

# *The imitative basis of ancient architectural design*

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## ABSTRACT

Copying is a loaded term that is best avoided in favour of imitation, which has a basis in Greek philosophy and embraces transformation and invention. To understand the workings of imitation some distinctions are important, even if they overlap: between the aims of evocation and emulation, and between design based on exemplars as opposed to principles. Evidence from Greek and Roman antiquity shows that straightforward repetition was rare. Instead, flexible principles underpinned the classical ethos of sameness-but-difference, and the capacity to generate fresh variations of familiar forms, themes and types.

## KEYWORDS

Copying, Imitation, Emulation, Greek and Roman Architecture, Architectural Theory

## 1. *Introduction*

Products of human endeavour inevitably have antecedents. Conventions, styles and traditions, and indeed all collective behaviours involving consensus leads to proliferation. This can take multiple guises, whether repetition, copying, emulation, citation or allusion, or any repurposing of precedent to create something new. The special status of classical architecture derives in large measure from the perceived value of the past living on in this way. Its suppleness and versatility represent the other key to its remarkable endurance, embracing as it does the various movements that we label Greek, Roman, Romanesque, Renaissance and so forth, not to mention their many regional variants.

This suppleness goes back to the source, antiquity. On encountering Greek and Roman architecture we sense a commonality that comes from a degree of sameness. Yet, on closer inspection, near identical buildings are rare. Looking beyond the sameness and likeness due to the condition of ruin or the limited palette of surviving materials, we can see countless variations of forms, themes and types.

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This sameness-but-difference is a positive paradox that merits contemplation not only from an art-historical perspective, but also in the light of a negative paradox observable in the contemporary built environment, that of myriad apparent novelties competing for our attention against a backdrop of global uniformity, alienation and placelessness. The ancient equilibrium between sameness and difference stems from the principle at the heart of creative tradition, that of *mimesis* or imitation. Imitation, it must be emphasized, is not synonymous with copying, even though the two are often conflated. This is important given pejorative perceptions of copying, witness routine qualifiers such as ‘mechanical’, ‘mere’, ‘rote’ or ‘slavish’. In contradistinction to innovation and the unexpected, this implies limited or absent creativity. As a result imitation has been tarnished, misrepresented and avoided, with unfortunate consequences for modern design and our built environment, given that experimenting with the untested can produce failures, while insufficient familiarity and continuity can contribute to alienation.

These introductory comments serve to connect with wider debates, but for reasons of brevity we must move on to the main theses advanced in this chapter. First, it is instructive to distinguish between imitation aimed at recalling earlier works and associations, which I dub “evocative imitation”, and that aimed at improvements in design, namely “emulatory imitation” (or simply emulation). Second, whereas the influence of precedent is usually discussed in terms of exemplars, I argue that generative principles were more fundamental to the classical ethos of sameness-but-difference. A correlate of this second point is my third, that copying had little place in the design of ancient architecture, despite its relative predictability. The ancients deployed principles and methods flexibly, thereby producing fresh variations of forms, themes and types. This is consistent with the concept of imitation, but not copying, a distinction that needs clarifying before proceeding further.

## 2. *Copying and seriality*

In most usage copying concerns processes of reproduction such as printing, photocopying, casting and using moulds, and their contemporary digital equivalents. But in the arts and architecture the word copy is used more loosely, which introduces certain dangers. The degree of resemblance that merits the term is subject to opin-

ion: do we mean a copy to be *exactly* the same or *vaguely* the same as what it copies? Interpretation can slide from one to the other, muddying discussion.

Copying is widely regarded as fundamental to the production of ancient sculpture, witness the trope of ‘Roman copy of Greek original’ as perpetuated on innumerable museum labels. But this is an over-exaggeration. It is true that some instances merit the label, that duplicates feature occasionally in Greek statuary (Ridgway 2004), and that the huge demand for display sculpture in the villas of the Roman elite gave rise to workshops producing statues in series. Hundreds of not dissimilar wine-pouring and resting satyrs have been found, for example, often in groups of four or more (Ridgway 1997; Anguissola 2015). However, our focus is on sameness with a temporal dimension, on the way influence promulgates, and on the characteristics of one building (or work of art) recurring later. The Roman caryatids replicating those of the Erechtheion on the Athenian Acropolis are the most obvious examples of Roman copying Greek originals – but caryatids are architectural supports, the nature of which lend themselves to repetition. It is actually rare for a surviving free-standing Greek statue to match a later copy, and for this and other reasons a growing number of scholars contest the presumed dominance of copying (Gazda 2001; Perry 2005; Claridge forthcoming), while recent exhibitions on replication show just how much variety can be produced by ‘free copying’ (Settis 2015). But are we sure that copying is the right characterization? As Claridge argues, expert Roman sculptors were capable of independently varying types that they had in their mind’s eye, having learnt such types during their training and experience, or perhaps using a relatively diagrammatic graphic scheme in circulation. This is the stuff not of copying, but of varying forms, themes and types, that is to say *imitation*.

### 3. *Imitation*

Roman texts show that in some contexts *imitatio* could include straightforward copying, as when Quintillian stated *imitatio per se ipsa non sufficit* (*Inst.* 10.11.6-7; Perry 2005, pp. 95-96). Imitation is nonetheless a more ample and elastic concept. Imitation implies learning from something that exists with a view to application in creating new work, and thus *transformation*. In imitative arts such

as traditional painting, we understand that a picture is a re-presentation of the subject, which, notwithstanding the goal of verisimilitude, is not the same as the subject. It cannot be the same, for the subject will have three dimensions and likely be alive and prone to move, while a painting has two dimensions and is fixed. A change of state also applies to any image based on a mythical or imaginary subject. Whether a subject is real or imaginary, posed or fleeting, its imitation in art involves observation, analysis, editing and transformation.

Ancient discourse on imitation contains the germs of modern critiques, whether positive or negative. The premise that it brings debasement goes back at least as far as Plato, who famously distinguished between the Idea of a thing that is most perfect in the collective mind, and the not-so-perfect manifestation that can be made (for example a couch), and the still less perfect representation of the latter in art. In his analysis of creativity (*poesis*), the grounding for so much subsequent art criticism, Aristotle gives a central, positive, role to imitation. He views it not only as instinctual, the basis for how humans learn from childhood, but also the source of pleasures associated with recall, comparison and fidelity (*Poetics*, IV, 1448b; cf. Quatremère de Quincy 1788-, s.v. imitation; Younés 1999). Crucially for the present debate, Aristotle does not see imitation as a bar to creativity, but rather as a spectrum from simple copying all the way to invention. Quintillian's view just mentioned that 'copying of itself is not enough' was a widespread sentiment, with which other Roman writings concur (*Rhetorica ad Herennium*, 4.6.9). It remains true that Roman art has a strong conservative current, but while in his *Ars Poetica* Horace recommends the aspirant poet to practice humility and defer to themes sanctioned by authority rather than risk inventing inferior material, he went on to write:

But then you must not copy trivial things,  
Nor word for word too faithfully translate,  
Nor (as some servile imitators do)  
Prescribe at first such strict uneasy rules,  
As they must ever slavishly observe ...

