Andri Gerber, Tibor Joanelly, Oya Atalay Franck (Eds.)
**PROPORTIONS AND COGNITION
IN ARCHITECTURE AND URBAN DESIGN**

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Foreword

Architecture is the art of the ensemble: the corporeal whole and its individual parts. For centuries, the theory of *proportions* was the cornerstone of architectonic design. This applied to all of the epochs from the Romanesque to the Gothic, from the Renaissance to modernity. Even Modernism, with its purported rejection of classical architecture, was grounded in timeless proportional systems such as the integer-based, "musical" proportions of 3:4, 2:3, or 3:5, as well as the golden ratio.

Even if there is no longer a school of thought teaching modules on "proportional theory," proportions almost always resonate with the design of contemporary buildings – diffidently, as if they were something objectionable. Proportional systems act as a means of taming the arbitrary and chaotic with order and structure.

Certain ratios are often perceived as aesthetically beautiful, pleasant to the eye, and therefore more harmonious than others. The preoccupation with correct dimensions and placement of parts in relation to the whole even goes so far as to categorize the natural world through numerical relationships. What could be more authentic and timeless than a proportional system that has already existed in nature for millions of years?

Despite its enduring relevance, there has not been any scholarly engagement with the topic of proportions in architecture for a long period of time. This makes the contributions to the conference at the ZHAW Department A, grounded in cutting-edge insight into the perception of space, all the more valuable when presented in book form.

Prof. Dr. Oya Atalay Franck
Director, Department A

PART I.

Andri Gerber

The Dead Live Longer …

> *"Within the terms of a new conception of the world the whole structure of classical aesthetics was systematically broken up, and in this process man's vision underwent a decisive change. Proportion became a matter of individual sensibility and in this respect the architect acquired complete freedom from the bondage of mathematical ratios. This is the attitude to which most architects as well as the public unconsciously subscribed right down to our own days."*
>
> *Rudolf Wittkower, 1949*[1]

There are discourses that perpetually haunt architecture, sometimes becoming an outright obsession for architects. Discourses such as 'utopia', 'the environment', or 'the social' are omnipresent, even dominant, for years – only to disappear suddenly and be replaced by other discourses. But sooner or later, these forgotten topics make their triumphant return to fashion, once again becoming the provisional center of architecture itself. This periodically recurring obsession with certain motifs serves only one purpose: to distract architecture from its own problematique, its irrelevance, and its fickleness.

Not so with the topic of proportions! Although for centuries proportions, along with the Classical orders, were the foundation of the discipline, they lost their significance during the Enlightenment and were forced into obsolescence, and remain of diminished relevance to this day.[2] There are and have always been architects who, more or less, explicitly applied proportions to their designs; however, they are a minority – and more importantly, they wrote little on the subject. This is the case even when proportions were fundamental to their work, as discussed by Rainer Schützeichel in his essay on Theodor Fischer (1862–1938). The final apostle of proportions was, of course, Le Corbusier (1887–1965) with his *Modulor*. His system was also adopted by Ernst Neufert (1900–1986) – a former disciple of the Bauhaus movement – for his design teaching, thus partially transposing the principles of proportion into the standardization of architectural detailing.

Nevertheless, proportions are not part of our contemporary discourse. There are numerous reasons for this, including the fact that proportions are associated

with order, harmony, and ideals; these qualities are no longer pertinent to the fluid digital world, cultural contradictions, and rapid change that characterize life today. Architecture based on proportions could serve as an alternative to this, but even self-professed 'conservative' architects do not hearken back to them, in part because they lack the knowledge to do so. Proportions, or what we associate with them on a case-by-case basis, generate touch of nostalgia. The quote by Rudolf Wittkower (1901–1971) introducing this chapter bears witness to that – evidence from one of the final 'rediscoverers' of proportions. It is certainly no coincidence that historians continually discover proportions anew, and having this discussion in contemporary times reveals how two worlds collide with one another, unable to communicate across their differences. In an essay in *Baumeister* in 2006, historian Jan Pieper, known for his meticulous research into Pienza, attempted to analyze the Mercedes-Benz Museum by UNStudio with the instruments of proportions. But confronting such a project with orders and harmony proved to be an impossible task. The parametric architecture of UNStudio lacks "[…] a sense of the right measures"[3] and its "appropriateness of form and dimension"[4] was questioned in Pieper's critique.

