

# The two-piece Corinthian capital and the working practice of Greek and Roman masons

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This paper is a first attempt to understand a particular feature of the Corinthian order: the fashioning of a single capital out of two separate blocks of stone (fig. 1).<sup>1</sup> This is a detail of a detail, a single element of one of the most richly decorated of all Classical architectural orders. Indeed, the Corinthian order and the capitals in particular have been a modern topic of interest since Palladio, which is to say, for a very long time. Already prior to



Fig. 1: A two-piece Corinthian capital. Flavian period repairs to structures related to it on the west side of the Forum in Rome, second half of the first century CE (photo by author).

the Second World War, Luigi Crema (1938) suggested the utility of the creation of a scholarly *corpus* of capitals in the Greco-Roman Mediterranean, and especially since the 1970s, the outflow of scholarly articles and monographs on the subject has continued without pause. The basis for the majority of this work has been formal criteria: discussion of the Corinthian capital has rested above all on style and carving technique, on the mathematical proportional relationships of the capital's design, and on analysis of the various carved components. Much of this work carries on the tradition of the Italian art critic Giovanni Morelli whereby a class of object may be reduced to an aggregation of details and elements of which, once collected and sorted, can help to determine workshop attributions, regional variations, and ultimately chronological progressions.<sup>2</sup>

Within this rather painstaking work, it is somewhat surprising that the two-piece form of the Corinthian capital has gone largely unnoticed.<sup>3</sup> As the present contribution suggests, however, this particular detail has potential

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<sup>1</sup> I extend my gratitude to all three organizers of the "Masons at Work" conference for the inclusion of this paper delivered there in a session entitled, "God is in the details." I also thank Arthur Jones for logistics both at the conference itself and with the work that followed. Timely support to turn that paper into the present written contribution was provided by the DAI Berlin to whom I am thankful. I hope shortly to develop the following study, presented here in preliminary fashion, into a more in-depth and expansive article on the subject.

<sup>2</sup> A limited bibliography of studies in this tradition might include: Crema 1938; Kähler 1939; Heilmeyer 1970; Bauer 1973; Lauter-Bufe 1987; Pensabene 1973; *id.* 1982; Diaz Martos 1985; Dentzer-Feydy 1990; Fischer 1990; Freyberger 1990; Gutierrez Behemerid 1992. The list could be much longer.

<sup>3</sup> The topic normally merits no more than a footnote or a paragraph in larger discussions. The lengthiest treatments thus far of which I am aware would be those of Strong and Ward-Perkins 1962: 12-13 and Ganzert 1996: 152-53.



Fig. 2: The choregic monument of Lysikrates in Athens (335/4 BCE), displaying the earliest external Corinthian order (photo by author).

not only to further our understanding of the order in-and-of-itself, but to help us to understand the transmission of masonry practices between Greece and Rome more generally. This is because, unlike many other details of the Corinthian capital, the two-piece technique relates in a direct manner to the techniques of building, rather than to any aesthetic decisions. In an assembled and finished monument, the seam between the upper and lower pieces of a single capital became nearly invisible, especially to an observer on ground level. Considering that we are starting to recognize that the capitals of many Corinthian temples in antiquity were painted, this was all the more true.<sup>4</sup> Thus, the two-piece capital relates to the building *process* rather than to its product, and as such forms a case study to understand the decisions of the mason at work in the Greco-Roman world. In following, this paper reviews the broader context of the Corinthian order (Part I), before focusing on the technique (Part II); elaborating its diffusion in space and time (Part III); and attempting a historical discussion of the origins (Part IV), expansion (Part V), and decline (Part VI) of the

two-piece capital.

### Part I. The Corinthian Order

From the last century of scholarship, a basic schema of the development of the Corinthian order has emerged as follows. The order originates in Classical-period Greece, and a capital from the interior of the cella of the Temple of Apollo at Bassae (mid-to-late 5th century BCE) is normally posited as the earliest documented archaeological example.<sup>5</sup> Shortly thereafter, a similar example, also interior, appears from the tholos in the Marmaria at Delphi.<sup>6</sup> Recently, Scahill (2009) points to similarities be-



Fig. 3: The Corinthian capitals from the bouleuterion of Miletus (174-64 BCE), now in the Pergamon Museum in Berlin (photo by author).

<sup>4</sup> Zink 2009.

<sup>5</sup> Roux 1953; Scahill 2009.

