

RESEARCH ARTICLE

Were Early Modern Architects Neoplatonists? The Case of François Blondel

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What was the status of Neoplatonism among early modern architects? What relationship did they see between their designs and the 'design' of nature? What, if anything, guaranteed the aesthetic claims for specific numerical ratios or geometrical forms? Did early modern architects even require such a guarantee? We have little direct evidence to answer these questions. It has generally been assumed, since the publication of Wittkower's *Architectural Principles*, that practitioners held to stronger or weaker versions of Renaissance Platonism. Music, bodies, and buildings, according to this notion, shared a structural affinity with the order of the heavens, because they depended on the same basic numerical ratios. It is worth pointing out, however, that Wittkower himself adduces only circumstantial evidence for such beliefs. Alberti and Palladio, while suggestive, are both very terse on this point, obliging Wittkower to supplement his case with further evidence drawn from philosophers and mathematicians, in particular Luca Pacioli, Francesco Giorgi, and Nicolas of Cusa. It is this set of circumstances that makes François Blondel's extensive response to Claude Perrault, in their famous debate over the efficacy of proportion, so important. The twenty chapters that Blondel devoted to this issue in the final volume of the *Cours d'architecture* (1675–1683) represent a rare historical testimony: an explicit, self-conscious, and theoretically elaborate justification of proportion by a Renaissance practitioner. Blondel's interpretation of this tradition, too, is noteworthy. What these pages show is not an orthodox expression of Platonic doctrine, but rather an attempt to adapt the age-old principle of cosmic *symmetria* to a new, modern context.

Introduction

Claude Perrault's 1673 edition of Vitruvius was innovative on a number of levels. Aside from the quality of the translation, the commentary was distinguished by very modern editorial values, in particular its transparency. The text is supported by extensive footnotes, which serve not only to clarify the Latin original but also to explain the rationale for the choices made in rendering it into French. It is there that Perrault showcased his scholarship, measuring his translation against those of previous interpreters and corroborating his decisions with reference to other classical sources. Indeed, Perrault pushed this quality of editorial transparency to unprecedented lengths. Unusually for an editor and translator, he often took it upon himself to confront Vitruvius directly, sometimes objecting to the author's advice or even dismissing it altogether. In the latter cases, Perrault used the footnotes to propound his own opinions about architecture, in effect, offering himself as a competing and equally valid authority.¹

One of Perrault's most famous objections concerned Vitruvius's attitude towards proportion. In a footnote on the origin of the Doric order in the first chapter of Book Four, Perrault digressed from the original text to offer a broad critique of current architectural thinking. Most

architects, he opined, favored Vitruvius's belief that certain fixed relationships between the different members of a building were somehow natural, like the distances between stars, or between parts of the human body. Perrault, however, was of a different view. The beauty supposedly derived from those proportions was neither verifiable nor – as was the case with musical harmony – upheld by common consent. For him, in lieu of any better explanation, proportional systems had simply become accepted over time. Whatever order architects bestowed on their buildings was not justified by any mathematical or natural basis but rather only by custom and precedent (Perrault 1673: 100, n. 1 and 102, n. 2).² Perrault fleshed out these arguments in a more closely argued form ten years later. The preface of his *Ordonnance des cinq espèces de colonnes* (1683) unmasked what he saw as the self-indulgence and self-interest of so-called architectural experts. The notion of proportion, Perrault argued, was merely one way in which such self-proclaimed *intelligens* relied on the blinding – but ultimately baseless – force of convention to enforce their authority.

Historians have justly celebrated Perrault's independence of mind. His pronouncements contravened centuries of established thinking. Indeed, they directly assailed a tradition central to Western architectural theory from its very origins. For this reason, the *Ordonnance* is often seen as a key text in the much broader Enlightenment debate known as the '*querelle des Anciens et des Modernes*'. Where

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his opponents sought to protect the ancients from criticism, Perrault did not hesitate to submit their works to the same unsparing critical analysis routinely applied to modern authors, especially in the sciences. In this as in so many other respects, Perrault appears to exemplify the figure of the lone, principled skeptic combating the widespread prejudices of his time (see Herrmann 1973 and Picon 1988).

Without detracting from Perrault's originality, I want to question his assertion in one respect. When Perrault says that 'most architects' favored Vitruvius's views on the single, mythical origin of the Doric order or on the natural basis of proportion, historians have typically taken him at his word. I propose that we do not really know enough about how – or even whether – early modern architects justified the use of proportions. Did they see it merely as a tool for solving formal design problems, or did they see it as a way of participating in larger truths about the grand 'design' of nature itself? What, in other words, did they think guaranteed aesthetic claims for specific numerical ratios? Did they even require such a guarantee?

