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Washington University Record, April 30, 1992

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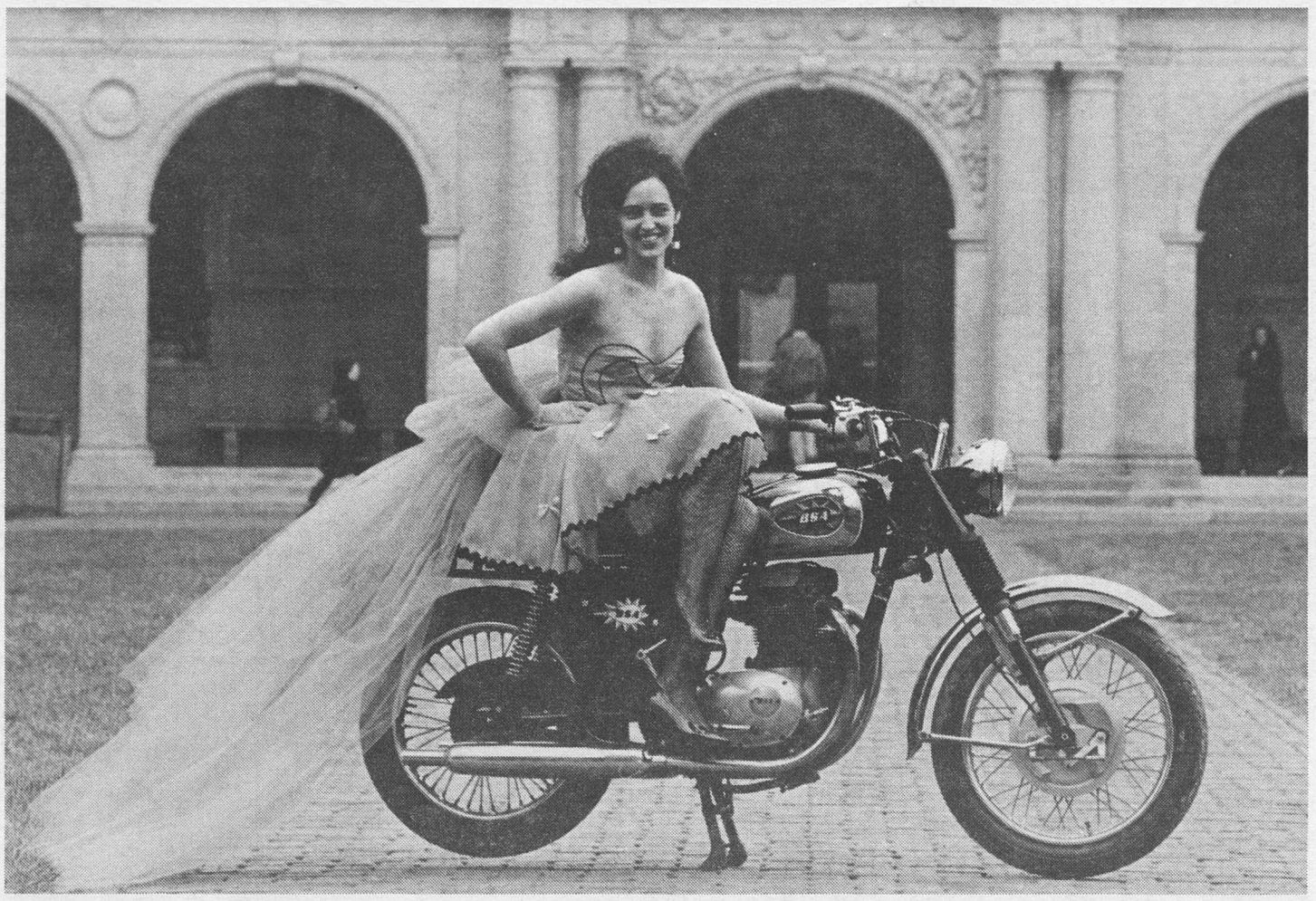


Taffeta and tulle: Senior fashion design student Kerri Stecher gets inspiration from the 1950s with this pink taffeta and tulle ballgown, which sports a blue organza skirt. The gown is modeled by friend Mary Bass. At the School of Fine Arts annual student fashion show, models will sashay down the runway in more than 100 designs, from cocktail dresses to bathing suits. The show is being held at the Missouri Historical Society's Jefferson Memorial Building at 5 p.m. and 8 p.m. Friday, May 8. For more information on the show, see the story on page 2.

Plane talking

Mathematicians show you can't hear geometric shapes

You don't have to march to the beat of a different drummer to know that you can't hear the shape of a drum. So says a husband-wife mathematics team who, with a colleague, have solved a century-old problem that borders on the psychedelic: Can you hear geometric shapes?

No, say Carolyn S. Gordon, Ph.D., professor of mathematics, and David L. Webb, Ph.D., associate professor of mathematics at Washington University, and Scott Wolpert, Ph.D., assistant professor of mathematics at the University of Maryland. Employing a novel geometrical approach that uses generalized surfaces called orbifolds and a recent theorem of French mathematician Pierre Berard, the three have shown that two very differently shaped geometric figures drawn in a two-dimensional plane may produce precisely the same sound. Thus, even with a perfect ear, you could not determine from the sound alone which of the geometric shapes you were listening to. An orbifold is a surface containing a few "bad" points where the geometry appears folded or crinkled.

Imagine two drumheads with different shapes. They can be oval, triangular, pentagonal, whatever. If both drums are struck, you would expect that the difference in their shapes would cause them to emit different sounds. But Gordon, Webb and Wolpert have discovered two differently shaped regions in the plane that, when they are set vibrating, produce exactly the same set of frequencies, or overtones.