<sup>6</sup> Pedersen 1989 has argued that the Delphi example in fact pre-dates the Bassae example. To our present concerns, this debate is not extremely important.



Fig. 4: A two-piece capital from the Temple of Castor and Pollux in the Forum in Rome (from Heilmeyer 1970).

tween the vegetal reliefs of these early examples and double-volute motifs with spirals and central palmettes (but no acanthus) depicted on Archaic funerary stelai on some white-ground Attic vases as well as one actual physical example from Megara Hybleia in Sicily (ca. 500 BCE). This seems preferable as a direct background to the Egyptian palmette-capital context suggested by Edmund Weigand (1920) in a study of the early twentieth century. The Corinthian emerges as an external order in the fourth century when it appears in the Athenian Monument of Lysikrates, dated to 335/4 BCE (fig. 2). It is noteworthy that the order does not seem to settle into a normal form until the first quarter of the second century, when a ‘Normalkapitell’ appears in mainland Greece and Asia Minor.<sup>7</sup> The two most frequently cited Hellenistic examples of this

emergent, canonical Corinthian order are the Olympieion at Athens (cf. fig. 5) and the bouleuterion at Miletos (fig. 3), both buildings dating to the second quarter of the second century BCE. Once created, this ‘normal’ Corinthian circulated broadly in models and through written treatises, such as that represented by passages in the fourth book of Vitruvius’ *De Architectura* (ca. 27 BCE), which we will discuss shortly.

## Part II. Technique

For our purposes, it is interesting that the style of the Hellenistic Corinthian reaches a period of stasis over the course of the second century, as it is at this same moment that the two-piece technique first appears. Before tracking the patterns of its appearance and diffusion, however, I want to focus on the technique itself. A typical two-piece capital divides the Corinthian form into two blocks at the top of the lower acanthus frieze, normally where the top of the lower cauliculus stalk springs the upper leaves of acanthus and volutes (cf. fig. 1 and fig. 4). A Corinthian capital’s decorative scheme naturally falls into three basic zones, from top-to-bottom: i) the abacus, ii) the upper zone with volutes and helices, and iii) the acanthus-leaf frieze. Typically, as the division between upper and lower block falls at the top of the lower cauliculus rim, this splits the block halfway up

<sup>7</sup> Bauer 1973; Heilmeyer 1970; Strong 1966.

the total height producing two blocks of roughly equivalent height.<sup>8</sup> This could slightly change the carving style, as it ensured that the rim of the cauliculus stalk was almost perfectly horizontal; whereas capitals carved from a single block could have slightly tilted rims.

A division in the middle was the case at the Augustan Temple of Mars Ultor (2 BCE), where the break comes almost precisely one meter up the 2 m total height of the capital.<sup>9</sup> Remarkable is the fact that the leaves curl somewhat higher than the break in the block, in this case over-reaching by a few centimeters. This was not always the case; in earlier Mid-Republican (125–75 BCE) examples, the break is carefully matched to the curl of the tall leaf (fig. 5). However, a higher central leaf, over-reaching the division between upper and lower capital block, becomes more prominent in the Augustan age (31 BCE–14 CE) and can be seen, e.g. at the Augustan Temple of Castor and Pollux in the Forum at Rome (fig. 4), or in the Temple of Diana at Merida. Thus, the mechanical division between upper and lower block was not simply a matter of sawing. Rather, the carving practice involved the labor-intensive hollowing out of a round portion of the lower block using a chisel and pick so that, essentially, the upper block nested within the leaves of the lower.

Moreover, we should keep in mind that some Corinthian capitals were lifted off the



Fig. 5: The lower half of a capital from Temple B in Largo Argentina vowed in 101 BCE. Note that the highest acanthus leaves rise just to the plane of the seam between lower and upper capital halves (photo by author).

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<sup>8</sup> In one Julio-Claudian example from Merida, we in fact see a capital sectioned into threes, which has a certain internal logic, but this is otherwise atypical.

<sup>9</sup> Ganzert 1996.

ground upside down, and then swiveled into place. This is shown by the fact that the capital blocks of the Mars Ultor temple have Lewis sockets on their lower faces, not on their upper faces. Therefore, the hollowing out of the lower block must have taken place once that block was placed on the uppermost column drum, but obviously before the upper block was placed, adding a stage to the entire building process.