The strategy of assembling multiple sources from which to selectively imitate, well-attested in texts, necessarily entails observation, analysis, editing and transformation. Cicero's account of Zeuxis creating his painting of Helen by combining the most

beautiful features of the most beautiful young women of Croton is particularly revelatory, since the Roman orator adds that this parallels his own technique for crafting speeches from his stock of exemplars. This for him was a strategy that could lead to invention – the passage after all is to be found in his writings on this theme (*De Inventione* 2.1-4) – which confirms that for ancient minds invention did not have to involve a ‘bolt from the blue’ epitomised by Archimedes shouting *eureka!* The ancient concept of decorum and intrinsic conservatism meant that emulation and invention could be considered as such even if significantly more muted by comparison with modern expectations. What some today too hastily regard as mere copying may for the ancient mind be honourable imitation, the art of producing variations of established forms, themes and types – established that is by testing and critique – while being open to the invention of new ones in response to genius or necessity. Necessity of course is the mother of invention, to paraphrase Aristotle.

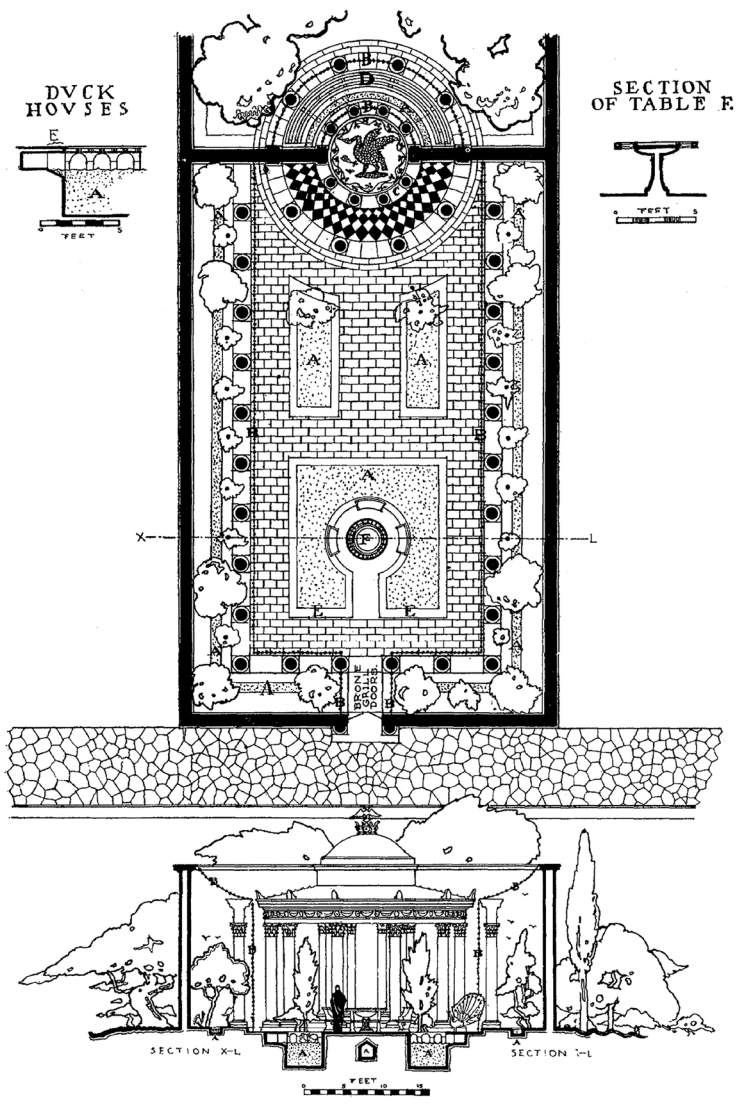
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Turning to architecture, the nature of building means that imitation operates differently (not by dint of verisimilitude) yet it remains fundamental. As for Rome’s debt to Greece, substantial as it undoubtedly was, Greek architecture was hardly simply copied. Instead, we witness the Romans deploying concepts and principles learnt from Greek sources, but all the while transposing and adapting them to suit their own purposes, contexts and materials. With time divergences grow, reflecting not just temporal distance but the development of concrete, vaulting and new building types, besides burgeoning self-confidence.

#### 4. *Evocation versus emulation*

Imitation in architecture predominantly involves two recurrent kinds of intention, one aimed at evocation, the other at emulation. The former arouses associations and meanings for the audience, providing the correspondences with the source are recognized. By contrast, emulation aims to improve on the model for the sake of aesthetic or technical coherence; the model(s) do not need to be apparent, but if so success in the implicit competition between imitated and imitator can be the source of appreciation. As with the other pairings advanced here, these intentions may overlap and operate in tandem.