Why had people thought it possible to "hear" shapes? First, some earlier mathematical theorems suggested the intriguing possibility. And second, everyday experience indicates it. The idea is routinely used in industry to test equipment such as turbines, plates and other components of machinery subject to stress and fatigue. If a propeller blade develops a tiny hairline crack — disastrous if undetected — the change in the blade's shape is reflected by a change in the way the blade vibrates, and thus in its sound. And in the old days, experienced railroad workers often would walk down the lines, striking the wheels of a stationary train with a metal rod, listening for anything suspicious. The old hands knew what a "healthy" wheel sounded like, and a wheel with a developing crack did not sound the same as a normal wheel.

Gordon and Webb first announced their discovery in June 1991 at the Institute Fourier in Grenoble, France, and then in July 1991 at the National Science Foundation's Regional Geometry Institute at Mount Holyoke, Mass. Their work will appear in a forthcoming issue of the *Bulletin of the American Mathematical Society*. Their announcement created a stir in the mathematics community because it resolved a question, nearly a century old, that first came into consideration in the days of Lord Rayleigh, the brilliant English physicist who pioneered the theory of radiation.

Rayleigh's theory of black-body radiation involves a calculation of the energy at every wavelength, and it ultimately sparked the mathematical question: If the spectra — the sequences of frequencies — of two surfaces or regions in the plane are the same so that both surfaces radiate at the same frequencies, do they have the same area? The German mathematician David Hilbert, one of the greatest and most prophetic mathematicians of this century, predicted that the question would not be solved in his lifetime. Two years later, in 1911, Hilbert witnessed his student Hermann Weyl prove him wrong when Weyl showed that if two surfaces produce the same sounds, then they have the same area. Later, two other mathematicians showed that if two plane regions produce the same sounds, then their perimeters must be the same. Thus, if two drumheads that produce the same sounds have the same area and perimeter, it was only natural to ask: Do they have the same shape?

In 1966, the highly regarded mathematician Mark Kac won the Chauvenet Prize, an award for mathematical exposition, for his celebrated paper, "Can One Hear the Shape of a Drum?" which posed exactly this question. His paper reawakened interest in the question.

A snapshot study

Imagine two drums, perhaps not the kind that Charlie Watts or Ringo Starr are famous for, but two similarly shaped regions in a plane. They may, in fact, be triangular, oval or even irregularly shaped. The question Gordon, Webb and Wolpert and many mathematicians before them considered is: If you could hear the entire array of overtones produced when the drum is hit, and if your ear could discriminate perfectly between different pitches, could you from the sound deduce the shape of the drum? The vibration of a membrane is described mathematically by a partial differential equation called the wave equation. This equation involves a mathematical entity called the Laplace operator. The eigenvalues of the Laplace operator are numbers that mathematicians can associate with the Laplace operator; their physical interpretation is that they specify the overtone frequencies at which the membrane can vibrate.

Gordon and Webb began with a problem in partial differential equations and solved it by a geometric proof that is easily visualized. The mathematicians, in effect, imagined a snapshot of one of the vibrating drumheads at a single instant. The peaks and valleys of the vibrating drumhead at that instant form a sort of "warped membrane," as Webb puts it. The researchers then cut apart the warped membrane and reassembled the pieces to get another warped membrane — a snapshot of the possible vibration of the other drumhead. They took considerable care to ensure that the pieces fit together

Continued on p. 2

Welfare program's payment policy shortchanges children

Children who live in poor states and those with a high percentage of blacks are being discriminated against by the federal government's passive approach toward funding Aid to Families with Dependent Children (AFDC), says Martha N. Ozawa, Ph.D., a professor of social work.

By not changing the formula used to figure federal subsidies for the welfare program, the government inadvertently slights AFDC recipients who live in states with a low per capita personal income, low tax rate and high percentage of blacks, reports a recently published study by Ozawa.

Ozawa, the Bettie Bofinger Brown Professor of Social Policy in the George Warren Brown School of Social Work, wrote about AFDC inequities in a paper titled "Unequal Treatment of AFDC Children by the Federal Government," published in Children and Youth Services Review (Vol. 13, 1991).

Because federal subsidies to AFDC hinge on the amount a state decides to provide, the federal subsidies are indirectly influenced by a state's idiosyncrasies, including its economic, racial and political conditions, Ozawa reports. As a result, the federal subsidies for AFDC vary wildly from Alabama to Alaska.

"It's an unfair policy and the biggest victims are our children," says Ozawa, a specialist in national social welfare policy.

In her paper, Ozawa contends that the federal government is shortchanging the nation's children — and the country's economic future — by not enforcing legislation that equalizes AFDC payments. In addition, she says AFDC children are being punished for the way society views their parents.

'It's an unfair policy and the biggest victims are our children.'

—Martha N. Ozawa

The first step needed, says Ozawa, is an overhaul of the AFDC payment method, a federally mandated matching plan that also is used to determine Medicaid payments. Currently, each state first determines its own payment level by using a formula that relies on the state's per capita personal income. Once that figure is established, the federal government steps in and subsidizes the program at a minimum rate of 50 percent and a maximum rate of 83 percent; the lower the state's share in financing, the higher the federal government's subsidy rate.

While that subsidy formula looks progressive, Ozawa points out that in absolute dollars, poorer states receive less money.