### Part III. Diffusion

Considering how widely diffuse the Corinthian order would become in the Greek and particularly Roman Mediterranean, the following discussion must be considered preliminary. I will not claim here the Olympian task of examining every single extant Corinthian capital. However, even sorting through published material, a number of clear patterns begin to emerge.

The earliest well-dated example is the aforementioned Olympieion, the Temple of Olympian Zeus built at Athens by the Seleucid King Antiochos IV Epiphanes (fig. 6). Construction on the temple had started long ago in the Archaic period, but was abandoned and re-started on an entirely different plan in 174 BCE shortly after the beginning of Antiochos' reign. The project was massive, each column being 55 m tall, and when Antiochos died in 164, the construction was again abandoned with very little of the actual architecture erected. It would finally be completed by the emperor Hadrian (117–38 CE) on much the same plan as the earlier Seleucid temple. As Tölle-Kastenbein's study suggests, several of the standing capitals of the colonnade probably belong to the Seleucid phase.<sup>10</sup> Vitruvius tells us that a Roman architect by the name of Cossutius was hired by



Antiochos to assist in the construction of the temple (*De Arch.* 7.pr.17), and epigraphy confirms the connection between the Cossutii and the building projects of

Fig. 6: The Temple of Olympian Zeus (Olympieion) in Athens, begun by Antiochos IV (174–64 BCE) and finished by Hadrian (ca. 120 CE) (photo by author).

<sup>10</sup> Tölle-Kastenbein 1994: 149 with bibliographic discussion at n. 811; Travlos 1971: 402-3.

Antiochos in Athens and at Antioch-on-the-Orontes.<sup>11</sup> Thus, we have a clear link between this Greek monument (and its techniques) and mainland Italy.<sup>12</sup>

Along with Athens, the only other major mid-Hellenistic city with any significant number of two-piece capitals is Alexandria. Here, about a half-dozen examples appear, but at present more study is needed to determine how many different buildings these fragments might derive from. There seem to be two groups: one of local limestone, usually assigned to the Ptolemaic period generally, that is, from 323–31 BCE, and another carved of hard basalt and of much larger size (1.38 m high) now re-erected on top of the column shaft with which it was found as the “Khartoum column,” a colonial-period monument (1899) celebrating the British retaking of the Sudanese city and standing a few streets back from the modern corniche. The original dating for all of these fragments, mostly found in the late nineteenth and early twentieth century, is vague and depends entirely on stylistic analysis.<sup>13</sup> On these grounds, the earliest would possibly be the Khartoum column capital. With its three finished sides and one unfinished side, it is normally assumed to have been the exterior corner of a much larger colonnaded structure.<sup>14</sup> Achille Adriani assigned it to the broad Ptolemaic period, whereas Patrizio Pensabene, who points to a strong stylistic connection with capitals from Epidauros, and especially Wolfram Höpfner suggest that it belongs to the very early Ptolemaic period, with Höpfner even leaving open the idea that it belongs to the very first few years of the city when Alexander the Great was still alive.<sup>15</sup> Notwithstanding the difficulties with our knowledge of these very early years of the Alexandrian settlement, the general unreliability of the date of this capital and the mystery surrounding the original Alexandrian building to which it belonged make this date, however enticing, nothing more than a hypothesis. Still, considering that much of this evidence seems Ptolemaic and pre-Roman, we must at least acknowledge that Alexandria played a major role in the development of this technique, as the city’s architecture did in so many important Hellenistic innovations.

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<sup>11</sup> On Cossutius see Rawson 1975; Torelli 1980; Bernard 2010: 51-52.

<sup>12</sup> There is also the evidence of Pliny, *NH*, 36.45 that Sulla actually took some of the columns from the Seleucid Olympieion back to Rome with him to use them in buildings on the Capitoline. The truth to this story, however, is difficult to establish, as see discussion in Tölle-Kastenbein 1994: 152, and with more recent bibliography in Haselberger 2003: 183 n. 115.

<sup>13</sup> These are listed and illustrated in the catalog of Tkaczow 1993: nos. 54 (bottom half, general Ptolemaic date), 67 (upper half, second century BCE), 68 (upper half, second century BCE), 90 (bottom half, generally Ptolemaic date), and 101 (full capital, see discussion of date in text). Pensabene 1993.

<sup>14</sup> Adriani 1966 C I p. 78 no. 35 for early bibliography; Pensabene 1993; Tkaczow 1993: 224-5 no. 101.

<sup>15</sup> Pensabene 1993; Höpfner 1983-84.



