

**Keywords:** Polychromy, Roman architecture, colour schemes, regional diversity, architectural decoration

*The following article serves both as an introduction to and a summary of the present volume. After a brief review of the history and current state of research on Roman polychromy, we summarise the evidence from the collected essays with the following objectives: 1. to present new data on raw materials, painting techniques, and traces of paint on the architectural orders; 2. to categorise the visual effects for which colour was used on architectural elements; 3. to collate observations on the (a) functional, (b) chronological and (c) regional variation of colour schemes in the architecture of the Roman provinces.*

The study of polychromy in ancient stone artefacts is currently enjoying a period of considerable popularity. As early as the 17<sup>th</sup> century, it was known from ancient texts, at least in principle, that Greek and Roman statues and reliefs had been painted. Nevertheless, the topic became highly disputed in the 19<sup>th</sup> century after the discovery of well-preserved sculptures which showed clear traces of paint, like the ones from the temples at Athens and Aegina<sup>1</sup>. One pressing issue was whether all statues from all ancient eras should be imagined as painted. Ideological aspects underpinned the debate: the seemingly white appearance of the statues was intertwined with aesthetic norms since the Renaissance, which were anchored in a conception of Classical Greece. Maintaining this ideology was important to contemporary ideas, even if it did not reflect the archaeological evidence<sup>2</sup>. By the end of the 19<sup>th</sup> century discoveries, e.g. of late Archaic sculpture from the ‘Perserschutt’<sup>3</sup>, as well as of the Alexander Sarcophagus<sup>4</sup>, had effectively settled the question – in favour of colour. Consequently, the subject almost immediately fell out of focus in archaeological research. Yet, ancient artefacts tended to remain colourless in the imagination of the general public, as well as the minds of many archaeologists and art historians, for a number of reasons. First, even if examined in first-person, the majority of sculptures appeared to be unpainted as traces of colour had long faded or been washed away. Second, the reproduction of traces of polychromy in the media of the day was a challenging endeavour. Plaster casts and prints, but above all black-and-white photography, could only be coloured with considerable additional effort resulting in an aesthetically unconvincing outcome<sup>5</sup>. Primarily, however, archaeologi-

cal research, as an increasingly specialised cultural study, had detached itself from the high-profile question of its own aesthetic ideals, as well as from the materiality of its subject. Instead, it has concentrated for long parts of the 20<sup>th</sup> century only on aspects of the form<sup>6</sup>.

In the past decades, colour reproductions in printed and digital formats have become more readily available, and methods have been developed and refined which allow for the identification of traces of paint, even on seemingly colourless objects. A good microscope is often sufficient to find the tiniest remnants of colour pigments. In addition, there are numerous other methods that can indicate the former presence of colour, even where residue cannot be observed with the naked eye<sup>7</sup>.

With the implementation of new scientific methods, impressive new findings have been generated. Paradigmatic is the exhibition ‘Gods in Colour’, which has been on show in over 25 cities in Europe and North America, since its first edition in 2003. Displaying numerous colour reconstructions of famous ancient sculptures, it was as provocative as it was captivating. While the exact colour code and the intensity of the colours still need to be defined more precisely, the polychromy of ancient marble statues is no longer in question<sup>8</sup>. In recent years, sculptures all across the Mediterranean, particularly in the major museums, have been subjected to intensive study. Resulting colour reconstructions, such as that of the Augustus of Prima Porta in the Vatican Museums<sup>9</sup> (see Müller fig. 6) or the Caligula portrait in Copenhagen<sup>10</sup> have become figureheads of a new perspective on ancient sculpture. Book-length studies have been devoted to the topic<sup>11</sup>, and work by an international community of scholars has found a

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1 For the polychromy on the temples of Aegina see Bankel 1993 and Wünsche 2011, 231–261.

2 For a detailed overview on the historical development of research, see Lenzi 2016, 65–76; Henke 2020, 27–78.

3 Brinkmann 2003.

4 von Graeve 1970.

5 Dally 2017.

6 Henke 2020, 78–82.

7 Østergaard 2017, 159–164.

8 Cf. most recently Brinkmann – Koch-Brinkmann 2020.

9 Liverani 2003.

10 Østergaard 2006.

11 See most recently Blume 2015; Henke 2020; Skovmøller 2020.



Fig. 1  
Colour reconstruction  
of the so-called temple  
d'Empédocle in Selinunte by  
Jakob Ignaz Hittorff in 1851

permanent place in the research landscape. Dedicated sections are organised at major specialist congresses, and researchers meet in regular roundtables<sup>12</sup>. The subject has also received attention in neighbouring disciplines such as philology, ancient history, or the archaeology of other periods and places<sup>13</sup>. However, a closer look at this active research landscape reveals gaps in the knowledge of polychromy in Classical Archaeology: outside the Greek and Augustan Roman periods, beyond marble, a favoured material, and above all beyond round sculpture and relief.