These questions have long been regarded as settled, but I believe that it is worth re-posing them, to frame Perrault's attack on the efficacy of proportion in an unexplored way. Doing so puts the emphasis not on Perrault's challenging views – for all their intrinsic interest – but on the direct and extensive reply that they engendered. The twenty full chapters that François Blondel devoted to this issue in the final volume of the *Cours d'architecture* (1683) represent a rare historical testimony: an explicit, self-conscious, and theoretically elaborate justification of proportion by an early modern architect. Blondel's interpretation of this tradition, too, is noteworthy. What these pages show is not an orthodox expression of Platonic doctrine, but rather an attempt to adapt the age-old principle of cosmic *symmetria* to a new, more skeptical context. In the second half of this paper, I will look back to the early Renaissance, to ask whether Blondel's thinking was representative of other early modern practitioners.

Wittkower and Blondel

That historians have largely put aside questions about the metaphysical basis of architectural proportion is due, partly, to the great influence of Rudolf Wittkower's *Architectural Principles in the Age of Humanism*. As Wittkower explains in the first chapter, his aim was to correct a predominant view of Renaissance architecture that defined it in terms of a crude and reductive opposition to the Gothic. Where the latter was understood as godly, religiously inspired, and highly symbolic, Renaissance architecture, Wittkower complained, was widely misconceived as essentially human-centered and worldly. It is a measure of his profound scholarship and persuasive power that we have for so long simply taken for granted the existence of strong Neoplatonic rationales for architectural proportion in the early modern period. In this view, specific mathematical relationships in the dimensions of a building conferred a harmony and unity analogous to that of music or an idealized human body.³ Vitruvius, who made an explicit parallel between the proportions of

the human body and the classical orders, was a principal source for this idea, but it would also have been informed and inflected by medieval authors such as Augustine and Boethius. Musical consonance offered an especially powerful analogy to architecture because the chief intervals of the scale could be expressed in a few simple ratios and were easily recognized by the ear. The octave, for example, corresponds to the proportion 2:1, the fifth to the proportion 3:2, and the fourth, 4:3, while unison corresponds to the ratio 1:1. Incorporated into the design of a building, the same proportions were understood to create a similar 'visual' consonance. 'Harmonic' proportions differed from those thought to be found in the human form; where the two doctrines agreed was in the idea that proportion itself was rooted in nature. To Wittkower, this idea linked most Renaissance architects to a very old Pythagorean-Platonic tradition. Music, bodies, and buildings, according to this notion, shared a structural affinity with the order of the creation. In their numeric and geometric structure, they expressed nature's own rigor and rationality.⁴

The strength and originality of Wittkower's account lay in the careful attention that he showed to Renaissance architectural treatises. He considered them not merely technical manuals but also literary sources, and their authors not merely artisans but also thinkers. This approach allowed him to link Renaissance architecture with the intellectual currents of Renaissance humanism, in particular the Neoplatonic revival of the fifteenth and early sixteenth century. In the *Timaeus*, Plato presents a physical theory in the form of a mythical creation story, in which proportion and geometrical form play primary roles. The demiurge, for example, composes the world from four elements in proportionate amounts: 'so that as fire is to air, so is air to water, and as air is to water, so is water to earth, and thus he bound together the frame of the world visible and tangible' (32b). The demiurge shapes the body of the world as a rotating sphere, the most perfect of forms and motions (33b). Finally, Plato imagines the world soul as a strip of pliant metal. After demarcating it into harmonically proportionate intervals, the demiurge splits it lengthwise and shapes the portions into circular bands. In this form, the world soul represents the motions of the planets, constructed on the model of a gigantic armillary sphere (35b–36c). In all three of these passages, proportion and geometry are symbolic of the rational, purposive nature of the demiurge and of his creation. In all three, mathematical concepts symbolize the direct relationship between the microcosm and the macrocosm, between the corruptible and the incorruptible, between the world of becoming and that of being (Cornford 1937: 44, 54, 66, 71, 73). Wittkower found echoes of these ideas in the writings of Luca Pacioli, Francesco Giorgi, Nicholas of Cusa, and Marsilio Ficino, where the same mathematical concepts become spiritual and theological metaphors. His account skilfully interweaves references to these authors with the more terse pronouncements of the *trattatisti*. The former thus provides a philosophical basis for the latter.⁵

Was Wittkower wrong? Not entirely: there are admittedly strands of Platonic number symbolism in early

modern architectural thinking. However, the evidence for such views is both more complicated and less compelling than we might think. To say that such symbolism was a foremost concern for most architects, that it explains their day-to-day practice, or that it remained untouched by other cultural and intellectual influences would be overstated. Blondel makes a good test case for Wittkower's thesis. Although Blondel was writing at some remove from the Renaissance theorists who formed the core of Wittkower's argument, he nevertheless saw himself as part of the same tradition, indeed as its principal defender. Wittkower, too, recognized the affiliation:

There was an important French classicist current, the representatives of which kept alive the Platonic conception of Numbers in a doctrinal and didactic sense. François Blondel was perhaps the first architect who gave this academic turn to the old Italian ideas on proportion. (Wittkower 1988: 131)⁶

Despite his association with this tradition, however, profound differences in the way Blondel understood the role of proportion in architecture distinguish his thought from earlier forms of mathematical Platonism. Any explanation of Blondel's position should be rooted in his own historical and cultural context.