With his book on proportions, Wittkower generated one of the last significant waves of enthusiasm for the topic. However, thirty years previously, the influential art historian Erwin Panofsky (1892–1968) had complained that "investigations into the question of proportions […] are usually treated with skepticism, or at the very least noted with disinterest," and that a modern observer "in his still largely romanticized view of art [finds] it embarrassing, or at least uninteresting, if a historian tells him that certain representations follow a rational law of proportions or are based on a particular geometric schematic".[5] For Panofsky, it was already apparent that proportions had no future.

What most precludes a resurgence of engaging with proportions is the fact that the generation of Le Corbusier, as Werner Oechslin and Martin Tschanz assert in their essays, could still draw from the fundamental principles of proportion they had been taught, whether directly or indirectly. Later, this knowledge was ultimately lost. Today, there is hardly a studio design teacher – with perhaps the exception of Peter Märkli – who attempts to impart students with such knowledge. And as Märkli observes in his interview in this book, it would require more than a single semester of studio design to convey the kind of complex knowledge required to expound upon this subject.

Finally, the nature of proportions themselves discourages their 'revival', because it is not inherently clear whether architecture itself belongs to art, science, or is a third, hybrid form. For centuries, architecture has asked itself this question in vain – at least until it lost interest, or flitted away to some other sort of extreme. As such, proportions remain a challenge for architecture on multiple levels, as well as a significant problem for anyone who attempts to consider the discipline from a distance. That is precisely what renders working with proportions so exciting, and is what inspired us to write this book.

The history of proportions in architecture is well documented, and is presented in the first three essays of this book. As an analogy, the canon of classical architecture

is based on proportions, which rely on mathematical, geometric, or musical relationships. Proportions were critiqued, in part, as early as the Renaissance, beginning the moment architects discovered that the ruins of antiquity they unearthed deviated from the measurements asserted primarily by Vitruvius. Even then, they posed the fundamental question as to which ideal should be pursued. Leon Battista Alberti (1404–1472), along with many others, was concerned about *beauty* as an ideal to be achieved through proportions, even if beauty remained somewhat difficult to define: "Now I come to a matter with which we have promised to deal all along: every kind of beauty and ornament consists of it; or, to put it more clearly, it springs from every rule of beauty. This is an extremely difficult inquiry; for whatever that one entity is, which is either extracted or drawn from the number and nature of all the parts, or imparted to each by sure and constant method, or handled in such a manner as to tie and bond several elements into a single bundle or body, according to a true and consistent agreement and sympathy – and something of this kind is exactly what we seek – then surely that entity must share some part of the force and juice, as it were, of all the elements of which it is composed or blended; for otherwise their discord and differences would cause conflict and disunity".[6] He concludes that it is necessary to understand the effects of this entity and its innate characteristics. Here it is about a relation between individual parts, and the question is then how binding this connection must be. However, Alberti's derivatives, including his mean proportion, were different than those of his contemporaries, even though he too based his system on absolute relations. It was the relativity of systems that Claude Perrault (1613–1688) had questioned in his 1673 translation of Vitruvius and in his 1683 *Ordonnance des cinq espèces de colonnes*. He distinguishes between positive and arbitrary principles of architecture. The former he characterizes as "solidité, salubrité" and "commodité," the latter as beauty, which is not exactly 'positive', but is dependent on "consentement": general consensus. Proportions are considered pleasing because people have become accustomed to them. Aesthetic judgment remains relative, and cannot be derived from musical proportions.

For proportions in the context of architectural history, it was all downhill from there. While this history could be extended to include several more or less well-known 'proportional apologists' – including Edwin Lutyens (1869–1944), Louis Kahn (1901–1974), Hans van der Laan (1904–1991), as well as Swiss artists André M. Studer[7] (1926–2007) and even Peter Zumthor (1943), or influential theoreticians such as Adolf Zeising (1810–1876), Matila C. Ghyka[8] (1881–1965), and Hans Kayser[9] (1891–1964) – this is not the point. It is much more about the nature of proportions *per se*.[10]

Even two of the most important advocates for a theory of proportions, August Thiersch (1843–1917) and Le Corbusier, did not consider them to be a panacea for architecture. Rather, they continually emphasized that proportions are only an instrument; it is up to the talent of the architect to use them correctly in order to create 'good' architecture.

