

and a conclusion. The introduction explores the role of mass housing in multiple modalities of modernism, interacting with the modern state and modern architecture. Part 1, “Mid-Nineteenth Century to 1945: The Gathering Storm,” comprises two chapters that provide a much-needed overview of the architectural legacies leading up to the development of the state-sponsored mass housing complex. These two chapters offer a concise historical account of mass housing explorations before state housing that will be highly useful for scholars and as class readings. Part 2, “1945–1989: The ‘Three Worlds’ of Postwar Mass Housing,” contains fourteen chapters that reveal the diversity of the seemingly repetitive forms of mass housing by discussing international modernism from global to local contexts, reflecting on the heritage of the categorizations of First, Second, and Third Worlds as spheres of political alliance and knowledge transfer. Bracketed by the years of the Cold War, this section identifies the fall of the Berlin Wall in 1989 as the symbolic end of the “Three Worlds” period, a period when states viewed citizen housing as an object of political warfare, as seen in the well-known “Kitchen Debate” between U.S. vice president Richard Nixon and Soviet premier Nikita Khrushchev in 1959. Several chapters cover well-known mass housing contexts, such as France during the Trente Glorieuses, the postwar United Kingdom, the Soviet Union, capitalist East Asia, and Latin America. Glendinning gives these settings extended meaning within his book’s comparative cross section of the mass housing typology. Moreover, other chapters offer highly productive but less obvious categorizations, such as “southern Europe,” connecting processes occurring in Italy, Spain, Greece, Turkey, and Malta; and the linguistic category “Anglophone,” connecting mass housing phenomena in the United States, Canada, New Zealand, and Australia.

The fourteen chapters of part 2 constitute the heart of the book’s original contribution to the study of mass housing, framed as the intersection of modern architecture and the modern state. Part 3, “1989 to the Present: Retrenchment and Renewal,” unsettles the convention that modern states are no longer involved in mass housing by exploring

state involvement in twenty-first-century Turkey and China, two contemporary settings where state-instigated mass housing redefines scholarly dictums of decline. The stakes outlined in part 3 echo the trajectories covered in parts 1 and 2; Glendinning proposes a disciplinary reevaluation of mass housing as an important object of inquiry that goes beyond high modernism and postwar reconstruction to offer a holistic perspective on the modernist enterprise. The book’s conclusion reiterates the author’s focus on mass housing as the major arena in which modern architecture meshes with state power. It suggests that this is not a bygone history sealed off at the end of the Cold War but rather an ongoing one. Glendinning therefore underscores the methodology proposed by this book, challenging many disciplinary conventions of architectural history.

The book is not without a few shortcomings. First, its wide scope places it somewhere between a monograph and a textbook, and the density and depth of the data provided for each case explored make the work as a whole difficult to grasp in one sitting. Use of simpler language and sentence structure would have made the content more accessible to a wider audience. Second, the book’s immense methodological contribution is not given its proper space. A full chapter dedicated to methodology would have highlighted the book’s tremendous contribution to architectural scholarship and benefited the growing community of scholars, policymakers, and activists invested in mass housing. And third, while the book includes numerous images and illustrations, many of them in color, these are often too small to serve as historical documentation.

Nonetheless, the book makes an important contribution to the growing field of the architectural history of housing. Its 688 pages are generously illustrated with archival materials, including architectural drawings, master plans, marketing brochures, historical pictures, protocols, models, and newspaper coverage. Site documentation highlighting art such as the Italian Ina Casa mural plaques is especially moving. The illustrations support the text in conveying the book’s main premise, namely, that a global history of modern mass housing should also be specific, unique, and case

sensitive. Beautifully written and edited, *Mass Housing* is a rich study of a phenomenon so complex that Glendinning is the first architectural historian bold enough to undertake it. Following the tradition of Hall, Mumford, and Vale, he positions himself here as an ambitious historian whose aims go beyond telling a well-researched story, as he strives to make an impact on both the narrative and the reality of our built environments.

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Note

1. Peter Hall, *Cities of Tomorrow: An Intellectual History of Urban Planning and Design since 1880*, 4th ed. (Malden, Mass.: Wiley Blackwell, 2014); Lewis Mumford, *The City in History: Its Origins, Its Transformations, and Its Prospects* (San Diego, Calif.: Harcourt, 1961); Lawrence J. Vale, *From the Puritans to the Projects: Public Housing and Public Neighbors* (Cambridge, Mass.: Harvard University Press, 2000).

