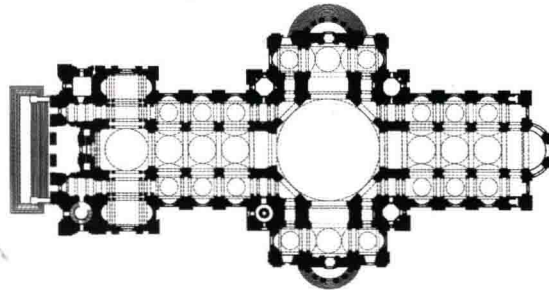


A World History of Architecture

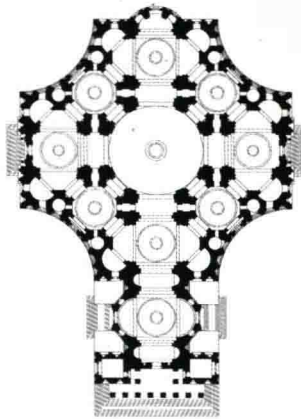
Third Edition



Michael Fazio
Marian Moffett
Lawrence Wodehouse



A WORLD HISTORY OF ARCHITECTURE



THIRD EDITION

Michael Fazio
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Lawrence Wodehouse

Laurence King Publishing



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Preface

Marian Moffett, Lawrence Wodehouse, and I wrote this survey of world architecture both for students taking introductory courses and for the general reader simply interested in buildings. We have searched out the stories these buildings have to tell, considered the intentions of the people who built them, and examined the lives of those who used them. We begin with prehistory and end with the early twenty-first century. We cover the Western tradition as well as works in the Islamic world, the pre-Columbian Americas, Africa, China, Southeast Asia, Russia, and Japan.

We have written about this diverse sampling of the built environment in a straightforward but lively style that is rich with detail. The text contains extensive descriptive narrative leavened with focused critical analysis, which both allows the book to stand alone and invites lecturers to impose their studied interpretations on the material without the danger of undue ambiguity or conflict. In a world that grows smaller by the day, it presents a global perspective, and in a discipline that concerns built objects that are often beautiful as well as functional, it is copiously illustrated, intelligently designed, and consistently usable.

Because architecture is at once utilitarian and a visual art, the text and its illustrations are inseparable. This book contains over 800 photographs and line drawings, most of which have discursive captions that can be read in conjunction with the text or appreciated independently. Short illustrated essays accompany each chapter (except for chapters 7 and 16). An annotated bibliography at the end of the book provides suggestions for further reading. Also at the end of the book is a glossary that defines the key terms set in bold throughout the text.

New to this Edition

- The page layouts have been designed for greater clarity and legibility.
- Chapters 13 through 16 have been significantly rewritten as a group, giving them a greater cohesion and a stronger historical narrative. This significant revision also includes photographs and textual discussion of almost 50 new buildings. In addition to strengthening Chapters 13–15, these new buildings bring Chapter 16 to the present moment in architectural history.
- There are 58 new illustrations, including the following twenty-first-century buildings:

16.25 Robert A.M. Stern, George W. Bush Center, Dallas, Texas, 2012; **16.41** Frank Gehry, 8 Spruce Street, New York City, 2011; **16.51** Zaha Hadid, MAXXI National Museum of XXI Century Arts, Rome, Italy, 1998–2010; **16.52** Zaha Hadid, BMW Central Building, Leipzig, Germany, 2005; **16.66** Renzo Piano, Modern Wing, Art Institute of Chicago, 2009; **16.68** Eric Owen Moss, Samitaur Tower, Culver City, California,

2011; **16.74** Steven Holl, Linked Hybrid, Beijing, China, 2009; **16.75** Jean Nouvel, Torre Agbar, Barcelona, Spain, 2005; **16.76** Jean Nouvel, Guthrie Theater, Minneapolis, Minnesota, 2006; **16.78** Santiago Calatrava, Liège Guillemins TGV Railway Station, Liège, Belgium, 2009; **16.80** Herzog and de Meuron, Walker Art Center, Minneapolis, Minnesota, 2005; **16.81** Herzog and de Meuron, National Stadium, Beijing, China, 2007; **16.82** Diller, Scofidio, and Renfro, High Line, New York City, 2004–09; **16.87** Thom Mayne, San Francisco Federal Building, 2005; **16.88** Thom Mayne, 41 Cooper Square, New York City, 2009.