Varro's aviary in his villa at Casinium represents an intriguing case of evocative imitation. It being both dear to him and elaborate, our author described it in some detail (Varro, *De re rustica* 3.5.17; van Buren and Kennedy 1919), leading to various reconstructions, most notably that of Pirro Ligorio (Cellauro and Gilbert 2015). The less fanciful plan reproduced here [Fig. 1] confirms the main outlines and the key combination of a portico and a domed rotunda. Interestingly, in the light of Cicero's spirit of eclectic borrowing mentioned earlier, Varro's text mentions a variety of structures that his aviary recalls in one way or other. He starts by paraphrasing the inquiry that came from his correspondent Appius, who complimented Varro on reputedly surpassing not dissimilar structures built earlier by M. Laenius Strabo (not the geographer) and Lucullus. Then Varro goes on to cite a seemingly domical precedent of Catullus's before concluding with mention of an eight-sided device installed underneath the dome that was akin to that in the clock-tower at Athens (... *orbis uentorum octo, ut Athenis in horologio, quod fecit Cyrrestes*), that is to say the *horologium* by Andronicus of Cyrrhus known nowadays as the Tower of the Winds (Kienast 2014). The aviary has been characterized as a 'replica' of the *horologium* (Salatin 2020, p. 15, over-extending Corso 2009, pp. 313-316), but really this may only be imputed to the 'eight-sided device'. The differences between the structures themselves must have been extensive (the original is an octagonal stone monument, very solid, with few openings; the aviary was round and had numerous apertures for light, air and insects, albeit screened by nets to prevent the birds escaping.) The *horologium* thus offered scant lessons for resolving the niceties of the design of the rotunda as a whole, which in any case borrowed more from Catullus's. This precedent was adjusted freely, so Varro's design was hardly a case of emulation targeted at its aesthetic qualities. Rather, visitors' eclectic recollections would have been triggered by certain features, and, presuming his company, the owner's recounting of his own experiences, whether his trip to Athens long before or visits to his friends' properties. The premise of the aviary was evocation, allusion and the conversational pleasures between cognoscenti who have travelled widely, or who aspired to do so, just as they aspired to inhabit the same cultural milieu as Lucullus, Catullus and Varro himself. Participation in a life of *otium* enjoyed in elite Roman villas presumed too the evocation of Greek savants philosophising and debating while perambulating in elegant surroundings, as registered by designations such as gymnasium and *xystus* that were adopted by Pliny the younger and his fellow owners (Zarmakoupi 2014, pp. 85-88).



- A, Water Channels or Pools.
- B, Bird Netting.
- C, Wood Columns.
- D, Wooden Bird Theatre.
- E, Pool Border with Duck Houses.
- F, Table.

1. Reconstruction in plan and section of Varro's Aviary, according to van Buren and Kennedy (1919).

In the realm of domestic architecture, whether residences in town or villas, the perennial phenomenon of one-upmanship naturally affected aspirations and so design. Besides his usual penchant for human foibles and parody, Plautus's play *Mostellaria* gives domestic architecture quite an extensive part, including to illustrate the strategy of taking an example and bettering it:

*As soon as a house is ready, decked out, constructed to a T, they compliment the builder and they approve of the house. Next, they request that it might be an exemplum for their own, they want similar ones for themselves and they spare hardly any expense or effort (Mostellaria, 101-4; Nichols 2010, p. 53).*

These lines bring to mind a process of taking an example and having an improved (and more costly) version made. Yet in the same personage, Philolaches, only a few lines earlier, uses *exemplum* in a much looser way, when he exclaims “now I have discovered this *exemplum*: I discern that a man is like a new house when he is born”. (*Mostellaria*, 90-92; Nichols 2010, pp. 52-53). In short, *exemplum* seems to carry a not dissimilar range of meaning as the modern word copy, so some caution is needed when it comes to interpretation.

In her recent article on the “*copia architetonica*” in antiquity, Salatin discusses other potential instances culled from the literature, the built counterparts, sadly, all being lost. It is clear nonetheless that most cases involved evocation rather than emulation, as for example when the model to be imitated was a city or memorable topography, since the new site can only have been different (Salatin 2020, pp. 8-11). The Greek term *aphidruma* was used to denote duplicate objects involved in transferring cults to new sanctuaries (Malkin 1991; Anguissola 2006). Some *aphidrumata* may have been small-scale architectural models, although most are likely to have been objects that carried functional or symbolic resonance rather than anything encapsulating design (Salatin 2020, pp. 8-11). In the absence of physical evidence all we can do is raise the various possibilities.

As regards actual buildings that acted as mementos of travels or deeds abroad, the pyramid of Gaius Cestius must surely have had this function, alluding as it did his prestigious offices in recently-annexed Egypt. Here evocation went hand in hand with the form, character and material of the monument, although it is hard to discuss this in terms of emulation, the design being so very elemental.



It might seem that Hadrian's Villa would be a prime locus for connections between its many components and things the restless emperor encountered on his travels. Two lines in the *Historia Augusta* citing the names of six "very famous places" that Hadrian gave to parts of his villa has given rise to no end of speculation, not to mention a plethora of additional names. Modern scholarship remains unconvinced however (MacDonald and Pinto 1995; Ortolani 1997; Gros 2002; Salatin 2020, p. 16), and with good reason. The architecture of the Villa extended the fertile experimentation that had been developing since the time of Nero, while, perhaps due to Hadrian's direction) achieving a remarkable unity of 'house style'. Any traces of foreign influence, inevitably varied, must therefore have been highly sublimated and of limited relevance to composition and emulation. Instead, we should imagine a world of allusion, citation and evocation, and abundant material for the kind of conversations that Varro's aviary elicited. Enigmatic personal associations doubtless played a part, as they did with Augustus's private retreat located in the upper levels of his house on the Palatine, a kind of contemplative laboratory that took its name 'Syracuse' perhaps to allude to Archimedes's inventiveness (Gowers 2010). Any morphological similarity with the city of Syracuse must have been either very tenuous or completely absent.

The possibility that 'copying' could involve a low degree of likeness brings to mind Krautheimer's understanding of how conceptions of the Holy Sepulchre informed the creation of certain sacred buildings in the medieval period (Krautheimer 1942); connections were there to be recognised, at least by an elite, but they only loosely affected design proper. It is a salient fact, moreover, that in the Greek and Roman world the chief means of using buildings to register patronage and events, or to convey meanings, did not typically involve their forms as such, but the inscriptions and architectural sculpture applied to them.

##### 5. *The Columns of Marcus Aurelius and Trajan*

The later of these two preeminent columns represents the clearest instance known to me from antiquity of architectural design based on the premise of a single specific exemplar. The dependence of the Column of Marcus Aurelius (Beckmann 2011; Martines 2013) on its Trajanic predecessor is undeniable. First, there is the

high degree of similarity between the two, including attributes that are quite specific. Second, this kind of design was uncommon. Indeed, the antecedents for Trajan's Column are sufficiently obscure to suggest that it was in large part the invention of its designer, Apollodorus of Damascus (Wilson Jones 2000, pp. 168-169; Di Pasquale 2019; Conti 2022), from which it follows that there were unlikely to exist any general advice as to how to proceed for this kind of monument. Third, the later monument includes features that are best interpreted as adaptations of Trajan's Column, adaptations based on a close critique of this model, and this model only. The later architect may have personally inspected or surveyed certain key details of the original, and / or he may have benefited from a textual description or specification the monument, one perhaps set down by Apollodorus himself.

