The newsletter of
The Acoustical Society of America

ECHOES

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Carleen Maley Hutchins
A half century of accomplishment

Carleen Hutchins, master violin maker, researcher in musical acoustics, teacher, editor, and administrator, is interviewed for Echoes by A. Thomas King, the current editor of the Catgut Acoustical Society Journal, dedicated to the acoustics of stringed instruments.

A.T.K. Your life and career are an unusual combination of roles: you are both a maker of fine stringed instruments and a prolific researcher in musical acoustics. How did you become involved in these two activities? Did the two happen independently or was one a consequence of the other?

C.M.H. I never intended to become involved in either of them. After I graduated from Cornell in 1933, I wanted to be a doctor and was accepted at Duke University's medical school. But there was no money and all my friends and family were against it, so I went into teaching. My friends at the Brearley School invited me to play music with them in a small New York apartment. But when I showed up with the trumpet that I had played all through high school and college, they said, "Carleen, that trumpet is fine for playing the Star Spangled Banner out in the street. What we need here is a viola. Why don't you get one and learn to play it."

The New Violin Family known as "The Violin Octet."

The $75.00 viola that I could afford at Wurlitzer's was not particularly good. Since I had eight years of good woodworking training in the Montclair, NJ schools and loved to work in wood, I decided to try to make myself a viola. With the help of a book and blueprints and a few instructions from a violin maker in the Bowery, after two years my first viola was finished. It was rated the work of a good carpenter, which I was, and the tone was reasonable, but not very good.

Then I was introduced to two experts who changed the course of my life: Karl Berger, a very fine Swiss luthier who was willing to teach me real violin making; and Frederick Saunders who had retired from Harvard and was continuing his violin research at Mount Holyoke. Saunders looked at my viola, tapped around on it, blew in the f-holes and said, "Young lady I'll be interested in your next one." I hadn't planned to make a "next one," but when I read some of Saunders' papers I decided to make him some experimental instruments that he could cut up. This began 15 years of experimental research on violins and violas that I did with Saunders. Later, Rembert Wurlitzer saw the work I had done under Karl Berger and made it possible for me to get instruction from Simone Sacconi, the best violin maker we have ever had in this country.

This was the start of a career that, along with caring for my husband and two children, has given me 50 years of challenging work, head aches, back aches, callused hands, discouragements, and many rewards, including friendships with wonderful people all over the world. I love to work in

(Continued on page 4)

We hear that...

The American Society of Mechanical Engineers (ASME) presented its Performance Test Codes Medal to **Ronald L. Bannister** at the November 1996 International Mechanical Engineering Congress and Exposition. Bannister is Manager of Emerging Technology Programs in the Technology Division of Westinghouse Electric Corporation.

On January 30, 1997, three ASA members were named Fellow of the ASME International: **Robert J. Bernhard**, Professor of Mechanical Engineering and Director of the Ray W. Herrick Laboratories at Purdue University; **Donald E. Bray**, Associate Professor at Texas A&M; and **Guillermo C. Gaunaurd**, Senior Research Physicist, Naval Surface Warfare Center, Carderock Division, in Maryland.

The Society of Automotive Engineers (SAE) gave two awards to **Pranab Saha** at its February 1997 International Congress and Exposition: one was the Forest R. McFarland Award in recognition of contributions to the Society's seminars and workshops, and the other was a certificate of appreciation for contributions to the SAE's Acoustical Materials Committee.

John R. Franks of the National Institute for Occupational Safety and Health received the Michael Beall Threadgill Award for Outstanding Service to the National Hearing Conservation Association at the Association's meeting in February, 1997.

The firm of **Kirkegaard & Associates** is part of the design team awarded a 1997 National Award for Interiors by the American Institute of Architects. The team was led by the New York architectural firm Hardy Holzman Pfeiffer Associates and included Fischer Dachs as theater consultants. The award was presented for the restoration of Dillingham Hall, Punahou School in Honolulu.

The National Academy of Engineering has elected into membership **Steven F. Clifford,** Director of the National Oceanic and Atmospheric Administration's Environmental Technology Laboratory in Boulder, Colorado.

ECHOES ECHOES

Newsletter of the Acoustical Society of America

Provided as a benefit of membership to ASA members

The Acoustical Society of America was organized in 1929 to increase and diffuse the knowledge of acoustics and to promote its practical applications.

