

extremes inevitably permeate discussions of dimension, composition, and aesthetics. Cohen continues the debate in Part VI, following his interview with Ackerman, where he lists ten fundamental principles for the study of proportional systems in the history of architecture. These principles derive from Cohen's critical reworking of the conclusions proposed by the volume's twenty-two contributing authors.

Part II consists of six chapters that examine theoretical principles in architecture from the classical world to modernity. Mario Curti addresses the unresolved conflict between proportional canons that claim to express natural laws, from the Renaissance to Le Corbusier's Modulor. Caroline van Eck considers the anthropomorphic characteristics of Michelangelo's design for the Laurentian Library vestibule as related to Wittkower's essay on mannerism. Sigrid de Jong explores the question of subjectivity with regard to classical proportions, focusing on eighteenth-century discussions of the anomalous Temple of Neptune in Paestum. Anthony Gerbino discusses the study of proportions in the work of François Blondel in early modern France. Stephen Murray explores the construction of Gothic architecture using digital studies of Beauvais Cathedral, comparing plans and sections to reconstruct geometric proportions. Marvin Trachtenberg closes the section with an essay on Wittkower's study of the role of perspective in shaping Filippo Brunelleschi's design practice and Renaissance theories of architectural proportion.

Part III considers proportion as a design tool and its relationship to modules and modular grids. Eight chapters span the history of architecture from the classical world to the dawn of the Enlightenment. Elizabeth den Hartog explains the symbolism of numbers in early Gothic constructions. Lex Bosman contextualizes the role of the module from Vitruvius through Italian Renaissance treatises. Mark Wilson Jones tackles measurement and the design logic of the Parthenon. Franco Barbieri examines Vincenzo Scamozzi's proposals for the correct dimensioning of rooms. Krista De Jonge investigates the significance of proportion for early modern Flemish artists and architects as seen in prints. Konrad Ottenheim illustrates the application of proportional systems in Dutch civil

architecture. Jeroen Goudeau explains the use of the modular grid as a design tool in early nineteenth-century France. Finally, Robert Bork provides an original reading of design strategies in Gothic architecture, demonstrating how geometric matrices formed a key element in design practices.

Part IV documents how sets of data provided by new analytical tools enable scholars to reassess earlier studies and conclusions, underscoring the value and effectiveness of digital representations for the study of architecture. Andrew Tallon describes the application of laser scanning to the study of the proportions of Bruges Cathedral. Gerd Graßhoff and Christian Berndt analyze entasis in the columns of the Pantheon portico. Francesco P. Di Teodoro explains the role of proportions in Leonardo da Vinci's drawings of religious buildings. Sara Galletti examines the chronology of Philibert de l'Orme's treatise in light of his changing ideas about proportions. Maarten Delbeke considers Claude Perrault's rejection of proportion as an aesthetic rule.

Part V comprises three chapters that explore theoretical interpretations of proportion. Jean-Louis Cohen approaches the debate around proportional systems in twentieth-century France by investigating Le Corbusier's reliance on the theoretical studies of Matila Ghyka for his Modulor measurements. Caroline Voet illustrates the refined proportional principle behind the Belgian Benedictine monk Hans van der Laan's plastic number, which anticipated the parametric logic of solid modeling. Finally, Francesco Benelli investigates the argument between Wittkower and Le Corbusier that stirred backstage at the 1951 conference.

With its distinguished list of contributors, this large and impressive book deserves careful reading. It offers a series of well-articulated perspectives on proportional systems across time and space and raises provocative questions. Persistent, centuries-old debates around proportion have reappeared in the new millennium. The rise of digital technology, contributing to this resurgence, offers yet another means through which scholars can understand and investigate the value and significance of proportional systems.

MICHELA ROSSI
Politecnico di Milano

Notes

1. "Es ist dafür gesorgt, daß die Baume nich in den Himmel wachsen." Quoted in A. D'Arcy Wentworth Thompson, *On Growth and Form* (Cambridge: Cambridge University Press, 1917), 20. Johann Wolfgang von Goethe, *Goethe's Collected Works*, trans. Robert R. Heitner (New York: Suhrkamp, 1987), 4:333.