It is further possible to postulate key steps in the design that led to the Aurelian Column, namely:

i) Appreciation of the suitability of Trajan's Column as the model for the new commission.

ii) Detailed observation and critique of the precedent for the purpose of distinguishing between aspects deemed so successful as to be reprised, as opposed to those that would benefit from revision.

iii) Outline design incorporating the chief aspects to be repeated:

– The conceit of a free-standing column rising from a pedestal with a square plan, made throughout of white marble;

– A Tuscan column 100 ft tall, with a capital doubling as a belvedere platform, and an echinus decorated with egg-and-dart.

– A relief scroll on the external face of the shaft of the column narrating military exploits, with further opportunities for relief sculpture on the pedestal.

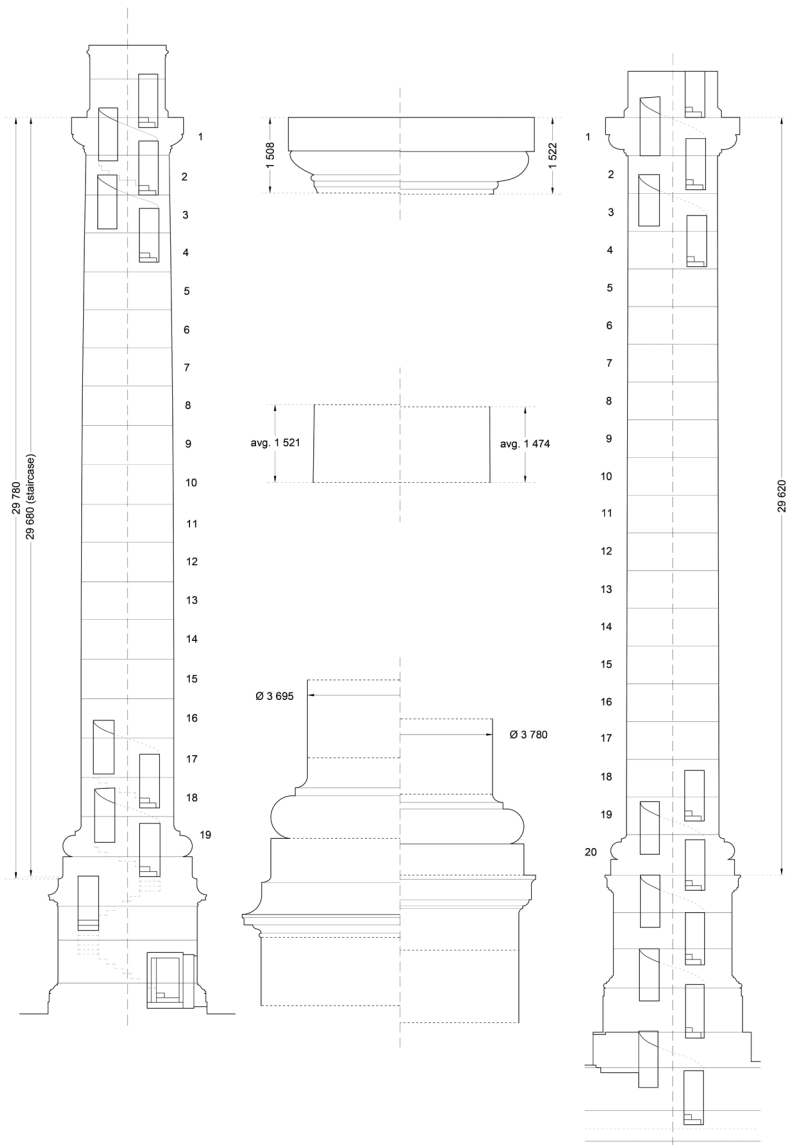
– A helical stair internally leading up to the belvedere platform.

– Fourteen steps per turn for the stair (giving a good balance between headroom and comfort).

– A megalithic constructional principle featuring a capital fashioned from a single block and roughly 5ft tall monolithic drums each incorporating a half turn of seven steps.

iv) Developed design incorporating the following revisions [Fig. 2]:

– The curious dimensioning of Trajan's Column, with its  $19\frac{1}{2}$  blocks  $5\frac{1}{8}$  ft tall adding up to  $100\frac{1}{2}$  ft for base, shaft and capital combined, was corrected; hence the revised obvious solution of 20 blocks of 5 ft, making 100 ft exactly (Wilson Jones 2000, pp. 165-169).



2. Hypothetical schematic steps in the transformation of the Column of Trajan into that of Marcus Aurelius, shown in section and elevation.

A: Column of Trajan; B-D: aspects of modification;  
E: Column of Marcus Aurelius (Author and Jakob Ryng).

- The transition from a square to helical stair in the middle of the course that straddled both pedestal and column base, a contorted feature indeed, was avoided by extending the helical stair down to the ground.
- The depth of the helical exterior relief, increased for greater legibility;
- The entasis and diminution was greatly reduced judged antithetical to the idea of an unfurling scroll;
- The pedestal was made taller, no doubt simply so that the overall height of the second monument exceeded its predecessor.

Trajan's Column was thus fundamental to the whole venture of creating its successor, from concept to detail. The revisions were evidently aimed at improvement, consistent with spirit of emulation. These objective improvements – including the accurate 100 ft height – may have supported claims for the superiority of the Aurelian Column. To modern eyes the original remains the more successful design, for it is Trajan's, not its successor, that inspired numerous imitations in the Neoclassical period. But this is another story.

## 6. *Exemplars versus principles*

The discussion of how imitation affected later developments is a staple of architectural history, especially from the Renaissance onwards (Mayernik 2013, Hemsoll 2019). Yet the imitation of exemplars was hardly the only mechanism perpetuating sameness and likeness. The past also informs the new when underlying principles and related methods are reapplied, when theory is put into practice.

This is not the place to examine ancient design theory in any depth, but some observations can help our present purposes. Vitruvius's treatise remains our main window onto such theory, but his treatment lacks a coherent structure while suffering from significant gaps and contradictions (Gros 1982), thus calling for qualification and integration in the light of how design proceeded in practice (Wilson Jones 2000, esp. ch. 2). The famous triad of firmness, commodity and delight (*firmitas, utilitas* and *venustas*) leaves out the meanings buildings may convey, and so too the potential for evocation. Meanwhile the three driving principles of *symmetria*, *eurythmia* and *decor* (*prepon* in Greek), tell us little about statics, construction and anything to do with making and the Greek conception of *techne* (Angier 2010; Wilson Jones 2015).