Blondel's understanding of proportion — and his defense against Perrault's attacks — rested on two main planks. The first was the Vitruvian tradition of architectural *trattati*. For Blondel, the expert application of proportions in building was the trait that distinguished the 'modern' architect from the simple mason, builder, or contractor. Blondel saw this expertise as coming predominantly from one source: books. Apart from extensive travel and the physical study of buildings, it was through the literature of architecture that the designer was able to gain an appreciation of proportion and its use. Blondel's motivation was to maintain architecture's intellectual legitimacy. In rejecting the 'natural' basis of proportion, Perrault seemed to be rejecting the authority of all previous writers on the subject. In the process, he was dangerously close to reversing the priority of theory and learning that differentiated the architect from the mere mason. It is for this reason that the first several chapters of Blondel's defense consist simply of paraphrases and commentary on the definition and importance of proportion in Vitruvius, Alberti, Philander, and Barbaro (Blondel 1675–1683, 3: 727–788).

Blondel's argument is backed up by an analysis of buildings, including examples by Bramante, Palladio, Scamozzi, Bernini, and even the otherwise disreputable Borromini. For Blondel, architectural practice reflected the primacy of proportional design. An extensive list of the proportions found in ancient buildings follows, culminating in a long section on the Pantheon. As a final example, Blondel discussed at length the façade of Milan cathedral, chosen presumably to demonstrate that even Gothic architecture could be redeemed by the expert use of proportions. His analysis, derived from the woodcut in Cesariano's 1521 translation of Vitruvius, lays out a series

of 1:1, 1:2, 2:3, and 3:4 relationships between different parts of the façade. Blondel does not cite the sources for his measurements, but it is evident that they were taken from published engravings and treatises, like Cesariano's. His supporting examples, in other words, were mediated by the same literary tradition that guaranteed the authority of proportion itself. The reasoning is circular, but it is in the service of his larger point: that in seeming to denigrate the importance of proportion, Perrault was acting against centuries of architectural practice and commentary. To Blondel, Perrault was contradicting a single, unified textual tradition, coextensive with the rediscovery of classical architecture in the fifteenth century.

The second of Blondel's two main defenses dealt more directly with Perrault's contention. It is here that Blondel felt compelled to provide an extended and very explicit justification for something that earlier architectural writers often simply state as a given. His defense of proportion relied, in essence, on a metaphorical conception of nature as a harmonious unity and on the special capacity of the mathematical sciences to reveal that unity. This was, of course, not a new idea. It was essentially a version of the old Pythagorean-Platonic explanation for the phenomenon of musical consonance. The fact that the chief intervals of the scale could be expressed in a few simple ratios and were easily recognized by the ear had long been taken as a reflection of the divinely ordered, mathematical structure of creation. The same phenomenon also provided music with privileged status as a mathematical discipline, that is, a scientific field defined by the study of discrete quantities. Nor was the conflation of music and architecture new. As Wittkower pointed out, Alberti had equated buildings with music for precisely these reasons.

The problem for Blondel was that the connection between architecture and music was no longer taken for granted. It was, in fact, under active assault. Doubts were expressed, in the first place, about the differences in the way that the eye and the ear perceived their objects. Perrault had made this point repeatedly in the *Ordonnance*, but it was Christiaan Huygens who suggested how ridiculous the idea had become. Writing to Leibniz, Huygens contemptuously dismissed René Ouvrard's 1679 treatise, *Architecture harmonique*:

I knew [Ouvrard] in Paris. He published a rather extravagant little treatise, in which he claimed that the proportions that make harmonies can be observed in architecture, as though the eye could recognize a divergence from these proportions as the ear can in song. (Huygens 1888–1950, 10: 298)⁷

The physiological claims for the effects of architectural proportion were therefore vulnerable to strict examination. That was bad enough. What was even worse were the doctrine's more mystical, even occult associations. For example, astrology, the world soul, and the harmony of the spheres all depend on the idea that physical processes are governed from a superior realm and can be described in the regular harmonies of number and proportion. As a mathematician and skeptic, Blondel must

have found himself in an awkward position, defending an idea so centrally bound to a discredited subculture. Alchemy seems to have posed a particular problem. Blondel took pains to distinguish his teaching from ‘those who apply themselves to the search for the philosopher’s stone’. The effects of architectural proportion, he argued, were not at all comparable to privileged and unverifiable insights of such self-professed adepts (Blondel 1675–1683, 3: 779).⁸

In its length – not to mention its defensiveness – Blondel’s reply is a direct product of this new intellectual environment. While he represents a continuing literary tradition stemming from Alberti, what really distinguishes Blondel’s response is, like Perrault’s provocation, its modernity. In reaffirming the natural basis of architectural proportion we find him relying on new arguments, attuned to a more demanding audience. The basis remained the analogy with musical consonance, but with important differences from classical harmonic theory. In the first place, Blondel did not conceive of harmony in arithmetic or numerological terms, but rather as a geometrical relation between physical quantities. The octave, for example, conforms to the ratio 2:1, not because that combination is significant of itself, but because that particular interval is produced by two corresponding lengths of string, or by two chimes of relative size. That the consonance registered by the ear can be translated into simple, numerical sequences only shows an admirable consistency in nature, not any generative power inherent in number itself. Likewise, an *a priori* belief in naturally recurring ratios did not preclude the need to search for them. Identifying those ratios, in other words, was an empirical task and required proper procedures of investigation.