Fig. 7: Capital from the Round Temple by the Tiber in Rome ca. 125–75 BCE (photo by author).

Otherwise, the technique is not attested for the century after the Olympieion in the Greek Hellenistic world.<sup>16</sup> Instead, it is in Rome and in Roman central Italy that we see the most examples at this time. The transmission of the two-piece capital to Italy seems readily explained by focusing on Cossutius' role in the Olympieion of Athens. As Richard Delbrück first noted, the early Corinthian order in Rome is modeled off of the type of the Olympieion: this is most recognizable in the capitals of the Round Temple in the Forum Boarium, beside the Tiber River (fig. 7).<sup>17</sup> The date of this building as well as its identification is very much debated, but, by all accounts, it belongs sometime ca. 100 BCE. It has two-piece Corinthian capitals, and in fact the same two-piece capital appears in our only other Roman Corinthian temple of this early date, preserved only in fragments in the basement of a 15<sup>th</sup> century house in what was the Roman Circus Flaminius (fig. 8); these fragments originally belonged to the Temple of Neptune *in circo*, dated to sometime around 135 BCE. Notably, both of these two temples with two-piece capitals at Rome connect to Athens in one further way: they are built of Pentelic marble from an identical quarry pit in the environs of the city of Athens.<sup>18</sup> We cannot be sure that the Seleucid Olympieion used the same pit, but it was certainly using marble from the same Pentelic quarries generally speaking. All in all, the



Fig. 8: Lower half of a capital from the Temple of Neptune *in circo* in Rome, after 133 BCE (photo by author).

technological connection represented by the two-piece Corinthian capital at Athens and at Rome itself in the second century BC makes a great deal of sense; as it speaks to the exchange of building materials, the connection may also imply the movement of trained masons between these two cities in this period.

Once the method of two-piece capitals arrives in Rome, it begins to be found in other areas where Rome was then building. From the Tetrastyle Temple in Ostia, dated to the late second or early first

<sup>16</sup> There are early examples at Baalbek to be considered in this context as this study continues.

<sup>17</sup> Delbrück 1912: Vol. 2, p. 162; Kähler 1939: 5.

<sup>18</sup> Bernard 2010.



century BCE, peperino columns were built in the two-piece method.<sup>19</sup> This contrasts, however, to the use of single-piece Corinthian capitals in other prominent Corinthian buildings from *Latium vetus* in the Republican period, in particular at Praeneste<sup>20</sup> and at the Sanctuary of Hercules at Tivoli. This also shows the adaption of the technique from the hard marble of Hellenistic architecture to the local volcanic tuffs that made up the building material *de rigueur* of Republican central Italy. At Rome, in Temple B in Largo Argentina, begun shortly after 101 BCE, two-piece capitals appear cut out of travertine.

The technique becomes particularly popular, however, in the last half-century of the last century BCE, when it can be found in a dozen or so examples from Italy and particularly Rome itself (tab. 1).<sup>21</sup>

**Table 1. Public Buildings at Rome with Two-piece Corinthian Capitals**

<b>Structure</b>	<b>Date and material</b>
Temple of Neptune <i>in circo</i>	ca. 133 BCE, Pentelic marble
Temple B in Largo Argentina	101 BCE, travertine
Round Temple by the Tiber	125–75 BCE, Pentelic marble
Forum of Caesar, possible fragment of first building phase	46 BCE, Luna marble
Temple of Apollo Sosianus	34 BCE, Luna marble
Temple of Apollo Palatinus	28 BCE, Luna marble
Fragment connected to the central bay of the Parthian Arch of Augustus <sup>22</sup>	19 BCE, (Luna?) marble
Temple of Mars Ultor in the Forum of Augustus	42–2 BCE, (Luna?) marble
Temple of Magna Mater, Augustan phase <sup>23</sup>	3 CE, volcanic tuff
Temple of the Castores, Augustan phase	6 CE, Luna marble
Julio-Claudian repair of the Round Temple by the Tiber <sup>24</sup>	10–20 CE, Luna marble
Flavian rebuilding of the Temple on via delle Botteghe Oscure	69–96 CE, travertine
Flavian repair to Temple A in Largo Argentina	69–96 CE, travertine
Flavian rebuilding of the Tabularium?Fragments now lying in the Porticus of the Dei Consentes <sup>25</sup>	69–96 CE, travertine

<sup>19</sup> Pensabene 1972: Nos. 198 and 199.