Further obstacles include Vitruvius's virtual silence on *imitatio*, and relatively little discussion of how hybrids, variants, and variety can come about, for example when treating different kinds of temple layouts (Vitruvius 4.8.4-7). Importantly, he does make it clear that ideal schema need to flex according to site conditions and contingencies (5.6.7; 6.2.1), a process which necessarily produces variety. A more theoretical examination of variety would have helped explain the full significance of the idea that architects should follow the lessons offered by the ideal human body as nature created it (III,1). He concentrates on its *symmetria* (mathematical harmony), its numbers, measures and ratios. But he did not say that architecture can possess analogous primary proportions (those ratified by convention) while exhibiting the endless variety we observe in human bodies thanks to varying secondary proportions, morphologies and detail. This principle of paradoxical sameness-yet-difference emerges on comparing well-preserved sets of ancient buildings and architectural elements, as we shall see. Similarly, we humans (or any other species) belong to the same species, yet every individual is unique. In my view this is the single most vital quality or 'secret' of the classical tradition that is generally overlooked.

Recourse to principle on the one hand and exemplar on the other can operate independently, as if at opposing ends of a sliding scale, although they are not mutually exclusive and in practice often overlap (just as observed for evocation and emulation). It is evident that many disciplines and associated didactic methods rely on the conveyance of a body of theory that can be illustrated and qualified by examples. This was a commonplace of ancient instruction on rhetoric (West and Woodman 1979; Perry 2005, 45). The design of the Column of Marcus Aurelius was dependent on the Trajanic exemplar, but it was status and *symmetria* (Gros 1989; Wilson Jones 2000, 40-43) that prompted the corrected symbolically attractive 100ft height. At the other end of this scale design depended predominantly on principle, as we can see in the deployment of entasis.

## 7. Entasis

Countless Greek, Hellenistic and Roman column shafts in diverse geographical regions partake of the subtly curving profile known as entasis. Naturally it is practically impossible to know

the nature of an entasis profile merely by looking at it.<sup>1</sup> At the same time, as I know from personal experience, surveying the profile of a shaft with sufficient precision to permit identification of its geometry is no easy matter. Indeed, scholarly papers have dissected in detail the criteria by which competing geometries can be distinguished: ellipse, parabola, hyperbola, catenary and oblique lines (along with combinations of lines and curves), but not without disagreement and scope for divergent interpretations (Haselberger 1999).

It is hard to imagine a scenario in which a Roman architect or master mason, on receipt of a commission to produce a particular set of column shafts, had to survey an existing shaft, or shafts, in order to know what method to use. It is true that Renaissance and later architects surveyed ancient shafts in the attempt to derive or verify their own propositions, given the loss of the drawing Vitruvius used for explication. But whereas they were seeking to recover lost knowledge, the situation in antiquity was quite different. Notwithstanding developments in style and technique, periodic innovations and regional divergences, there was significant continuity in the field of column design from the Greek Archaic period to Late Antiquity. Moreover, entasis was one of the most stable of all the niceties invested in columns. Most architects and masons involved with monumental architecture would have been aware of the main contending methods for producing entasis, availing themselves of a common pool of knowledge transmitted by varying combinations of oral knowhow, more or less formal training / apprenticeship, and written authority, be it in the form of a manual, Vitruvius's (lost) drawing, or the specialist Greek sources that he drew on.

All this is consistent not only with the two entasis templates on stone that survive from antiquity, one from Didyma the other from Aphrodisias, but also with the patterns that emerge from comparing profiles obtained by survey. The method employed at Didyma entailed incising an arc of a circle and then in effect 'stretching' the arc in the process of execution, thereby producing a part-ellipse (Haselberger 1980; Wilson Jones 1999; 2000, p. 128). The method used at Aphrodisias was cruder, involving the simple device of two

<sup>1</sup> The one exception I have personally encountered concerns the shafts of the Temple of Hadrian in Rome, where some flutes survive crisply intact for their entire, considerable, height. Scrutinizing these with the benefit of scaffolding in 1983 the profile appeared to comprise just two oblique straight sections, as was then verified by measurement, and as accords with the principle of the full-size ancient template subsequently discovered at Aphrodisias, see Hueber (1998).

straight lines at an oblique angle to each other (Hueber 1998; Wilson Jones 1999; 2000, p. 129). Both solutions are known from monumental columns in Rome, with at least one instance more or less matching each of the two templates just mentioned. But these the simplest options are, significantly, not so common. Instead, surveys attest to numerous related or hybrid profiles, typically combining a curve with a straight line, and showing considerable variation in the precise extent and relationship between straight and curve (Wilson Jones 1999; 2000, pp. 128-132). It is possible that choices were facilitated by designers being aware that such-and-such a set of columns were made according to such-and-such a method, but otherwise the role of specific precedents was probably limited. What counted was *generalized precedent*, which may be likened to a pool of distilled prior collective experience, perpetuated by means of principles that were sufficiently malleable to generate new variations according to the materials used, size, budget, taste and circumstance.

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Having outlined two extreme positions on a sliding scale of imitation, with exemplar at one end and principle on the other, let us now consider where on this scale to locate other manifestations of Greek and Roman design, namely the Arch of Constantine, the amphitheatre at Arles along with amphitheatres in general, Roman Corinthian columns, and lastly Greek Doric temples.

## 8. *The Arch of Constantine*

By the time of the Arch of Constantine there existed an extensive repertoire of triumphal and honorific arches spread all over the empire, including of course in Rome itself. Given the conservative nature of this typology, the consensus that its composition should revolve around the fornix, and the relative simplicity of function, it seems likely that a skilled trained architect could have generated a new project without recourse to a particular exemplar. Yet if a suitable one were within reach it could potentially offer valuable lessons for improving details.

Notwithstanding these observations – or because skills were on the wane by this period and the model was so near at hand – comparison of the Arch of Septimius Severus with that of Constantine reveals substantial dependence of the latter on the former (Wilson

Jones 1995; 2000, pp. 123-127; 2000b). Even if not so marked as for the two Columns, considering both the popularity of the type and the compositional latitude exhibited in triple arches elsewhere (e.g. Djemila, Orange, Palmyra, Sbeitla and Volubilis), the two Roman arches are strikingly alike. Specific compositional and dimensional characteristics include the following:

i) in both the columns are 3ft in diameter with 24 ft tall shafts incorporated into a total height of 30 ft (including a sub-plinth under the usual base);

ii) in both the width of the central fornix, measured between the opposing columns, equals the column height (without the sub-plinth), thereby implicating notional squares;

iii) there is a near but not exact equivalence in the total height of about 70 ft;

iv) the second architect appears to have adapted the antecedent by introducing revisions aimed at aesthetic improvements, proportional and geometrical coherence, and the need to accommodate the spolia that were recycled into Constantine's version.