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President's message

You have given me the opportunity this year to serve as your President, for which I am most grateful. While each Society activity in which I have participated is also common to many of you, I believe my personal combination of them may be unique to me. My guiding principle has been to attend and participate in activities that I have a strong interest in without the need to be an "official" appointee.

The problems that the Society must solve change gradually with time, notably with the introduction of new technology and goals. This creates new opportunities for constructive action. In addition, we have the continuing tasks of maintaining and expanding our ongoing activities, acquiring new members, growing and replacing natural losses, and allocating our resources prudently so that we can remain financially solvent as well as increase our commitments to the members and to society in general. The ASA is very dependent on volunteer efforts, as it employs a very small staff to operate all of its services and activities.

My predecessor, Bob Apfel, had taken the lead in some ventures into electronic communication during his administration last year, and I have encouraged him to continue. If I try to name all the others who are contributing to this effort, I shall most likely omit some that deserve recognition.

I have shared the lead with Bill Lang and Paul Ostergaard for organizing the new Acoustical Society Foundation, about which you can expect to hear further. The ASA has budget shortfalls in several ongoing and prospective activities that must be addressed by increasing dues, by increasing registration fees at meetings, or by educating members to make annual and longer-term contributions to the Foundation. If all of you who are able will participate in the Foundation's fund raising activities, we can continue to keep our dues assessment and meeting registration fees at or near their current amounts, which are relatively low.

I can only guess what my successor, Larry Crum, will have to act on. One likely item is the continuing "de facto" internationalization of our Society. About 20 percent of our members and 40 percent of the published papers in our *Journal* come from outside North America, and we have recent and future meetings with: the Acoustical Society of Japan in Honolulu (1996); the 16th International Congress on Acoustics in Seattle (1998); and the European Acoustics Association in Berlin (1999). These call for new directions for our leadership in the worldwide community.

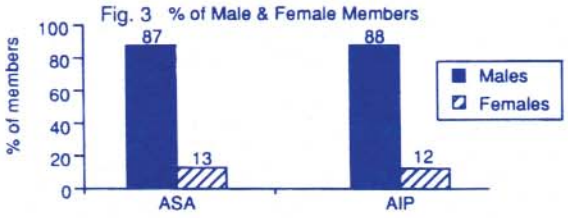
I should like to close with a philosophy that was expounded many years ago: "Love mercy, do justice, and walk humbly with your God." I commend it to you and to myself.

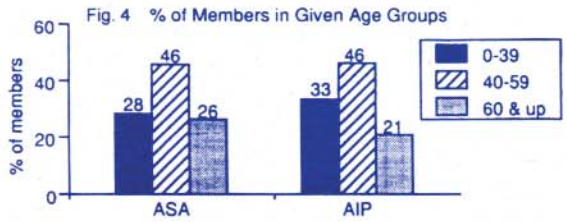
Stan Ehrlich, President

ASA Membership Data

Membership data have been complied by ASA Vice President Pat Kuhl and Membership Committee Chair Joe Dickey in response to a request by the Executive Council. The resulting report was made available to all ASA members attending Technical Committee meetings at the Honolulu meeting last December.

The report consists of demographic material for the Society as a whole and for each of the technical areas separately. Growth of the ASA since 1971, as shown in Figure 1, has been steady, with some uncertainty for 1996, in part because of incomplete dues collection at the time of data analysis. Figure 2 shows that ASA membership growth has been roughly the same as the average data for other AIP member societies, with ASA falling slightly below the AIP mean since about 1983. Figures 3 and 4 show the ASA to have a similar composition by comparison to other AIP societies in terms of gender and age, with the vast majority being male members and the age group between 40 and 59 being the most prevalent.





At the Honolulu meeting the Executive Council approved a new committee to study the membership data further and to make recommendations regarding future growth of the Society.

Copies of the complete report may be obtained from the ASA Woodbury office: Tel (516)576-2360, fax (516)576-2377, e-mail asa@aip.org.

