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(The answer is concrete)

Who Won the Race to the Sky?

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Photo courtesy of the Skyscraper Museum

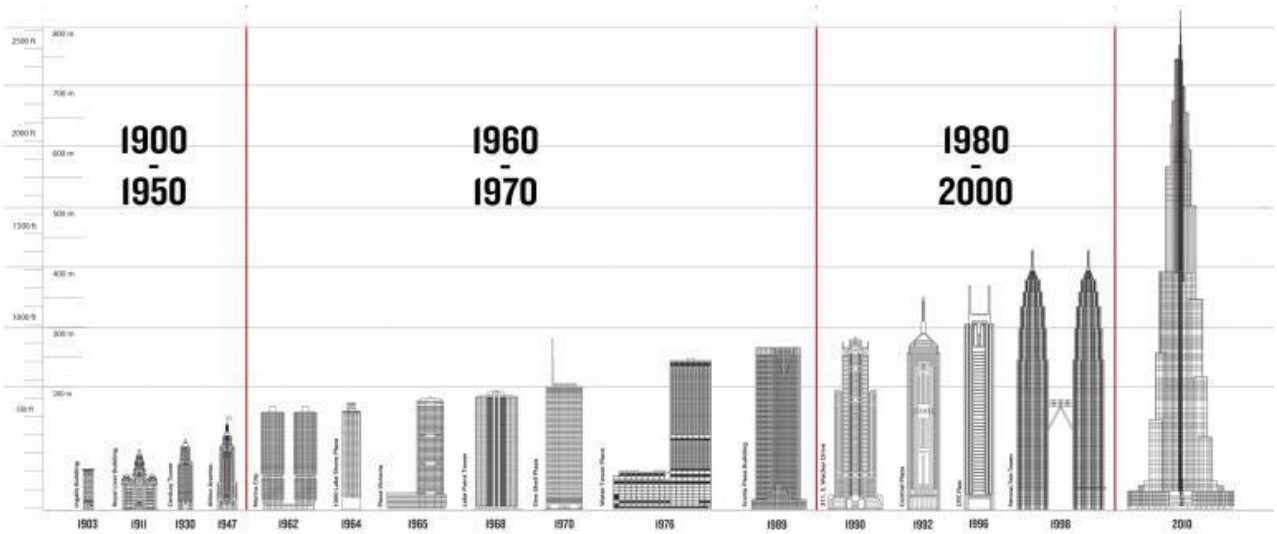
***The Modern Concrete Skyscraper*, a new exhibition at the Skyscraper Museum in Lower Manhattan, explores how concrete supplanted steel as the material of choice for structuring tall buildings around the world. World-Architects stopped by the museum soon after the exhibition opened in March. Here are our impressions.**

The last time I was at the Skyscraper Museum was almost exactly a year ago, to see and write about *Tall Timber: The Future of Cities in Wood*, an exhibition exploring the short history of mass timber and its wider adoption for tall buildings in the future. It was a timely show, given the advances in mass timber construction in recent years and the need in our age of climate change to build with low-carbon materials. The new exhibition, on display since last month, goes back to a time before mass timber, to tell the apparently neglected history of concrete in the construction of skyscrapers. *The Modern Concrete Skyscraper* is curated by Skyscraper Museum founder and director Carol Willis and Thomas Leslie, a Professor of Architecture at the University of Illinois, Urbana-Champaign (UIUC). The exhibition is compact, dense with information, and accompanied by even more information in the companion online exhibit (including many hours of lectures). It can be seen as the starting point of a deeper exploration of concrete's impact on the design, engineering, and construction of tall buildings. Or as Willis said during my visit, “There is clearly a book in here.”

The entrance to *The Modern Concrete Skyscraper* at the Skyscraper Museum. (Photo courtesy of the Skyscraper Museum)

Other repeat visitors to the Skyscraper Museum may feel a tinge of déjà vu at the entrance to *The Modern Concrete Skyscraper*. Where two cubes of mass timber sat beneath a video showing the manufacturing of CLT panels during *Tall Timber*, now a chunk of concrete sits next to a screen looping *This Is Marina City* (photo above), a short film made by the Portland Cement Association in 1965. That year is not necessarily the beginning of the story for tall buildings in concrete, but the complex designed by architect Bertrand Goldberg, as well as other buildings in and beyond Chicago in the 1960s, is a bellwether of concrete's dominance just a few decades later. Thanks in no small part to the efforts of the Portland Cement Association and other interested parties, concrete was finally competing with steel after decades of being used mainly for just the foundations of tall buildings. The material's wider application found a dramatic expression in Goldberg's sculptural “corncobs,” their scalloped balconies seeming to taunt steel, saying “Can *you* do this?”

