental building known as the cultural complex of Calle Claudio Marcelo, where we have detected the use of other stone materials of regional origin. Such is the case of a stone that comes from the quarries of Almadén de la Plata, whose resemblance to the *cipollino* of Karystos (Euboea, Greece) is truly amazing.²⁶ Moreover, the use of “*nodulosa violácea*”, that is a limestone of local origin, for the paving of the square, plays a symbolic key role. In fact, the *temenos* would be demarcated by the purple tone given by this stone, thus distinguishing, through colour, the profane space of the sacred area.²⁷

It is also possible that the remains of “supposed *cipollino*” found in the *Divus Augustus* temple of Cordoba, could be a stone material from Almadén de la Plata which is known as “*cipollino* from Almadén”. If so, it would be the only possible imitation *marmora* used in the temple. Nevertheless, a detailed petrography analysis is needed to differentiate the regional stone from the *cipollino* of Karystos. The high price of the *cipollino* marble, as it is reflected in the Edict of Diocletian, but also other factors such as the proximity,

accessibility and availability of the quarries of Almadén de la Plata, the extraordinary similarity of both materials, and finally, the complex transportation and process of the *cipollino*, could explain the use of an alternative stone material to reduce building costs.²⁸ However, this hypothesis should be corroborated by the study of the stone material in a laboratory in order to discover its nature and origin.

As for the polychrome decoration of the *Divus Augustus* temple, as it happens in the Palatine temple of Apollo, the chromatic scheme combines the use of painted areas with parts where the marble colour remained visible. In fact, in Cordoba, it is possible that the aim was to highlight only some parts of the temple. As regards the gilding technique, it was used in several surfaces such as stucco (i.e. architectural decoration elements inside the temple of Apollo Sosiano in Rome), bronze, and of course, marble.²⁹ The use of this technique involves the application of a preparation ground for gilding, as it has been detected by different researchers.³⁰ In the case of the *Divus Augustus* temple, we were able to identify this preparation ground for gilding in one of the capitals. Moreover, it was able to find remains of gilt under the concretions of part of the architrave. As a result, the use of gilding should have been one of the most expensive costs associated to the building of the temple.

Finally, regarding the use of pigments, we believe that the high price of the purple as a dye, and the large number of purple needed for the pictorial decoration of the temple, led to searching for alternative solutions.³¹ In this way, we suggest that the Egyptian blue pigment was mixed with a red pigment, making a precious colour that, together with the gilt, gave the building all the symbolic and ideological connotations related to sacredness and power, and were suitable for a space where people could worship the emperor as a god.

Notes

¹ Portillo 2015a, 75.

² The square measures 126.822 m in width by 131.100 m in length.

³ Portillo 2018, 46.

⁴ Portillo 2018, 46–47.

⁵ Ventura 2007, 224.

⁶ Borghini 2004, 202. 214. 264; Pensabene 2013a, 423–425; Pensabene 2013b, 23–25.

⁷ Beltrán – Rodríguez 2010, 565–568.

⁸ Verri 2009, 1013.

⁹ Liverani 2005, 196 f.; 2008, 66–80; Liverani – Santamaria 2014, 14–16.

¹⁰ A digital camera with a RG 830 filter and without its internal IR cut filter.

¹¹ *Visible Induced Luminescence* image of reference: Egyptian blue at its finest and mixed with yellow (= green) and red (= purple) from a stucco of the Roman villa of Almedinilla, Córdoba (IPPH).

¹² Portillo 2015b, 181.

- ¹³ Fernández 2010, 278–287.
- ¹⁴ Stylow – Ventura 2013, 311; Portillo 2016, 33.
- ¹⁵ The technique used in this building was UV-VIS Absorption Spectrometry.
- ¹⁶ Zink – Piening 2009, 112–114.
- ¹⁷ Berke 2002, 2486; Bradley 2009, 148–150.
- ¹⁸ Fernández 2010, 267 ff; López – Dalmau 2007, 110.
- ¹⁹ Among the main sources of the time that provide information about pictorial materials, it can be highlighted the texts of Theophrastus (4th century BC) and Vitruvius, Pliny and Pedanius Dioscorides, all from 1st century AD. A special mention deserves the Papyrus of Leyden and Stockholm (end of the 3rd century – beginning of the 4th century AD), as both could be considered the first alchemical texts which artistic materials are intentionally mentioned. Both papyri contain numerous recipes; while the first papyrus focuses on metallurgy and describes methods for gilding, plating and colouring metal surfaces; the second contains recipes for dyeing, mordanting and manufacturing artificial gems. Moreover, all these texts have a key role in the history of alchemy.
- ²⁰ Porat – Shimon 1998, 81–83; Orna 2016, 43–45.
- ²¹ Fernández 2010, 133–156.
- ²² Ricci 1925–1926, 3–7.
- ²³ Barresi 2003, 151–153; Pensabene 2013b, 14–22.
- ²⁴ Portillo 2016, 28–35.
- ²⁵ Rodríguez 2009, 233–235.
- ²⁶ Gutiérrez 2016, 189–191.
- ²⁷ Luzzato – Pompas 2001, 36–38.
- ²⁸ Barresi 2003, 151–153; Rodà 2012, 87.
- ²⁹ López – Dalmau 2007, 126.
- ³⁰ Liverani 2009, 392.
- ³¹ Porat – Shimon 1998, 83 f.; Orna 2016, 43–45.

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Fig. 1: Source: <<http://www.arqueocordoba.com>>. – Fig. 2: Portillo 2018, lam. 2. – Fig. 3: Portillo 2018, Imagen 3D n° 1.

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