2. Tensions between Wittkower and Le Corbusier, both of whom claimed to have rediscovered classical proportional theory in architecture, are well documented. For a discussion of Wittkower's impact on modernist architecture, see Alina Payne, "Rudolf Wittkower and Architectural Principles in the Age of Modernism," *JSAH* 53, no. 3 (Sept. 1994), 322–42.

Emanuele Lugli

The Making of Measure and the Promise of Sameness

Chicago: University of Chicago Press, 2019, 309 pp., 16 color and 40 b/w illus. \$35 (cloth), ISBN 9780226612492

An inscription on the inner courtyard of the Sponza Palace (ca. 1516–21) in Dubrovnik promises that all merchants who pass through the city will be treated fairly: "Our weights do not permit cheating or being cheated. When I measure goods the Lord measures with me." The city claimed it was an honest broker and verified its measures—according to the declaration—by divine presence. Asserting its independence in the Adriatic, Dubrovnik offered a promise of fair trading practices that lifted it above other settlements along the Dalmatian coast.

Measuring was a way for travelers to understand places they did not know. When they knew a building or a town square, they might begin to compare it to other places. Early guides to Rome routinely included the dimensions of the Aurelian Walls and the number of their gates. Such quantitative description then justified a qualitative assessment of a city's greatness. Measuring was also a way to study architecture closely through the often physically demanding work of recording actual dimensions to document relative size. If a sketch offered an impression of a building, a measured drawing allowed an architect to copy the building's ornament or even reconstruct the entire structure in a new location. Sebastiano Serlio notes throughout his sixteenth-century treatise that he measured ancient buildings himself,

using both words and images to reinforce the authority of his descriptions (Henry Parke shows such an activity in his 1819 painting *Student Measuring the Temple of Castor and Pollux in Rome*). Measuring represented a way of knowing and understanding, as well as a means of communication.

In *The Making of Measure and the Promise of Sameness*, Emanuele Lugli deals mostly with medieval Italy, and Dubrovnik is not included among his examples. However, after reading this challenging and original book, I could not stop thinking of all those other examples where number, proportion, and measure are at the heart of architectural history. As with the study of materials, measurement has frequently been taken for granted, at least until recently. Correct and consistent measuring was believed to be inherent in sound buildings, and it was considered to be the determining factor in the success or failure of a structure. To be fair, Lugli is not immediately concerned with the nature of architectural or building practice. Rather, he approaches measurement and its objects as an index of a more diffuse process of cultural change and debate during the Middle Ages.

The book is organized in reverse chronological order, belying the author's method and bringing to the Middle Ages a modern perspective and a poetic eye. Lugli begins in Napoleonic France with the invention of the meter. The decision to start there, in the modern era and with the history of the meter, defines the book's approach and marks its baseline. The shift from national and regional units of measure to a standard that transcended political borders and united an empire was accomplished only through the advocacy of scientists and politicians. Trade before this time required participants to determine equivalencies and to rationalize the units of one national market with those of another through mathematical processes and the use of *tavole di ragguaglio*, or conversion charts. Yet the history of measurement is not, Lugli asserts, simply a result of merchants and civic authorities seeking standardization. Measurement and its tools were a form of political control that expressed deeply held assumptions about the role of the state and the sources of its power.¹

The four sections of Lugli's book move out in ever-expanding spatial realms, from

the safe that encloses the meter rod to city squares and layouts to agricultural fields. As the author makes clear in his preface, the reader is not obligated to start at the beginning and push straight on to the end. The narrative circles back on itself, and themes repeat in a way that some readers might find exasperating. Yet it is also part of the book's argument that the history of measurement is not one of a linear progression from lesser to greater precision and ultimate surety. Rather, it is enmeshed in the motivations of political actors and their desire to find external justifications in the power of numbers.

The objects of measurements can be almost transparent, as the representation of ideal standards that dissolve themselves in the authority of nature, and the study of the physical objects through which measurement was accomplished helps to trace this history. The platinum meter rod enshrined in the Paris archives is unmarked and unsigned, as if its universality removes it from human interaction. In contrast, medieval *pietre di paragone*, to use Lugli's term for standards inscribed on buildings, were placed in the most public of spaces, near the market and city center. These incisions in stone, against which merchants and others could compare their own measuring tools, created a pact of trust in the public sphere.