In contrast to the extensive discussion of polychromy in Greek as well as in Roman sculpture, research on colour and painting in architecture has focused almost exclusively on the Greek period. Greek architectural polychromy received considerable attention in the beginning of the 19<sup>th</sup> century, culminating in the visually powerful colour reconstruction of the temple of Selinunte by Jakob Ignaz Hittorff (fig. 1). New evidence has been made available on a regular basis, and today, Greek architectural polychromy can be regarded as relatively well-known<sup>14</sup>. On the con-

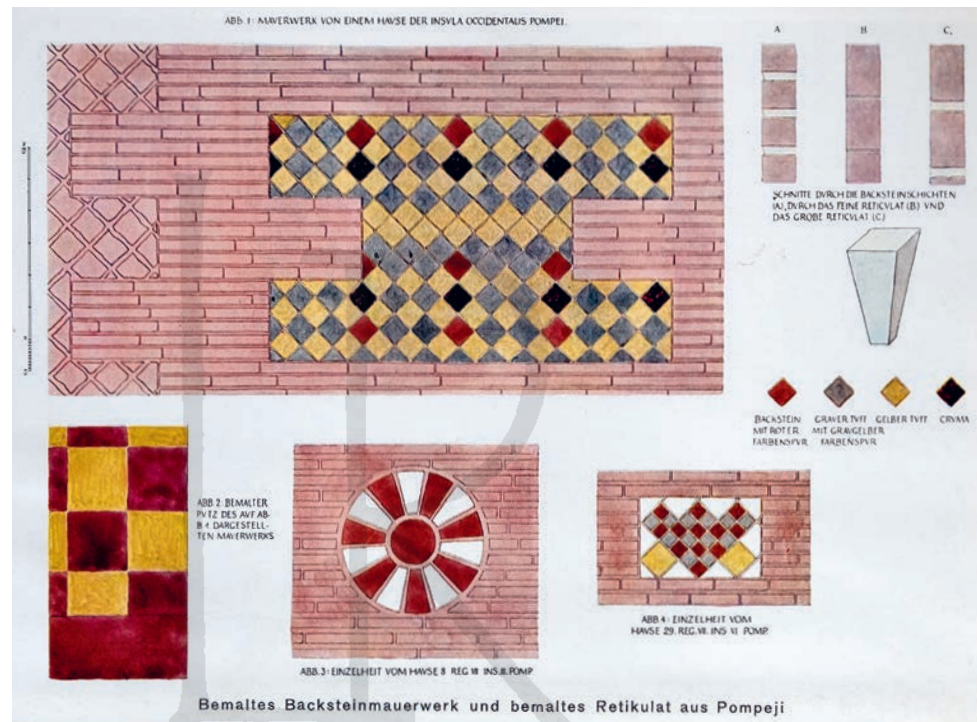
12 Most recently the 11<sup>th</sup> International round table on Polychromy in Ancient Sculpture and Architecture in Rome in November 2022, the session “Polychromy in Practice: Casting Colour onto Roman Artworks”, organised by Louisa Campbell and Gabrielle Kremer at the 29<sup>th</sup> EAA Annual Meeting 2023 in Belfast, the Chroma Symposium after the exhibition “Chroma: Ancient Sculpture in Color”, in the Metropolitan Museum of Art, New York, in March 2023 or the international conference “Colours

Revealed. Polychrome Monuments in the Roman Provinces Detection, Interpretation, Visualisation”, realised by the Heritage Science Austria, ÖAW, in Vienna in March 2024.

13 Cf. e.g. Goldmann 2016; Ierodiakonou – Derron 2020.

14 On the history of research for Greek architecture see Henke 2020, 38 f. and Zink 2022, 236 with note 3. Overviews are given in Hoepfner 2002; Hellmann 2002, 229–256; Guimier-Sorbets 2018; Zink 2019.

Fig. 2  
Coloured brickwork and  
reticulate masonry from Pompeii  
after Hermann Phleps



trary, the polychromy of Roman architecture, remains under-examined<sup>15</sup>. The limitations of our knowledge in this regard can be exemplified by a brief examination of three texts on the topic from 1834, 1930, and 2022, providing insights into the state of knowledge at the time of their publication.

In 1834 Gottfried Semper was one of the first to write about Roman architectural polychromy<sup>16</sup>. He believed that Roman architects continued the work of their Greek forebears, principles of architectural polychromy included, and that “all monuments of Rome, made from white marble or common stone, show traces of painting”<sup>17</sup>. This was a bold statement. But he also argued that the Romans had achieved their colourful architectural effect mainly by employing naturally coloured stones and rare timbers rather than by painted stuccowork. Almost a century later, in 1930, Hermann Phleps attempted to provide a more comprehensive description of Roman architectural polychromy<sup>18</sup>. Drawing upon examples from Pompeii, he noted again the use of naturally coloured stone, of patterned reticulate (musivic masonry) and brickwork, but also of red painted socles, cornices with red and blue paint to enhance their plasticity, as well as capitals with coloured kalathoi (fig. 2). His model of a Roman colour system

remained inevitably static, with no regional or functional diversity. He did, however, note that in Late Roman times, the system may have been simplified. Another 89 years later, one of the most prominent experts for architectural polychromy, Stephan Zink, who, fifteen years ago, collaborated with Heinrich Piening on groundbreaking colour studies on the components of the temple of Apollo Palatinus<sup>19</sup>, attempted to construct a chronological narrative that distinguished between the Early/Middle Republican, Late Republican/Augustan, Imperial/Late Antique periods. In general, he argues that colour was initially used in accordance with Greek principles, e.g. as evidenced by the 3<sup>rd</sup>-century BC tombs at Sovana. And, that there was also a growing preference for the use of bright and varied hues as well as occasionally monochrome white. In addition to the first patterned masonry and brickwork, the Augustan period saw an increased use of metal and gilding in temple architecture along with the integration of coloured stones, which peaked in late antiquity<sup>20</sup>.