As an analogy to architecture, Blondel provided a series of examples drawn from different sciences that demonstrated the proportional basis of diverse natural phenomena. Blondel pointed out that in mechanics, two objects on a balance will be in equilibrium at distances reciprocally proportional to their weight. In optics, a fixed proportion of 1:1 describes the behavior of light rays reflected in a mirror. A comparable situation, Blondel continued, holds when light is refracted as it passes from a rarer medium to a denser one. The sine of the angle of incidence always remains constant with the sine of the angle of refraction (Blondel 1675–1683, 3: 768–71). The examples that Blondel adduced were not chosen at random. The example of the balance had been described by Archimedes in *On the Equilibrium of Planes*. The properties of the reflective mirror were explained in Euclid’s *Catoptrica*. Descartes had revealed the sine law of refraction in his *Dioptrics* (1637). These examples of the occurrence of proportion in nature rested on a logic of physical-mathematical discovery.

The debate with Perrault, therefore, was not one that pitted an advocate against an opponent of ‘modern science’. The two parties were struggling, rather, over rival conceptions of what science was. Blondel was holding on to a mathematical tradition that had seen its last great exponents, a generation earlier, in Johannes Kepler and Marin Mersenne. Both strove, in the same way, to reconcile a commitment to scientific method with a belief

that the universe was created according to a ‘harmonic’ archetype. In Kepler’s *Harmonice mundi libri V* (1619) and Mersenne’s *Traité de l’harmonie universelle* (1627), each of these authors clung to the idea even as they tried to wrest it from those they considered hermeticists and mystics.⁹ This was a ‘Platonism’ common to early modern mathematicians: a disciplinary expectation that nature was mathematically intelligible and that patterns encoded in it would be familiar and consistent, even across different kinds of phenomena.

Blondel’s affiliation with this tradition is evident in his defense of proportion. The most beautiful and affecting passages in what is otherwise a very dry architectural encyclopedia are those that celebrate the effect of beauty as a reflection of the unity and order of creation. Blondel describes that effect as an act of understanding, in which a comprehensive notion of order is distilled from a thousand particular elements. In this respect, the arts and the sciences were directed towards the same end. Both served to reveal the simple, pure structures hidden behind the world of appearances. A military parade, for example, was no less capable of producing such an effect than a concert or a building. Working together, the soldiers awaken in the soul what Blondel calls a ‘*une unité de connoissances infinies*’:

Because *the order, the disposition, the arrangement, the number, the proportion* of the size of the battalions, of the squadrons, of the distances and of the intervals [between them], the justness, the regularity, the variety, and the speed of the movements of so many different objects create in our eye, or rather in our imagination, the impression of *a unity of infinite ideas* in which each object finds its place distinctly without hindering the others and which, under a universal notion, produces that *harmonious accord* that is called *beauty*. (Blondel 1675–1683, 3: 784–85; his italics)¹⁰

Note the qualities by which the mind apprehends this unity: order, disposition, arrangement, number, proportion. Not only are these concepts mathematical and geometrical, they are heavily weighted with Vitruvian and Albertian associations.

Were early modern architects Neoplatonists?

This brings us back to the question posed in my title. At first glance, Blondel would seem to provide evidence that early modern architects were Neoplatonists. He is one of the only practicing architects since Alberti to provide us with an explicit, intellectually capable justification of the naturalistic interpretation of architectural proportion. It is tempting to see him as a representative of a much larger class of practitioners. Yet he was not a Neoplatonist. His belief in the unity and order of nature was influenced more by contemporary empirical standards of physical inquiry than by a commitment to intelligible forms in the realm of pure being. In this respect, his differences with Perrault probably owed more to his disciplinary identification as a mathematician than to any explicit form of Platonism.

This circumstance casts some doubts on Wittkower's more general aim. In treating the survival of this tradition over the *longue durée*, Wittkower necessarily collapses the traits that distinguish individual architects and theorists from each other. In particular, he consistently overemphasizes learned, theoretical tradition over the needs of everyday practice. Even Wittkower's discussion of Alberti is susceptible to such doubts. Admittedly, *De re aedificatoria* remains Wittkower's best and most powerful example for the Renaissance belief in the metaphysical basis of architectural proportion. In the famous ninth book, Alberti defines *concinnitas* as a rule or method that combines parts of a design into a coherent whole, 'according to some precise rule (*ratio*).'¹¹ This process encompasses the quantitative and geometric qualities of the design, namely number, outline, and position (Book 9, Chapter 5).¹¹ The role of proportion as such is implied by the term *ratio* and by Alberti's immediate analogy between *concinnitas* and musical harmony. The connection with nature writ large is both numerological and organic. That certain numbers are 'naturally' perfect can be seen by the number of fingers on the hand or planets in the sky.