Salient revisions include the following [Fig. 3]:

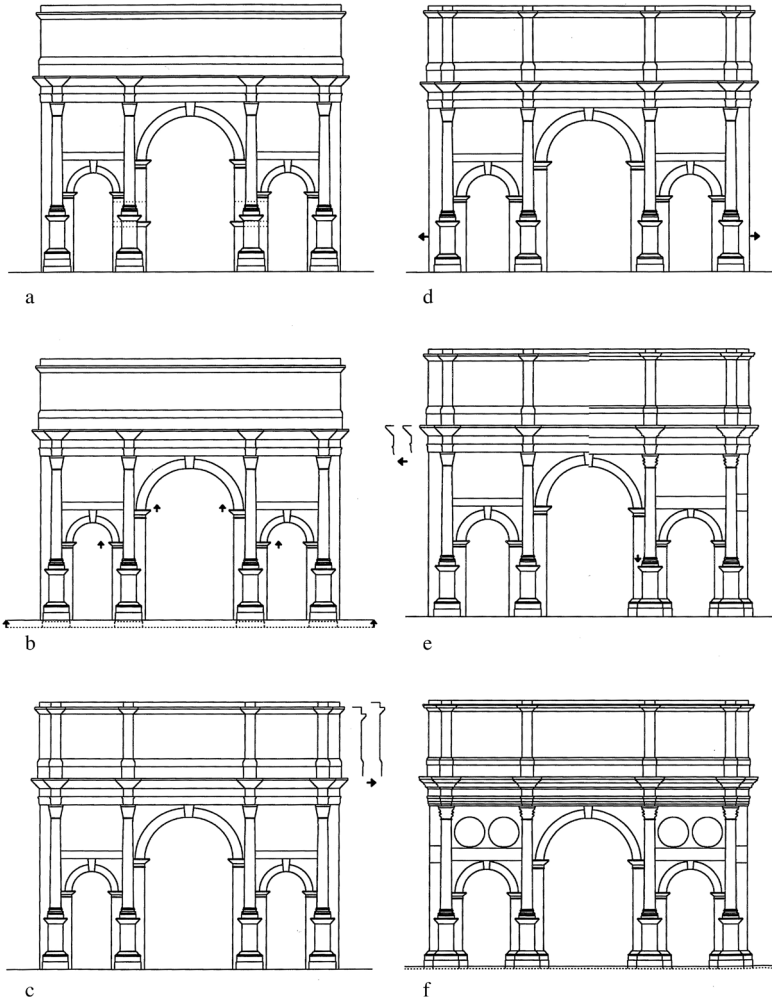
– A widening of the side arches to accommodate the twin spoliated *tondi* and the twinned relief panel *spolia* above.

– A concomitant widening of the overall interaxial width, 70 ft for the Severan arch, to 75 ft. As in the case of the two Columns, and other pairs of not dissimilar projects (for example the mausolea of Augustus and Hadrian), it was normal for the successor to exceed the size of the antecedent in some respect. This was a kind of emulation besides a matter of prestige.

– A thorough overhaul of the proportions so as to achieve, usually quite accurately, a series of square and double square proportions, certain rectangles in the ratio of root 2 and root 3 (Wilson Jones 1995; 2000b; 2000, pp. 123-126). This entailed a series of adjustments with respect to the model, as for example the entablature height becoming 7½ ft rather than 7 ft, making the height of the order 37½ ft, or half the 75 ft interaxial width already cited.

– Such revisions cumulatively transformed the exemplar into the successor, although not necessarily in the sequence suggested by Fig. 3. As noted, the revisions were in large part driven by the principle of *symmetria* allied to geometrical satisfaction, and there must have been considerable testing of competing options before arriving at the final design. Rather than seeking to position the project on a linear scale from exemplar at one end and principle at the other, a more apposite mnemonic diagram would be a loop, or iterative loops.





3. Hypothetical schematic steps in the transformation of the Arch of Septimius Severus into that of Constantine. Each drawing is at the same scale and shares the same column height.

A: Arch of Septimius Severus; B-E: aspects of modification;  
 F: Arch of Constantine (Wilson Jones 2000b, Fig. 21).

It would be interesting to expand this discussion to embrace other monuments, but brief comment must suffice. The propylon or tetrapylon at the west entrance to the Roman Agora in Athens is of interest, given that the gap in time that separates the Classical model(s) it echoes is even greater than that between the reigns of Constantine and Septimius Severus (Wilson Jones 2000, pp. 36-37). It is not entirely idle, incidentally, to speculate that Vitruvius was its architect. Having already donated funds for the agora in 51/50 BC (Cic. *ad Att.* 6.1.25, cf. Suet. *Div. Iul.* 28), Julius Caesar is thought to have visited Athens in 47 BC in connection with his campaign in Asia Minor that year (Shear 1951, p. 358). Vitruvius is known to have been on that campaign, and he cites Attic monuments in his treatise, including the Tower of the Winds (Vitruvius I. 6. 4) not far from where the tetrapylon was to rise. The inscription on its architrave is dated between 27-10 BC (*IG II3 4 12*), but this would not exclude an earlier conception or start on site. The conservative stance implied by the look of Doric as it was practised in the 5<sup>th</sup> and 4<sup>th</sup> centuries BC fits with Vitruvius's own disposition, so it is not impossible that he produced the original design. Alternatively, the design was by a younger colleague who shared some of his views. The great propylon of Eleusis erected in the second century AD similarly looks back to Mnesikles's propylon on the Athenian Acropolis, but even more so than the Athenian tetrapylon, given the more monumental hexastyle layout, its dimensions and certain details (Giraud 1989; Baldassarri 2007; Salatin 2020, pp. 17-18). There is also evidence for a reprise of the Temple of Concordia in the temple "de la calle Holguin" in Merida, the forum of ancient Emerita Augusta (Mateos and Pizzo 2008; Salatin 2020, 13).