This model, based on a considerable amount of new and reliable evidence, certainly represents a significant advancement. However, the question remains whether Roman architecture is characterised by fundamentally binding colour schemes<sup>21</sup> or whether the colours chosen,

15 A summarising appraisal of research into the polychromy of 19<sup>th</sup>-century Roman architecture is now provided by Zink 2022, which, however, is limited to Rome and central Italy. Most recently, studies have also been carried out on the polychromy of Roman architectural terracottas: see the corresponding contributions in Reinhardt 2024.

16 Semper 1834.

17 Semper 1834, 14.

18 Phleps 1930.

19 Piening – Zink 2009.

20 Zink 2019; cf. before Mattern 1999, 21–29.

21 Zink's schematic structure bears resemblance to the initial attempts to systematise the chronology of Roman architectural elements at the beginning of the 19<sup>th</sup> century, undertaken in

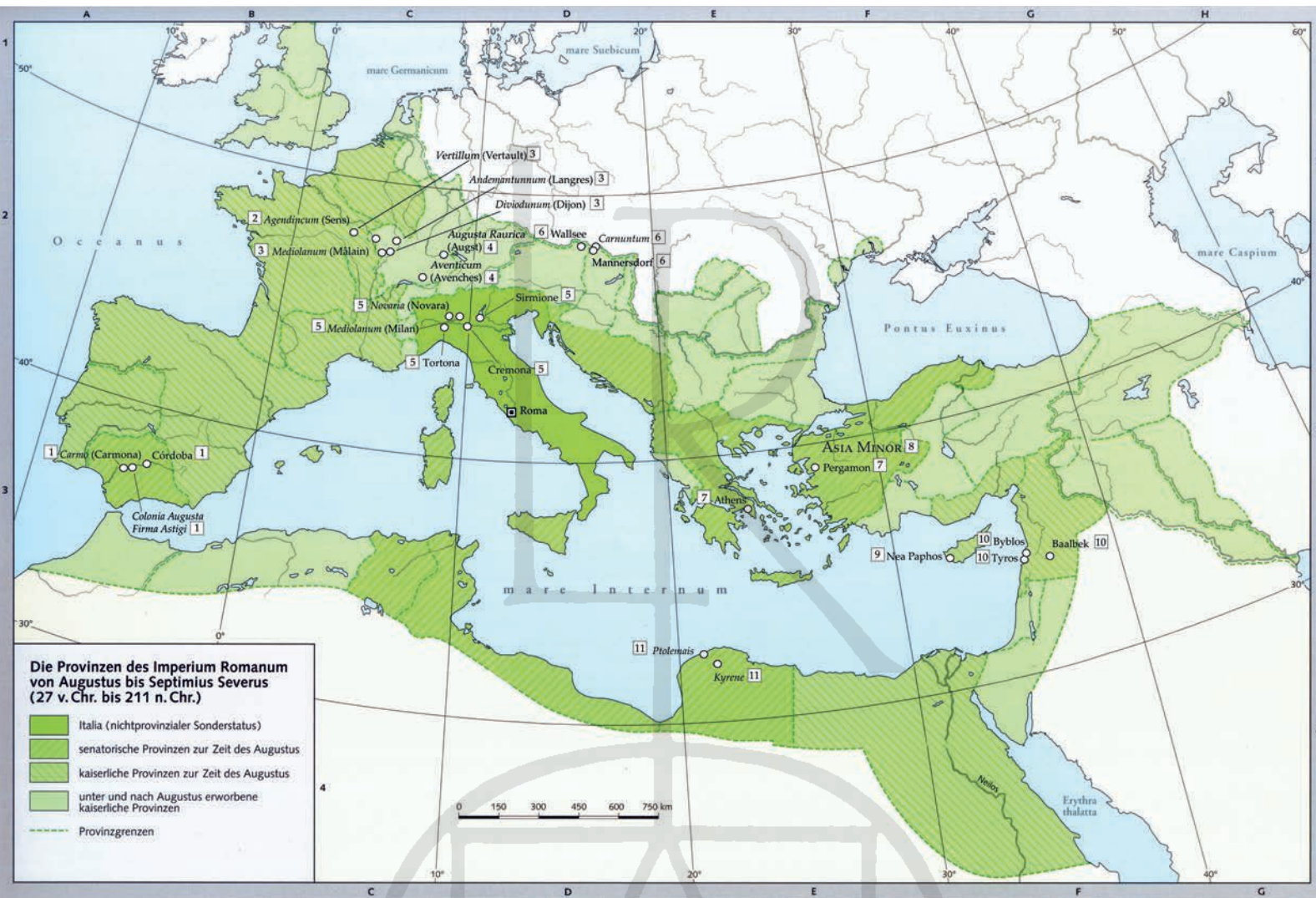


Fig. 3 Areas and places focused on by the contributions in the present volume:

- 1 Ana Portillo
- 2 Nicolas Delferrière – Mathieu Ribolet
- 3 Nicolas Delferrière – Anne-Laure Edme
- 4 Thomas Hufschmid
- 5 Furio Sacchi – Sara Lenzi – Luca Polidoro
- 6 Georg Plattner – Gabrielle Kremer – Robert Linke – Eduard Pollhammer – Robert Krickl – Václav Pitthard – Klaudia Hradil
- 7 Burkhard Emme
- 8 Barış Yener
- 9 Aleksandra Brzozowska-Jawornicka
- 10 Hany Kahwagi-Janho
- 11 Eleonora Gasparini – Monika Rekowski

and their associated visual effects, are not only determined by time and functional contexts<sup>22</sup> but also reflective of regional variety. This final point has not yet been fully acknowledged by Zink or others in the field of polychromy research<sup>23</sup>.