Natural organisms reflect this perfection, as can buildings, Alberti suggests, to the extent that they incorporate such numbers. The ensuing discussion (Book 9, Chapter 6) uses room dimensions (length to width and length to height to width) as a primary example of how proportional terms might be architecturally related to each other, but this appears to be merely a special application of the general rule. It is evident from the other examples throughout the text that Alberti conceived of design as a process of linking discreet architectural elements to each other in terms of related whole-number dimensions. The procedure for setting out the profile of the Doric base, for example (Book 7, Chapter 7), or the levels of a classically inspired tower (Book 8, Chapter 5) calls for the multiplication and division of their elements into simple, commensurate parts. We also have independent evidence, rare for Renaissance architects, that the metaphysical justification for these ratios may have governed Alberti's thinking about his own practice. When he warned Matteo de'Pasti, in his famous letter to the site-architect of the Tempio Malatestiano, that tinkering with the placement of his façade piers would 'put all that music into discord', Alberti was applying – if only rhetorically – a rather abstruse philosophical tenet to a real world situation.¹²

Alberti's emphasis on naturally perfect numbers may be described as broadly Pythagorean and Platonic, as can the analogy between *concinnitas* and the structure of natural organisms. In other respects, however, the role that Alberti plays in Wittkower's account is arguable. Caroline van Eck, for example, has proposed that Alberti's understanding of *concinnitas* as a feature or regulating principle of nature is not exclusively mathematical. As is well known, Alberti borrowed the term itself from rhetoric, specifically from Cicero, who uses it to suggest speech or a form of writing that is closely knit, elegantly joined, or skilfully put together. In this respect, *concinnitas* can be associated with a strong medieval current of Aristotelian teleological and biological thinking, in which the defining

quality of both natural beings and works of art is a purposive unity or perfect adaptation to their end or nature.¹³ Christine Smith has singled out a different Aristotelian-rhetorical motif evident in Alberti's explanation of *concinnitas*, namely the emphasis on visual delight and on the pleasurable experience of architecture on the senses. As Alberti puts it, 'When the mind is reached by way of sight or sound, or any other means, *concinnitas* is instantly recognized. It is in our nature to desire the best and to cling to it with pleasure'. In this view, the effect of *concinnitas* is not simply the result of a purely intelligible relation to an ideal schema, but also a function of the building's physical, sensual effect on the mind, through the eyes of the beholder (Smith 1992: 82–83). Branko Mitrović, the most rigorous of Alberti's modern interpreters, similarly downplays the role of mathematical proportion – symbolic or not – in Alberti's understanding of *concinnitas*. For Mitrović, too, this term refers to the mathematically and spatially definable properties of beings. It is a precondition of visual beauty because it reflects, in thoroughly Aristotelian terms, nature's own effort to fulfill its essence (Mitrović 2005: 102–115).

In sum, Alberti's view of architectural beauty was more complex than Wittkower implied. It depended not on the humanist revival of Plato in particular, but on a broad and syncretic tradition shaped by medieval scholasticism. Perhaps more damning is that Wittkower's interpretation also ignores the insistently practical – if not to say mundane – character of the treatise as a whole. Dipping into the contents is enough to show the breadth of Alberti's aims. *De re aedificatoria* is concerned to treat – with proper Latin expression and learned references to the ancients – the whole apparatus of building. The emphasis throughout is not on philosophical speculation or general principles, but on the standardization of nomenclature, form, and technique. Indeed, it is hard to see the encyclopedic coverage of site conditions, materials, tools, construction techniques, and building types – all manner of accidents and particulars that an architect might encounter – as the product of a mind intent on the immutable forms. It was surely not Wittkower's intention to mischaracterize Alberti's views, yet by placing so much emphasis on a relatively small part of the treatise, he did just that.

The second and more serious problem with Wittkower's use of Alberti is that it colors his interpretation of other fifteenth- and early sixteenth-century authors. Filarete, Francesco di Giorgio, Fra Giocondo, and Cesare Cesariano also understood architectural proportion to be rooted in nature, each of them taking the human analogy as their point of departure. Few other practitioners, however, could boast an erudition on a par with Alberti, nor the same ability to fashion an architectural discourse in the acceptable terms of contemporary philosophy and rhetoric. In many of these authors, we see a larger or smaller gap between learned proportional theory and everyday workshop practice. In the *Trattato di architettura*, for example, Filarete waxes lyrical about the God-given proportions of the human body, which provide the basis of the three 'qualities' of building: Doric, Ionic and Corinthian. He also provides a schema of whole-number

relationships between the parts of the body, for which the head serves as a module (Averlino 1972, 1: 19–20). These measurements do not, however, reappear in the text, nor do they have any apparent relationship to the buildings he describes throughout the treatise. They appear to be merely a dressed-up version of the medieval painter's traditional sketchbook technique.