These objects and tools of measuring are some of the physical evidence that Lugli discusses, yet he misses an opportunity here to explore how these instruments could become extensions and avatars of the human body. For example, I wanted to know more about the seeming neutrality of the nineteenth-century metric standard, as opposed to the lavishly ornamented weight standards crafted into the shape of an amphora in the sixteenth century by Bernardino Arrigoni for the Gonzaga family. Every bit of ornament on this amphora seems a willful and superfluous addition, from its coat of arms to its elaborate handles. Nothing seems divinely given or neutral. All the design decisions were made by an artist, not a notary or keeper of truths. Yet, as Lugli points out, the abundance of ornament made replication of the object impossible. It was unique as well as a standard, and therefore it served dual purposes, one seemingly at odds with the other.

This is not precisely a book about architecture, although buildings and spaces are

woven throughout the medieval history of measurement, from the cathedrals carrying standards in their fabric to the critical role of surveyors dimensioning agricultural fields. Lugli approaches measuring as a process rather than a product, one that occurs over time and directly engages with the social conditions in which it is performed. The size and location of a cathedral might be ordained by a divine sign, such as the miraculous snowfall in Rome during the summer of 358 that determined the dimensions of Santa Maria Maggiore, but such sacred or profane signs were made both visible and permanent through measuring. As Lugli argues: "Measuring does not enact order, but it is the process that interlocks various practices, enabling forms to exist across them and through society. And it does so because it constantly joins the source of legitimization to its destination" (193).

From Ovid to Fibonacci, Lugli focuses on texts as evidence for ongoing debates about the unifying diversity of measures and the possibility of reaching universal consensus. Yet if texts offer insights into this long evolution throughout the Middle Ages, the material evidence is more elusive. While some measures, such as standards inscribed into buildings, might survive, the ephemeral and human experience of measuring is more difficult to recover. The use of measuring instruments, for example, seen throughout the ancient Roman world and still visible in the form of Italian cities today, coexisted with the common act of pacing out distances. Before surveyors worked out ways to measure through instruments and devices, there was the movement of the body walking and the length of a stride.

This book moves fluidly through varieties of evidence, yet clearly these were often in conflict. The materiality of the measuring process, even when it does not offer the promise of sameness, deserves further study. Lugli ends his book by returning to measurement in the modern era and the promise of atomic studies, analyzing objects that we cannot see or touch. In the premodern period, by contrast, measurements were embodied in the fist of a merchant or the length of a measure cut into the side of a building.

Measuring brings with it assumptions and alignments. Precision and the promise

of sameness, as the book's title makes clear, are interests embedded in the power of numbers. Lugli cites the work of Filippo Brunelleschi, whose religious architecture articulated inherent modular and numerical systems in both its spaces and its surfaces. The Renaissance attention to number offered a mechanism for understanding a divine world through the materials and composition of earthly objects. And thus, one can trace out of medieval traditions a history of architecture commanding both precision and authority because of this fundamental belief in the power of numbers. Lugli's book offers an important and subtle reading of that history before the emergence of better-known Renaissance traditions. The dominance of this history, however, leads me to wonder how much of this model is unique to the Western tradition and what results might come from the study of other architectural histories. At the very least, perhaps a session at a future SAH meeting could expand this topic to address a global perspective.

CHRISTY ANDERSON
University of Toronto

Note

1. See, for example, the essays produced by the Instruments project, organized by Zeynep Çelik Alexander and John J. May, available on the website of the Aggregate Architectural History Collaborative: <http://we-aggregate.org/project/instruments> (accessed 12 July 2020).