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In writing this book, we have received assistance from many sources. Our colleagues Lynn Barker, Jack Elliott, David Lewis, Daniel MacGilvray, Charles Mack, Mark Reinberger, and Julia Smyth-Pinney contributed essays. The following reviewers read portions of the manuscript at various times and made comments that assisted us in clarifying and improving the text: Jane Ostergaard, College of DuPage; Wayne (Mick) Charney, Kansas State University; Lyle Culver, Miami Dade College; Katherine Wheeler, University of Miami-Coral Gables; Eleni Bastea, University of New Mexico-Albuquerque; Phil Gruen, Washington State University-Pullman; Dane Johnson, Ferris State University; Margaret Dale Woosnam, Blinn College; Shelley Roff, University of Texas at San Antonio; Susan Wadsworth, Fitchburg State University; Kestutis Paul Zygas, Arizona State University-Tempe; Douglas Klahr, University of Texas Arlington; Brian Zugay, Texas Tech University. Six students in the School of Architecture at Mississippi State University—Yan Huang, Kai Pan, Charles Holmes, Jared Brown, Kristin Perry, and Rachel McKinley—used their exceptional talents with graphics software to produce line drawings. Thanks also to School of Architecture librarians Judy Hammett and Susan Hall for bibliographical assistance and having patience with me and with the piles of books and papers that I keep in their library.

My special thanks to Art Pomponio for his editorial guidance. At McGraw-Hill, Penina Braffman, Rhona Robbin, and Laura Wilk provided important support. At Laurence King Publishing all editorial, design, illustrating, scheduling, and production issues were expertly managed by Kara Hattersley-Smith, Liz Faber, and Simon Walsh. Allan Sommerville of blok graphic laid out this new edition with great skill, and Giulia Hetherington researched most of the new photographs.

Photographs are acknowledged in the photo credits. In addition to photographs we have taken ourselves, some were taken by our colleagues, whom we would like to thank: Gerald Anderson, Robert Craig, Mark DeKay, Jeff Elder, Jason Labutka, David Lewis, Dan MacGilvray, Rachel McCann, Allison Moffett, Kenneth Moffett, R. Bruce Moffett, Max Robinson, J. William Rudd, Brenda Sartoris, Pamela Scott, Raiford Scott, Ronald Scott, Murray Smart Jr., and Patrick Snadon.