Liu Yan

Woven Arch Bridge: Histories of Constructional Thoughts

London: Routledge, 2021, 412 pp., 461 color illus. \$280 (cloth), ISBN 9780367618230; \$52.95 (paper), ISBN 9780367624316

Ronald G. Knapp, Terry E. Miller, and Liu Jie

China’s Covered Bridges: Architecture over Water

Shanghai: Jiaoda Art Publishing, 2020, 480 pp., 600+ illus. \$65 (cloth), ISBN 9781952461026

Two recently published English-language books on China’s wooden bridges make significant contributions to our understanding of this important, yet understudied, genre of Chinese architecture.¹ An estimated three thousand covered bridges still survive in China, more than anywhere else in the world. *China’s Covered Bridges: Architecture over Water* provides an engaging and informative introduction to the most remarkable bridge types and individual examples among them. *Woven Arch Bridge: Histories of Constructional Thoughts*, in contrast, focuses on one subset of Chinese bridges located in a mountainous region in northern Fujian Province and southeastern Zhejiang Province, in China’s southeast. Inscribed in 2009 by

UNESCO as a form of intangible cultural heritage, extant woven arch bridges number only around one hundred, of which the earliest known dates to 1625.

The authors of *China's Covered Bridges* are among the world's most seasoned experts on wooden bridges. Ronald G. Knapp, professor emeritus at State University of New York, New Paltz, has published more than twenty books on the vernacular architecture of China and Southeast Asia, including a 2008 monograph on Chinese bridges.² Terry E. Miller has visited more than one thousand covered bridges in North America, three hundred in Europe, and one hundred in China, and has researched the topic extensively. Liu Jie, associate professor of architecture at Jiaotong University in Shanghai, has published seven books and many articles on China's wooden bridges, specializing in bridge architecture in southeastern China. The authors have traveled to far-flung regions to study bridges, and their book is richly illustrated with their own photographs, as well as those of A. Chester Ong, a professional photographer who has collaborated with Knapp since 2005. The joint expertise of the authors enables them to cover a much broader scope in this book than would be achievable by a single author.

The author of *Woven Arch Bridge*, Liu Yan, is a lecturer at Kunming University of Science and Technology and a leading expert on China's woven arch bridges. His technical understanding of these bridges, much of which was gained through years of fieldwork, is most impressive. Liu has participated in the construction of three woven arch bridges: two in China and one in Germany. On the two projects in China, he worked closely with master carpenters; for the project in Germany, he had gained enough skills to qualify as a "bridge master," which meant that he was able to oversee the design and construction process himself. Liu's practical experience allows him to tackle many questions about these complex structures that would be impossible to answer through a scholarly approach alone. For example, to better understand the structure of a nineteenth-century Japanese woven arch bridge known today only through historical design drawings, Liu created a 1:50 scale model of the bridge. The process of making the model enabled him to figure out that the beams in this

bridge were likely fixed with iron nails rather than wooden joints, as was typical in China. Liu's model is so sophisticated that it is now housed in the Deutsches Museum in Munich.

Both books adopt a cross-cultural perspective. The first part of *China's Covered Bridges* includes a thorough introduction to covered wooden bridges in China, North America, and Europe—the only geographic regions worldwide where such bridges are found. This discussion is useful in that it helps readers understand what makes Chinese bridges distinctive. One major difference between Chinese covered bridges and those in Europe and North America is that the latter were built predominantly for the passage of vehicles, while those in China were mainly pedestrian bridges that doubled as places for shelter and socializing. In Liu Yan's narrower typological focus, the global perspective emerges throughout the book in comparisons between woven arch bridges in China and those in Germany, Italy, Japan, Norway, and the United States.

The authors of these books do not attempt to trace linear developments in wooden bridge building over time; instead, they adopt a pluralistic approach whereby the independent origination of various structural types is highlighted. In their discussion of covered bridges in North America, Knapp, Miller, and Liu argue against the idea that immigrants brought covered bridge technology from Europe to the United States, stating that "American bridge building does not appear to be a continuation of European traditions but rather an innovative solution to the same challenges faced in Europe" (19). With regard to woven arch bridges, Liu Yan similarly counters previous claims that all woven arch bridges originated in China, arguing instead that they developed independently in different times and places. Rather than trying to trace the origins of woven arch bridges, Liu asserts, it is "of greater technical value" to ask how the idea of the woven arch structure came about in the first place (353).

