



Professor Emeritus David P. Billington

See:

http://www.princeton.edu/cee/people/display_person/?netid=billingt
http://www.princeton.edu/cee/people/display_pubs/?netid=billingt
<http://www.worldcat.org/identities/lccn-n81-17316>
<http://www.amazon.com/David-P.-Billington/e/B001HCY1BO>
<http://www.barnesandnoble.com/c/david-p.-billington>
http://videlectures.net/david_p_billington/
http://www.goodreads.com/author/show/5563361.David_P_Billington_Jr

Gordon Y.S. Wu Professor of Engineering
Civil and Environmental Engineering
Princeton University

Personal:

Born June 1, 1927, Bryn Mawr, PA
Married Phyllis Bergquist, 1951, six children

Education

Princeton University, BSE, 1950

Fulbright Fellowship, Louvain, Belgium, 1950-51 and Renewal of Fellowship, Ghent, Belgium, 1951-52: to study post-war innovations in bridge construction, structural design theory, and prestressed concrete

Courses Taught:

EE102 Engineering in the Modern World

CEE262 Structures and the Urban Environment

CEE263 Rivers and the Regional Environment

CEE540 Thin Shell Concrete Structures

Research Areas:

Mechanics, Materials & Structures

Structures and Structural Art

Design & Consulting

Professional Engineer, State of New Jersey

Structural Designer, Roberts & Schaefer Co., New York, 1952-1960 for bridges and buildings including aircraft hangers, piers, thin-shell tanks, and missile-launch facilities

Member, Delegation to observe Concrete Construction in the Soviet Union, 1958

Consulting engineer, 1970-date on Thin Shell Concrete Cooling Towers, Highway Accident Analyses, Thin-Shell Silos, Bridge Design, on France's Largest Overland Bridge and for a study of Federal Dams

Educational & Professional Activities

Assoc. Professor, Princeton University, 1960-1964,

Professor, Princeton University, 1964-date

Visiting Professor, Technical University Delft, 1966-67

Chairman, ACI-ASCE Joint Committee on Concrete Shell Design & Construction, 1973-79

Visitor, Institute for Advanced Study, Princeton, 1974-75, 1978-79

Chairman, ASCE Committee on Aesthetics in Design of Structures, 1978-85

Visitor, Federal Tech. Inst. Zurich, Summers 1980-83

Elected to Executive Council of the Society for the History of Technology, 1985-88

Invited to visit Japan and Write Detailed Aesthetic Evaluation of its New Bridges, 1989

Director, Princeton Program on Architecture and Engineering, 1990-2008

Named the first Gordon Y. S. Wu Professor of Engineering, 1996-date

Recent Honors

Dexter Prize for an outstanding book in the History of Technology, 1979

Phi Beta Kappa Visiting Scholar, 1984-85

History and Heritage Award, American Society of Civil Engineers, 1986

Elected Member, National Academy of Engineering, 1986

Honorary Doctor of Humane Letters, Union College, 1990

Honorary Doctor of Science, Grinnell College, 1991

George Winter Prize, American Society of Civil Engineers, 1992

Andrew D. White Professor-at-Large, Cornell University, 1987-1993

Usher Prize for the Best Scholarly Work, Technology & Culture (with Jameson Doig), 1995

Honorary Member, Princeton Class of 1995 and Princeton Class of 1979

Honorary Doctor of Engineering, Notre Dame University, 1997
Election as a Fellow of the American Academy of Arts & Sciences, 1998
Election as an Honorary Member of the American Society of Civil Engineers, 1999
Sarton Chair 1999-2000 and Sarton Medal, University of Ghent, Belgium, 1999
Election as an Honorary Member of the American Concrete Institute, 2003
National Science Foundation Director's Distinguished Teaching Scholar Award, 2003
Election as an Honorary Member of the International Association of Shell Structures, 2004
A Symposium in Honor of David P. Billington, Dept. of Civil & Environmental Eng., 187 pages, 2004.

Selected Publications:

Billington, D. P.: Thin Shell Concrete Structures, second edition, McGraw-Hill, NY 1982
Billington, D. P.: Thin Shell Concrete Structures, McGraw-Hill, New York 1965

Yung-shih Wang and David P. Billington (Dept. of Civ. and Geological Engrg., Princeton Univ., Princeton, NJ), "Buckling of Cylindrical Shells by Wind Pressure", ASCE Journal of the Engineering Mechanics Division, Vol. 100, No. 5, September/October 1974, pp. 1005-1024

ABSTRACT: An analytical method is developed to solve approximately the bifurcation buckling load of a circular cylindrical shell under nonaxisymmetrical lateral pressure. The assumption of semi-inextensible deformation is made, which sets the circumferential strain to zero and simplifies the system of equations as well as the boundary conditions. In order to investigate the accuracy of the new method, solutions are first obtained for a cylindrical shell under uniform lateral pressure with either simple-simple or clamped-free boundary conditions. Comparisons are made in the former case to Flugge's theory and, in the latter case, to a finite element analysis. Agreement in both cases is very good. The theory is then applied to find the buckling load of a clamped-free cylindrical shell under nonaxisymmetrical lateral pressure created by wind. Disagreement with a previous theory by Langhaar and Miller is examined. Comparisons with results of some experiments are also made and possible reasons of the discrepancies are considered.

Peter P. Cole (1), David P. Billington (2), and John F. Abel (3)

(1) Laboratorium H. Hosdorf, Basel, Switzerland

(2) Department of Civil Engineering, Princeton University, Princeton, New Jersey, USA

(3) Department of Structural Engineering, Cornell University, Ithaca, New York, USA

"Buckling of Cooling-Tower Shells: Bifurcation Results", ASCE Journal of the Structural Division, Vol. 101, No. 6, June 1975, pp. 1205-1222

ABSTRACT: This paper describes studies of bifurcation buckling of hyperboloids used for large-scale cooling towers. Those studies include the effects of flexible supports, combined loadings from wind, dead weight, and temperature, shell cracking, different variations in the wind pressure distribution, and changes in the shell thickening. Comparisons are made between numerical and wind-tunnel results. The finite element formulation used is examined and results are presented for the tower at the Trojan Nuclear Power Plant on the Columbia River, Oregon.