Even more characteristic of the divide between Filarete's artisanal background and his humanist aspirations is the episode he describes in Book 8, identified by Howard Saalman as the heart of the dialogue. In this book, after several delays and false starts, the narrator finally consents to introduce the prince to specific 'rules and proportions' for the orders and for arches and portals. In contrast to the numerical ratios given for the three kinds of columns, the proportions of openings are described in terms of their geometrical form:

First of all about the rules that doors should observe, I will speak to you about their height and width. The form, as I have said, can be of three types, like the columns and other members mentioned before. These again vary according to the place, for different places require different measures. They are made in two squares, one and one-half, and one diameter. (Averlino 1965: 103)¹⁴

Filarete is referring here to the ratios 2:1, 2:3, and 1:√2, but as Saalman has noted, this geometrical shift in terminology is revealing. These proportions 'taken from the square' reflect setting-out procedures similar to those described in masons' handbooks. In its simplicity and expressiveness, this passage surely draws not on learned theory but on the day-to-day language of the workshop. In that context, these proportions need no metaphysical or symbolic justification, only practical and instrumental efficacy. My point is not to challenge Filarete's authority as a source; he may well have believed in the legendary, quasi-religious, and 'natural' bases of proportion that he expounds in Book 1. The point is that such a commitment cannot account for a practice that was already deeply engrained in and adapted to the masons' culture. The needs of an author — writing for an audience of humanistically inclined artisans and patrons — are not necessarily those of a practitioner in the studio or on the building site.

Filarete makes an easy target — his learning is relatively patchy — but the tension evident in his text also appears in those of other *trattatisti*. Francesco di Giorgio's writings, for example, are heavily invested in the human analogy.¹⁵ His illustrations, particularly those of plans and classical elements superimposed onto bodies and faces, provide Wittkower with some of the most evocative examples of his thesis. Francesco's use of the analogy, however, is remarkably flexible. He applies it almost indiscriminately: to the orders, entablatures, church plans, façade elevations, even to cities and fortifications. Within this constellation, the 'body' appears as the basis of several different proportional systems, and some of the analogies are not mathematical at all. The relationship of a citadel to the city, illustrated on the first page of the Codex Saluzziano,

for example, is understood in purely functional terms, as that of the mind to the body. More importantly, the analogy does not always, or even primarily, serve to generate the design, but instead appears to be largely rhetorical. As Richard Betts has shown, underlying many of Francesco's church plans is a primary method of design that relies on a linked series of quadratures.¹⁶ Much like Filarete, Francesco seems to have been at least as comfortable with a graphic tradition of constructive geometry as he was with an arithmetic one defined by whole-number ratios. To be clear, Francesco was not being disingenuous about the symbolic value of numerical proportion. It is likely that he saw the two design methods as complimentary. The important difference between them is that in the mason's graphic tradition, the design is constructed from a progressive series of compass-based operations of a purely practical kind. Explanation, let alone any numerological or cosmological justification, is virtually absent. That, too, likely reflects the predominant attitude of the workshop.

I have focused on three examples from the Quattrocento, but the same doubts would equally apply to later theorists. Modular or metrical design had the force of philosophical and literary tradition behind it, but there is no inherent reason why it, too, could not be treated in a purely operative or instrumental manner. Palladio, for example, is very terse on the question of symbolism. Wittkower makes much of the famous passage in the *Quattro Libri* about 'the beautiful machine of the world' (Preface, Book 4), but this appears as a lone macrocosmic flourish in a treatise that is otherwise deeply practical, technical, and formally oriented.¹⁷ If anything, Vignola is even more circumspect. The *Regola* was among the driest design manuals of the early modern period — and all the more popular for it. For extensive textual support, it is notable that Wittkower had to turn to philosophers and mathematicians. It is really Pacioli, Giorgi, Cusanus, and Ficino who provide the fully articulated justification for the power of numerical ratios acting in concert between the sublunar, celestial, and supra-celestial spheres.