The main challenge faced by builders of wooden bridges anywhere in the world was that of the span. The sizes of the timber members were naturally limited by the height of the trees. To meet the demands of a large span, shorter members had to be pieced together. In Europe and

North America, the span challenge was most often resolved through the use of the truss, a rigid framework of triangularly connected timber members held in tension. The structural systems of most surviving wooden bridges in Europe and North America comprise a series of trusses, which enabled them to support very large loads. Not only were truss bridges extremely strong and sturdy, but they were also relatively convenient to build, because the frames could be made on land and then hung into position above the water. However, wooden trusses, especially their joints, were susceptible to damage from moisture. Therefore, roofs and siding had to be erected above the supportive deck for protection, which allowed the bridges to last much longer.

Across China, several different types of wooden bridges developed, including simple beam bridges, horizontal cantilever bridges, angled cantilever bridges, and woven arch bridges. Among all the Chinese bridge types, the woven arch is capable of the greatest spans, and, as Liu notes in *Woven Arch Bridge*, it is likely that the wooden arch structure developed as a "natural and reasonable solution" to limitations in timber length (308). One of the rarest and most remarkable bridge types in China is the angled cantilever bridge, in which a complex system of cantilevered logs project upward to create a polygonal arched deck. Only ten examples of this bridge type are known to exist today, and they can all be found in remote regions of the Bai minority in Yunnan Province in southwestern China. Before 2016, when the authors of *China's Covered Bridges* began documenting and studying them, angled cantilever bridges were virtually unknown outside their region. Despite the great structural variety in Chinese wooden bridge construction, in no case was a truss framework ever employed. Unlike trusses, which could be built in advance on land, the wooden members in woven arch and angled cantilever bridges had to be assembled on-site and required complex falsework and scaffolding systems to support them during construction. Generally speaking, this made bridge building a much more dangerous profession in China than it was in the West.

In both the East and the West, the techniques of bridge building were closely related to the construction of roofs, since bridges and roofs had to deal with the

same span challenges. Like bridges, wooden roofs in Europe were usually built with truss frameworks, and it is therefore not surprising that some of the most famous European bridge-building families also specialized in roof trusses. As Liu Yan explains, in traditional Chinese architecture, roof construction was instead handled by means of a corbelling system, in which horizontal members of increasing length are laid atop one another so that each beam transfers the roof load to the one directly below it. Although triangular-frame roof structures were common in architecture of the Tang dynasty (618–907) in China, they cannot be considered true trusses because the individual members were not held in tension. After the Song dynasty (960–1279), the use of inclined structural members disappeared altogether.

Why the truss never developed in Chinese architecture is a fundamental question, which Liu addresses in an important discussion in his conclusion. He postulates that the answer lies in the complex wooden joints used to link the horizontal and vertical members. Much more so than the joint types used in Europe, those used in traditional Chinese architecture connect the members tightly together, which creates a rigid framework so structurally stable that a truss is unnecessary.

Both books identify Chinese bridge building's associations with ritual and religion as a unique feature. As in house and temple construction, the most important rituals revolved around the *dong*, the topmost beam in the structure. The first step in the bridge-building process often involved planting a tree decades in advance or, if that was not possible, carefully selecting a tree from which to harvest the *dong*. The tree was then felled and processed in a ritualized manner and covered with a red cloth until it was used. After the *dong* was successfully positioned (a process known as “raising the ridge pole,” *shangliang*), a religious ceremony involving offerings of food and drink was conducted. Completed bridges functioned, in part, as temples, with shrines to local or Buddhist deities placed in their centers facing the oncoming water. Like all traditional buildings in China, bridges were believed to have the power to affect the fortunes of the local populations and were thus constructed and decorated in ways that would bring good luck.

Chinese bridges also played important economic roles. Especially in mountainous areas, such as the Fujian-Zhejiang border region discussed by Liu, bridges connected isolated villages to one another and to the outside world. Thus, bridge building was closely linked to transportation flow and, by extension, to the local economic situation. Liu convincingly theorizes that the construction of woven arch bridges in this region began only after the fifteenth century, following the arrival of peace brought about by the government's prohibition of silver mining, which had contributed to centuries of unrest. The newfound stability in the region led to economic and commercial developments, resulting in greater need for roads and bridges. Still, it was the relative geographic isolation of this mountainous area that enabled the woven arch bridge tradition to persist for so long, without succumbing to modern influences. This was also the case in Europe: in remote areas in Norway, woven bridge technology continued into the twentieth century, even though the more convenient-to-build truss bridge had been in use for centuries in more developed parts of Europe.