This question was the point of departure for both the Ingelheim Colloquium and this volume. Our intention is to focus, for the first time, on architectural polychromy

in the Roman provinces. In doing so, we combine three objectives: first, we seek to improve the data and gather examples of as many architectural elements with traces of colour, observations on raw materials and painting techniques as possible. Secondly, we attempt to categorise the visual effects achieved by the painting of architectural elements. This involves considering aesthetic ideas, atmospheric qualities and semantic statements, as well as

the wake of Winckelmann and soon became obsolete, see Nibby 1830, 76–86.

22 As already suggested by Zink 2022, 260.

23 Zink 2019; Zink 2022.

questions regarding the interplay of the painted building elements with wall paintings and furnishings. Building on these ideas, our third goal was to make initial observations of (a) functional, (b) chronological, (c) regional variation.

The contributions in this volume, encompass a wide geographical range including modern Spain, France, Switzerland, Italy, Austria, Turkey, Cyprus, Lebanon, and Libya. The area represented can be broadly described as falling into three macro-regions: the northwestern provinces, Greece and Asia Minor, and the southeastern Mediterranean (fig. 3). The architectural elements presented cover a broad chronological period from the 2<sup>nd</sup> century BC to the 3<sup>rd</sup> century AD. The essays on individual regions and sites are preceded by two more introductory articles including broader perspectives on polychromy, from the Middle Ages and ancient written sources, to provide an overview of the cultural-historical significance of the topic for the reader.

Matthias Müller draws attention to coloured cathedrals in the Middle Ages<sup>24</sup>. Using the example of the cenotaph of Rudolf of Habsburg in Speyer (see Müller fig. 1. 2), whose portrait looked much younger in the painted version than it appears today without colour, the author first underlines the great importance polychromy had in the Middle Ages not only for the aesthetics but also for the semantics of sculpture. His account of the progress of research on polychromy in art history parallels that of archaeological research in many ways. At the beginning of the 19<sup>th</sup> century, it was established expert knowledge that Medieval cathedrals were painted with colour, both inside and outside. However, over the course of the century, the idea of stone foundations and unplastered walls prevailed, driven in part by an ideological agenda in the conception of Medieval cathedrals. In turn, the evidence was even re-modelled to meet these expectations – for example, by chiseling off the exterior plaster of Limburg Cathedral in 1871–1874. Müller impressively describes the struggle, still ongoing, for the correct use of colour in restoration work, using examples of Amiens and Chartres. It is noteworthy that in recent years, as for ancient sculptural polychromy, the debate is not any more centred on the question if cathedrals were painted or not, but has largely focused on the extent to which and the opacity with which colour tones were once applied.

In addition, the example of the Medieval cathedrals – where colour can often be better reconstructed than for ancient buildings – also helps to understand the extent to which a building's polychromy contributed to its aesthetics. According to Müller, the applied colour scheme in the interior of Chartres cathedral lent the otherwise dark and cold-looking interior a “cheerful and festive” atmosphere. It also visually emphasised the load-bearing elements, making architectural structure immediately legible. Most importantly, however, Müller is able to demonstrate that, in Medieval times, different colour schemes existed simultaneously. For example, the cathedrals of Amiens and Marburg employed a more limited palette and accentuated structural elements differently than in Chartres. This finding highlights the regional and supra-regional transfer processes of established colour schemes for Medieval sacred architecture, and also raises the question of whether different colour systems and modes of dissemination can also be expected for the architectural polychromy of the Roman provinces<sup>25</sup>.

Antonio Dell'Acqua gives a detailed account on gold and gilding in Roman architecture, drawing on numerous ancient written sources in addition to selected archaeological materials<sup>26</sup>. After a brief description of the techniques employed in gilding as described by Pliny the Elder, he traces a history of gilding in Roman architecture from the 2<sup>nd</sup> century BC to late antiquity. Gilding in Roman architecture can be traced back to the first use of this practice in the eastern Mediterranean in 146 BC parallel with the early use of Greek marble. Having become widespread from the Augustan period onwards, the technique, among other things, provoked the Roman luxury debate, but continued to be used until Late Antiquity. Comparisons to literary sources, particularly their value judgements of gold, provide insight into the social implications of colour and material in Roman architecture<sup>27</sup>.

### Collecting data of painted building elements, their painting technique and maintenance

One of the first and foremost concerns of this colloquium was to bring together scholars working on different parts of the Roman Empire in order to collect new evidence for polychromy on Roman architectural orders. A famil-

24 A first joint observation of ancient and medieval polychromy using the example of sculpture has already been made to some extent by Brinkmann et al. 2008.

25 Cf. the transfer and transformation processes of Roman architecture, which have recently been increasingly analyzed in terms of the import of raw materials, the mobility of actors and knowledge, ground plans and elevations, as well as individual ornamental

forms for the Roman provinces: Lipps 2017; Dell'Acqua – Peleg-Barkat 2021; Mugnai 2023.

26 Cf. the comprehensive collection of written sources on gilded statues in Henke 2020, 557–580, and on gilded ceilings in Lipps 2018.

