

P. H. Scholfield: Review of *The Theory of Proportion in Architecture*

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Abstract Michela Rossi reviews the newly-republished treatise by P. H. Scholfield on proportion theory.

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It may seem unusual, perhaps out of time, to spend words and ink speaking about a book reissue. As a matter of fact, *The Theory of Proportion in Architecture* (Fig. 1) by P. H. Scholfield was recently republished—in a paperback edition—by Cambridge University Press. This book first came out in 1958, a Spanish edition was released 13 years later (Scholfield 1971), and in 2007 the volume was digitalized.

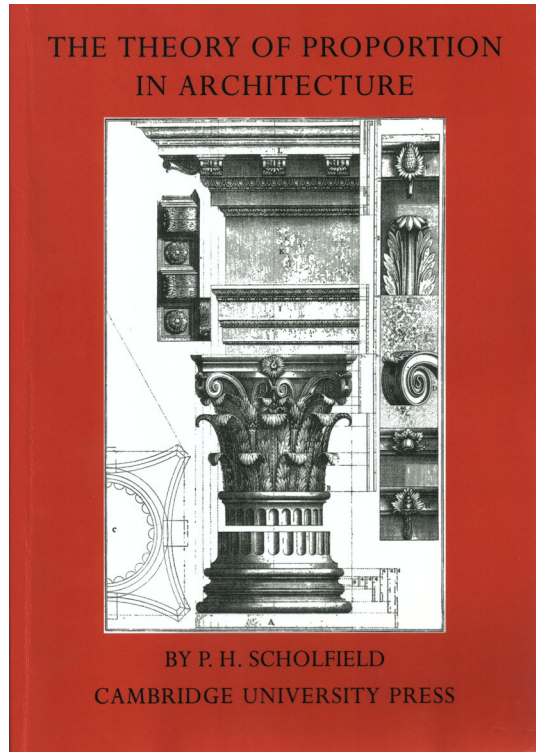
The time span between the two printed issues indeed underlines the high importance of the topic for architecture scholars and still today shows several noteworthy aspects. But actually the delay in the republication is both the strength and the weakness of this book, which first stemmed from the writing of a M.A. thesis at the Architecture School of Liverpool University.

First of all we can appreciate the author's knowledge of the topic thanks to a broad historical overview of the previous literature, not only limited to the English-speaking world. Because of that, the book still offers a valid review of the theory of proportion across the centuries, from the Classic Age to Le Corbusier's Modulor. It explains briefly, but without gaps, the substance of this issue in architecture theory and refers to the main works addressing this question, thus providing scholars with a useful working tool.

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Fig. 1 Cover of The Theory of Proportion in Architecture



The comparison of the various authors' statements in the major architectural treatises together with evidence drawn from both built works and critical writings of the past subtends the demonstration of Scholfield's main point, namely the existence of a continuous attention to proportions, without the existence of a real design theory. Thus the different historical theories appear to be a nearly random consequence of design practise, more than the aesthetical rules that any good design should follow. The essay stresses the evidence of two opposite approaches to visual proportion: the arithmetical one that comes from the additive properties of numbers, with finite ratios, and the geometrical one, consisting of the sub-division of a shape as a unit, referring to the intrinsic irrational ratios present in regular polygons.

Scholfield attempts to synthesize these two main rules into a single law, capable of solving design problems. He explains clearly the connection with the concept of symmetry, which is related to balance and therefore, as far as architecture is concerned, to evidence of stability, thus a means to fulfil Vitruvius's requirement of *concinntitas* in *firmitas*, (*utilitas*), *venustas*.

Furthermore he provides the reader with an appendix offering an array of different possible patterns of proportion involving the application of the most important irrational numbers.

A glimpse at the Internet shows both the large influence that the book had and still has on academic community, due to its rigorous scientific setting and to the

exhaustive approach of the dissertation, and the numerous citations that it receives still today, including some in the pages of this very journal, such as that in the paper by Fletcher (2005).

The volume is divided into seven chapters plus the appendix. While the first chapters concern a critical review of previous works and the text could thus appear as a mere bibliographic research, the appendix which contains a clear explanation of proportion examples based on different patterns, confirms the originality and the scientific value of the volume. The appendix also compensates for the lack of images that the reader endures while reading.

Introducing the topic, Scholfield declares that his goal is “to state a unified theory of proportion... [that] arises out of... the history of proportional theory in the past” (p. 1). He describes what the word “proportion” means, stressing that it became important in the field of fine arts because of the pleasure that some formal arrangements give to the eye, and he narrows his own study to only the proportions existing in the visible elements of architecture, therefore disregards the requirements of the structure firmness or of the purpose and use of a room, and focuses on the search for a rule of beauty in design.

According to Scholfield, Vitruvius’s treatise, which he regards as “the broken link in the chain of communication between us and the Greeks” (p. 16), mainly shows the problems of translation of his statements. Consequently, any argument about proportion design in antiquity is only a supposition.