Christiane L. Joost-Gaugier

Islamic Elements in the Architecture of Puglia

Turnhout: Brepols, 2019, 220 pp., 234 color and 1 b/w illus. \$143/€110 (paper), ISBN 9782503580319

There is a clear faith-based division in the Mediterranean region today. The north, from Portugal to Greece, is mostly Christian. The south, from Morocco to Egypt, is mostly Muslim. The east, which includes Turkey and the countries of the so-called Levant, is largely Muslim with sizable pockets of Christians and Jews. Europe purged itself of Islam centuries ago and has sought to uphold a monoreligious culture ever since; the Islamic side has rarely uprooted its native Christian populations,

although it has not always treated them fairly.

The division was not as neat in medieval times. The two sides intermingled in ways that render any projection of the present split into the past difficult to sustain. Christians were numerous in the Islamic countries, and Europe had Islamic dominions in all of its southern edges. We are all familiar with the cultural achievements of the Muslims (the Moors of yesteryear) in Iberia (modern Spain and Portugal), which emerged over seven centuries. Some of us are also aware that Sicily was part of the Islamic world for three centuries (from the ninth to the end of eleventh century), although almost all Islamic traces there have long been erased. Few, however, know that parts of the Italian peninsula, especially the heel of the geographic boot known as Puglia, witnessed a sustained Islamic presence for long stretches from the ninth to the thirteenth century.

Only hints of these settlements appear in written sources, and even less in architectural remains, so thorough has been the eradication of any reference to Islam or Muslims since the medieval period. It was not until the late nineteenth century that a new generation of Orientalists, notably the Sicilian historian Michele Amari (1806–89), began to dig into the history of Islam in medieval Italy and to uncover textual references hidden in plain sight in well-known (and sometime obscure) treatises.¹ Later scholars added archaeological research and evidence from building techniques, ornamental details, and reused fragments from destroyed Islamic monuments all over the region, especially Sicily and northern Puglia, to their source material.²

This is where Christiane L. Joost-Gaugier aims to make a contribution with her *Islamic Elements in the Architecture of Puglia*. An art historian whose previous publications focused on masters of the Italian Renaissance, the author deploys an impressive survey of Pugliese late medieval and later monuments and a keen eye for architectural and artistic details to make the case for a robust Islamic influence on the architecture of (northern) Puglia long after the Muslims themselves had been deracinated. Her main example is Lucera, today a small town, the site of an unusual and cruel experiment in

population engineering initiated by the celebrated Holy Roman Emperor, king of Sicily, Italy, Germany, and Jerusalem, Frederick II of Hohenstaufen (1194–1250).

Facing resistance and potential rebellion by the remaining Muslims in Sicily more than a century after its conquest by the Normans, Frederick II decided to banish them all to southern Italy in 1220. A large number of the expelled (estimated to be between twenty thousand and sixty thousand) were forcibly settled in Lucera, to the dismay of the local Christian population. Muslims expelled from Sicily built an urban compound complete with a congregational mosque, madrasas, houses, markets, and a castle with a palace inside for the emperor. However, this Muslim community did not survive for long in Lucera. Living precariously under Manfred, Frederick's son and heir as king of Sicily, and later under Charles I of Anjou, Manfred's vanquisher and successor, the city was finally eliminated in 1289 by Charles II. It was destroyed and the bulk of its population was slaughtered or sold into slavery.

In her chapters 5 and 6, Joost-Gaugier questions the degree of the destruction. Through a stylistic and visual analysis of the new cathedral of Lucera, built in record time (1300–1302) on the site of the main mosque, she convincingly argues that, contrary to boastful claims, the mosque was not razed to the ground before Christian construction began. Thus, not only did the cathedral's architecture diverge from the expected Gothic model, but it also incorporated distinctly Islamic elements, such as the minaret base and the main façade of the supposedly destroyed mosque. Continuing her architectural detective work in chapters 6 and 7, Joost-Gaugier asserts that at least three other early churches in Lucera, built in the aftermath of the Muslims' annihilation, and many other buildings with towers or domes in the city and its immediate rural vicinity were originally Islamic. She reads the survival of these distinguishing elements, truncated, displaced, or recovered between the fourteenth and eighteenth centuries, as signs of "appreciation" for Islamic architecture. Such an assessment sounds farfetched to this reviewer given the fervor with which the Muslims were decimated. Instead, it is more plausible that the total destruction of the Muslim settlement was a tale invented by the Angevins