

ROBERT BRADFORD NEWMAN NEWSLETTER 89

S T U D E N T A W A R D F U N D

Eleven Medals Awarded to Students During 1989

In 1989, the fourth year of the Robert Bradford Newman Student Award program, eleven students were selected to receive the medal "For Merit in Architectural Acoustics." Five of this year's recipients attend architectural schools not previously represented on the awards list, bringing the four-year total of schools represented to thirteen. The five new schools are: Cornell University, Roger Williams College, University of Illinois, University of Maryland, and University of North Carolina, Charlotte.

Following is a list of recipients of medals and their projects:

Michael Kwok-Kwong Au
University of Maryland
Acoustical Treatment of Swimming Pool Facilities

F. Prescott Bowden
Rhode Island School of Design
Design of a Music Education Facility*

Maria DeAngelis
Massachusetts Institute of Technology
Street of Rock'n'Roll Dreams; The Story of a Pop Music School for Washington, D.C.

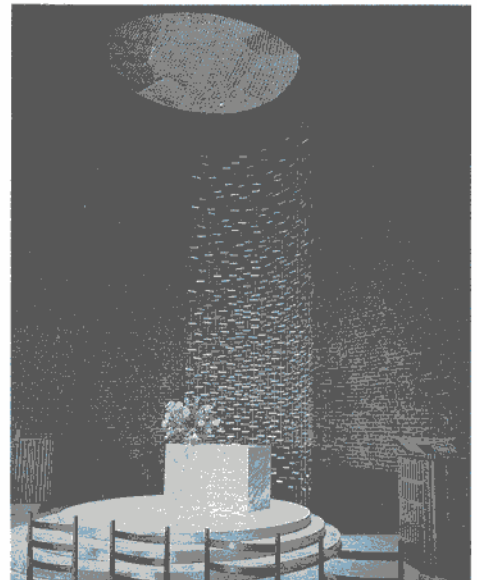
David Eplee
University of Florida
An Acoustical Evaluation of Stage Environments with High Ceilings

Lynette Frances Freidin
Boston Architectural Center
The Massachusetts School of Music and Education, Swampscott, Massachusetts

Kenneth Scott Gordon
University of North Carolina, Charlotte
Computer Application in Architectural Acoustics



A. Undulating walls, the MIT Chapel



B. Bertioia's altar screen, the MIT Chapel

Julian L. Hook
University of Illinois
Acoustical Variation in the Foellinger Great Hall, Krannert Center for the Performing Arts

Robert Haitch Lee
Oklahoma State University
Design of a Music Education Facility*

David Scott Matero
Roger Williams College
Portland Concert Hall, for Portland, Maine

David Richard Moore II
Clemson University
Design of a Music Education Facility*

Adam Stettner
Cornell University
Computer Graphics for Acoustic Simulation and Visualization

*Design Competition, sponsored by the Acoustical Society of America

Benefit Concert at MIT Planned for February 1990

The third Robert Bradford Newman Student Award Fund Benefit Concert will be given on Wednesday evening, February 7, 1990, at the MIT Chapel, in Cambridge. Organist Barbara Bruns will be the featured soloist in a concert of the Chamber Brass of Boston. A reception will follow. The concert is sponsored by the Greater Boston Chapter of the Acoustical Society of America, the MIT Music Department, and the MIT School of Architecture and Planning.

The Chamber Brass of Boston, currently in residence with the New England Philharmonic of Boston, includes: Richard Waddell and Jeff Conner, trumpet; Suzanne Chasalow, french horn; Ed Clough, trombone; and Velvet Brown on tuba. Unique to Chamber Brass of Boston is its exclusive collection of transcriptions of early Renaissance dances,

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Designing the Acoustics of the MIT Chapel

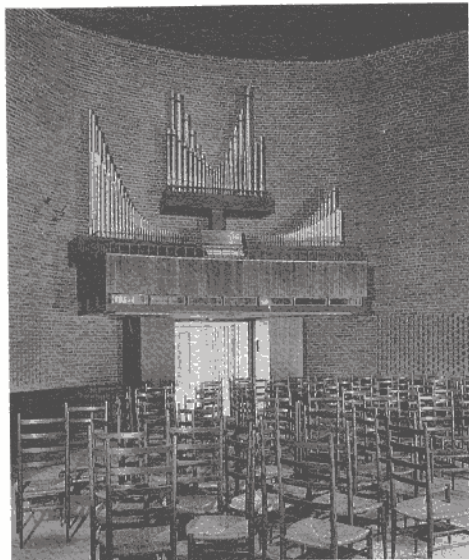
When Eero Saarinen accepted the invitation to design the Kresge Auditorium and Chapel, he went to Europe to seek inspiration for this challenging opportunity. How might these facilities for a world-renowned institution relate to the bustling city that surrounds it? He thought about questions of this kind as he experienced the feeling of medieval strongholds, Gothic vaults, and scholarly establishments.