Accordingly, in 1883, Thiersch claimed that no rule of art "[replaces] the lack of genius. The diligent use of an encyclopedia of rhymes does not yet make a poet, but
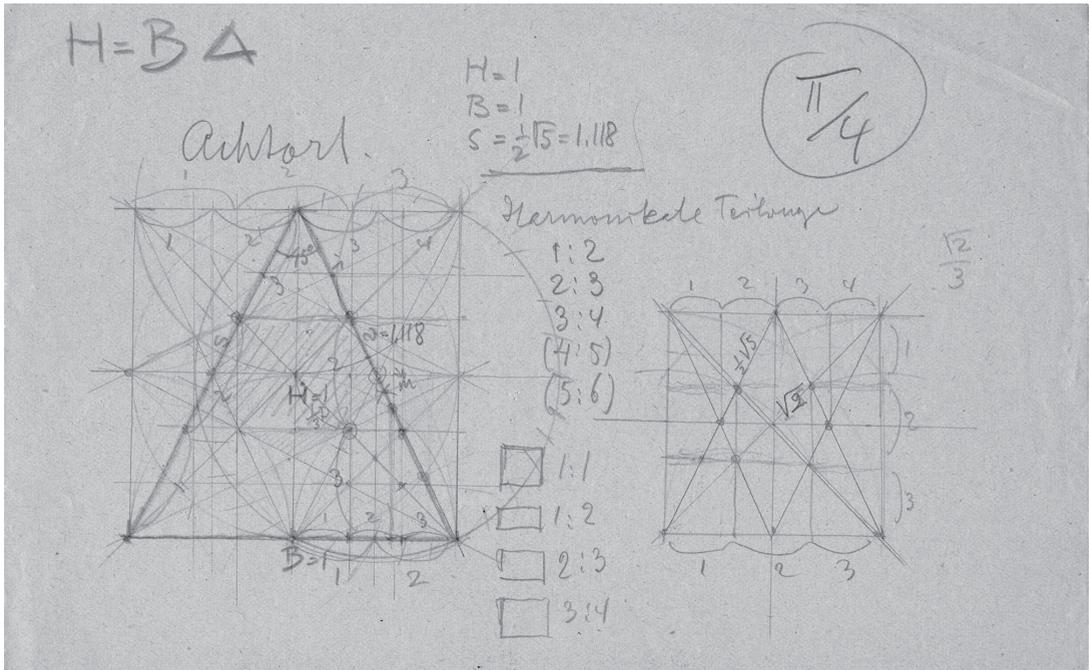
Fig. 1: Theodor Fischer, *Proportions*, no date

the poet must carefully observe the rules of rhyme. Thus the knowledge of the laws presented here will not make anyone a master builder. But it will allow talent to take a shortcut in this experiment and to protect it from excesses. It describes a curative restraint within which genius must move, in order to produce works that satisfy aesthetic perception while simultaneously justifying themselves to scientific intellect".[11] And in 1950, 67 years later, Le Corbusier noted: "Maintenant, voulez-vous admettre en simple bonne foi, avec moi, que le 'Modulor' est un outil de travail, un outil précis; disons que c'est un clavier, un piano, un piano *accordé*. Le piano est accordé; il vous reste à jouer bien et c'est vous que cela regarde. Le 'Modulor' ne donne pas de talent, et du génie encore moins. Il ne rend pas subtil les épais; il leur offre l'aisance pouvant résulter de l'emploi de mesures sûres. Mais, dans le stock illimité des combinaisons du 'Modulor', c'est vous qui *choisissez*".[12] Despite these warnings, it is precisely such a conceptualization of proportions as a quasi-automatized design tool that subsequently prevailed, leading to its stigmatization.