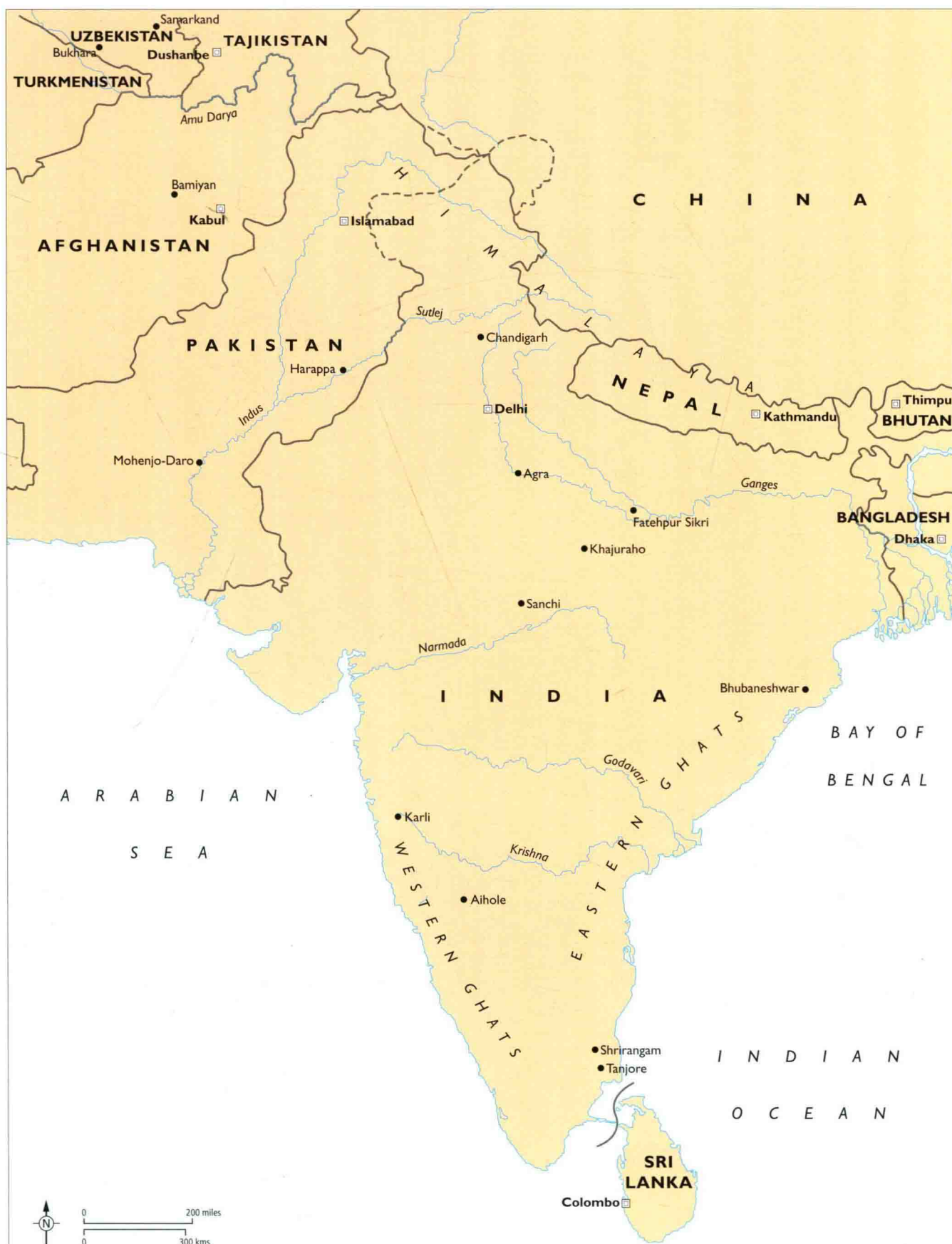
Michael Fazio April 2012



Map 1 Central and Eastern Europe and the Middle East



Map 2 Europe and North Africa



Map 3 Western Asia and India



Map 4 North America



Map 5 Central and South America



Map 6 Eastern Asia and Australia

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Introduction

You, the reader, are the reason for this book. We, the authors, have drawn on our cumulative experience in teaching and writing about architectural history to convey in words and images information about some of the world's most interesting and important buildings. This book surveys Western architecture in some depth and offers an introduction to non-Western architecture in Africa, India, China, Southeast Asia, Japan, the pre-Columbian Americas, and many Islamic settings. Together the text and illustrations encourage discussion, thought, and analysis. In this introduction, we offer a guide to the effective use of this book.

Architectural history begins with buildings. In order really to see these buildings, one needs to use precise descriptive language. Hence we have tried throughout to present clear, understandable, but provocative prose, and to define basic terminology when it is first introduced. Still, if left at the level of pure information, these words produce little true insight. We have therefore written this book in a way that encourages looking, but more than that, *seeing*; and the difference between the two is considerable. Seeing requires proceeding beyond the image projected on the retina to a process of analysis and the making of critical judgments. This, in turn, calls for placing buildings in their various contexts—social, political, economic, artistic, technological, and environmental—and determining whether they fulfill their obligations to their clients, to other users, and to society at large. To do this, it is necessary to enter the mind of the architect and to suspend modern biases so that we can evaluate the work as the product of a particular time and place.

What is architecture? Certainly it is shelter, but it can be much more. The phrase “frozen music” is often used, but such a description seems to imply that architecture has only an esthetic component. The “shaping of space for human use” seems more obviously useful, but it hardly explains the fascination of the Egyptian pyramids or the symbolism of a state capitol building. The Roman architect and engineer Vitruvius, active around 40 BCE, considered the essentials of architecture to be *firmitas*, *utilitas*, and *venustas*, commonly translated as firmness, commodity, and delight. Here firmness is structural stability, commodity is the meeting of functional requirements, and delight is beauty. One can hardly disagree with the need for firmness and commodity: any building that collapses or does not provide the right kind of space for the client's purposes must be considered a failure. Delight, or beauty, however, is a more elusive term, one with standards that have changed over time. Some have argued that beauty arises

naturally from the fulfillment of functional requirements. Others have seen it as an inevitable result of the logical use of building materials and structural systems. Still others have found it in applied ornamentation.