New on the Internet

Some new listings of interest to acousticians on the Internet:

The Catgut Acoustical Society now has a home page providing information about the Society and its publications, the Violin Octet, the Catgut Musical Acoustics Research Library at Stanford University, and upcoming acoustics conferences.

http://www.marymt.edu/~cas

Women members of ASA should visit the temporary web site of the Committee on Women in Acoustics.

ftp://sunspot.nosc.mil/incoming/WIA/index.html

ASA's World Wide Press Room has a new, permanent web site. Contact it for details about recent and upcoming meetings, including presentation abstracts and copies of lay-language papers.

http://www.acoustics.org

There is a web site for the Noise Pollution Clearinghouse, a national non-profit organization that seeks to raise awareness about noise, distribute information, and establish networks among interested groups.

http://www.nonoise.org

The following web sites may be familiar by now:

For information about the 1998 ASA/ICA joint meeting:

http://www.apl.washington.edu/ASA/asa.html

ASA's home page, which includes links to the home pages of other societies and academic programs in acoustics:

http://asa.aip.org

Echoes provides a good venue for announcing pertinent new web sites. Please send information to the *Echoes* Editor, ASA, 500 Sunnyside Blvd, Woodbury, NY 11797.

Editor's note

Dear Reader:

I thought that I would indulge my editorial prerogative once more in this, my last issue as editor of Echoes, to share some musings about the joy that sound can bring to people's lives.

I have never wondered why so many members of the ASA are lovers of music, some of them musicians in their own right. The subject of this issue's feature article, the life and work of Carleen Hutchins, represents a superlative blending of scientific research with aesthetics.

As acousticians, we may be unusually sensitive to the sounds of nature, some of which, like the calls of certain birds and frogs, may be endangered. And we are in a position to appreciate the need for preserving the hearing of both factory workers and consumers.

Poetry is another example of the aesthetics of sound. So, as a parting gesture, I would like to share a few lines from one of my favorite operas, Handel's Semele, which combines the composer's genius, the glory of the human voice, and the beauty of poetry. These particular lines are ascribed to Alexander Pope:

> But hark! the heavenly sphere turns round,
> And silence now is drowned
> In ecstasy of sound.
> How on a sudden the still air is charmed,
> As if all harmony were just alarmed!
> And every soul with transport filled....

May the love of sound and *Echoes* thrive.

Alice Suter, Editor

Carleen Hutchins Interview

(Hutchins interview..., continued from page 1)

wood and have made nearly 400 instruments, including 162 violas which are my specialty. Another 50 instruments are waiting to be finished.

A.T.K. I know that your instruments have been played by some luminaries of the music world, such as Yo-Yo Ma and the Tokyo String Quartet. Perhaps you could give some other examples of who has played them.

C.M.H. Yes, Yo-Yo Ma has recorded Bartok's *Viola Concerto* on my alto violin. He played the concerto in its normal range, using viola fingerings, and held it like a cello! In addition, my violas have been played in the Budapest, Kroll, Julliard, Shanghai, Van Brugh, Laurentian, and other quartets; also in the Boston, Detroit, New York Philharmonic, and Israeli symphonies, to name just a few.

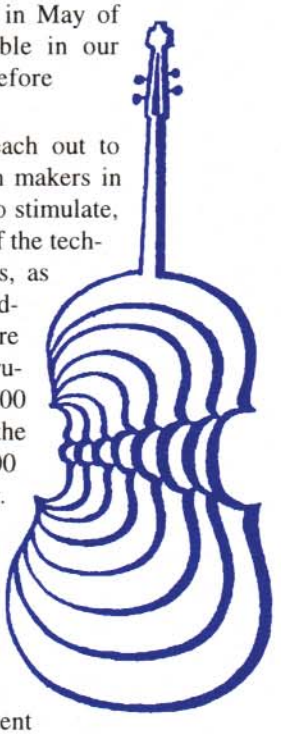
A.T.K. What do you consider to be the most important contributions to the craft of violin making from your work in musical acoustics?

C.M.H. The first is the development and application of the Chladni pattern method of visualizing and measuring accurately the normal modes in nearly finished top and back free plates of instruments of the violin family. It took 20 years and over 200 instruments made by me and my students to tie down the modal activity and frequency relationships that, with good violin making, would result in a fine sounding instrument every time. This method is working for violin makers all over the world.

The second is the knowledge and understanding of how the cavity vibrations of the violin box and the entire wooden structure interact to control tone and playing qualities. For the past 15 years I have worked with the two lowest cavity modes and three lowest body modes. This information makes it possible for makers to adjust a completely finished instrument ready for playing, and to construct violins that are suitable for playing solo, orchestral, or chamber music by good amateurs as well as beginners. It also explains why violins left unplayed for a long time need to be "played in" again, and provides measurements to show why fine concert violins made several hundred years ago are wearing out under the demands of modern performance. To be successful in these efforts I have had to make and test during construction at least ten instruments at a time to see if an idea would work or not. Tests on one or two violins are subject to so many variables that it is impossible to draw reliable conclusions.