For example, in 1990, the federal government subsidized Alabama's average payment per person at 73 percent and Alaska's at 50 percent. Yet the recipients in Alabama, a state with a low per capita personal income, received, on average, $40 per month, $29 of which came from the federal government. Recipients in Alaska, a wealthier state, received an average of $246 a month, $123 of which came from the federal government. Those differences, she says, are far greater than any cost-of-living adjustment could explain.

Within a state, payments vary according to how many children are in the family and how much outside income is earned.

Continued on p. 4

'Haute (Hot) Stuff' is fashion show theme

The School of Fine Arts will hold its annual fashion show, titled "Haute (Hot) Stuff," at 5 and 8 p.m. Friday, May 8, in the Missouri Historical Society's Jefferson Memorial Building.

The specially choreographed fashion show, complete with music and lights, features ballgowns, cocktail dresses, bathing suits, spring dresses, fall knit dresses, coats and pants ensembles, sportswear, menswear and collector's items such as embellished tops. Jeigh Singleton, associate professor of art and fashion design, says his 22 students (11 seniors and 11 juniors) created 175 "clothed figures" this year. A clothed figure is a complete outfit, such as a jacket and skirt, rather than a single piece.

Design prizes will be awarded at the 5 p.m. show. Those prizes are being awarded by many companies: Anatol's Fabrics, Bernina of America, Dominic-Michael Hair Design Inc., Eunice Farmer Fabrics, Jackman's Fabrics, Kellwood Corp., Lord & Taylor, the Stanley Heller National Association of Men's Sportswear Buyers (NAMSB) Foundation, and Winston's Fabrics.

The 8 p.m. show, which will be held in the Lionberger Gallery of the Jefferson Memorial Building, includes a cash bar, a dinner buffet, and dancing to Orquesta Solucion Latina, a 15-piece salsa band. The show also features a preview of the Missouri Historical Society exhibit, titled "From Carriage Trade to Ready-Made: St. Louis Clothing Designers, 1880-1920." The school's annual fashion show is being held in conjunction with the society's exhibit on St. Louis fashion design, which runs from May 9 through the end of 1992.

Tickets to the 5 p.m. show and awards ceremony are $12.50 and tickets to the 8 p.m. show are $50. "Haute (Hot)" seats in the front row may be reserved for $100. All proceeds from the fashion shows benefit the historical society.

Tickets are available at the Museum Shop in the Jefferson Memorial Building or by calling 454-3100. For more information, call 935-6470. Tickets also are available from noon-1 p.m. in the lobby of Mallinckrodt Center.

Students exhibit works at local gallery

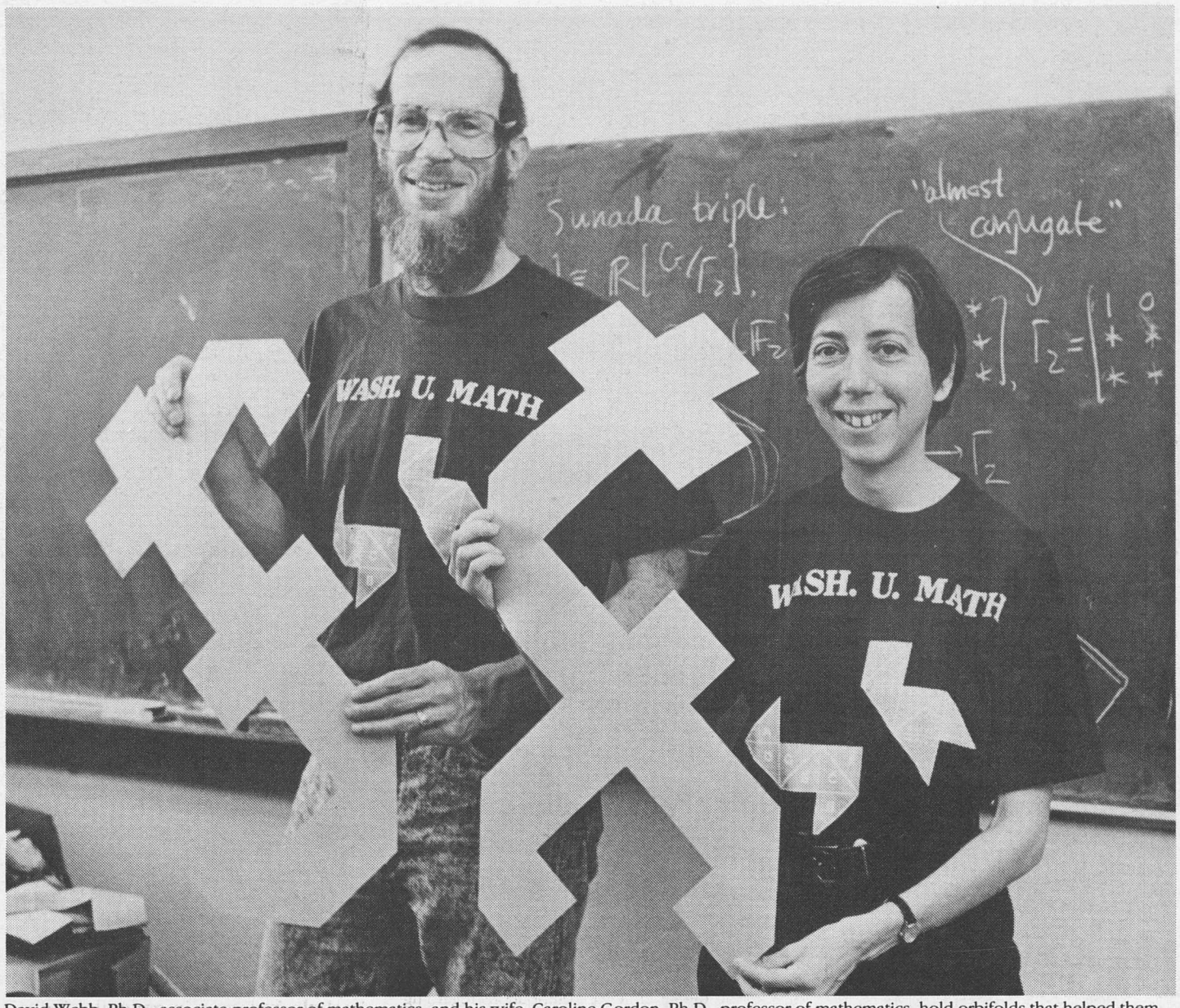
Juniors, seniors and graduate students in painting in the School of Fine Arts will exhibit their works in a free show, titled "Pentimenti," May 9-16 at the Utopia Loft Gallery, 3524 Washington Ave.