27 Cf. generally on the ancient luxury topic: Baltrusch 1989; Bernhardt 2003.



Fig. 4 Watercolour of capitals from houses in Pompeii by James William Wild, 1840s: Victoria and Albert Museum, London, E3965-1938

iar experience when visiting museums and excavation storerooms around the Mediterranean is the discrepancy between the high number of elements with faint traces of colour and the small number of published studies on the subject<sup>28</sup>. It is therefore still of primary importance to make documentation available, even if only in most basic form. Traces of paint are often very limited, surviving in small, protected areas of the building elements. The degree of preservation depends on the building material used, the climate and the specific storage conditions. Thus, on the one hand, there are large areas of the former Roman Empire where there are hardly any examples of painted building elements. On the other hand, there are individual sites that provide a wealth of information. For the northwestern provinces, there are the famous funerary monuments from Neumagen<sup>29</sup> or the area around

Dijon<sup>30</sup>, made of sand- and limestones on which traces of painting have been preserved particularly well. For the East, the Herodian monuments and palaces or the shrines at Jerash and Horvat Omrit stand out<sup>31</sup>. In Italy, Pompeii is a case in point. Its building elements, in particular those made of tuff, were often found painted in the 18<sup>th</sup> and 19<sup>th</sup> centuries; however, evidence of this paint has been lost in many cases. Consequently, a study on architectural polychromy in Pompeii would have to draw extensively on the watercolours of the 19<sup>th</sup> century (fig. 4), which, of course, entail its own methodological difficulties<sup>32</sup>.

In many of the examples presented here, the traces of paint on the building elements could still be easily recognised by the naked eye. Archival material (Delferrière – Edme, Kahwagi-Janho) or historical watercolours (Delferrière – Ribolet, Gasparini – Rekowska) provided additional reference points. The authors of this volume regularly use magnifying glasses (Hufschmid) or microscopes, which also provide good illumination. Digital imaging with visible induced luminescence (VIL) was also frequently employed (Portillo, Sacchi et al.), which made visible a considerable amount of Egyptian blue residue. A larger array of non-invasive and invasive measurement methods were used by Georg Plattner and colleagues: comprehensive multispectral examination (MSI) and the use of an X-ray diffractometer (XRD) identified colour residues and pigment phases that were no longer visible to the naked eye. The preparation of cross-sections and their examination using light microscopy techniques (LM) and energy-dispersive X-ray microanalysis in the scanning electron microscope (SEM-EDX) made it possible to determine not only the chemical composition and individual pigments but also the painting technology and degradation phenomena such as pigment changes or sintering. Gas chromatography-mass spectrometry revealed the organic binders.

Non-marble building stones were usually coated with a more or less thin white or white-beige layer of lime (sometimes containing gypsum) which served as a primer for the subsequent painting, evened out the surface and sometimes might have also provided a certain degree of protection for the stone from weathering (Delferrière – Edme, Brzozowska-Jawornicka, Gasparini – Rekowska). Nicolas Delferrière and Mathieu Ribolet assume furthermore that the whitewashing was intended to evoke a marble-like ap-

28 The associated publications often lack comprehensive descriptions of the visible paint residues.

29 Grenier 1904; von Massow 1932, 274–279 Taf. 65–68; Binsfeld et al. 2020.

30 Thiollet 1847–1859 and more recently Delferrière – Edme 2018a; Delferrière – Edme 2018b; Delferrière – Edme 2019a; Delferrière – Edme 2019b; Delferrière – Edme 2020.

31 For example Eristov – Seigne 2002; Rozenberg 2008; Peleg-Barakat 2013; Rozenberg – Mevorah 2013, Rozenberg 2021.

32 See for example the illustrations by the Niccolini-Brothers in Schütze – Kockel 2016.

pearance. In some cases, however, the colour was painted directly on the stone, as Thomas Hufschmid observed on a limestone capital in Avenches (see Hufschmid fig. 21.22)<sup>33</sup>. The colours applied directly mostly used the *secco* technique with a lime binder. Thus, they are likely to have had more muted pastel shades but occasionally also organic binders (egg/casein) were used, resulting in stronger colours, as Georg Plattner and colleagues are able to demonstrate for a Corinthian capital and a molding in Carnuntum. Based on the available (though incomplete) evidence, it seems that usually base colours were used without shading or highlights and with sharp transitions to neighbouring colours and surfaces.

Special techniques were required for gilding, including the use of mercury or the application of gold leaf to a preparatory layer of a red clay specific to gilding (Dell'Acqua, Portillo, Sacchi – Polidoro – Lenzi, Yener, Kahwagi-Janho). Comments on the techniques and use of gilding can be found in many literary and epigraphic sources, discussed at the beginning of the volume by Antonio Dell'Acqua. However, the majority of these sources refer to Athens and Rome. Against this background, the observations, reported in this volume, on the use of gilding in different Roman provinces are most welcome. Capitals of the temple of the Forum Novum in Corduba with traces of red over large areas, are presented by Ana Portillo and interpreted as a primer for gilding. Nicolas Delferrière and Mathieu Ribolet come to the same conclusion about a capital from Sens, as does Bariš Yener at the Temple of Hadrian in Kyzikos. In addition, Hany Kahwagi-Janho tentatively suggests the identification of similar traces on the capitals of the temple of Jupiter Heliopolitanus in Baalbek. While the former existence of gilding based solely on the red primer cannot definitely be proven, Furio Sacchi and colleagues, as well as Kahwagi-Janho, discovered concrete remains of gold on various marble elements from northern Italy and Lebanon. From these examples, it is evident that the practice of gilding was widespread.

Consecutive phases of polychromy on the same building elements can be detected in cross-sections. In the case of a composite capital from Carnuntum, Georg Plattner and colleagues succeeded in distinguishing four layers of lime whitewash applied on top of each other, which testifies to continuous maintenance and renovation, which was especially necessary when the architectural elements

were exposed to weather<sup>34</sup>. Using the example of the August Theatre, Thomas Hufschmid shows that former colour schemes could be replaced during the process of later repair work. The same applies to a colonnade in Tyros, which changed colour from red to white in two phases (Kahwagi-Janho). Painted ornament could also be employed as a substitution for damaged carving or when blocks were put to new use in different positions. Evidence for this phenomenon at Lebanese sites has been collected by Hany Kahwagi-Janho. At Byblus, for example, a raking cornice was reused in a horizontal position, the necessary adjustments of the modillions executed in stucco and hidden by paint.