A.T.K. You are one of the founders of the Catgut Acoustical Society and I understand that you've been its Permanent Secretary (at no salary) since 1963. What is the importance of the "CAS" for violin making?

C.M.H. It started as an outgrowth of the research of Frederick Saunders and three of us who had been working with him during the 1950s. Jokingly we called ourselves the Catgut Acoustical Society. At the time there was research in violin acoustics going on in a few scattered labs in Europe and one in Australia. By 1963, when Saunders was doing less work, we decided it was time to get the scattered researchers in touch with each other. The Society was formally founded in May of 1963 around a ping pong table in our garden, just three weeks before Saunders died.



The CAS has continued to reach out to researchers as well as to violin makers in many countries. It has helped to stimulate, coordinate, and publish much of the technical work of the last 33 years, as well as interpret and publish findings for violin makers that are helpful in making better instruments. There are now nearly 800 members in 36 countries with the office sending out about 3000 pieces of mail each year. (Elizabeth McGilvray, the Executive Secretary for 25 years has kept count!)

A.T.K. You were instrumental in developing the New Violin Family known as the Violin Octet, the first time a consistent theory of acoustics has been applied to a whole family of instruments. What is its significance for audiences and musicians?

C.M.H. The Violin Octet is a tonally balanced consort of seven or more instruments in the violin family, spanning the range of written music. Such a concept has been in the minds of creative musicians for over 400 years. When Leopold Stokowski, the famous conductor, heard the first performance of our octet in 1965, he said, "Bravo! ... That is the sound I have always wanted from the violas in my orchestra."

Our work started in 1957 when Henry Brant, the composer, showed up at our home at 112 Essex Avenue in Montclair, saying that he would like a violin maker crazy enough to try an idea he had. This was to develop instruments with violin sound -- which is different from viola sound and cello sound -- at each half-octave from an octave above the violin to the double bass six octaves

(Continued on next page)

(Hutchins interview.... continued from previous page)

below. I agreed to try, and with help from Saunders on resonance placements and from John Schelleng on scaling theory, it took me nearly ten years to get the first experimental set on the road. Since then I have constructed over 100 of the Octet instruments, with six full sets that are now in Edinburgh, Stockholm, St. Petersburg, and the Shrine To Music Museum in Vermillion, SD. There have been a number of concerts over the years in these places. There is also a set in the Metropolitan Museum of Art in New York City and one at 112 Essex.

Carleen Hutchins in her workshop at 112 Essex Avenue *Photo: Edith Munro*

The Violin Octet is a challenge and a delight to composers as well as musicians who want a consort sound with a full balance of tone quality, power, and dynamics across the musical spectrum. The instruments have been designed to have more power than conventional instruments, can hold their own with winds and the piano, and can be heard through the thick texture of a symphony orchestra.

A.T.K. What current directions in research do you think hold the greatest promise for improving the maker's ability to produce fine instruments?

C.M.H. Much more research is needed to understand the effects of the higher cavity resonances on tone and playing qualities. Also, more needs to be done to study the effects of the player on the instrument. Many of the more subtle elements involved in free plate tuning have been studied to some extent, but they need more work. These include the effects of different arching contours, how to handle plate thicknesses, and how best to deal with sealers, varnishes and their physical effects.

Creating a truly fine violin requires the knowledge and skills of the makers themselves – in selecting wood, assessing stiffness, shaping archings (which are very different between violin, viola, and cello), and all else that goes into the work. This is basic to the help that acoustical research can provide. A truly fine instrument will always be a work of art combining many skills and much knowledge.

Tom King displays two of his instruments, both made using the results of Hutchins' acoustical research.

Carleen Maley Hutchins is an internationally renowned luthier and researcher in musical acoustics, whose career spans more than 50 years. In addition to hundreds of lectures, technical seminars, and scholarly papers on violin acoustics and the Violin Octet, she has edited and written commentary for the two benchmark volumes of collected papers on violin acoustics from 1800-1975 and the recent volumes, "RESEARCH PAPERS IN VIOLIN ACOUSTICS 1975-1993." She has received two Guggenheim fellowships and four honorary doctorates, as well as the Silver Medal in Musical Acoustics from the Acoustical Society of America.