The exhibit will feature between 16 and 18 works from a class, titled Upper Level Drawing, taught by Phyllis Plattner, a local painter and visiting associate professor of art. Plattner specializes in still lifes. Her work is in major collections nationwide.

"Pentimenti" is an Italian word for repentance. In art, the word is used to describe a condition that occurs when the top layers of a painting fade with age, allowing earlier versions of the work to be seen. Pentimenti reveals how a painter changes his or her mind during the artistic process.

The students chose this for the title of their show as a way to convey how their ideas and styles evolve.

The Utopia Loft Gallery is open from 11 a.m.-4 p.m. Tuesday through Sunday. For more information, call 531-3515.



David Webb, Ph.D., associate professor of mathematics, and his wife, Caroline Gordon, Ph.D., professor of mathematics, hold orbifolds that helped them solve an old mathematics problem: Can you hear geometric shapes? Gordon, Webb and University of Maryland colleague Scott Wolpert showed that two very differently shaped geometric figures such as those Webb and Gordon are holding can produce precisely the same sound. Thus, the sound produced by a shape is not distinctive. The T-shirts Gordon and Webb are wearing were designed by Washington's mathematics department in honor of their proof.

Plane talking —

continued from p. 1

smoothly so that they could be reassembled into a snapshot of the other drumhead vibrating. The examples they produced settled Kac's question definitively: The sound produced by a shape is not distinctive.

Several things fell into place, paving the way for Gordon, Webb and Wolpert to arrive at their solution. The first involved a theorem of the Japanese mathematician T. Sunada. The theorem provided an algebraic framework for the "reassembly" of the pieces of the warped membrane. Many mathematicians, including Robert Brooks of the University of Southern California and Swiss mathematician Peter Buser, already had used Sunada's work to construct surfaces that produce the same sounds. However, these surfaces did not solve Kac's problem because they are two-dimensional surfaces that exist in higher dimensional spaces, but not inside the two-dimensional plane, so they could not be used as drumheads.

Sunada's theorem intrigued Gordon, Webb and Wolpert, but it was inapplicable to the geometric regions in the plane that they wished to study. Then, along came Pierre Berard's proof that Sunada's theorem works in a context that would include the orbifolds the three-member math team intended to explore. Berard's proof showed how to take the waves from one drum and "transplant" them to the other.

"Berard's proof was an invaluable idea, opening the door for the use of orbifolds," says Webb.

An orbifold arises, Webb explains, when an ordinary smooth surface is folded or crinkled in a certain way. While it looks like a smooth surface at most points, there are a few "bad" points where, for example, it resembles a fold in a sheet of paper. Gordon and Webb constructed their examples by folding Buser's examples of surfaces to produce orbifolds. They used Berard's version of Sunada's theorem to show that, because the time-frozen waves could be reassembled, the frequencies produced by both orbifolds were the same. Finally, they built models of the orbifolds to see that they were shaped very differently.

Building paper models

Because the researchers needed to show that the frequencies of the two drums are identical, a computer, which can only calculate very close approximations to the frequencies, was of no use. And while the researchers devised a complicated abstract, theoretical proof, the essence of their work is easy to see in simple construction-paper models that Gordon and Webb built in the living room of their home.

"One of the unusual and refreshing aspects of this project is that such concrete models can be constructed," Webb says. "One of Carolyn's major contributions to the question of how shape is related to sound is her discovery, with Edward N. Wilson (dean of Washington University's Graduate School of Arts and Sciences), of whole families of higher dimensional surfaces that sound the same. But these examples are all in six or more dimensions, so you can't hope to build models. What was fun about this project is that we could sit in our living room and, beginning with some elementary algebra called group theory, build paper models of surfaces. The model-building was an important aspect of the process."

Indeed, in addition to laying to rest an old math question, what may be most impressive about the Washington University team's work is its simplicity, says Dennis DeTurck, Ph.D., professor of mathematics at the University of Pennsylvania.

"Webb and Gordon have taken an essential mathematics problem, around which an incredibly abstract mathematics machinery has been built over a hundred years, and solved it so that a sophomore calculus student can understand it," DeTurck says. "Their proof will be a part of mathematics textbooks and monographs for years to come."

— Tony Fitzpatrick

RECORD

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NOTABLES

Karen L. Brock, Ph.D., assistant professor in the Department of Art History and Archaeology, chaired a panel, titled "Terms of Engagement: Rephrasing Japanese Art History," at the annual meeting of the College Art Association in Chicago. Other participants in the department were **William E. Wallace**, Ph.D., associate professor, and **Robert Jensen**, Ph.D., assistant professor.