## 9. Amphitheatres

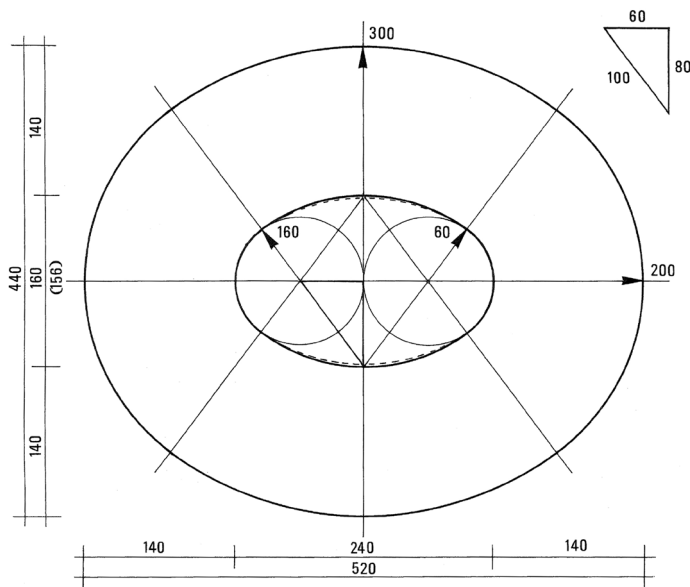
By comparison with temples, propylaea and honorific arches, the design of amphitheatres had greater need to flex subject to multiple variable local factors, including capacity, budget, operational and technical requirements (involving sometimes complex circulation). Accordingly, amphitheatres across the empire display very substantial variety (Golvin 1988; Wilson Jones 1993), and no two examples resemble each other to the extent that do the triumphal arches just discussed. This said, there are significant similarities between the amphitheatres at Nimes and Arles, and the fact of them being relative neighbours geographically makes some degree of direct influence likely, if not continuity in terms of the individuals involved.

The one at Arles being seemingly later in date, probably looked to that at Nîmes. The spirit of competitive emulation can be seen in the latter's slightly increased size and an improved section for the sake of a more elegant exterior, in tune with a shift from Tuscan to Corinthian capitals on the upper level (Wilson Jones 1993, p. 434). In short, influence and not dependence is the best characterization.

That the later design was not generated solely by adjusting its predecessor seems likely given that a method for laying out both was in general circulation, being used for a large number of imperial amphitheatres. The point of departure in each case was an oval constructed from a bisected equilateral triangle, with an arena measuring 250 x 144 ft (initially), and 60 bays on the exterior. Adjustments to the geometry (a routine practice aimed at obtaining desirable dimensions around the circumference of the façade) may have occurred independently, leading to slight divergences. Further minor differences stemmed from the cavea being widened at Arles, thus outdoing its older cousin. Some corrections were introduced too, notably to avoid the anomaly of the horseshoe-shaped arches over the upper arcade at Nîmes (Wilson Jones 1993, p. 434). I use the word *cousin* pointedly, to register that there was not a simple descent as from progenitor to progeny. The underlying methods constituted the dna they shared, as it were. Other groups of amphitheatres may also be likened to cousins in this spirit, save that some used the other dominant geometry, that based on a 3:4:5 triangle. Recent work on a group of amphitheatres in the Hispanic province of Baetica shows that three of them, those at Ecija, Córdoba and Italica, were all set out using the same starting point as I identified for the latter [Fig. 4], with a 160 ft by 240 ft arena based on a 60:80:100 triangle (Wilson Jones 1993, pp. 403-406; Hernández 2015, esp. pp. 137-138).

The amphitheatre at El Jem mimics the Colosseum to the extent that the Tunisian structure might be regarded as a down-sized variant of the Roman megastructure. This is not the case, since there is little consistent with a strategy such as scaling (as when using a photocopy), or taking the 80 bays of the Colosseum and reducing them to 64, while removing a storey. There are too many differences for this to be plausible, for example the greatly increased mass of the piers of the facade at the expense of the openings. Much of the commonality stems from both buildings being set out with the familiar 3:4:5 triangle (Wilson Jones 1993), with its application being informed by knowledge of the Colos-

seum, which may have been transmitted from Rome by way of an itinerant specialist or team. It seems a case of principles and methods being supplemented by lessons learnt from an exemplar, a scenario that must have affected many ancient buildings. But ultimately learning from exemplars was a supplementary activity. The sameness and familiarity that accompanies all the variety is, I contend, due to principles and methods, ones that were sufficiently flexible to produce unique solutions to the requirements asked of them, time after time after time.



4. Conjectural geometry representing the starting point for the layout of the amphitheatre at Italica (Wilson Jones 1993, Fig. 15).

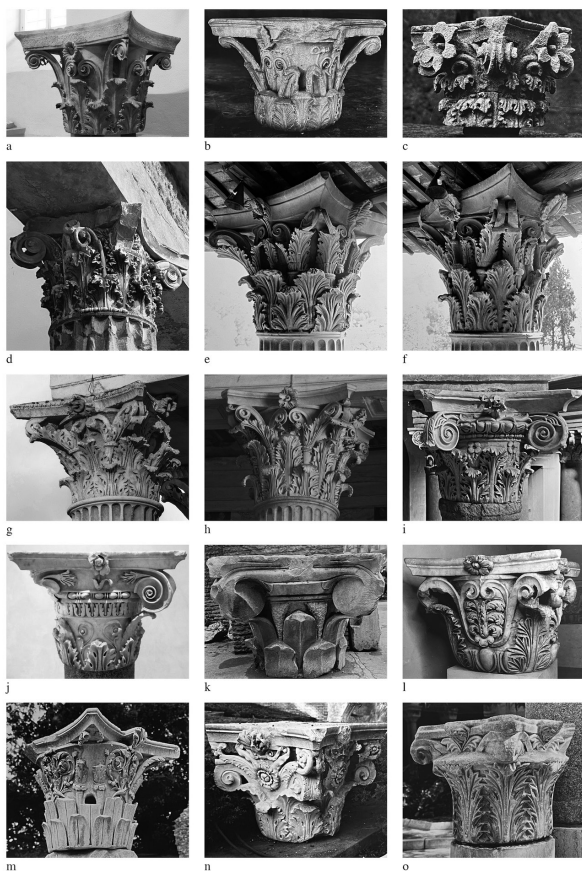
## 10. Conclusions

In working towards a conclusion, we might ask where to collocate other categories of civic building on the scale of imitation from exemplar to principle, using the same methodology (the comparative analysis of a set of examples selected by virtue of being well preserved). Intuitively, Roman temples and theatres seem broadly comparable to amphitheatres in this respect. Bath

buildings would go further along the scale towards principle, given the array of varying configurations suggests only an occasional reliance on exemplars. Turning to components, I have long been convinced that from Augustan times onwards Roman Corinthian columns and capitals exemplify the dance of rule and variety consistent with the flexible application of principles and a quotient of semi-standardization (Wilson Jones 1989; 1991; 2000, ch. 7). Corinthian design exemplifies in fact the paradigm of sameness-yet-difference operating in analogy with nature's model of the ideal male body – witness how capitals obeying the 1:1 cross-section rule can be extraordinarily different [Fig. 5]. A comparable degree of system seems unlikely for Ionic capitals, so diverse are the many sub-types and variants, and their contexts from Archaic to Roman times; nonetheless the existence of shared methods in certain periods would hardly be surprising.