<sup>20</sup> The lower complex and the small round temple on the very top of the Fortuna Primigenia Sanctuary (ca. 110–100 BCE) are Corinthian.

<sup>21</sup> This builds on the list of Strong and Ward-Perkins 1962: 13 where eight examples are given.

<sup>22</sup> For discussion and a reconstruction of the arch, see Rose 2005.

<sup>23</sup> It is not impossible, though to my mind less likely, that these pertain to the earlier phase shortly after the fire of 111 BCE.

<sup>24</sup> Strong and Ward-Perkins 1960 never mention the repair, but it is clear from the different capital groups delineated by Heilmeyer and Rakob 1973, who hold this repair to be Tiberian. A new study of Lipps 2012 suggests that the date may instead be Augustan. I give a representative range.

<sup>25</sup> The original location of these architectural elements is presently at the center of an intense debate over what sat atop the ancient structure at the west side of the Forum known as the ‘Tabularium.’ Whatever the answer may be, they are normally agreed to be Flavian for the *foglie lisce* style, although Strong and Ward-Perkins 1962 call them Julio-Claudian.



Complementing this is a number of examples from about the same period found in several cities of Judea, along the Levantine coast where the technique is actually quite common in Corinthian architecture belonging to the reign of Herod the Great (37–4 BCE). Fisher has detailed examples from Masada, Kypros, Samaria-Sebaste, Herodion, and Alexandreion-Sartaba.<sup>26</sup> Recent excavations at Herodion continue to turn up similar examples.<sup>27</sup> To my mind, the commonality of the two-piece technique in this place and time is owed to strong architectural connections between Herodian Judea and Rome. As Ehud Netzer's work has shown, the link between Rome and the vassal king Herod was manifest in the appearance in Herodian Judea of strongly Roman masonry techniques such as *opus reticulatum*, which was otherwise not yet so diffuse around the Mediterranean. Petrological analysis has even shown that the Herodian harbor at Caesarea made use of several boat-loads of *pulvis puteolanus*, the concrete binder exported from the Bay of Naples, in the construction of the harbor's underwater mole.<sup>28</sup> Within this context, it seems feasible that the two-piece technology was not a legacy of Judea's connections with the Hellenistic kingdoms of the east, but was transmitted from Rome eastward, perhaps moving again with masons themselves.

At this point, two-piece Corinthian capitals expanded outward through the provinces as part of the general Mediterranean-wide diffusion of architectural forms under the Roman Empire. Fine examples appear throughout Italy, into the Po Valley, as well as in Spain and North Africa. It is perhaps noteworthy that we see better examples at sites that were then more recently exposed to Roman power: thus, for example, I could find no examples of two-piece Corinthian capitals from the first Roman bridgehead of the Po Valley, Aquileia, founded as a colony in 181 BCE,<sup>29</sup> whereas fine examples from the Scaenae Frons of the Julio-Claudian theater are found at Verona, which only received *municipium* status in 49 BCE.<sup>30</sup> We also see two-piece capitals on the engaged half columns of the Arch of Augustus at Rimini.<sup>31</sup>

To sum up so far, the two-piece Corinthian capital may have had origins in the Hellenistic East, but it was in Italy and at Rome itself that it was most fully incorporated and used, and at Rome we can count over a dozen examples. The technique continues there into the Flavian period, when we see two-piece examples of the so-called *foglie-lisce* Corinthian (cf. fig. 1).<sup>32</sup> There are no post-Flavian examples from Rome of which I am aware, and generally the technique becomes less commonly found. The Hadrianic com-

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<sup>26</sup>Fisher 1990: 12-20.

<sup>27</sup>Netzer, Kalman, Porath, and Chachy-Laureys 2010.

<sup>28</sup>Oleson and Branton 1992.

<sup>29</sup>None noted in Scrinari 1952.

<sup>30</sup>Sperti 1983.

<sup>31</sup>The Rimini arch raises the question of the importance of the purely Roman form of the *arcus* with its engaged half columns and ashlar construction in the persistence of the two-piece capital in Roman architecture.

<sup>32</sup>On the *foglie lisce* capitals, see Cressedi 1952.

pletion of the Seleucid Olympieion makes use of two-piece capitals, but this fits with the general continuation of the architectural forms of the earlier Hellenistic phase. Only in North Africa does its popularity remain sustained through the Antonine period, during which time two-piece capitals appear at Timgad, Sbeitla, Djemila, and Häidra;<sup>33</sup> in Roman Egypt, we find examples in Dendera.<sup>34</sup> I have yet to uncover a suitable historical explanation for this late proliferation in North Africa, but, in any case, by the Severan period the practice seems to have completely disappeared, and Corinthian capitals are from then onward cut only from a single block of stone.