Ramaswamy Chandrashekar, Ph.D., research instructor in the Departments of Medicine and Molecular Microbiology, presented an invited lecture, titled "Immunodiagnosis of Onchocerciasis and Lymphatic Filariasis Using Recombinant Parasite Antigens," at the London School of Hygiene and Tropical Medicine, London.

Marilyn French-St. George, Ph.D., research audiologist and assistant professor of audiology in the Department of Speech and Hearing, is the clinical researcher at the Central Institute for the Deaf (CID) responsible for coordinating the CID Aural Rehabilitation Program. The program sponsors a class that gives adults with hearing loss training in communication skills.

Charles L. Leven, Ph.D., emeritus professor of economics, was invited to spend two weeks at the Luigi Bocconi Commercial University in Milan, Italy. While in Italy, Leven also visited the University of Venice where he gave a seminar on "Issues in Decentralization of Fiscal Authority in the U.S. and Europe." He spoke on "State and Local Instruments for Economic Development; Relevance of the U.S. Experience for Europe" at both the University of Bergamo in Italy and the University of Fribourg in Switzerland. He also gave a talk on "Achieving Privatization of Investment in Poland" to the Swiss Bankers' Research Institute of Canton Tocino in Lugano, Switzerland.

Charles F. Quest, professor emeritus in the School of Fine Arts, exhibited his works at the Hershel and Adler Gallery in New York City. Three of his prints were sold during a show at the Bethesda Art Gallery in Maryland. A fourth work, a black and white woodcut called "Two Women," was purchased by a collector at the University of California, Berkeley. Eventually, the woodcut will enter the university's permanent collection. Quest's painting "Studio Interior, No. 2" was acquired by the Savannah College of Art for its permanent collections.

Mark R. Rank, Ph.D., associate professor of social work, presented the paper "Focus on Families, Poverty, and Welfare Use" at the Groves Conference on Marriage and the Family, in Washington, D.C.

Salvatore P. Sutera, Ph.D., professor and chair of the Department of Mechanical Engineering, was elected a founding fellow of the American Institute of Medical and Biological Engineering (AIMBE). This signifies recognition of accomplishments and research contributions to the field of medical and biological engineering. About 100 founding fellows were honored at an inaugural symposium held in Washington, D.C. The AIMBE was established to unify the medical and biological engineering communities in the United States.

Have you done something noteworthy?

Have you: Presented a paper? Won an award? Been named to a committee or elected an officer of a professional organization?
The Washington University Record will help spread the good news. Contributions regarding faculty and staff scholarly or professional activities are gladly accepted and encouraged. Send a brief note with your full name, highest-earned degree, current title and department along with a description of your noteworthy activity to Notables, Campus Box 1070, or by electronic mail to p72245DP at WUVMC. Please include a phone number.

Maintaining a fine tradition: Maya Zuck, director of the Nursery School and a lecturer in the Department of Education, received an award April 22 from the University's Women's Society for exhibiting high educational standards in the tradition of the late Adele Chomeau Starbird. Starbird was Washington's dean of women for 28 years. Zuck, who will retire in June from both of her positions, has been director of the Nursery School for more than 20 years. She received a framed citation from Mary Behnke, the society's vice president for special events and funding committee chairman.

Christopher Walsh to deliver Lowry lecture

Christopher T. Walsh, Ph.D., chairman of the Department of Biological Chemistry and Molecular Pharmacology at Harvard Medical School, will present the 15th annual Oliver H. Lowry Lecture in Pharmacology. The lecture, titled "Molecular Studies on the Cyclophilin Class of Peptidyl Prolyl Isomerases," will be at 4 p.m. May 14 in the Carl V. Moore auditorium.

Walsh, who is Hamilton Kuhn Professor at Harvard and president of the Dana-Farber Cancer Institute in Boston, is a world renowned bio-organic chemist whose career has focused on a variety of topics. His work in the field of enzymology has provided conceptual and experimental strategies that have been of enormous importance to those studying enzyme reaction mechanisms and developing inhibitors of enzymes. He has made fundamental contributions to the area of molecular toxicology including the detoxification of organomercurials. He has recently directed his attention to an analysis of signal transduction pathways in T-lymphocytes and of a class of immunosuppressive agents known as cyclosporins.

He is a role model for those who want to combine the tools of organic chemistry, enzymology and molecular genetics to understand structure/activity relationships in proteins. His textbook, *Enzymatic Reaction Mechanisms*, on chemical reactions in biological systems, had a great impact on a generation of students.

The Lowry Lecture, sponsored by the Department of Molecular Biology and Pharmacology, honors Oliver H. Lowry, M.D., Ph.D., Distinguished Professor Emeritus of Molecular Biology and Pharmacology. Lowry was head of the Department of Pharmacology from 1947-1976, and acting head from 1989-1990. He is an internationally renowned biochemist who pioneered development of sophisticated analytic techniques that allow measurement of the activities of enzymes and the levels of their substrates and products in single cells. These ultrasensitive methods have provided a great number of insights about the regulation of metabolism in a variety of differentiated cell types.

For information about the lecture, call 362-7053.

Correction

Due to computer problems, several errors appeared in the April 23 edition of the Medical Record.

On Page 3, three sentences were omitted fron the last paragraph of the story "Pump you up: Growth hormone no magic bullet for building muscle." The paragraph should have read: According to Yarasheski's findings, even if former NFL defensive lineman Lyle Alzado had used actual growth hormone, it probably didn't enhance his muscle growth. Yarasheski says the converse is that it probably did not hurt him, other than in his bank book. The black-market price for growth hormone runs into thousands of dollars per week.