When Eero returned, he spent hours in my home, talking about the MIT project. He started by saying, "I want to surround the chapel with a moat and bridge to give some feeling of isolation from the noisy city." Then he said, "I want the chapel to be round." I reminded him about the acoustic difficulty with a smooth, round enclosure. But I understood why he wanted it round, so I said, "Eero, we can make it round to the eye but not to the ear." I explained that the interior wall could undulate, with undulations of varying length, to avoid emphasizing particular frequencies and directions of sound.

In the final design, the interior is a simple cylinder. The serpentine undulations of the interior are formed by bulges in the wall, enclosing cavities between the exterior and interior surfaces. Just inside of the undulating brick inner surface is a low wall, connected to the brick wall by a glazed opening (photo A). This opening allows sunlight, reflected off the water in the moat, to come up onto the undulating brick surfaces.

Eero opened our next topic by saying, "I want a dome on the chapel." I asked, "Do you remember what a circular dome can do to the sound?" He said, "Yes, but can't we fix it?" I responded, partly facetiously, "I'll give you a dome if you will turn it upside down." His response was unexpected. "Could it be a cone pointing downward?" I said, "Yes, but why?" He had asked Harry Bertolia to design a metal screen, made of many small pieces, to hang behind the altar. Eero had been wondering how to bring sunlight into the chapel to shine onto this screen.

In the final design, the small end of the cone-shaped ceiling is truncated by a circular glass skylight, ten feet in diameter, through which the sunlight enters. From this skylight, the ceiling spreads upward to form a convex shape that avoids focused reflections of the kind that a conventional dome would have produced (see photo B).



C. Holtkamp organ, the MIT Chapel

I suggested that we work toward two different acoustical goals: a cathedral-like environment for organ music but, also, a space that could assure high intelligibility of speech sounds. Several features help to achieve these goals. The chapel interior is 50 feet in diameter and 30 feet high. The upper two-thirds of the walls are finished in brick, with no sound absorption treatment. The organ and its pipes are located above the entry door. Thus, to some extent, the upper space serves as a reverberation chamber to enhance the organ sound (see photo C).

The lower third of the room contains sound absorption treatment, located in the cavities behind brick grille openings. Thus, these cavities contribute a resonator effect for low-frequency sound absorption, resulting in a uniform amount of absorption over a wide range of frequencies.

With all the absorption treatment confined to the lower third of the space, which contains the plane of speech communication, speech intelligibility is enhanced without appreciably reducing the reverberation desired for music. At the same time the design and location of the grilles offer a visual enrichment of the space.

Eero and I discussed these solutions before he started drawing. Many details emerged later as his architectural drawings developed, a process that exemplifies my ideal of the way excellent acoustical quality becomes an integral part of distinguished architecture.

*Richard H. Bolt,
M.A., Architecture, and
Ph.D., Physics, University of
California, Berkeley*

Benefit Concert (Cont. from p. 1)

madrigals, classical works, and modern jazz arrangements. The group performs extensively at concert recitals, receptions, and graduations. Its diverse range of music appeals to a wide audience.

Barbara Bruns, a member of the faculty of the New England Conservatory of Music, often presents organ recitals and appears as soloist with orchestral groups in New England and with the Chamber Brass of Boston.

Since its completion in 1955, the Chapel at MIT has developed an enviable reputation for its fine acoustics for liturgical music and a variety of music recitals. Designed by the internationally acclaimed architect, Eero Saarinen, the Chapel has a superb twelve-stop Holtkamp organ.

BBN provided the acoustical consulting services for the MIT Chapel. Bob Newman was a major participant. As related in the adjoining article, Dr. Richard Bolt was particularly instrumental in the development of the initial acoustical design decisions.

Student Design Competition Winners Announced by ASA

The winners of the 1989 ASA Architecture Student Design Competition were announced in July by Ewart Wetherill, Chairman of the Technical Committee on Architectural Acoustics of the Acoustical Society of America (ASA). The competition was sponsored by the Committee in cooperation with the Robert Bradford Newman Student Medal Committee, to recognize excellence in the study of acoustics and in its application to architectural design.

Thirty-two students of architectural schools participated in the sixteen teams that submitted entries. The students represented five schools — Clemson University, Oklahoma State University, Rhode Island School of Design, University of Florida, and University of Maryland.

The Clemson University team of Gabe Hulin, David Moore, and Davis Schull received the \$1000 Honor Design Award. Two Merit Awards of \$500 each were given to two teams from the University of Maryland. These Awards were made possible by a grant from Wenger Corporation, a leading supplier of auditorium and music education equipment.

The design competition jury included:

- Dr. Richard H. Bolt, recipient of the Gold Medal of the ASA, and founding partner of Bolt Beranek and Newman Inc.
- Ewart A. Wetherill, Chairman of the Technical Committee and Principal of Wilson, Ihrig & Assoc., of Oakland, CA
- Edward H. McCue, musician and Director of Acoustical Design for Wenger Corporation
- Robert F. Mahoney, Julliard School graduate and Principal Consultant with Kirkegaard Associates
- David H. Adams, President-elect of the National Association of Acoustical Consultants and President of David Adams Associates of Denver, CO

When announcing the awards Mr. Wetherill said, "My colleagues in architecture often complain that acoustics is strictly a matter of luck . . . but if they could see the quality of design and incorporation of good acoustical engineering principles in these entries, they would know better. Good acoustics and good design go hand in hand, and that's what the Newman Student Medal and such student design competitions are

all about. We hope to sponsor more of these events at future Acoustical Society technical meetings."

