

VITRUVIUS

Ten Books on Architecture

The only full treatise on architecture and its related arts to survive from classical antiquity, the *De Architectura libri decem* (*Ten Books on Architecture*) is the single most important work of architectural history in the Western world, having shaped humanist architecture and the image of the architect from the Renaissance to the present. Extremely influential in the formation of the medieval and modern concept of a broad liberal arts education as the basis for responsible professionals, this work is remarkable also because over half of its content deals with aspects of Hellenistic art, science, and technology, music theory, law, artillery, siege machinery, proportion and philosophy, among other topics.

This new, critical edition of Vitruvius's *Ten Books on Architecture* is the first to be published for an English-language audience in more than half a century. Expressing the range of Vitruvius's style, the translation, along with the critical commentary and illustrations, aims to shape a new image of the Vitruvius who emerges as an inventive and creative thinker, rather than the normative summarizer, as he was characterized in the Middle Ages and Renaissance.

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Ten Books on Architecture

Translation by Ingrid D. Rowland

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with additional Commentary by Ingrid D. Rowland and Michael J. Dewar



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PARENTIBUS AC PRAECEPTORIBUS

"Parentium cura et praeceptorum doctrinis . . . copias disciplinarum animo paravi" (6.pref. 4)

MATRI
MEMORIAE PATRIS

T. N. HOWE

"Itaque ego maximas infinitasque parentibus ago atque habeo gratias" (6.praef. 3)

and the memories of
HARRY J. CARROLL, JR.
COLIN EDMONSON
KYLE M. PHILLIPS, JR.

I. D. ROWLAND

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Two long-deceased colleagues seem worthy of special mention, although nearly half a millennium separates us from them. Fra Giovanni Giocondo's contribution to the understanding of Vitruvius through his printed edition of 1511 is well known, but not for that reason any less remarkable. The influence of his protégé Angelo Colocci

is still a well-kept secret, yet it is Colocci's carefully annotated version of Giocondo, Vatican Library R.I.III.298, that afforded many crucial insights into the magnum opus of that opinionated old Roman who has nurtured alert readers and conscientious builders for over two thousand years.

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TRANSLATOR'S PREFACE

Vitruvius is an important writer, quite possibly a highly innovative writer, and certainly among the most influential writers the world has produced, but he is not, perhaps, a very *good* writer. It is difficult to translate him without at the same time trying to improve his sometimes clumsy phrasing, his endless sentences, his abrupt digressions, and his congenital failure to use one word when he can use two, especially when they sound alike ("evade and avoid" is a typical example). Yet in the middle of the fourteenth century, a reader as sensitive as Petrarch found Vitruvian style perfectly acceptable (although another sensitive reader, Leone Battista Alberti, could lament around 1450 that the *Ten Books* were such a pastiche of corrupted Latin and Greek that it would have been better if Vitruvius had never written at all).

Vitruvius's chief problems as a writer stemmed from the fact that he was addressing a whole series of different subjects for the first time in Latin. There were no fellow writers to offer him suggestions; often, there were not even words in his own language to describe what he wanted to discuss. Sometimes, as in his treatment of column types in Books 3 and 4 or of war machines in Book 10, he is clearly translating as best he can from Greek authors who have written treatises on a particular subject, but on other occasions, as in his discussion of the Tuscan temple in Book 4, he is just as clearly working entirely on his own. Sometimes these new forays succeed admirably (the description of Tuscan architecture is quite concise); sometimes, however, the fledgling writer abandons a floundering description and simply refers his reader to an illustration at the end of the book, where he promises to draw what he cannot effectively explain.

Vitruvius wrote in an age when writing had already been sharply defined into genres, each with its own appropriate form of expression. In addition, however, the persuasive writer was expected to maintain readers' interest by constant variation in emotional tone and intricacy of language. In his prefaces, therefore, Vitruvius aims for the dense, complex rhetorical style that his contemporary Cicero had been perfecting for years on

the Rostra, in the law courts, and in the Senate House, this was called the "high style," and its preferred quality was *gravitas*: weight or seriousness. These moments of high style are the occasions when two words are always better, "heavier," than one, and they are the moments when the twentieth-century writer's impulse to avoid "turgidity" obeys an aesthetic code that is utterly alien to the ancient Latin sense of what is appropriate.

In the rest of his *Ten Books*, with mixed results, Vitruvius tries above all to write clearly, using a narrative "middle style" for his anecdotes and a tersely descriptive "low style" for the technicalities of constructions, sundials, clocks, and machines.

By keeping closely to the Latin text (by making the English text account, one on one, for every single Latin word), the present translation tries to follow Vitruvius's shifts in style, from high rhetoric to halting description, and to resist, as much as possible, "improving" his roundabout attempts to find words where no words have been found before. Similarly, the translation opts for a vocabulary that is consistent with Vitruvius's own usage, most evident in its abandonment of the word "orders" to describe the types of Classical column. Vitruvius classifies his world by using the term "genus," here translated as "type," whether he is referring to columns, music, war machines, or levels of rhetoric, and it surely reveals more about his thought to take him at his word than to fit him into modern ideas of architectural terminology.