The key distinction — which Wittkower often blurs — is between practice and theory. The question is not simply whether a given set of proportions can be identified in an executed work. That bar is not high enough, even assuming the researcher can overcome all obstacles of measurements and methodology. By the sixteenth century there was simply no alternative to proportional design. We can expect all architects to have used it, whether or not they believed that those proportions had a 'natural' basis. We need other reasons to accept that the architect and his audiences understood those proportions in some sort of symbolic dimension. For that, there is as yet little solid data. The strongest evidence we have comes from figures like Blondel, who had strong theoretical commitments, who identified with the theory, and who felt some personal stake in promoting it. Catherine Wilkinson, for example, has found compelling evidence in a façade drawing for the church of the Escorial of a linked series of numbers in a 'harmonic' relationship (Wilkinson 1985). Matthew Cohen's discovery at the basilica of San Lorenzo in Florence of a 'Boethian' number system is even more

striking (Cohen 2013: 87–97). Both of these cases go beyond what might be normally expected in terms of complexity and precision in a proportional system, and given their architects' backgrounds, both may reflect some sort of esoteric doctrine of a loosely 'Platonic' kind. These examples, however, can hardly be taken as representative of the mathematical abilities of medieval and Renaissance designers. Neither Juan de Herrera nor Brunelleschi, nor Matteo Dolfini, his predecessor, was trained as a mason-architect. Either man would have brought to the project a level of formal mathematical education and/or practical mathematical ability that would have been very unusual for most building practitioners.

Blondel belongs in the same category. Despite his importance as a source, I suspect his background was unusual enough to distinguish his views from those of most guild-trained practitioners. A provincial nobleman and a self-taught amateur, he was privileged with a thorough classical education, probably with the Jesuits. He had, in other words, the kind of education that would not only have prepared him for a debate with Perrault, but that would have made it imperative for him to take a stand one way or another. This observation also applies in reverse. The practical apprenticeship of most early modern builders did not offer a background in the classical sources and contemporary literature relevant to this debate. But more to the point, that background simply wasn't necessary to everyday practice. As Matthew Cohen states in our Introduction, proportional systems satisfied 'a general condition of order that was integral to pre-modern notions of structural stability and beauty'. As a practical matter, it was not important whether the visual effects produced by this design technique were 'natural' or not. A deeply held conviction either way would neither help nor hurt a designer. This line of reasoning suggests that Perrault was overstating the case. I doubt whether 'most architects' cared one way or the other whether certain fixed relationships between the different members of a building were natural or not. They would have used them regardless.

Notes

- ¹ This essay expands on material covered in my monograph: Gerbino (2010).
- ² 'Il y a au texte *cum non esset symetriarium ratio nata*. Cette expression de Vitruve semble favoriser l'opinion de la plus grande partie des Architectes, qui croient que les proportions des membres de l'Architecture sont quelque chose de naturel, telles que sont les proportions des grandeurs, par exemple, des Astres, à l'égard les uns des autres, ou des parties du corps humain. Pour moy j'ay traduit suivant la pensée que j'ay que ces proportions ont esté établies par un consentement des Architectes, qui, ainsi que Vitruve témoigne luy-mesme, ont imité les ouvrages les uns des autres, & qui ont suivy les proportions que les premiers avoient choisies, non point comme ayant une beauté positive, necessaire & convaincante, & qui surpassast la beauté des autres proportions, comme la beauté d'un diamant surpasse celle d'un caillou; mais seulement parce que ces proportions se trouvoient

en des ouvrages, qui ayant d'ailleurs d'autres beautés positives & convaincantes, telles que sont celles de la matière de la justesse de l'exécution, ont fait approuver & aimer la beauté de ces proportions, bien qu'elle n'eust rien de positif.

- ³ The ancient sources on Pythagoras and his doctrine are collected in Kirk and Raven (1962: 217–231, 236–262). On Plato's interpretation of this doctrine, see Cornford (1937: 43–52, 66–93). As in Polyclitus' *Canon*, the idea of *symmetria* often concerned the harmony of the human body. See the classic article by Panofsky (1955: 55–107) and Pollitt (1974: 14–22, 256–258). On Vitruvius's borrowing of the term (in Book 1, Chapter 2 and Book 3, Chapter 1) and his dependence on the Pythagorean tradition, see Raven (1951) and Gros (2001). For the medieval legacy of these ideas, see Eco (1986: 28–42). On the gradual wane of Renaissance Platonism, see Tigerstedt (1974).
- ⁴ 'Renaissance artists firmly adhered to the Pythagorean conception "All is Number" and, guided by Plato and the Neo-Platonists and supported by a long chain of theologians from Augustine onwards, they were convinced of the mathematical and harmonic structure of the universe and all creation' (Wittkower 1988: 38). The first edition was published in 1949; subsequent editions appeared in 1952, 1962, 1973, 1988, and 1998.
- ⁵ Wittkower's approach took a cue from Erwin Panofsky and Anthony Blunt, who had also dealt with Renaissance art theory as an offshoot of philosophy. See Panofsky (1924; English edition 1968) and Blunt (1940). The main authorities for his interpretation of Neoplatonism are cited toward the end of the first chapter, namely Cassirer (1927) and Kristeller (1943).
- ⁶ Frances Yates cites Blondel with a similar purpose in Yates (1988 [1st ed. 1947]: 287, 311).
- ⁷ 'Je l'ay connu à Paris. Il fit imprimer un petit traité assez extravagant, où il vouloit qu'en matière d'architecture on observast les proportions qui font les consonances, comme si l'oeil pouvoit reconnoitre quand on s'écarte de ces proportions, de mesme que l'oreille le fait au chant'. Dated July 11, 1692, from the Hague (my translation).
- ⁸ '[...] ceux qui s'appliquent à la recherche de la Pierre Philosophale'.
- ⁹ See Kepler (1997: 503–508); Field (1988); and Stephenson (1994). 'Universal harmony', which figures in the title of four of Mersenne's books, is discussed at length in Dear (1988: 80–116) and de Buzon (1994). For Mersenne's critique of natural magic, cabala, alchemy, and astrology, see Lenoble (1971: 83–167).
- ¹⁰ 'Parce que l'ordre, la disposition, l'arrangement, le nombre, la proportion de la grandeur des Bataillons, des Escadrons, des distances & des intervalles, la justesse, la regularité, la variété & la vitesse des mouvements de tant de differens sujets, font dans nostre oeil, ou plutost dans nostre imagination l'espece d'une unité de connoissances infinies, dans laquelle chaque objet trouve distinctement sa place sans empêcher les autres, & qui sous une notion universelle produit ce Concert