On Page 5, the name of Joshua R. Sanes, Ph.D., professor of anatomy and neurobiology, was misspelled in an article about Sanes being elected a fellow of the American Association for the Advancement of Science.

Introductions to new faculty

The Record is running a series profiling new faculty on the Hilltop and Medical campuses.

Diane E. Beals, Ed.D., assistant professor of education, comes to Washington from Harvard Graduate School of Education, where she served as teaching fellow while completing her doctorate in human development. She received her bachelor's degree in general science and elementary education, cum laude, in 1978 from Seattle Pacific University. She received her master's degree in developmental reading in 1984 from the University of Washington, Seattle, and her doctorate in 1991 from Harvard. She has many research and teaching interests, including child lanuage, development of discourse skills, and individual and cultural differences in language and literacy development. She has published many articles, including "Stories From the Classroom: Rate of Response to Personal Event Narratives in a Computer Network," published in 1991 in the Quarterly Newsletter of the Laboratory of Comparative Human Cognition.

M. Bruce Fegley Jr., Ph.D., associate professor of earth and planetary sciences, comes to Washington from the Lunar and Planetary Institute in Houston, Texas, where he was a staff scientist. He received his bachelor's degree in chemistry in 1975 and his doctorate in earth and planetary sciences in 1980 from Massachusetts Institute of of Technology (MIT). At MIT, he was principal research scientist in the Department of Earth, Atmospheric and Planetary Sciences from 1984 to 1990. Fegley's principle research interests involve the experimental and theoretical study of chemical processes in the early solar system, on planetary surfaces, and in planetary atmospheres.

David Tab Rasmussen, Ph.D., assistant professor of anthropology, comes to Washington from the University of California, Los Angeles, where he held the same position. He received his bachelor's degree in anthropology in 1980 from Colorado College and his doctorate in anthropology in 1986 from Duke University. His research interests include primate evolution and adaptations, Prosimian biology, anthropoid origins, mammalian and avian paleontology and behavioral and life history studies of primates. Rasmussen has published numerous works. His most recent article, titled "Primates: Recent Developments in the Study of Early Anthropoids," was published in 1992 in the McGraw-Hill Yearbook of Science & Technology. He also has six works in press.

English department announces winners

The Department of English has announced the winners of its 1992 fiction and poetry contests.

Entries in fiction were limited to graduate students in the English department and were judged by David Carkeet, professor of English at the University of Missouri-St. Louis.

This year's Carrie S. Galt Award in Fiction went to Damien Wilkins for his work, titled "Orders." Sarah Beck received honorable mention for "Vikings."

All poetry entries were judged by Allison Funk, assistant professor of English at Southern Illinois University. The Roger Conant Hatch Fund Prize, open to all Washington University undergraduates, was awarded to Michael Sinclair, a University College student, for his poems "Monkey" and "Olympic Drive-In." The Norma Lowry Memorial Fund Prize, open to all Washington University students, was won by Camelia Isbell, a graduate student in the Writing Program, for "Elephant Rocks." Xiaolong Qiu, a student in the joint Ph.D. Chinese and comparative literature program, received honorable mention for "Li Shangying's English Version." The Academy of American Poets Prize, also open to all students at Washington University, was won by Anne-Marie Cusac, a graduate student in the Writing Program, for her poem "Salt Mother."

Prizes from the contest will be awarded at the English department's final meeting of the academic year.

CALENDAR

April 30-May 9

LECTURES

Thursday, April 30

9:30 a.m. Dept. of Internal Medicine Grand Rounds Presents the 16th Annual I. Jerome Flance Visiting Professor Lecture, "The Many Faces of Pulmonary Hypertension," Kenneth Moser, prof. of medicine, director, Pulmonary and Critical Care Division, U. of California-San Diego Medical Center. Clopton Aud., 4950 Audubon Ave.

11 a.m. Dept. of Mathematics Seminar, "Complex Dynamics," Richard Laugesen, WU grad student. Room 199 Cupples I.

2:30 p.m. Dept. of Mechanical Engineering Seminar, "Development of Intermetallics for High Temperature Applications," S.M.L. Sastry, WU prof. of metallurgy and materials science and prof. of physics. Room 100 Cupples II.

4 p.m. Dept. of Chemistry Seminar, "Radiochemistry in Medicine: Production and Application of Radioactive Drugs," Michael Welch, prof., WU Dept. of Radiology. Room 311 McMillen.

4 p.m. Dept. of Physics Theory Seminar, "Formation and Decay of Hypernuclei," Angels Ramos, TRIUMF. Room 241 Compton Hall.

4:30 p.m. Dept. of Physical Therapy Steven J. Rose Lectureship, "Rehabilitation of Balance Disorders in the Elderly," Fay Horak, physical therapist, assoc. scientist, R.S. Dow Neurological Sciences Institute, Good Samaritan Hospital; adjunct assoc./asst. prof., Depts. of Neurology and Physiology, Oregon Health Sciences U. Moore Aud., 4580 Scott Ave.

Friday, May 1

9:15 a.m. **Pediatric Grand Rounds,** "Work-up and Treatment of Primary Amenorrhea," James R. Schreiber, prof. and head, WU Dept. of Obstetrics and Gynecology; and obstetrician-gynecologist-in-chief, Barnes Hospital. Clopton Aud., 4950 Audubon Ave.

Noon. Cell Biology and Physiology Seminar, "Cellular Roles of Yeast 70 kD Heat Shock Proteins," Elizabeth Craig, U. of Wisconsin. Room 423 McDonnell Medical Sciences Bldg.