No translator can approach Vitruvius without making hard choices about individual words in a text that has come down from antiquity with significant alterations. All of the surviving medieval manuscripts have many confusing or nonsensical passages and impossible – or missing – numbers for the dimensions of buildings, aqueducts, and machines. From 1511 onward, however, readers of Vitruvius could avail themselves of a printed text in which many of these errors had been corrected by a brilliant process of guesswork. The editor of this printed Vitruvius was an Italian monk, Fra Giovanni Giocondo da Verona, who had worked both as a classical scholar

and a practicing architect in Italy and France; he was one of the few people in the Renaissance, and one of the few people ever afterward, who have had the range of expertise to understand every aspect of Vitruvius's text and therefore to anticipate what might have been misread as generations of scribes copied down the *Ten Books* with all too human fallibility. Frequently Giocondo went too far in his conjectural corrections, for once he had begun to tinker with the Latin of the manuscripts, nothing and no one could warn him when to stop. Still, the notes to the present translation show how often the Veronese monk seemed to be the first reader in fifteen centuries to understand what Vitruvius must really have said.

In addition to Giocondo's pioneering edition, consulted in the 1511 Venetian original and in the 1522 Florentine revised edition, the present translation has relied closely on the work of more recent scholars, making extensive use of the well-documented Latin edition of Valentin Rose and Hermann Müller-Strübing (Leipzig:

Teubner, 1867), as well as those of Friedrich Krohn (Leipzig: Teubner, 1912); Frank Granger (London: Heinemann, 1931–1934); Kurt Fensterbusch (Darmstadt: Wissenschaftliche Buchgesellschaft, 1964); and the multi-volume edition with commentary still being published from Paris by Editions des Belles-Lettres. Furthermore, Michael Dewar in particular has consulted the two preceding twentieth-century English translations of Morris Hicky Morgan and Frank Granger; Morgan's stately English, especially, will always stand as an achievement, whatever the subsequent changes wrought on our understanding of Vitruvius by new archaeological findings and the continued study of ancient Latin.

Vitruvius set out clarity and comprehensiveness as the chief goals to which he strove as an author; a translator, by contrast, strives only for fidelity. Michael Dewar's careful comments on several drafts of the translation manuscript have made that goal more attainable than it would otherwise have been.

ILLUSTRATOR'S PREFACE

The illustrations of this project are designed with two principal purposes in mind: first, to investigate the possibility of a consistent design approach in Vitruvius, and second, to illustrate the relation of this approach to the broad principles of liberal knowledge that constitute approximately half of the material in the *Ten Books*.

The latter intent is more difficult to achieve within the scope of this project because a full commentary and illustration of the background knowledge of Vitruvius would almost constitute a complete panorama of Hellenistic liberal and technical knowledge. But any successful attempt to interpret Vitruvius must deal with the most salient feature of the *Ten Books*: that over half the material does not deal with architecture per se, but with other, supposedly supportive, fields of knowledge, like astronomy, geography, and natural philosophy. As Frank Brown has asserted, the mission of Vitruvius is to present architecture as a liberal art, based on a Hellenistic belief of the unity of knowledge.¹ The *Ten Books* must be read therefore with at least a general knowledge of the numerous fields that Vitruvius touches upon, and also attitudes toward religion and cultural tradition.

The references to scientific knowledge in particular can appear digressive, fragmentary, and even bizarre to the modern reader (e.g., fish, being "dry," can live in water, whereas humans, being "wet," can live in air; 1.4.7). In fact, virtually every illustrative digression is a fragmentary reference to a large and coherent body of knowledge, of which Vitruvius is more or less a firm master. Our example refers to the Empedoclean chemical theory which asserts that bodies are stable when they are a tempered balance of the four elements (earth-air-fire-water) and unstable when there is excess or lack of one.

¹ Strictly speaking, there may be no such thing as a Hellenistic belief in the unity of knowledge. This may be simply the common phenomenon of reading another culture from the outside, and hence seeing it as a simplified unity. In Vitruvius, as in most well-educated ancient writing, there is considerable awareness of the dynamic nature of advanced knowledge.

They are stable when complemented by their environment and are corrupted when there is an excess or lack of an element in the conjunction of body and environment. Hence fish must be "dry" because, living in water, their lack is complemented by their environment, and they are corrupted in air because they then have an excess of air and a lack of water. This may sound strange to us, but in antiquity it was science.

Vitruvius's knowledge of science appears to be extensive and highly consistent, but some of his analyses suggest that it is still at a somewhat personal and popular level. His anthropological analysis of the difference between northern and southern cultures based on the image of the earth being similar to a harp (6.1.3–7, people of the north have the heaviest voices because they are farthest from the sun, just like the longest string) and his explanation of retrograde motion (9.1.11, based on the attractive power of heat rather than on geometrical epicycles and deferents) are apparently outside the "proper" science of the time. They are logical, but they may be personal attempts to demonstrate his own ability to extend commonly known scientific principles to explain other phenomena. A little knowledge can be a dangerous thing.