Alvin Thomas King is editor of the CAS Journal and immediate past president of the Catgut Acoustical Society. He has been making and repairing violins, violas, and cellos for the past 15 years, under the tutelage of Carleen Hutchins, Karl Roy, and other well-known luthiers.

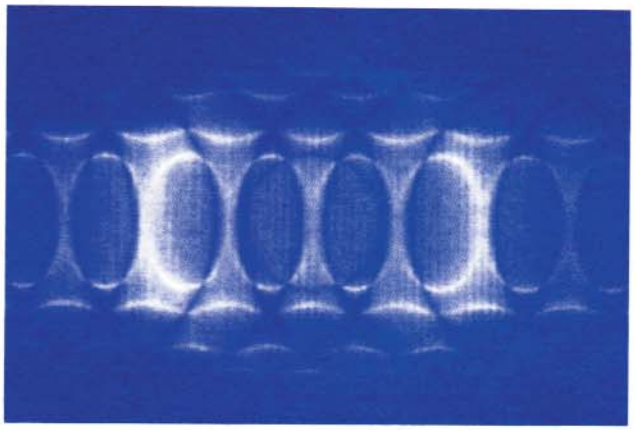
Gallery of Acoustics

The Gallery of Acoustics is an exhibit of images, both still and video, depicting interesting acoustical phenomena in an aesthetically pleasing manner. Sponsored by the Interdisciplinary Technical Group on Signal Processing in Acoustics, it is held annually at the fall meeting of the ASA. The Gallery provides a means by which researchers can display their work in a forum that emphasizes the diversity and inter-disciplinary nature of acoustics, a means for all attendees to appreciate the natural beauty and aesthetic appeal of physical phenomena.

The first Gallery of Acoustics was displayed at the 130th ASA meeting in St. Louis. The judges were able to agree on the four best entries, but not on a single winner. The four were:

- "Collapsing Cavitation Bubble," still entry by Lawrence Crum.
- "Acoustic Dunes," still entry by Brian Ferguson, Gary Speechley, and Lionel Criswick.
- "Magnetic Resonance Imaging of Acoustic Shear Waves," video by R.R. Muthupillai, P.J. Rossman, J.F. Greenleaf, A. Manduca, D.J. Lomas, and R.L. Ehman.
- "Sonoluminescence in a Standing Wave Field," still entry by Lawrence Crum.

The joint meeting of the ASA and Acoustical Society of Japan in Honolulu was the site of the second Gallery of Acoustics.



"Structural and Acoustic Response of Stiffened Plates," one of four winning images by Benjamin Cray, Naval Undersea Warfare Center, Newport, RI.

- First place went to Benjamin Cray for the still entry, "Structural and Acoustic Response of Stiffened Plates."
- Second place was awarded to Yang-Hann Kim for the video, "Acoustics and Vibration Characteristics of the King Seong-Deok Bell."
- The third place winner was the still entry, "Plate Mode Visualization with Laser-Modulated Phase-Stepped Digital Shearography," submitted by Benjamin Bard, Shudong Wu, and Girowen Lu.

The Interdisciplinary Technical Group on Signal Processing in Acoustics is currently investigating procedures for publishing the winning entries. Details about the Gallery, including information on past Galleries and Calls for Entries, may be found on the WWW at http://www.arlut.utexas.edu/asaspweb/ASAPages/Gallery.html. All ASA members, as well as non-members, are encouraged to submit entries.

Comments and questions should be directed to Randall Smith, Applied Research Labs, University of Texas, Austin TX 78713-8029. Ph. (512)835-3768; e-mail smithr@arlut.utexas.edu.

Happening at Penn State

The upcoming Penn State meeting promises to be one of ASA's largest: over 800 abstracts have been received, suggesting an attendance of about 1200, plus accompanying persons. The meeting is held jointly with Noise-Con, which will bring added attention to noise topics.

The two Distinguished Lectures should be timely and interesting: Mathias Fink's lecture titled "Time-Reversed Ultrasound" follows close on the heels of his recent article on the subject in the March issue of *Physics Today*. Professor Fink is director of the waves and acoustics laboratory at the Ecole Superieure de Physique et de Chimie Industrialles de la Ville de Paris and Professor of Physics at the University of Paris. Noted architectural acoustician George Izenour will present the lecture "From Dampened Steel & Reinforced Concrete to Mesquito Netting and Back Again to Dampened Steel & Reinforced Concrete."

Certain happenings at the Penn State meeting have become finalized since the last issue of *Echoes*. For example, there will be some not-to-be-missed musical events.