Let us consider the first two terms in Vitruvius's triad in a slightly different way by asking, why and how is architecture produced? In order to erect buildings, people must have a motive—a will to build; materials and a knowledge of how to use them—a means to build; and systems of construction—an ability to build. The will to build certainly includes responses to functional requirements, but often goes well beyond these to address spiritual, psychological, and emotional needs. For some building types, such as industrial buildings, practical concerns naturally predominate. In others, such as civic or religious buildings, meanings may be dramatically revealed through symbolic forms. To most people, for example, the interior of a religious building should elevate the human spirit, while a warehouse must only protect material goods. However, utilitarian high-rise office buildings are usually designed to reflect the corporate image that the CEO and board of directors wish to project, and homeowners commonly modify their houses both inside and out, not only to accommodate changing functional demands but also to express their own personalities and values. All architecture reflects such values, and the best of it expresses the tastes and aspirations of the entire society. More money, finer workmanship and materials, and (often) better design have typically been expended on buildings that shelter activities important to large segments of society. Thus, for many periods, religious buildings have been the principal laboratories for architectural experimentation and have been built to endure, while residential architecture and even commercial buildings have been more transitory, which explains the abundance of religious buildings in a text such as this one.

At the beginning of an architectural project, the client and architect develop a program, or statement, of projected spatial uses, sizes, qualities, and relationships. The program for an apartment building, say, would itemize the number of apartments and their sizes, the common spaces such as lobbies, the service spaces such as mechanical rooms and storage, and also include an allowance for horizontal and vertical circulation (corridors, stairs, ramps, and elevators). Because many designs can satisfy such a program, it is the architect's responsibility to develop alternatives, to select the best ideas from among them, and to present the results in the form of drawings and models from which the building can be erected.



0.1 Library of Celsus, Ephesus, Asia Minor, 114–17.
Constructed by the Romans, this is an example of post-and-lintel (column-and-beam) construction.

No matter how strong the will to build, people must also have the resources with which to build, which historically has meant local building materials. In turn, materials have strongly influenced architectural character. One of the most fascinating aspects of studying everyday buildings from the past is noticing how the simplest materials, such as wood, clay, thatch, and stone, have been employed to create architecture. If clay alone was available in abundance, people used tamped earth or made bricks. If people lived in areas that were heavily forested, they built in wood. The ancient Greeks were among the most skilled carvers of stone, but they would hardly have become so without the abundant local marble that could be chiseled with extremely fine detail.



People must also have the ability to build. That is, they must be able to assemble materials into stable systems of construction. Structural materials can be classified according to the way they accept loads: in tension or compression, or a combination of the two. When in compression, the fibers of a material are pressed together; when in tension the fibers are pulled apart. Stone, brick, and concrete are all strong in compression but not in tension. Wood is strong in both tension and compression, as is iron; but iron is also brittle. In the nineteenth and twentieth centuries, metallurgists refined iron into steel, a material to which small amounts of other metals have been added to form alloys that are highly malleable. Because it combines the compressive strength of **concrete** with the tensile strength of embedded steel, reinforced concrete is also strong in both tension and compression.

All structures respond to the vertical pull of gravity in the form of live and dead loads, and to side loads or lateral forces created by the wind and earthquakes. Live loads are the people (and/or animals) that inhabit a structure. Dead loads are the weight of the building itself and of its inanimate contents such as furniture. Wind loads are accommodated primarily by diagonal bracing, and seismic loads through flexible connections.

Only in the past 150 years has it become possible to quantify the direction and magnitude of loads and to

0.2 (below left) Arch, Kabah, Mexico, 850–900.

Built by the Maya of Central America, this is an example of corbeled construction. Note that the stones forming the triangular arch are laid in horizontal courses and slightly overlap one another as they rise.

0.3 (below) Barn, Cades Cove, Great Smoky Mountains National Park, Tennessee, 19th century.

This is an example of cantilevered construction. The second-floor loft overhangs the log cribs of the base, supported on long, wooden cantilevers extending to the sides and front-to-back across the width of the barn.