Visual proportion is related to the sense of order, and a visible order is based on the repetition of similar shapes, such as in fractals, but the first system of proportion with strong mathematical references stems from the additive properties of *numbers* or of *shapes* (gnomons).

After a short demonstration of the essence of additive properties the author explains the various systems in architectural practice ranging from commensurable to incommensurable ratios. Those can apply to both analytical (“by numbers”) or geometrical (“by shapes”) systems of proportion.

The introductory chapter ends with a reference to historical sources for the theory of proportions in Antiquity: direct literary evidence and drawings, indirect evidence and archaeological monuments. He stresses that “the only surviving literary evidence from antiquity is the work by Vitruvius” (p. viii), and the later Renaissance interpretation of his words.

If a theory of proportion existed, its rules are hidden in buildings’ design options. Architecture history shows two opposite approaches that overlap and alternate mutually, until the British Gothic revivalists gave new evidence to the use of incommensurable ratios in Gothic architecture. In the nineteenth century the studies on proportion flourished, clearing the way for new theories that combine the advantage of the main systems of the past, or try to do so. The works by William Schooling,¹ Jay Hambidge and Le Corbusier apply the analytical method to incommensurable dimensions and Scholfield demonstrates the wide range of additive properties of the series of ϕ (the golden number, $\phi = [(1 + \sqrt{5})/2]$, related

¹ Schooling’s little known work on the ϕ series is found in Cook (1979, p. 441–447).

to the golden rectangle) and θ ($\theta = 1 + \sqrt{2}$ series, and is related to the $1:\sqrt{2}$ rectangle).

Where is then the weakness of the volume? It is not related to the research quality but to its new publication.

When it was first released, the book offered a quite thorough summary of systems of proportion over the centuries and introduced new arguments in the later debate, inspiring several essays that the new edition does not mention.

The paperback edition does not offer any updated revisions to text, notes or images. It is a rather “frozen copy” of a half-century-old study on proportions, without any critical reference to the successive, ongoing discussion regarding the significance of proportion in architectural design. Obviously the author has had no active—direct or indirect—role in the new edition, which could have been enriched with pictures and an updated bibliography.

As a matter of fact the many references to Scholfield’s book in the literature that followed testify to the scientific relevance of his work, but this evidence barely justifies the lack of a critical discussion in addition to Lionel B. Budden’s foreword to the original edition.² The volume still tells us about the state of the art in the 1950s, whereas many other later studies broadened and enriched the debate, confirming the importance of the subject and the significance of this study.

We may wonder then why no effort was made to give new scientific relevance to this important work, which is both still compelling but old at the same time. We may wonder why there is no further inquiry on the topic, nor on related subjects. This issue may influence our approach to the book that is the mere “anastatic” reprint of its first publication.

Perhaps the non-mathematician reader will suffer from the lack of additional images, since drawing is actually the language of architecture and the most effective way to explain geometry and visual proportion, the two topics on which the book focuses. Today we live in the image communication age and new representation tools allow anybody to manipulate pictures easily. Readers have thus grown accustomed to images and require illustrations. Nevertheless the book’s reading is enjoyable for people interested in the history of architectural theories or in the relationship between mathematics and design and proportions.

The original set of illustrations gathers some plates from historical treatises and contemporary volumes. It includes samples of proportions, starting with the Classic Orders, which are the first and best-known examples of natural models in man’s buildings. It also includes the human body’s proportions after Barbaro and Dürer, and example of application in Renaissance architecture design, with typical studies of geometrical patterns in the work of Leonardo, of regular shapes in that of Scamozzi and of numbers series in that of Palladio.

The few pictures from critical essays of the past century illustrate the statements about harmonic proportion of the golden ratio in the human figure, and eventually Schooling’s contribution to Cook’s *Curves of Life*, which put forward the two series of Le Corbusier’s Modulor.

² Lionel B. Budden was professor in architecture at Liverpool University at the time when Scholfield was a student.

To be sure, the author borrows images from the earlier literature but those plates—only 16 in total—hardly give an exhaustive illustration of the differences between the different systems of proportion.

The content, as Budden pointed out in his foreword, provides a description of the proportion theories that have been elaborated and applied in Classic, Renaissance, Revivalist and Contemporary architecture, with a mention of Gothic references to geometry and incommensurable.

Eventually the book goes beyond the author's goal, since it also serves as a good introduction to any reader interested in the study of mathematical concepts hidden behind organic design. The search for innovative kinds of symmetry in the natural world is rooted in the theory of proportion since the latter establishes links between the geometrical patterns of the past and today's algorithmic computing. This fact underlines the actuality of history and traditional scientific tools. On the one hand a new printed edition of an already digitalized book confirms the importance of paper in the spread of knowledge, on the other hand its content stresses the importance of Nature's model in the science of building, indicating the very first reference to organic design in the harmonic proportions of living organisms.

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