Noon. Dept. of Metabolism Seminar, "Etiology and Pathogenesis of NIDDM: Genetic and Metabolic Aspects (Lessons From Family Studies in Finland)," Leif Groop, Helsinki U. Schwarz Aud., Maternity Hospital.

4 p.m. Program for Cancer Research Seminar, "Developmental Properties of Hematopoietic Stem Cells," Ihor Lemischka, Princeton U. 8841 Clinical Sciences Research Bldg.

6 and 8:30 p.m. WU Association Travel Lecture Series Presents "Portraits of the Great Far East," with Doug Jones. Jones has produced 13 feature-length travel films. Graham Chapel. Cost: $4.50 at the door. For info., call 935-5212.

Monday, May 4

4 p.m. Dept. of Mathematics Seminar, "Teaching Calculus at Washington University," Ron Freiwald, assoc. prof. of mathematics and Robert McDowell, prof. of mathematics. Room 309 Rebstock Hall.

6 p.m. Mallinckrodt Institute of Radiology Lecture, "Interventional Radiology," Daniel Picus, assoc. prof. of radiology, chief of interventional radiology, Mallinckrodt Institute of Radiology. Scarpellino Aud., First Floor, Mallinckrodt Institute of Radiology.

7 p.m. Molecular Biophysics Seminar Series, "Multidimensional NMR Strategies for Probing Lipid-Protein Interactions," with David P. Cistola. Room 311 McMillen Lab. (Dinner begins at 6:30 p.m.)

Tuesday, May 5

8 p.m. International Writers Center Presents poet Tess Gallaher, reading from her works. Co-sponsored by River Styx. Graham Chapel. Advance tickets available at Left Bank Books and Paul's Books. Tickets at the door are $10 for the general public; $9 for seniors and River Styx members; and $5 for people with a WU ID. For more info., call 935-5576.

Wednesday, May 6

8 a.m. Dept. of Obstetrics-Gynecology Grand Rounds, "Uterine Anomalies," Kelle Moley, chief resident, WU School of Medicine. West Pavilion Amphitheater, Barnes Hospital.

4 p.m. Dept. of Biochemistry and Molecular Biophysics Seminar, "Assembly of the Dinuclear Iron Center — Tyrosyl Radical Cofactor of Ribonucleotide Reductase," JoAnne Stubbe, Dept. of Chemistry, Massachusetts Institute of Technology, Cambridge, Mass. Cori Aud., 660 S. Euclid.

Thursday, May 7

Noon. School of Medicine Presents the 39th annual Alpha Omega Alpha Lecture, "Brain Injury: New Ideas for Treatment," Dennis W Choi, Andrew B. and Gretchen P. Jones Professor and head, WU Dept. of Neurology; and neurologist-in-chief, Barnes Hospital. Clopton Aud., 4950 Audubon Ave.

4 p.m. Dept. of Chemistry Seminar, "Polymer Pyrolysis Route to Pre-ceramic Materials, With Examples From Organosilicon Chemistry," Dietmar Seyferth, Massachusetts Institute of Technology. Room 311 McMillen.

Friday, May 8

9:15 a.m. Pediatric Grand Rounds Presents the Second Donald L. Thurston Memorial Lectureship, "The Monkey Visual Cortex: Physiology, Architecture, and Development," David H. Hubel, John Franklin Enders University Professor, Dept. of Neurology, Harvard Medical School.

Noon. Dept. of Cell Biology and Physiology Seminar, "Regulation of Neurotransmitter Receptors by Serine and Tyrosine Protein Phosphorylation," Richard Huganir, Johns Hopkins U. Room 423 McDonnell Bldg.

Saturday, May 9

2 p.m. The Craft Alliance Presents a Slide Show/Lecture, "Insights Into the Rainforest 'Dilemma," Scott Landis, editor of Understory, a Woodworkers Alliance for Rainforest Protection publication. Steinberg Hall Aud.

MUSIC

Sunday, May 3

8 p.m. Dept. of Music Electronic Music Concert, "Patchwork." Free. Tietjens Rehearsal Hall, 6500 Forsyth Blvd.

Monday, May 4

8 p.m. Dept. of Music Clarinet Recital with Mark Smith. Free. Women's Bldg. Lounge.

Tuesday, May 5

7:30 p.m. The Baha'i Student Association Sponsors a vocal recital and some words on the Baha'i faith through a musician's eyes with Gretchen Hewitt, vocalist, pianist and composer of the Seattle Opera. Women's Bldg. Lounge. Free. For more info., call 863-5065.

8 p.m. Dept. of Music Graduate Flute Recital with Kristina Lampe. Free. Steinberg Hall Aud.

Thursday, May 7

8 p.m. Dept. of Music Presents a Piano Concert with Seth Carlin, WU prof. of music. Carlin will play on a Vladimir Horowitz Steinway piano. Graham Chapel. Cost: $5. For more info., call 935-5581.

Saturday, May 9

6 p.m. Dept. of Music Presents a South Indian (Carnatic) Vocal Music Performance with T.N. Seshagopalan and Party. Steinberg Hall Aud. Cost: $10 for general public; free for WU faculty, staff and students; $5 for other students and senior citizens. For more info., call 434-4804.

EXHIBITIONS

"Bachelor of Fine Arts Exhibit." Opening reception: 5 p.m. May 8. Through May 17. Gallery of Art, upper gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. Free. For more info., call 935-5490.

"Master of Fine Arts II." Through May 3. Gallery of Art, upper gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. Free. For info., call 935-5490.