What we are attempting to do here is to show at least part of this background. Therefore, there is a limited selection of architectural comparanda, and there are graphic written attempts to summarize some of the scientific fields that Vitruvius brings into his discussions.

It is hoped that the comparanda will show certain tensions and selectivity in the relation between Vitruvius and his material. There are indeed similarities between some of Vitruvius's prescriptions and our archaeological picture of contemporary or earlier architecture (e.g., the temple at Tivoli is often taken as the closest parallel to his method of designing the Corinthian type of capital), but the comparanda also show that Vitruvius exhibits a strong but judicious preference for more innovative approaches. Features of his recommendations for city walls (polygonal towers and left-turn approaches) are

attested, but they are not the most typical form of Hellenistic, much less Roman fortification.

Our drawings of the Vitruvian prescriptions do not take the prescriptions all the way to full reconstructions of paradigmatic designs. In fact, the point is that none of Vitruvius's prescriptions constitute what could be called a full design.² Gaps and ambiguities in the drawings are left because that is probably the way he intended them to be understood.³ The prescriptions seem to carry the act of design only up to a certain point, after which it seems that the final business of design is left until the time of execution, possibly to other artisans.⁴

This accords with Vitruvius's constant admonitions that the "symmetries" of any type of form must always be adapted to exigencies: to site, to the local materials, to optics and scale, to function. The prescriptions for the house and the basilica contain adjustable, rather than fixed, proportional parameters (the length of the basilica can be between two and three times its width). Hence the construction lines are left on our drawings of Vitruvian prescriptions because they, not the finished form, are the essence of the drawing. It is they that show the method and the potential for altering the design while still maintaining control.

Many of the prescriptions for building types, such as the Roman country house, the Greek-style house, and the palaestra, are presentations of a group of optimal orientations and features for rooms, and not an attempt at fixed relationships. In fact, in some cases Vitruvius seems to be shaping his prescriptions almost in the manner of a modern practicing architect when he writes an initial

program, in that he includes a number of desirable, but sometimes mutually conflicting, features, which rarely can all be equally well satisfied in the actual design. The fact that these recommendations have produced such a wide variety of "reconstructions" from Palladio to the present is testimony to the fact that there are inherent ambiguities and contradictions in them and that using them to arrive at (or "reconstruct") a full design automatically produces different solutions. There is no such thing as "the Roman house" or "the Greek house" in Vitruvius. Vitruvian prescriptions seem to admonish that a designer work from principles, not paradigmatic forms.

As for dimensions (or rather proportions), the modern habit is usually to reduce them to a common denominator.⁵ However, in antiquity the habit was to use "unitary fractions," that is, those with a numerator of 1. (Two-thirds is thus represented as one-half plus one-sixth.) This may seem like a small point, but it represents a profound difference in the way arithmetic is used. Modern Hindu-Arabic numerals in decimals allow much more rapid comparison of quantities; which is larger? $1/4 + 1/60$ ($4/15$) or $1/5 + 1/15 + 1/90$ ($5/18$; i.e., 0.2666 or 0.2777)? The ancient system of unitary fractions aimed less at systematic unity in presenting measurable reality.⁶

Therefore the drawings, and to some extent the translation, retain the unitary fractions and the sequential instructions for proportions rather than reducing them to the more "convenient" decimals or other common denominator, with the intent that this too may reveal more of a relatively open system of design.

2 The most nearly complete are probably the catapults in Book 10, but even these lack important dimensions. These descriptions are almost identical to the tradition of technical engineering description represented by Philo of Byzantium, and it is quite possible that Vitruvius modeled his most meticulous descriptions of architectural features (e.g., the column types) on this type of description, rather than on the form of earlier architectural treatises or contracts.

3 For example, what he calls a "cymatium" in Books 3 and 4 is drawn as a generic half round because the term seems to cover a variety of molding types. The projection of the intermediate moldings of the Ionic bases are shown with a small section of the various possibilities because several possibilities are permitted within the range of his prescriptions.

4 This suggestion was made in conversation by Dr. Lucy Shoe Meritt.

5 For instance, the Ionic epistyle relative to the frieze is proportioned 4 parts to 3, but the 4 is then divided into 7 to give the subdivisions of the epistyle (fascias, crown molding); thus one can relate the subdivisions of the frieze directly by a common denominator of 28.

6 Or at least this consistency was more difficult for the average practitioner to achieve. The cumbersome arithmetic also does much to account for ancient architects' preference for thinking geometrically rather than arithmetically. Graphic/geometric calculation allowed one to handle such irrational numbers as square root of two (diagonal of a square) or complex curves such as an ellipse (created by stretching the diameter of a circle) or conic sections. Similarly, the bases of trigonometry were known from the time of Hipparchus's tables of chords in the second century B.C., but the exercises of the *agrimensores* (surveyors) several centuries later still do not make use of them.