The Acoustical Society meeting in May 1989 was held at Syracuse University, where student design competition entries were displayed in conjunction with several technical sessions on acoustics of facilities for music education.

Theodore Schultz Dies, Noted Acoustical Scientist

Theodore John Schultz, physicist, musician, acoustical research scientist, and member of the Advisory Committee of the Robert Bradford Newman Student Award Fund, died suddenly of heart failure on August 6, 1989, in Boston.

Born in Jefferson City, Missouri, in 1922, Ted prepared for a professional music career as a bassoonist at the Eastman School of Music, but later switched to study electrical engineering at the University of Missouri. In 1943, he joined the Navy's V-7 program at the University of Texas. In 1945, he transferred to the U.S. Naval Academy, where, after receiving a commission as Ensign, he taught mathematics, radar, and electrical engineering. Later, he taught Reserve Officers at the Naval Academy Graduate School, then operating at Harvard University.

After the war, Ted returned to Harvard to study acoustics under F.V. Hunt, receiving an M.S. in 1947 and a Ph.D. in 1954. Ted



Theodore John Schultz

left Harvard University in 1955 and spent five years at Douglas Aircraft as the Assistant Chief of the Acoustics Section. In 1960, Leo Beranek, who had known Ted during his years at Harvard, persuaded him to join Bolt Beranek and Newman Inc., where he became a Principal Scientist and the Director of Architectural Acoustics and Noise Control.

During his 22 years at BBN, Ted worked on a wide variety of research and consulting projects, many related to music acoustics. He was principal consultant for numerous major concert hall projects, including those for Toronto, San Francisco, Baltimore, and Melbourne. He was also a prolific writer of technical and popular papers on acoustics, and often spoke at technical conferences and educational seminars. He was a Fellow of the Acoustical Society of America and a member of numerous other technical and professional societies. In 1983, Ted left BBN to establish his own consulting practice in Boston.

Ted is survived by his sister, Mary Carter, of Littleton, Colorado, and several nieces. His dedication in all areas of acoustics and his great personal warmth and charm will be missed by a wide circle of friends and colleagues everywhere.

Schools of Architecture Teaching Courses in Architectural Acoustics

The following list, based on a review by David Egan of information provided by the Acoustical Society of America and The Association of Collegiate Schools of Architecture, includes schools of architecture in the United States where at least one course is taught on the subject of Architectural Acoustics. Note that asterisks indicate those schools which have awarded at least one RBN Student Award Medal, through 1989.

Arizona State University
Ball State University
Boston Architectural Center*
California Polytechnic State University,
San Luis Obispo
Clemson University*
Columbia University
Cooper Union
Cornell University*

(Cont. on p. 4)

Schools

(Cont. from p. 3)

Georgia Institute of Technology*
Harvard University*
Iowa State University
Lawrence Institute of Technology
Massachusetts Institute of Technology*
Montana State University
North Dakota State University
Oklahoma State University*
Pennsylvania State University*
Princeton University
Rhode Island School of Design*
Roger Williams College*
Southern California Institute of Architecture
Stanford University
State University of New York, Buffalo
Texas A&M University
University of California, Berkeley
University of Florida*
University of Hawaii, Manoa
University of Houston
University of Illinois*
University of Maryland*
University of Michigan
University of Minnesota
University of Nebraska
University of New Mexico
University of North Carolina, Charlotte*
University of Southern California
University of Texas, Arlington
University of Utah
Washington State University
Yale University

The promotion of the teaching of courses in Architectural Acoustics is one of the major objectives of the Robert Bradford Newman Award Program. We hope that in the near future, all accredited schools of architecture will offer courses in Architectural Acoustics. This will allow more students to appreciate the critical importance of the subject that was taught with such dedication and enthusiasm by Bob Newman during his 35 years of lecturing throughout the world.

Newman Fund Establishes Support Grant for Teachers

The Newman Award Fund Advisory Committee is currently developing a monetary grant program which will award grants to teachers of architectural acoustics. The Theodore John Schultz Grant, named in memory of Dr. Theodore Schultz, who was a member of the Advisory Committee, will be awarded every two or three years. The Fund expects to award the initial grant, in the amount of \$3000, in 1990.

The grant will enable recipients to develop improved teaching methods and new curricula, or to support research in architectural acoustics education. Applicants should have teaching experience in architectural acoustics at an established school of architecture or architectural engineering, and should manifest a strong desire to develop improved methods of teaching architectural acoustics.

Applicants should send a curriculum vitae, a two-page letter describing how the grant will be used, and an outline budget, indicating expenses for which support is being sought. Applications and attachments should be postmarked no later than June 30, 1990.

For further information, applicants are encouraged to contact William J. Cavanaugh (Cavanaugh Tocci Associates, Inc., 327F Boston Post Road, Sudbury, MA 01776, telephone: 508-443-7871) or other members of the Fund Advisory Committee.

Robert Bradford Newman Student Award Fund

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