The entertainment at the Plenary Session will be provided by The Nova Consort, three instrumental musicians and a soprano, all from the Penn State area, who will perform medieval and renaissance songs of love and spring. The musicians will use period instruments, including recorder, percussion, vielle (medieval fiddle), shawm (early English horn), portative organ, psaltery, and viola da gamba.

Renowned musical acoustician and luthier Carleen Hutchins will give a lecture entitled "Acoustics of Violin-making" at the Fellows Luncheon, followed by a performance by Penn State musicians on the Violin Octet (see this issue's feature article.)

In the special session on the Acoustics of Bells, Kathleen Ebling-Thorne of the Westminster Choir College will present a paper on "The art of handbell ringing" and then direct the Westminster Concert Bell Choir in a concert following the session.

Meetings and Conferences

There will be a special session organized by the ASA entitled, "Meeting Room Acoustics - an essential part of planning sessions and choosing hotels" on July 31, 1997 at the meeting of the Council of Engineering and Scientific Society Executives (CESSE) in Pittsburgh. The session will be chaired by ASA Executive Director Charles Schmid, and speakers will be George Maling, Ewart Wetherill, Richard Talaske, and Howard Kingsbury. Attendees will be representatives of the hotel industry as well as CESSE members.

ASA co-sponsored meetings

Previous issues of *Echoes* have announced the 16th International Congress on Acoustics (ICA) to be held in conjunction with the 135th meting of the ASA in Seattle, June 20-26, 1998. Individuals interested in updated information may refer to the ICA/ASA'98 site on the WWW at http://www.apl.washington.edu/ASA/asa.html or by calling (206)543-1275.

As at past ICA meetings, the 1998 meeting will bring together the international community of researchers in a variety of areas. A satellite meeting in musical acoustics, co-sponsored by the ASA and the Catgut Acoustical Society (CAS), will be held at a site in the Cascade Mountains, June 27-30, 1998. The conference is designed to attract luthiers as well as researchers in acoustics, and its Honorary Chair, Carleen Hutchins, is expert in both areas. Special sessions should include innovation in violinmaking, performance in electronic music, and sound production. A broad selection of workshops on instrument making is also planned. There will be published proceedings. Further information is available at: http://www.boystown.org/isma98/

Other meetings of interest

The University of Iowa will hold two conferences pertinent to acoustics in 1997: The "International Hearing Aid Conference IV" is scheduled for June 6-8. Guest of Honor will be Harvey Dillon of the National Acoustics Laboratories in Australia. The "Fifth Annual Conference on Management of the Tinnitus Patient" will be held September 19-20. The conference will be open to health care professionals and tinnitus patients. Further information: Richard Tyler, phone (319)356-2471, fax (319)356-7639, email rich-tyler@uiowa.edu.

The Thirteenth U.S. National Congress of Theoretical and Applied Mechanics will meet at the University of Florida, Gainesville, June 21-26, 1998. Contributed papers may be submitted for consideration by Sept. 15, 1997 to the Conference Chair, Martin A. Eisenberg, AeMES Dept., University of Florida, P.O. Box 116250, Gainesville FL 32611-6250. Tel (719)333-4034, fax (352)392-7303, e-mail meise@eng.ufl.edu.

The International Union for Theoretical and Applied Mechanics (IUTAM) is calling for proposals to host a symposium in 2000 or 2001. The purpose of an IUTAM symposium is to assemble a group of active scientists within a well-defined field for the development of science within that field. Participation is by invitation only on the basis of scientific merit. Typical symposia invite about 60 scientists of whom about 25 present prepared lectures. Persons desiring to submit a proposal to host a symposium should contact his or her National Committee of Theoretical and Applied Mechanics.

For further information: Prof. Philip Hodge, Secretary, USNC/TAM, Dept. Applied Mechanics, Mail Drop 4040, Stanford, CA 94305-4040. Tel (415)854-5575, fax (415)424-1778, e-mail hodge@am-sun2.stanford.edu.

ASA officers honored

On February 18, ASA President-Elect **Lawrence Crum** was awarded an honorary doctorate from the College of Engineering (Faculty of Applied Science) of the Free University of Brussels for his accomplishments in the field of sonoluminescence. The award included a Silver Medal from the Faculty of Applied Science, a Gold Medal from the University, and an ermine epaulet. In addition to scientists, the Free University of Brussels also honors prominent statesmen. Former recipients include Vaclav Havel and Nelson Mandela.