Both books address the topic of funding, explaining that bridge construction was usually financed by donations from various local individuals or groups, and bridge maintenance relied on charitable contributions. Local genealogies highlight the involvement of prominent families in the building and repair of covered bridges. Donors who contributed particularly large sums had their personal names and the names of their hometowns inscribed in large text on a prominent bridge beam, while the names of those who donated lesser amounts were inscribed on smaller beams. Liu Yan points out that a huge variety of place-names can be seen on bridges located at crucial traffic junctures, “indicating the power and influence of the bridge in the transport network of the time” (133).

The folk traditions associated with bridge building in China do not belie the technical sophistication of the bridges themselves, a fact that Liu conveys particularly well in *Woven Arch Bridge*. He describes in detail the traditional building techniques of the woven arch bridge, including the methods of siting the bridge, selecting the materials and tools, constructing the scaffolding, calculating

the dimensions of the members, determining the angles to form the arch, and deciding on the joint types. Liu identifies *choudou* (crossbeam ramming) as the most crucial step in the construction process, in which large mallets were used to pound the topmost crossbeams tightly into position to create a rigid framework. Liu provides a helpful step-by-step photographic guide to facilitate the reader's understanding of the complex construction process. *China's Covered Bridges* similarly presents a clear and succinct overview of woven arch bridge construction.

One of the most fascinating aspects of *Woven Arch Bridge* is its lengthy discussion of bridge-building families. Information on the builders is derived from inscriptions on timber members, project contracts, interviews with surviving carpenters, and family genealogies collected by the author. Each group of carpenter “families” actually comprised several families from a local area with different surnames. Because the profession was so dangerous, carpenters often did not marry or have children; therefore, multifamily involvement was necessary to sustain the craft lineage. Each carpenter family kept its own trade secrets, which resulted in distinctive approaches to the structures. Remarkably, by closely investigating elements such as the joint types or the angle of the crossbeams used in a bridge, Liu Yan can often determine which carpenter family built the bridge, as well as the experience level of the carpenters.

Despite their overlap in content, these two books differ considerably in their approaches. *China's Covered Bridges* is broad in scope and presents the information in a straightforward and survey-like manner. *Woven Arch Bridge* is narrower in focus and takes a more creative and theoretical approach. The two books will likely also attract different audiences. With its informative text and spectacular photographs, *China's Covered Bridges* is suitable for general audiences wanting to learn more about the Chinese bridge-building tradition. The hardcover format and large size, moreover, make it an attractive coffee-table book, inviting readers to peruse it again and again. *Woven Arch Bridge*, on the other hand, is denser and more technical, making it more appropriate for scholars who want a deep dive into the mechanics of timber-frame bridge construction. Full of original data, surveys,

maps, and architectural drawings, all thoroughly analyzed by the author, this book also serves as an important reference tool.³

China's Covered Bridges and Woven Arch Bridge not only greatly expand our knowledge about tangible bridge architecture in China but also contribute to our understanding of the intangible craft practices, social customs, and religious beliefs that were essential to the creation and meaning of the bridges. Even though timber bridges may not endure much longer into the future, the work done by these scholars will help to ensure that the bridges and their associated cultural practices are thoroughly investigated and documented for posterity.

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Notes

1. Earlier scholarship in English has been focused largely on the distinctive “Wind and Rain” bridges of the Dong minority in southwest China. See, for instance, Xing Ruan, *Allegorical Architecture: Living Myth and Architectonics in Southern China* (Honolulu: University of Hawai'i Press, 2006); Klaus Zwirger, *Vanishing Tradition: Architecture and Carpentry of the Dong Minority of China* (Bangkok: Orchid Press, 2006); Li Xuemei and Kendra Schank, “Time, Space, and Construction: Starting with Auspicious Carpentry in the Vernacular Dong Dwelling,” *JSAH* 70, no. 1 (2011), 7–17.

