

Princeton University

Honors Faculty Members
Receiving Emeritus Status



May 2010

The biographical sketches were written by
colleagues in the departments of those honored.

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Contents



Faculty Members Receiving Emeritus Status

Jeanne Altmann	1
David Perkins Billington	5
Patricia Fortini Brown	9
William A. P. Childs	11
Perry Raymond Cook	13
Slobodan Ćurčić	15
Arcadio Díaz-Quñones	17
Gerard Charles Dismukes	20
Avinash Kamalakar Dixit	22
Emmet William Gowin	25
Ze'eva Cohen (Ludwig)	27
Janet Marion Martin	29
Anne Marie Treisman	31
Daniel Chee Tsui	35
James Wei	37
Froma I. Zeitlin	39

David Perkins Billington



David Billington was born in Bryn Mawr, Pennsylvania, in 1927. He graduated from Princeton University in 1950 with a degree in basic engineering. He then won a Fulbright Fellowship and spent two years in Belgium to study post-war innovations in bridge and pre-stressed concrete structural design. In 1951, he married Phyllis Bergquist, also on a Fulbright Fellowship, who was studying the piano in Brussels. In 1952, David started working for Roberts and Schaeffer Company, consulting engineers in New York City, where he spent eight years as a structural engineer and designer of bridges, aircraft hangars, piers, thin-shell tanks, and missile-launch facilities. In 1958, he was chosen to be a member of a six-man delegation to the Soviet Union to observe concrete construction. In the same year, while he was still working in New York, David started to teach a course on structural engineering at Princeton as a visiting lecturer. He was a lecturer for two years before officially joining the faculty in 1960. He has remained on the Princeton faculty ever since and was named the Gordon Y. S. Wu Professor of Engineering in 1996. In 1966, he was visiting professor at the Technical University of Delft in the Netherlands. He was a visitor to the School of Historical Studies at the Institute for Advanced Study in Princeton from 1974–75 and 1977–79. In 1984–85, he was a Phi Beta Kappa Visiting Scholar, the first engineer in the 30-year history of the program.

David has won many prestigious awards and honors. He received the Society for the History of Technology's Dexter Prize for the best book in 1979 for *Robert Maillart's Bridges*. In 1985, he was elected to the Executive Council of the Society for the History of Technology. In 1986, he was elected to the National Academy of Engineering, and that year he also received the History and Heritage Award from the American Society of Civil Engineers. David served as an Andrew D. White Professor-at-large at Cornell University from 1987–1993. In 1990, he received the

Dana Award for Pioneering Achievements in Education. The Carnegie Foundation for the Advancement of Teaching named him New Jersey Professor of the Year in 1995 and he was named one of five top educators in civil engineering since 1874 by the *Engineering News Record* in 1999.

He and Professor Jameson Doig, a professor of politics and public affairs, shared the 1995 Abbot Payson Usher Prize, which recognizes the author of the best scholarly work published during the preceding three years under the auspices of the Society for the History of Technology. This award was for their co-authored paper, “Ammann’s First Bridge: A Study of Engineering Politics and Entrepreneurial Behavior,” which has been described as a masterful example of the value of a collaborative and interdisciplinary approach to the history of technology. In 1998, David was elected fellow of the American Academy of Arts and Sciences. In 1999, he was elected honorary member of the American Society of Civil Engineers. David holds honorary degrees from Union College (1990), Grinnell College (1991), and the University of Notre Dame (1997). He was the 2003 recipient of the Director’s Award for Distinguished Teaching Scholars, which is the highest honor bestowed by the National Science Foundation for excellence in both teaching and research in science, mathematics, engineering, and technology. In 2006, David was named the Walter L. Robb Senior Engineering Education Fellow of the National Academy of Engineering and in 2008 he was awarded the Distinguished Award of Merit from the American Council of Engineering Companies.

During his first decade on the Princeton faculty, David focused his teaching and scholarship on the theory and design of shell structures, leading to his first book, *Thin Shell Concrete Structures* (1965). He would later become chair of the American Concrete Institute-American Society of Civil Engineers Joint Committee on concrete thin-shell design and construction. In this first decade he worked closely with Professor Robert Mark. From 1971 to 1983 he worked with the Princeton University Art Museum, eventually curating five exhibits. He introduced the new course CEE 262 “Structures in the Urban Environment,” and published two books: *Robert Maillart’s Bridges* (1979) and *The Tower and the Bridge: The New Art of Structural Engineering* (1983). He also worked closely

then with Professor John Abel on the largest thin-shell structures being built, used for natural draft cooling towers. It was in this period that he discovered that structural design was a new art form, parallel to but independent from architecture. Describing this thesis, he would later publish two further books, *Robert Maillart and the Art of Reinforced Concrete* (1990) and *Robert Maillart: Builder, Designer, Artist* (1997).

Beginning in 1984, David developed a new course, CEE 102 “Engineering in the Modern World,” which centered on radical engineering innovations that have transformed America since the Industrial Revolution. The teaching led, in 1996, to a first book on American innovators, *The Innovators: The Engineering Pioneers Who Made America Modern* (1996). He started at this time to work closely with Professor Doig who later became chair of the Princeton politics department; twice the two gave a seminar in the American studies program on engineering and politics. David pursued this subject further with Professor Donald Jackson, professor of history at Lafayette College, with whom he wrote *Big Dams of the New Deal Era: A Confluence of Engineering and Politics* (2006).

In the mid-1990’s, David began to work closely with Professor Michael Littman, who developed the lab science part for both 262B and 102B. David wrote a book for CEE 262, *The Art of Structural Design: A Swiss Legacy* (2003), which went together with a new art museum exhibition by the same name; it traveled within the United States and to Toronto and Zurich.

In 2006, a second major book for the 102 course, *Power, Speed, and Form: Engineers and the Making of the Twentieth Century* (2006), appeared. It was followed in 2008 by David’s 10th book, *Felix Candela: Engineer, Builder, and Structural Artist*, co-authored with Professor Maria Garlock, which accompanied another exhibition in the Princeton University Art Museum, co-curated with Garlock.

Beginning in the early 1990s with the large enrollments of CEE 262 and 102, David and his colleagues began to enroll graduate students based on their ability to teach Princeton undergraduates and to pursue publishable scholarship. David and his colleagues admitted more than 60 such students. Half have become full- or part-time teachers; the

others are practicing structural engineers. A version of 262 now is being taught at other universities.

Meanwhile, here at Princeton, there is a legacy for this type of program, and especially the example of how large engineering courses built upon scholarship and with outstanding graduate student teachers can have an influence, not only on the civil engineering program, but also on the entire University community. David has taught various undergraduate and graduate courses on structural analysis and design to students in engineering and architecture. His teaching and research have also explored the connections between engineering and the liberal arts, and he has developed curriculum materials aimed at teaching engineering to liberal arts students. It is estimated that through David's two unique courses 262 and 102, taken by engineering students as well as students from the liberal arts, at least one quarter of all Princeton students have taken a course from David during their four years at Princeton.

The lasting impact of David's teaching on the Princeton community is substantial. He has been the recipient of the President's Award for Distinguished Teaching as well as the Distinguished Teaching Award for the School of Engineering and Applied Science. But, perhaps more important, are the large numbers of letters from former students stating how he inspired them and developed in them a long-term interest in a career in structural engineering as well as in the social and artistic impact of structures.