### Categorising visual effects

Above we have summarised the analytical methods used, as well as observations on the raw materials and painting techniques. But why was the effort made to paint architecture? What effect was polychromy intended to achieve? In order to approach these fundamental questions, we will explore different visual effects for which painting was used in architecture.

First and foremost, colourful architectural design conforms to the aesthetic ideal of *varietas*<sup>35</sup> and enriches a building not only through the diverse range of geometrical shapes and ornaments created through the use of columnar orders, but also through the use of colour to contrast or override the palette of the building materials' natural hues. In comparison to the more canonical Greek architectural polychromy, with its relatively consistent use of the colour triad (white, red, blue/black) and the additional use of green for vegetal motifs, it becomes evident that *varietas* was increasingly one of the intended effects. Of course, in Roman architecture not all colours were used with equal frequency. Natural clay earth pigments in yellowish and reddish hues are the most common – not unexpected, as they are presumably the cheapest, easiest to work with, and most widely available. And still, an intriguing range of rarer other colours were also used: mineral pigments like green and blue, Egyptian blue and gold, or other pigments, used in combination with different organic binding agents (Plattner et al.)<sup>36</sup>. All these findings reflect a remarkable diversity of colour schemes in Roman architecture<sup>37</sup>. Corinthian capitals, for example,

33 Direct painting on stone is the usual technique in Greek marble architecture, see Rumscheid 1994 II, 334 (i.e. in the staircases of the temple of Apollo at Didyma); Hellmann 2002, 238, and the various examples referenced by B. Yener in this volume; cf. also Lenzi 2016, 257–259.

34 Cf. on ancient restoration in polychromy in Roman sculpture: Neri et al. 2022.

35 On the term and its significance for ancient aesthetics: Cf. Mulletz 2014, 36–40; Fitzgerald 2016.

36 Cf. Brécoulaki 2006b; Rozenberg 2021, 168–176.

37 Cf. Mattern 1999, 21–29.



Fig. 5 Column drum with relief and drilled contour lines from Cologne: Römisch-Germanisches Museum, report no. 81.26

could remain without paint and draw their effects only from the natural colour of the stone (Emme) or the plasticity of the carving alone (Yener), be simply whitewashed (Brzowska-Jawornicka, Gasparini – Rekowski)<sup>38</sup>, partly gilded (see below), or painted in red and green (Delferrière – Ribolet), in green and black (Plattner et al.), in yellow, red, and green (see Brzowska-Jawornicka fig. 7),

in yellow, orange, gold, and violet hues (Sacchi – Polidoro – Lenzi), or in many other colour combinations<sup>39</sup>.

Different colour could be used on neighbouring buildings for emphasis, as Ana Portillo demonstrates for the temple at the Forum Novum in Cordoba (see Portillo fig. 3. 4). Here, large areas of the temple's architectural surfaces are painted with expensive and highly contrasting colours, and make the temple stand out from its surroundings (the temple's lower shafts were porphyry-coloured and the capitals presumably set off in gold). Remarkably, even within the same building, different colour schemes could be used, shaping the viewer's experience by highlighting important vistas, as Aleksandra Brzowska-Jawornicka shows for the Rhodian peristyle in the so-called Hellenistic House in Nea Paphos, with monochrome white on the lower lateral porticoes and vivid colour on the higher main side<sup>40</sup>. In the House of Leukaktios in Ptolemais, variations of the same colour schemes are used for the two superimposed orders of the peristyle (Gasparini – Rekowski).

Just as vivid or expensive colours were used to emphasise single buildings within their built environment, or to single out important parts of a building, paint was also able to increase the legibility of the ornamental apparatus and to guide the visual experience. In this respect, the drawing of red primary and contour lines is a striking phenomenon and is reminiscent of drilled contour lines in Roman relief sculpture (fig. 5)<sup>41</sup>. They are found on many architectural elements from Sens (Delferrière – Ribolet) and other areas of eastern Gaul (Delferrière – Edme) but also on the geisa of the Cigognier temple at Avenches (Hufschmid fig. 8), where they frame and accentuate profiles and individual ornaments. A cornice block from Wallsee also displays red lines delineating the contours and midribs of the foliage (Plattner et al. fig. 23–27). Such lines, often red, are reminiscent of the *rubricatio* of inscriptions<sup>42</sup> and can also be observed in the garment folds of sculpture (fig. 6)<sup>43</sup>. Why exactly the colour red was chosen remains unknown<sup>44</sup>.

The contrasting red lines served to accentuate the reliefs and to clarify their contours. More generally, also the

38 Further examples and discussion below notes 99 and 101.

39 See below notes 111–113, 119–122.

40 The practice of highlighting single building elements at height, as in the case of Rhodian peristyles, clearly goes back to the Hellenistic period (for painted modillion cornices, tentatively associated with Rhodian peristyles from Rhodos see now von Hesberg 2020). It might be true that different colour schemes could be used to the same end, as may be suggested by the temple of the Artemis Leukophryene at Magnesia on the Meander, for which Stefan Zink and colleagues were able to demonstrate the use of yellow and orange for two capitals presumably from the temple's long lateral colonnades (Zink et al. 2019), whereas Jean-Nicolas Huyot in 1820 reported gilding on the front (Huyot's "hopisthodome"), see Paris BNF, NAF 664, fol 211 r: "Les ornements de l'hopisthodome étaient dorée. On voit encore dans divers

partie le fond qui était dessous l'or." For the use of different colour schemes on the same building in the Greek period see Zink 2021, 161.