The exhibition begins with a timeline, organized in eight panels that present significant chapters in the evolution of the concrete skyscraper. (Photo courtesy of the Skyscraper Museum)



“Tallest Concrete Skyscrapers by Year of Completion” (Drawing courtesy of the Skyscraper Museum)

Although the concrete skyscrapers that followed on the heels of Marina City were not as expressive architecturally, many of them were also found in Chicago. As illustrated by a handy timeline of “Tallest Concrete Skyscrapers by Year of Completion” (image above), which is found in the middle of the Skyscraper Museum gallery, these include the boxy 1000 Lake Shore Plaza designed by Sidney Morris; the undulating, Y-shaped Lake Point Tower designed by Schipporeit-Heinrich Associates; and the marble-faced Water Tower Place designed by Loebl, Schlossman, Bennett and Dart. Even though these buildings alternate in the timeline with towers in Montreal (Place Victoria; Luigi Moretti, with Pier Luigi Nervi), Houston (One Shell Plaza; Skidmore, Owings & Merrill), and Toronto (Scotia Plaza, WZMH Architects), the outsized importance of Chicago in the evolution of concrete skyscrapers in the latter half of the 20th century makes architect Thomas Leslie the ideal co-curator for the exhibition. In addition to teaching at UIUC, Leslie is the author of two excellent histories of tall buildings in the Windy City: *Chicago Skyscrapers, 1871-1934* and *Chicago Skyscrapers, 1934-1986*.

Installation views of the cases for Marina City, One Shell Plaza, and the CBS Building. (Photo courtesy of the Skyscraper Museum)

Installation view with model of Petronas Towers in Kuala Lumpur by Cesar Pelli, 1998. (Photo courtesy of the Skyscraper Museum)

In concrete's vertical progress over time, Chicago would regain the “tallest” crown in the early 1990s with the construction of 311 South Wacker Drive, but that postmodern design by Kohn Pedersen Fox was quickly supplanted by Central Plaza in Hong Kong—the beginning of Asia's dominance in skyscrapers, concrete or otherwise. By the end of the decade and the completion of Cesar Pelli's design of the Petronas Towers in Kuala Lumpur, the world's tallest concrete skyscraper and the world's tallest skyscraper, in any material, would be one and the same. Setting aside the coincidence that they are both pairs of towers, how did the world get from Marina City to Petronas Towers over the course of three and a half decades? How did concrete shift from becoming a structural outlier to the default material for tall buildings? And considering that both the current tallest building in the world (Burj Khalifa, SOM) and the tower that should soon displace it (Jeddah Tower, AS+GG) feature “buttressed core” structural systems that echo the form of Frank Lloyd Wright's unbuilt Mile-High Illinois skyscraper, how did concrete “bearing buildings” supplant steel framing for the tallest of the tall?

Installation views of the cases for 432 Park Avenue, One Thousand Museum, and Burj Khalifa. (Photo courtesy of the Skyscraper Museum)

Answers to these and other questions can be found in the technical breakthroughs of Marina City, as well as of those that predated it, such as the Hennebique system. The decades since Marina City have seen every player in the web of design and construction—manufacturers, architects, engineers, contractors—playing integral roles in the material's spread. With the Portland Cement Association and other groups lobbying for the material and steadily increasing the strength of concrete mixes, with architects designing buildings to the benefits of concrete, with engineers using computers to better calculate the behavior of “liquid stone,” and with contractors using better pumps to push concrete higher, it seems almost preordained that steel would lose to concrete in the race to the sky. Now, with climate change demanding material choices with little to no carbon emissions, it is imperative for similar advances to be made in mass timber, as last year's exhibition provoked. Yet to date, the tall timber buildings that have been completed are relatively modest, even boring compared to some skyscrapers in steel or concrete. Clearly, the world needs something like a Marina City in wood—a tall timber everyone can get excited about.

***The Modern Concrete Skyscraper* is on display at the Skyscraper Museum (39 Battery Place, New York, NY) until October 2025.**