### **Part III. Origins**

So far we have been treating the two-piece capital as a unitary practice in all instances. This is not true: the earliest examples from Alexandria and from the Athenian Olympieion stand out because of their great size and consequent weight. In the case of the Khartoum column at Alexandria, we find the exceptional Corinthian capital carved in harder (and heavier) basalt. In fact, the megalithic temple that Antiochos started and Hadrian finished was one of the very largest Corinthian temples in the empire. Considering this fact, it seems logical that a primary motivation in the two-piece technique, at least at its origins, was the desire to reduce the weight of individual structural components of an oversized building. However, in his study of the Temple of Mars Ultor, Joachim Ganzert doubted that lifting technology lay exclusively behind the two-piece capitals, because, he points out, that there were heavier components in the temple's architecture. Both he and Donald Strong suggested instead that economy of material was the primary driving force behind the two-piece technique, as the upper and lower sections of a Corinthian capital required very different diameters of stone, and in some cases finding blocks large enough to suit whole capitals may have been difficult. I am not so sure, however, that we can in this manner dismiss the importance of lifting technology. First of all, the two-piece capitals appear in all Roman building stones—tufo, travertine, and marble—each with vastly different quarrying technologies. Secondly, the capital, while perhaps not the heaviest block in a stone structure, was certainly among the most difficult to maneuver. It had to be raised higher than any column drum, and in some cases, as mentioned, swiveled from an upside-down position. Furthermore, while architrave blocks had to be raised even higher, they could be lifted and placed using a rope cradle around their mid-section, whereas a capital was positioned with its entire lower surface flush on the upper column drum and so any sort of rope or cradle wrapped underneath it had to be removed before its final positioning. All of this meant that the capitals were, if not the heaviest, one of the more awkwardly maneuvered blocks in a temple's entire superstructure.

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<sup>33</sup> I am thankful to Thomas Morton for this insight.

<sup>34</sup> Pensabene 1993: 361-62.

On the other hand, I would agree with Ganzert and Strong that lifting technology is not a fully satisfactory explanation. To my mind, this is because many examples of two-piece capitals after the Olympieion (in fact, the large majority of examples) are significantly smaller and lighter (tab. 2).

**Table 2. Heights of some representative Corinthian capitals in Rome<sup>35</sup>**

Structure	Height in m*
Round Temple by the Tiber (125–75 BCE)	1.22*
Largo Argentina Temple B (101 BCE)	(.58)* <sup>†</sup>
Temple of Apollo Palatinus (28 BCE)	1.63*
Temple of Mars Ultor (2 BCE)	2.00*
Temple of the Castores (6 CE)	1.62*
Pantheon portico (ca. 120 CE)	1.64
So-called Temple of Trajan (ca. 120 CE?)	2.08
Hadrianeum (ca. 140 CE)	1.66

\*An asterisk designates two-piece capitals with the measurement being total height.

<sup>†</sup>Only the lower halves of this temple's capitals survive.

Instead, I would argue that the technique of the two-piece capital requires a more complex explanation. While it is hard to argue away the importance of decreasing lifting loads in the earliest example of the megalithic Olympieion, we need a better explanation for why the technique remained so popular even in smaller-scale temples, and especially in Roman Italy.

### Part V. The Expansion of the Technique

Instead, to explain the technique's popularity in Roman Italy in the Republican period, we need to look more closely at the context of Republican architectural practice. Here, I would argue, the technology developed in a Greek setting found favor with the specific way that Roman masons conceived of architectural ornament, even in contrast to the method of Greek masons. In an article published in 1972, Heide Lauter-Bufe noted that several half-worked Corinthian capitals in volcanic tuff from the area of the Porta Nocera at Pompeii are laid out in a very different way from unfinished examples from the Classical and Hellenistic Greek East. She highlighted the fact that the Roman capitals were treated as two super-imposed geometric forms; a single rectangle contains the entire abacus and volute section, whereas the acanthus frieze forms a truncated cone with rings that would eventually be carved into the curls of leaves. The Porta Nocera capitals are not unfinished *per se*, but half-finished, as they would have been presumably placed engaged in a wall, where only the finished external half would have been seen. This importantly contrasts the capitals from, e.g., the unfinished Republican example found on the southwest-