41 See the contour lines of the reliefs in southern Gaul: Böhm-Küpper 1996 or Roman Germany: Faust 1998, 89 f. But also a column drum in relief in Cologne: Römisch-Germanisches Museum, report no. 81.26 (Klatt 2001, 64 f.; <<https://arachne.dainst.org/entity/1109205>>, here fig. 5).

42 Cf. Edmondson 2014, 127; Duggan 2016.

43 See, i.e., sculptures from Ingelheim/Rhine: Campbell – Hack 2024, esp. figs. 4. 6; Paris, Musée Carnavalet, inv. AP864-1: Guineau 1993, or a sarcophagus in New York: Sargent 2011, esp. 19 f.

44 Of course, some red pigments were cheap and readily available, but black pigments must have been, too. Red may have probably





Fig. 6 Hellenistic statuette from the Boubasteion in Alexandria with folds highlighted in red

juxtaposition of contrasting colours helped to make details legible even from a greater distance, as suggested by Thomas Hufschmid's colour reconstruction of the Cignonier temple at Avenches (Hufschmid fig. 24). There, the tendrils on the frieze have been left white, and stand out only in contrast to the blue background. Similarly, colour contrasts were used on the frieze of the aforementioned temple in Corduba, where *litterae aureae* were combined with a dark painted frieze background (Portillo fig. 3. 4). The comparison of the two reconstructions from Avenches and Corduba reflect a fundamental difficulty: on the basis of the mostly isolated remains of pigments, it is often impossible to decide whether larger areas of the surfaces were painted in the same colour, or if only ornaments applied in relief and associated contours were marked in colour, as can be observed on the Danube (Plattner et al.).

Another use for paint was to enrich carved decoration with additional ornament. This is a phenomenon well documented in Greek architecture and in the realm

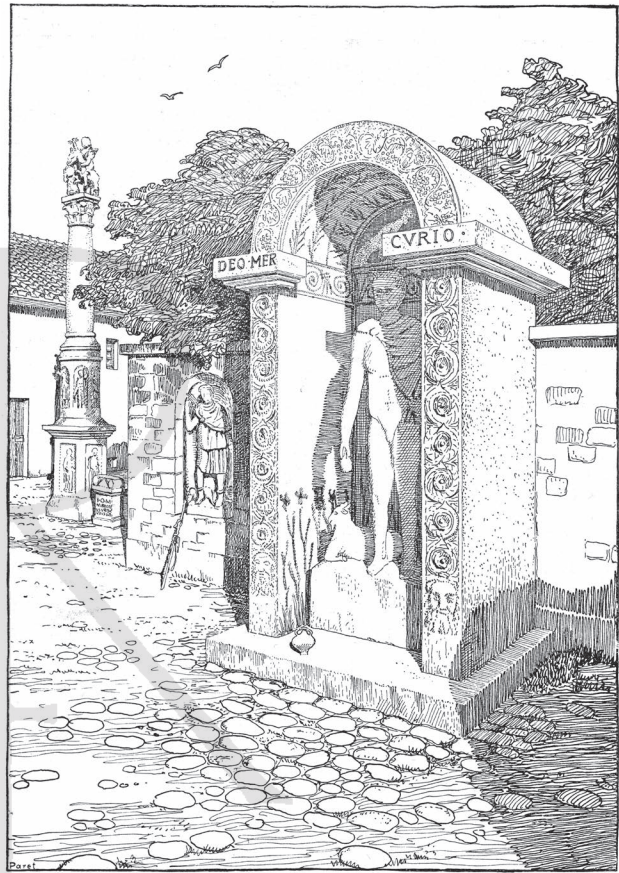


Fig. 7 Shrine of Mercury in Bad Cannstatt with painted ornamentation, drawing by Oskar Paret

of sculpture, where often even critical details are added in paint<sup>45</sup>. The same is also known from Roman funerary monuments, especially in eastern Gaul<sup>46</sup>, as well as from the well-known marble veneer in the so-called Sala del Colosso in the Forum of Augustus<sup>47</sup>. Further examples are added in this volume: Ana Portillo draws attention to a white-painted column shaft from Seville, crowned by a painted red ornament perhaps alluding to textiles (Portillo fig. 14). On a pilaster capital from Sens (J 210), Nicolas Delferrière and Mathieu Ribolet observe curved red strokes on the smooth midribs of the acanthus, probably meant to give them a corrugated appearance, and a cymation on the cornice (no. 2017.2.1) with shear-shaped leaf-and-dart is depicted in paint only (Delferrière – Ribolet fig. 10. 11). At Bad Canstatt, Stuttgart, an impressive aedicula from with smooth interior walls adorned with a red-painted tendril frieze can also be included with these examples (fig. 7)<sup>48</sup>. On a sculpted *rotulus* in one of the coffers of a modillion cornice from Dijon, red painted

been chosen for its salience, one of the deeply innate aspects of the psychology of human perception. On the meaning of red in ancient art and aesthetics and semantics see Wunderlich 1925; Bradley 2009, 95–97. 189–211; Henke 2020, 581 f.