Harmonique que l'on appelle *La Beauté*, laquelle est la source du plaisir que nous y prenons' (my translation).

- ¹¹ 'From this we may conclude, without my pursuing such questions any longer, that the three principal components of that whole theory into which we inquire are number, what we might call outline, and position. But arising from the composition and connection of these three is a further quality in which beauty shines full face: our term for this is *concinnitas*; which we say is nourished with every grace and splendor. It is the task and aim of *concinnitas* to compose parts that are quite separate from each other by their nature, according to some precise rule, so that they correspond to one another in appearance.

'That is why when the mind is reached by way of sight or sound, or any other means, *concinnitas* is instantly recognized. It is in our nature to desire the best and to cling to it with pleasure. Neither in the whole body nor in its parts does *concinnitas* flourish as much as it does in Nature herself; thus I might call it the spouse of the soul and of reason. It has a vast range in which to exercise itself and bloom – it runs through man's entire life and government, it molds the whole of Nature. Everything that Nature produces is regulated by the law of *concinnitas*, and her chief concern is that whatever she produces should be absolutely perfect. Without *concinnitas* this could hardly be achieved, for the critical sympathy of the parts would be lost. So much for this.

'If this is accepted, let us conclude as follows. Beauty is a form of sympathy and consonance of the parts within a body, according to definite number, outline, and position, as dictated by *concinnitas*, the absolute and fundamental rule in Nature. This is the main object of the art of building, and the source of her dignity, charm, authority, and worth' (Alberti 1988: 302–303). Also see Vagnetti (1973); Westfall (1969); and Tavernor (1998: 43–48).

- ¹² See Grayson (1957). Alberti does not appear to have been referring to specific 'musical' proportions: see Hope (1992: 109). Robert Tavernor's proportional studies of San Francesco's façade and of Alberti's other buildings appear relatively restrained and credible, although they have yet to be re-measured and confirmed by subsequent scholars. See Tavernor (1998: 75).
- ¹³ On the Aristotelian associations of *concinnitas*, see van Eck (1999). For Alberti's debt to classical and medieval rhetorical treatises, see van Eck (1998).
- ¹⁴ The original reads: 'Signore, alla vostra adomanda io vi voglio sodisfare in prima alle ragioni che vogliono essere le porti, cioè la larghezza alla altezza vi dirò. La forma: come ho detto, possono essere di tre ragioni di misure, come sono ancora le colonne o altri membri antedetti. E queste ancora secondo e' luoghi dove si fanno, ché secondo il luogo, così richieggono la misura. E fannosi a due quadri, a uno e mezzo, a uno diamitro; e così sono di tre ragioni di misure'. Filarete then offers additional ratios for arches: 'a uno quadro e mezzo, e a uno quadro diamitro, e a due quadri' (Averlino 1972, 1:

232–233). On this passage, see Saalman (1959). There is some disagreement about whether the last ratio refers to 1:2 or 1:√5. See Cohen (2013: 85, n. 38).

- ¹⁵ Francesco may have also relied on a common medieval analogy of the body as a corporate ideal. The perfection of the human form, in this view, provides an analogy for the church, the state, or the city. See Lowic (1983). For the codices, see Martini (1967).
- ¹⁶ Betts (1993). Also see the judicious remarks in Galli (2002). On Francesco's use of modular proportions, see Millon (1958).
- ¹⁷ Wittkower argued that the room dimensions in Book II of the *Quattro libri* were determined by harmonic ratios. Two very technical studies, the first by Deborah Howard and Malcolm Longair and the second by Branko Mitrovic, have offered some qualified support of the thesis. What should be emphasized, however, is that nowhere does Palladio himself give any justification or rationale for either the ratios or the dimensions offered in the book. Moreover, the specialized analysis in both of these articles suggests that it would have been very unlikely that readers of the treatise would have been able to glean any such justification solely from the text. See Howard and Longair (1982) and Mitrović (1990).

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