<sup>35</sup> Measurements are average heights recorded by Wilson Jones 1991.

ern Palatine and published by Carettoni (1980): there, while the layout is different than the Pompeian examples, we cannot be sure that this capital was not further worked on on-site before being abandoned. Thus, the interior half left in these two superimposed geometric forms represents the export state of the capital in the Republican period. Lauter-Bufe contrasted this with a similar half-finished example from the aforementioned Athenian Monument of Lysikrates where, rather than left in geometric forms, the internal unfinished half had its acanthus leaves and volutes blocked out and carved out, as it were, from the stone, but left without the final details carved in. A similar example of this can be seen from the Mausoleum of Belevi, a third century BCE monument from Asia Minor (fig. 9).

The difference in working practice here is between a Greek/Hellenistic conception of a capital as forms emerging from the exterior of a single geometric form versus the Roman conception that sees the essence of the capital as two superimposed geometric shapes, square above cone. As Lauter-Bufe remarks, the difference is between a sculptural and a stereometric approach to the forms of the Corinthian capital. The Roman approach (stereometry) was linked to the general rationalization of production of architectural components in the Hellenistic period, best embodied by the movement from *opus incertum*, where each individual stone had to be blocked out and placed in the wall, to *opus reticulatum*, where a concrete wall was faced with a network of identically-shaped stones that could be mass produced and distributed to building sites.<sup>36</sup> Ultimately, the greatest manifestation in Roman architecture of this division between material production and construction-site assembly can be found in the *figlinae* providing bricks to the building projects of the High Empire.



Fig. 9: A partly finished capital from the Belevi Mausoleum (mid-3rd century BCE). Note that the lower acanthus frieze has been finished all the way around (photo by author).

Of course, the fine-quality stonemasonry of a Roman Corinthian temple was ultimately an intensive and individual project—hardly akin to economies of scale achieved in the Roman Imperial brickyards. However, as Lauter-Bufe points out, the stereometric approach to the Corinthian capital was well-supported by a more mechanized, rationalized mindset to the production of Roman architecture in general. On the Pompeii capitals, we find long, even carving lines rotating around the unfinished surface of the blocks and

<sup>36</sup> Coarelli 1977; Torelli 1983; Rakob 1983.

suggesting that the lower conical part of the capital may have been finished with some sort of mechanical chisel. In fact, bolstering Lauter-Bufe's observation is the fact that similar tool-marks appear on examples from Herodion with the same half-finished state as published by Fisher.<sup>37</sup> The Herodion examples, notably, are two-piece Corinthian capitals.

Further confirmation of this idea that two different approaches characterized the approach of Greek and Roman masons towards the carving of a Corinthian capital may be found in Vitruvius' famous story of the origins of the Corinthian order. In an anecdote at *De Arch.* 4.1.9-10, Vitruvius recalls how a Corinthian maiden died and her nurse placed over her tomb a calathos filled with all the things that the girl had loved while alive. The Corinthian calathos has a distinctive shape, un-footed or with a small foot, and a profile that tapers outwards as it moves upwards. A brick was placed to cover the calathos, and eventually an acanthus plant grew from the tomb to surround the base of the jar. When the Athenian sculptor Callimachus, who by chance happened then to be in Corinth, saw this combination of acanthus, outward-tapering calathos body, and abacus-like brick lid, Vitruvius tells us, he was struck by it and borrowed the assemblage as the basis of the first Corinthian order. The passage has stirred much debate, and it seems difficult to align at face-value to evidence on the ground. Anyway, as Wolf-Dieter Heilmeyer and Mark Wilson Jones have both pointed out, Vitruvius' description of the Corinthian order more generally, and his ratio of the various elements of the capital, seem to find little basis in real Roman examples, and he rather seems to be working from a Hellenistic ideal.<sup>38</sup>