Architecture, City, and Proportions

Proportions pose a significant challenge not just for architecture, but also for urban design, particularly in regard to the assumption that the latter can simply be understood as an extension of architecture. The high degree of abstraction

inherent to proportions – whether mathematical, geometric, or musical – renders them attractive, in order to apply them to both the architectural and the urban scales without differentiation – without considering the specific differences of these realities. If both a house and a square can be designed according to certain relationships, then the differences between these two dimensions are eliminated. In fact, there are numerous examples from antiquity, in which the *agora* of the Hippodamian Plan was laid out according to very specific ratios for its sides. The numerous ideal city blocks of the Renaissance were planned according to certain proportional relationships in regard to their grid, the width of the streets, the shape of the squares – even down to the angle at which buildings and axes were rotated from one another. Alberti distinguished between streets, squares, and palaces, in which the former was determined by the ratio of width to length, and the latter by the ratio of width to length *and* height. This means that, in regard to proportions, architecture also consists of a third dimension.[13]

This same logic is reflected in many of the previously noted examples. Le Corbusier's vision for an abstract landscape viewed from the airplane, as well as his plans for the ideal city, were both governed by the golden ratio; his architecture can also be understood as an extension of this. The same could be said, too, of the proportional models of Hans van der Laan, which can simply be extended from the scale of architecture to the scale of the city. It should be abundantly clear that the city is more than just great architecture. One must only refer to Plato, when he discovered an example of the distinction between justice and injustice in the context of the city: "'I'll tell you', I said, 'Do we talk sometimes of a justice of an individual person, and sometimes perhaps of a whole city-state too?' 'Certainly,' he said. 'And of course a state is something larger than one person?' 'Yes it is,' he said. 'In which case justice may be of a greater scale in the larger context and be easier to understand. If you wish them, let's firstly try to find out what kind of a thing it is in states, then let's examine it in this way in each individual too by looking closely at the resemblance of the greater in the form of the lesser'".[14] Proportions thus reveal a perilous tendency to suspend any difference in scale, which is particularly inadequate considering the controversial context of the city pitted against architecture, and the question of who is responsible for designing the city. As Rainer Schützeichel describes in his contribution, the fact that there are alternative approaches is demonstrated by Theodor Fischer, who structured this transition between architecture and urban design in a much more subtle way.

Finally, there are also proportions in translation. We have chosen to remain as close to the original formulation of the German texts as possible in this English edition of the book.

Explanatory notes

1   Rudolf Wittkower, *Architectural Principles in the Age of Humanism* [1949], Chichester 1988 (5th Edition), pp. 136–137.

2   But perhaps the architectural journals will rediscover proportions in 10 years, in their desperate search for the "newest new."

3   Jan Pieper, Kritische Annäherung an die Peripherie der Architektur, in: *Baumeister* 7, 2006, p. 44.

4   Ibid., p. 45.

5   Erwin Panofsky, Die Entwicklung der Proportionslehre als Abbild der Stilentwicklung [1921], in: Erwin Panofsky, *Aufsätze zu Grundfragen der Kunstwissenschaft*, Berlin 1964, p. 169.

6   Leon Battista Alberti, *De re aedificatoria. On the Art of Building in Ten Books*, translated Joseph Rykwert, Robert Tavernor and Neil Leach, Book 9, Ornament to Private Buildings, Cambridge MA 1988, p. 301.

7   See also the exhibition on André M. Studer, which was shown at the Architekturmuseum Basel in 2016, as well as: Lucia Gratz, Das Atelierhaus Studer in Gockhausen, in: *werk, bauen + wohnen* 11, 2015, pp. 64–67.

8   Mathyla C. Ghykla, *Le nombre d'or*, Paris 1931.

9   Hans Kayser, *Grundriss eines Systems der harmonikalen Wertformen*, Zurich 1938.

10 As an introduction to the topic of architecture and proportions, refer to: Paul v. Naredi-Rainer, *Architektur und Harmonie. Zahl, Mass und Proportion, in der abendländischen Baukunst*, Cologne 1982.

11 August Thiersch, Die Proportionen in der Architektur, in: *Handbuch der Architektur*, Darmstadt 1883, p. 77.

12 Le Corbusier, *Le Modulor. Essai sur une mesure harmonique a l'echelle humaine applicable universellement à l'architecture et à la mécanique*, Paris 1950, pp. 132–133.

13 "Architects employ all these numbers in the most convenient manner possible: they use them in pairs, as in laying out a forum, place, or open space, where only two dimensions are considered, width and length; and they use them also in threes, such as in a public sitting room, senate house, hall, and so on, when width relates to length, and they want the height to relate harmoniously to both." Alberti 1988, p. 305.

14 Plato, *Republic*, book II, edited and translated by Chris Emlyn-Jones and William Preddy, Cambridge 2013, p. 159/161.