ASA Vice President **Patricia Kuhl** has been invited by President and Mrs. Clinton to the White House on April 17 to take part in the conference: "Early Learning and the Brain." She is one of a group of only three scientists and three health professionals who received an invitation, in addition to policy makers and members of the press. Each panelist will make a short presentation, and Mrs. Clinton will conduct a question and answer session.

The Society of Women Engineers (SWE) will award its highest honor, the Achievement Award, to ASA Vice President-Elect **Ilene Busch-Vishniac**. The award, consisting of a plaque, gold membership in the SWE, and a Stuben bowl, is being presented for Busch-Vishniac's outstanding contributions in the areas of transduction, noise control, and micro-automation. It will be presented this June at the Society's annual meeting in Albuquerque, where she will be the keynote speaker.

Acoustics in the News

Newspapers

The *San Jose Mercury news* carried an article, "Sounding out an imperfect science" by Janet Rae-Dupree, which gives a history and description of medical ultrasound, emphasizing the fetal image (1-14-97). A Feb. 15 article by Gordy Holt in the *Seattle Post-Intelligencer*, "Scientists not your typical good-time crowd," discussed the recent AAAS meeting in Seattle. The article was accompanied by a dramatic photo captioned "Fiery speech" of Robert Keolian, from the Naval Postgraduate School in Monterey. Keolian is demonstrating how words spoken into an acoustic log-starter changes the outflow of gasses and thereby the intensity of the flames.

In the "Science Watch" section of *The New York Times,* (3-18-97), Malcolm W. Browne discusses the acoustics of sand as reported on in the journal *Nature.* Researchers at Laurentian University in Ontario suggest that sand seems to "sing," "boom," or "bark" because of a resonance between the grains as they slide against each other.

Another article about Tadeusz Drzewiecki's "Kosher Sound System" appeared in the Jan. 17 issue of *The Dallas Morning News* (see also *Echoes,* Vol.7, No.1). In "Orthodox Jews find answer with new contraption," writer Jeffrey Weiss refers to the paper presented at the Honolulu ASA meeting, in which the authors describe a "wind microphone" enabling the voices of rabbis and cantors to be amplified without resorting to electronics.

Magazines

The same subject was also discussed in the February/ March 1997 issue of *Technology Review* in the article "Kosher Sound" by Stephen Strauss. In April, *Technology Review* carried another article on acoustics, "Hearing What We Want to Hear" by Karen Chenausky. The author describes the work of MIT speech scientists Kenneth Stevens, Louis Braida, and Nathaniel Durlach, as well as Patricia Kuhl at the University of Washington, as they study the phenomenon of "categorical perception." It appears that the way individuals discriminate between different versions of the same vowel may aid in the teaching and learning of foreign languages and the design of speech recognition systems.

Two pieces on acoustics have appeared recently in *The Economist,* both authored by Gideon Lichfield. In the Dec. 21, 1996 issue, the article, "Dolphin perception: The sound of shapes," describes research on dolphin communication derived from several papers in a session on the acoustics of vocalizing animals at the recent ASA meeting in Honolulu. The article mentions research indicating that sight and sound perception are handled similarly by the dolphin brain. The Feb. 22 issue of *The Economist* ran the article, "In one ear and out the other" in its "Science and Technology" section. Here the author reviews theories of how the brain processes speech and music. He discusses the research of Diana Deutsch in musical illusions and her theory that language-processing areas of the brain may be involved in the processing of music as well.

The March issue of *McCall's* carried an article about the effects of community noise, including recreational noise and noise in the home. "The invisible health risk" by Gay Norton Edelman discusses the observations of several noise experts and gives suggestions for the concerned consumer. Another noise related article appeared in the January issue of *Aerospace America* in "Lowering the volume on helicopters" by Edward D. Flynn. The author discusses recent research in reducing noise and vibration generated by helicopter transmissions and rotor blades, mentioning both active and passive approaches.

Radio

A lengthy interview between *National Public Radio*'s Linda Wertheimer and acoustician Christopher Clark was aired on February 18 during the program, "All Things Considered." The discussion covered a variety of undersea sounds and the recent use of Naval sonar arrays for scoping the acoustics of the sea. Clark played various recorded underwater sounds, modified so as to be audible to the human ear. These included the sounds of an earthquake, a volcano, a ship passing a whale, and, of course, the songs of whales.

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