What needs to be emphasized, I think, is the fact that Vitruvius' Hellenistic-inspired conception of the Corinthian order, and this story of Callimachus, describes a conception of the Corinthian order that differs from the Roman stereometric ideal described by Lauter-Bufe. The idea of acanthus growing *around* a single upright vase emphasizes the capital's composition as i) ornament around ii) a unified vertical surface beneath the abacus. Scahill (2009) has recently identified a capital at Corinth, which looks every bit like the lithified version of an unadorned calathos in profile, as an early Corinthian-order exemplar that would have originally held a metal-work frieze of acanthus around its otherwise plain surface. Otherwise, Pliny the Elder records that the Porticus Octavia at Rome, begun in 168 BCE, contained similar bronze Corinthian capitals (*NH* 34.13). These capitals, of course, were not of Roman manufacture, but were in all likelihood part of the triumphal spoils that the builder of the Porticus, Cnaeus Octavius, had brought back with him from his eastern military victory the previous year. Although we have no physical trace of these early Roman examples, the practice in the Hellenistic period of creating a Corinthian capital as metal ornament appears to have been known both in the Greek East as at Rome, and makes sense in Vitruvius' conception.

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<sup>37</sup> Fischer 1990: Pl. VI n. 33.

<sup>38</sup> Vitruvius 4.1.11-12; Heilmeyer 1970; Wilson Jones 1991.

It is not hard to make the leap from the conception of a capital as two geometric forms to the separation of those two forms, rectangle above cone, into separate blocks, and in this context the employment of the two-piece Corinthian capital makes a good amount of sense. After all, the horizontal plane that represents the stereometric division between the rectangle and the cone lies in exactly the same spot where a normal two-piece capital divides into sections: at the base of the volutes and just above the acanthus frieze. While this is not the place to treat the topic sufficiently, one might also consider in the same approach the development of the Roman composite capital where a capital's orders change from Ionic to Corinthian at the same juncture. To conclude this section, I would like to suggest that the practice of two-piece capitals, formed in a Hellenistic Greek *milieu* and perhaps for practical purposes, was adopted energetically in a Roman setting, where it remained valid as it accorded well with the particular Roman approach to architectural production. As an aside, I would think that part of the reason for the modularity of the Roman approach was attached to very old traditions of Italian architecture in terracotta, quite often made out of multiple sections to prevent problems in the firing process.<sup>39</sup>

## **Part VI. The Decline of the Technology**

It remains finally to be explained why the practice disappears in Rome with the end of the Flavian dynasty (69–96 CE), and in the empire with the end of the Antonine period (96–192 CE). I must admit that explaining the decline of this technology is more difficult than explaining its origins and persistence: the answer in following must be considered preliminary. Again, at Rome one suspects that advances in lifting technology were at play. By the later first century CE, the beginning of the use of monolithic granite columns, often upwards of 50 Roman feet (14.8 m), is evidence enough of the growing ease with which Roman builders were maneuvering and raising heavy materials. Lynne Lancaster's work (1999) has detailed the impressiveness with which Roman engineers were able to raise the drums of the Column of Trajan, some upwards of 80 tons, to great vertical height within a confined space. Whatever the massive capital at the foot of the Column of Trajan belonged to, be it the temple of divine Trajan or otherwise, at 2.08 m, it was the tallest Corinthian capital in Imperial Rome. It is cut from a single block of stone, and it must have been raised to a considerable height.

However, just as lifting does not totally explain the lifespan of the two-piece capital, a change in the fabrication process of the Corinthian order in the second century AD may have also helped to spell the end to the two-piece capital. Around this time, Roman emperors first began to exploit on a very large-scale the Proconnesian quarries for monumental architecture. From several dozen unfinished capitals both from Marmara itself, and at various worksites in the Mediterranean, Nusin Asgari has worked out the stages

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<sup>39</sup> See e.g. the example from Tyndaros in Lauter-Bufe 1987.

for the blocking out and delivery of the Proconnesian Corinthian capital.<sup>40</sup> While masons still progress from the rectangle and cone pattern of the earlier unfinished Roman examples, it is important to note that the export stage of a capital now normally comes *after* the lower acanthus leaves have been demarcated in the stone. This state is so common in exports, that Asgari hypothesized that this formed a sort of Proconnesian trademark. If this is correct, it would represent a return from the stereometric to the sculptural.

The shift in quarry supply was broadly significant for the Corinthian order: Stefan Freyberger has identified a new basic pattern in the design of Corinthian capitals under the architects of Trajan, but here we are moving beyond the scope of the present paper.<sup>41</sup> Instead, we may conclude simply by recognizing that, for its development, diffusion, and lifespan, the two-piece Corinthian capital represents evidence of the complex interplay between Roman and Greek building technologies and materials in the fluid Mediterranean world of the Roman mason.

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<sup>40</sup> Asgari 1988.

<sup>41</sup> Freyberger 1990, 1991.



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