2. Ronald G. Knapp, *Chinese Bridges: Living Architecture from China's Past* (Rutland, Vt.: Tuttle, 2008).

3. Liu Yan has created a Chinese-language database of historical woven arch bridges along with an interactive map: Min-Zhe Woven Arch Bridges Database, <http://w-bridge.wiki> (accessed 18 Oct. 2023).

Jorge Otero-Pailos, ed.

Historic Preservation Theory: An Anthology, Readings from the 18th to the 21st Century

Sharon, Conn.: Design Books, 2022, 608 pp.
\$70 (paper), ISBN 9780578547145

Jorge Otero-Pailos's collection is an important contribution to historic preservation's intellectual infrastructure. Many well-known texts are included; others are presented in valuable English translation (e.g., works by Camillo Boito and Gustavo Giovannoni, who are both important to my own teaching). Other pieces are novel and revelatory (Countee Cullen's 1925 poem; Francis Lieber's 1863

wartime policy), and some well-known works are reset in the context of preservation's intellectual history (from Walter Benjamin and Martin Heidegger to Kevin Lynch and Jane Jacobs). In comparison to previous preservation theory anthologies and analyses, *Historic Preservation Theory* is a leap ahead in number, variety, and geographical-disciplinary-perspectival diversity. The collection rightly and assertively goes beyond the literature on preservation per se, linking developments in preservation thinking to other narratives of architectural culture, cultural policy, and intellectual history. The anthology is unquestionably valuable, diverse yet directed in its choices, and well crafted. However, the question that persisted for me, a teacher of preservation theory, was “How useful is it?”

Presenting preservation theory to professional students as a history of theory is not the best approach. The chronological presentation of “original primary sources” here seems to presume a history-of-theory approach. Precedent and evolution are of course very important perspectives, but these ultimately yield to a more instrumental project of constructing contemporary theory that works for right now and guides future-facing decisions. Otero-Pailos's collection is deeply committed to refining the intellectual histories of preservation theories. Intellectual work is necessary and valuable, but we should recognize its limits. It is an end in itself for a very small audience. Otherwise, intellectual production gets put in the service of workable theories applicable in practice (for instance, relating directly to contemporary issues of public policy, public space, community engagement, political economy, ecology, public health, and so on). Much more could be said about this; I mention it here to clarify my biases in reflecting on the benefits of the present book and its core concern for the intellectual history of theory.

The editor's introduction sets the overall interpretive frame of the anthology and raises a few overarching issues worth noting and debating. The ideas of the “Enlightenment” have pride of place in the collection: “We are working within an intellectual tradition that stems from the Western Enlightenment” (xx). Do they still resonate in preservation theory today? Yes, in received value systems, in scholarship, in public policies. The a

priori valuing of the original expressions of these ideas sends us looking for traces of the original still at large (like looking for the authentic fabric in a much-altered building). More to the point, though, the issues of the Enlightenment—or, more aptly, modernity—continue to unfold and prompt societies and creatives to respond anew, to create new modes of preservation in response. In other words, I find it less consequential that the old issues have endured in their original form and more consequential that they continue to evolve and be valorized. The question is how much the contemporary field continues to be nourished by original ideas and issues (the first third of the book), as opposed to their evolving uses.

The assertion that “historic preservation is a discipline” (xii) looms large in the introduction. Clear judgments of “inside” and “outside” (xix), canons, and critiques are built up from the idea of a “discipline” organized around “safeguarding.” (In a related vein, the introduction plumbs the variability of the field's lexicon and even what we call the field, be it preservation, conservation, or something else.) The presumption that historic preservation is a discipline needs interrogation. The fact (borne out by the present collection) that preservation has always drawn ideas and methods from other disciplines (history, art history, architecture, physical science, and so on) signals that historic preservation is more accurately a “field” or a community of practice as opposed to a “discipline” possessing an exclusive theoretical and methodological domain. The anthology serves the profession's disciplinary ambitions by consciously reproducing the Western bias (while also wisely acknowledging the same and noting recent departures from it). Otero-Pailos affirms there is no single Western way of thinking (“the discipline is not a cultural monolith”; xi), and in the end he posits the collection as a long dialogue and debate serving those enthusiastic for preservation's status as a discipline as well as those skeptical of it. Notwithstanding (indeed because of!) the positions staked in this thirteen-page essay, it could be the basis of a great critical-reading assignment in a graduate course.

The heart of the book is the anthology of primary sources: ninety-six entries in chronological order, prefaced by the introduction (plus a QR code on the next-to-last page linking to a