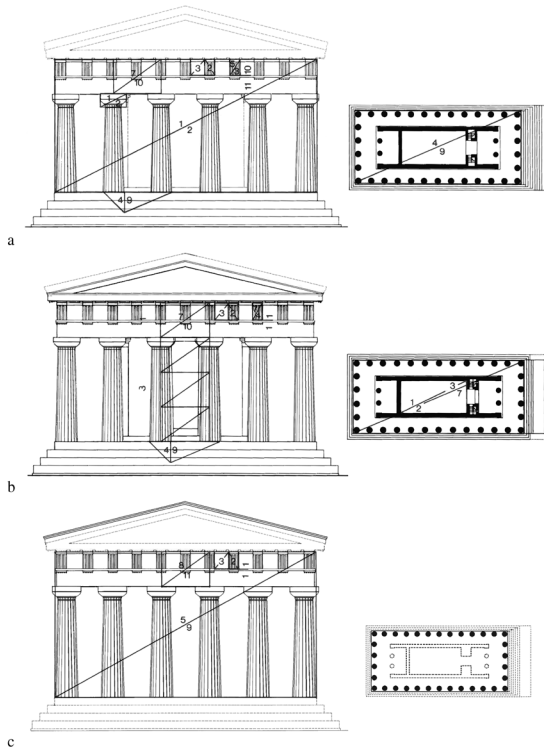
Finally, there is the Greek Doric temple with which the classical tradition starts, with its tightly controlled set of conventional details that varied, but not too much. Indeed, many hexastyle temple fronts of the Classical period are decidedly similar. The three temples aligned on the ridge at Agrigento are so very alike, including in terms of dimensions, that exemplar-based processes of imitation seem inherently plausible [Fig. 6]. Mertens's analysis is compatible with the earliest of the three providing the model for the second, and the second for the third, with each progression tweaking proportions towards greater gracefulness (Mertens 1984). Yet the designs are also compatible with the strategy of 'modulated proportions' in tune with broadly coeval temples elsewhere (Wilson Jones 2001). We should not, however, oppose exemplar to principle, for both can operate in tandem. Perhaps the situation can be compared to that at Arles; all three temples at Agrigento may have been composed using a common method, with the design of the later ones benefiting from a critique of the predecessor(s) so near to hand. Interestingly, given the otherwise intensely singular character of the Parthenon, this building too may be the product of essentially the same principles (Wilson Jones 2018). It is this approach that ultimately reappears, somewhat changed and poorly digested, in Vitruvius's account of Doric design (Vitruvius 4.3).<sup>2</sup>

<sup>2</sup> I cannot make this claim with the same confidence with which I would defend my interpretation of Roman Corinthian design, which has never been seriously challenged. Pakkanen (2013) raises objections on the grounds of statistical rigour, but his own methodology is slanted and flawed to the point of muddying the issue (see Wilson Jones 2018, p. 223, n. 45). Barresi (2015) offers support, but it is fair to say that the question remains open.



5. Selection of Corinthian, Composite and Corinthianizing capitals, each of which are characterized by the same proportion, the equality between the total height and the cross-sectional width of the abacus (Wilson Jones 1991, with measurements in the Appendices): a. Epidauros, tholos, ca. 360 BC; b. Miletus, Laodike building, ca. 250 BC; c. Rome, House of Augustus, mid 1st c. BC; d. Pompeii, House of the Faun, late 2nd / early 1st c. BC; e. Rome, Tholos by the Tiber (Temple of Hercules Victor?), 1st phase, mid second half 2nd c. BC; f. Rome, Tholos by the Tiber, 2nd phase, second half 2nd c. BC; g. Nimes, Maison Carrée, ca. 5 AD; h. Rome, Pantheon, ca. 120 AD; i. Rome, S. Costanza, Augustan?; j. Rome, Capitoline Museums, first half 1st c. AD?; k. Rome, Colosseum, portico summa cavea, early 3rd c. AD?; l. Rome, Via Eleniana, 2nd c. AD? (so-called sofa type); m. Tivoli, Hadrian's villa, Triclinium; n. Rome, Capitoline Museums, 2nd c. AD?; o. Bethlehem, 5th c. AD

[For inventory numbers and photo credits see Wilson Jones 1991, except for b, m and o (Author), g (Wikimedia Commons, Krzysztof Golik), h (Maxim Atayants), and k (Roger Ulrich)].



6. Elevations of the three Doric temples at Agrigento, with proportions overlaid: top: Temple of Juno-Lacinia; middle: Temple of Concord; bottom: Temple of the Dioscuri (Wilson Jones 2000, Fig. 3.25, after Mertens 1984).

The sameness-yet-difference of ancient architecture reflects it seems a broad spectrum of imitation, the default kind being the application of principle and method. Exemplars served to illustrate and qualify the principles, as a stimulant for emulation, and, on occasion, the basis for adaptive copying. Trajan's Column and Constantine's arch are exceptional in exemplifying this approach. Design hardly ever involved straightforward copying. After all, is this not the impression we take away from reading Vitruvius's treatise, given that his guidance on design generally took the form of ideal schema?

At the same time the vaguer form of evocative imitation associated with specific precedents and conveyed by varied means, whether broad similarity, certain features, statuary, paraphernalia, inscriptions,

correspondence or casual anecdote, must have been more prevalent than we can ever know. This is surely true both for sacred architecture and the villas of the elite, as indicated by Varro's account of his aviary and letters by figures such as Cicero and Pliny the Younger. Allusions, associations and citations bringing to mind past achievements are sure to have been enjoyed – and exploited – by those commissioning significant works of architecture. This enjoyment is not insignificant, especially if we heed Aristotle's contention that we enjoy encountering likeness because it invites us to contemplate, to learn and to infer connections. So we connect the past with the present. And we can infer something else from the distinction he goes on to make in the *Poetics*, that the most important mode of imitation is not that of examples resulting from actions, but that of the actions themselves. If this advice on the writing of tragedies is transposed to architecture the message is clear. It is also in perfect accord with the evidence: proper design comes from the cogent deployment of principles. It may be better to imitate than to produce poor inventions, just as Horace advised, but simple copying was not the done thing.

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