45 Bankel 2007; Fragaki – Guimier-Sorbets 2013; Teuscher 2016, 245 f.; Zink 2019, 4–7. From Hellenistic and Roman Sicily Italic-Corinthian capitals with ovoli in paint are known, see

Lauter-Bufe 1987, 22 no. 32; 31 no. 51 (ovolo not alabaster, as described). From sculptures and reliefs in Roman Germany: Reis 2010/11; Campbell – Hack 2024, fig. 5 left.

46 Delferrière – Edme 2018a; Delferrière – Edme 2018b; Delferrière – Edme 2019; Delferrière – Edme 2020.

47 Ungaro 2006.

48 Paret 1925.

scribbles indicate writing (Delferrière – Edme fig. 11). Likewise, the wings of an Amor are added in red paint on a corner block of a tomb at Dijon (Delferrière – Edme fig. 12). And perhaps the best example is the so-called Butcher’s monument in Dijon, where the red lines are used not only to outline but also to add details such as the drooping of the leaf tips, lending them a visual plasticity (Delferrière – Edme fig. 14a). The use of painted additional ornament is also impressive at Marina el-Alamein<sup>49</sup> and in the house of Leukaktios in Ptolemais where a painted vine climbs up the column and an astonishing wealth of detailed painted ornament is set in red and white on the already richly coloured cornices (Gasparini – Rekowski fig. 3).

While previously we have discussed graphic uses of paint, plasticity is a quality that can be achieved through painting shadows or highlights. Already a simple black line could be used to imitate shadows and to suggest plasticity. Again, the phenomenon is already well known from Late Classical and Hellenistic architectural polychromy<sup>50</sup>. In this volume, Nicolas Delferrière and Mathieu Ribolet present a Roman example from Sens. The half-column (no. J 317) is decorated with scales pointing downwards in relief, and the overlapping part of each scale is accompanied on its sides by red lines, which become narrower towards the tip of the scale. This elaborate scheme was probably intended to suggest shadows and to render the ornamentation more three-dimensional (Delferrière – Ribolet fig. 13). Thomas Hufschmid observes lines of carbon black (charcoal) on the frieze of the Cigognier temple, intended to accentuate the shadows of the tendrils (Hufschmid fig. 23). Georg Plattner and colleagues likewise detect carbon for shading on the cornice from Wallsee. Recent observations by Werner Oenbrink on the so-called harbour temple at Xanten are another example<sup>51</sup>. The transition to trompe l’oeil painting is complete when in Byblus a nymphaeum niche is entirely plastered and adorned with a plastically rendered shell conch in paint only (Kahwagi-Janho fig. 3).

Interestingly, it seems that, at our current understanding of polychromy, the use of painted shadow lines seems to be far less widespread in the eastern provinces of the Roman Empire. For example, in the spectacular and colourful ornamentation of a Syrian arch in the House of Leukaktios, the three-dimensional effect is accomplished

through only the combination of deep grooves and contrasting colours (Gasparini – Rekowski fig. 7). Given the general lack of painted architectural elements from Roman Asia Minor, Bariš Yener concludes that in this region chiaroscuro effects and plasticity were achieved only by increasingly deep carving and the use of the drill.

While building elements with painted highlights have, to our knowledge, not yet been identified, gloss may have played a generally important role. Polishing and coatings have already been observed on sculpture, stucco and wall paintings, and it is conceivable that they could also have been applied to building elements such as column orders. This could, in connection with the intentional use of light, have provided lustre effects for painted building elements or unpainted surfaces. Strong highlights could also be achieved through gilding and the attachment of bronze. Capitals in bronze are known from Rome<sup>52</sup>, and examples can also be found at the temple of Bel in Palmyra and the propylon at Baalbek, as Kahwagi-Janho reminds us, where not only the stone elements but also a dedicatory inscription indicate their presence.

Specific types of stones, like porphyry, and metals, like gold, silver, and bronze, had economic value and it was desirable to imitate them, or allude to them, in paint, with the effect of intermateriality and intermediality. There was a genuine effort to imitate precious materials by pictorial means, as Maud Mulliez has recently shown for Roman wall painting<sup>53</sup>. Furthermore, painting allowed the artist to combine qualities of different precious stones, creating new and fantastical materials that did not exist in the natural world<sup>54</sup>. It could also, by colour alone, allude to materials without direct imitation, thereby creating a new intermaterial and intermedial aesthetic.

Bright white painted columns were obviously intended to imitate white marble<sup>55</sup>. Both, in Corduba (Portillo fig. 2) and Carnuntum (Plattner et al. fig. 18), column shafts were found with remains of Egyptian blue on a red base coat which were perhaps intended to imitate porphyry. A column that can probably be assigned to the upper floor of the Basilica in Augusta Raurica shows remains of flat brown to golden yellow paint, for which Thomas Hufschmid suspects the imitation of yellow marble (Hufschmid fig. 19). Remains of a painted column from St. Maximin in Trier clearly point to giallo antico

49 Czerner 2009, 38 fig. 66.

50 Brécoulaki 2006a, 208 pl. 51 (cyma). 75. 97 (shield); Stanzl 2015, 183; Guimier-Sorbets 2018, 303.

51 Oenbrink 2021, 109.

52 Liverani 1992/93. On the use of bronze in architecture see von Normann 1996; Mattern 1999, 13–22; Reinhardt 2022a and Dell’Acqua in this volume.

53 Mulliez 2014.

54 See for example Mulliez 2014, 120–122 “marbres fantastiques”.

55 Cf. Vit. De arch. 7, 3, 6–7; Mattern 1999, 25; Grawehr 2022, 166. 168.