"Faculty Pieces From the Permanent Collection." Through May 17. Gallery of Art, lower gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends.

"Land Ho: Early Exploration of the Americas." Through June 30. Olin Library, Special Collections, Level 5. Hours: 8:30 a.m.-5 p.m. weekdays. Free. For more info., call 935-5495.

"The Book as Patient, Crisis of the Printed Text." Through May 15. Glaser Gallery, Seventh Floor, Medical Library, 660 S. Euclid Ave. Hours: 9 a.m.-5 p.m. weekdays.

FILMS

Friday, May 1

7:30 p.m. The St. Louis Psychoanalytic Institute Presents "Last Tango in Paris," with a lecture by Gerald Izenberg, prof., WU Dept. of History. St. Louis Art Museum Aud. Cost: $3 for general public; $2 for students and senior citizens; $1 for Friends of the Psychoanalytic Institute and the Art Museum. For more info., call 721-0072.

Calendar Deadline

The deadline to submit items for the May 7-16 calendar of the Record is May 1. Items must be typed and state time, date, place, nature of event, sponsor and admission cost. Incomplete items will not be printed. If available, include speaker's name and identification and the title of the event; also include your name and telephone number. Send items to Melissa Kohne, Box 1070, or by electronic mail to p72245CM at WUVMC.

MISCELLANY

Thursday, April 30

8:30 a.m. Computer-Integrated Manufacturing Center Presents a Seminar, "Continuous Flow Manufacturing," Robert Carringer, vice president, regional operations, Institute of Business Technology. STIM Lab, 1144 Hampton Ave. Cost: $50 for faculty and staff. For public pricing and more info., call 935-4444.

8 p.m. Dept. of Music Opera Workshop Presents opera scenes in English from "Julius Caesar," "Turn of the Screw," and others. Free. Graham Chapel. For more info., call 935-5581.

Friday, May 1

9 a.m. Computer-Integrated Manufacturing Center Presents a Seminar, "Intellectual Process Productivity," Robert Carringer, vice president of regional operations, Institute of Business Technology. STIM Lab, 1144 Hampton Ave. Cost: $50 for faculty and staff. For public pricing and more info., call 935-4444.

Monday, May 4

8:30 a.m. Center for the Study of Data Processing Presents a Seminar, "Local Area Networks," Kimberly Coye, Delphi Inc. Cost: $100 for WU faculty and staff. Room 9 Prince Hall. For more info., call 935-5380.

8:30 a.m. Center for the Study of Data Processing Presents a Seminar, "Document Imaging Systems," Joseph Haspiel, senior assoc., CSDP. Cost: $100 for WU faculty and staff. Room 232 Prince Hall. For more info., call 935-5380.

Thursday, May 7

9 a.m. Computer-Integrated Manufacturing Center Presents a Seminar, "Activity Based Costing," James Brimson, affiliate, Coopers & Lybrand-Deloitte. Cost: $50 for WU faculty and staff. STIM Labs, 1144 Hampton Ave. For more info., call 935-4444.

9 a.m. Computer-Integrated Manufacturing Center Presents a Seminar, "Implementing Statistical Process Control," Dale Besterfield, principal, Besterfield & Associates. Cost: $100 for WU faculty and staff. For info. call 935-4444.

Payment policy—

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In her study, Ozawa, who has researched income maintenance for two decades, analyzed a variety of 1987 data from each state, including per capita personal income, tax rates and minority percentages.

In addition to showing that less federal money goes to poorer states, Ozawa's research also found that the amount of federal money a state receives is related to a state's percentage of blacks and its tax rates. According to Ozawa's research, even if two states have identical per capita personal incomes and tax rates, race affects the payment. States with higher percentages of blacks receive less, even when the other two variables are constant.

Deep-seated prejudices

Ozawa blames the inequities on legislative bodies overrepresented by whites and on this country's deep-seated prejudices against the welfare program, which President Franklin D. Roosevelt started in 1935.

"Taxpayers see AFDC recipients as social deviants," says Ozawa. "The public thinks their economic problems are their own fault. That's not supported by research but it's a strong stereotype."

States have the legislative power to increase their AFDC payments beyond what is calculated in the federally mandated formula. But Ozawa says she believes that primarily white legislative bodies veto AFDC funding hikes in states with higher black populations.

"In states with a lot of blacks, I think it's hard for the legislators to identify those kids as our kids," says Ozawa. "So those children have become a political pawn between taxpayers and adults who receive AFDC."

Ozawa said she feels the prejudices stem from this country's obsession with work. Because AFDC adults aren't working, it is difficult for taxpayers — working citizens — to feel comfortable supporting them, regardless of their personal situations. Ozawa goes on to explain that the concept of work unites this country, something she says made sense in the formative years, but that it's now time to move beyond the obsession with work and start investing in children.

By failing to support AFDC children, Ozawa says the country is jeopardizing its economic future. With a swelling older population and a diminishing younger one, Ozawa believes that not investing in AFDC children will make it difficult for the United States to support its burgeoning Social Security payroll. In addition, a growing pool of underprivileged, undereducated children will dull this country's economic edge in the global economy.

Richard Barth, Ph.D., professor at the School of Social Welfare at the University of California, Berkeley, says, "Dr. Ozawa has brought a new perspective to understanding the economic shortcomings children in this country are experiencing."

Ozawa also has conducted studies detailing payment inequities between recipients of AFDC and Social Security. Children whose parents are disabled, deceased or retired receive more money through Social Security than those children whose parents are on AFDC or welfare. That the federal government treats children differently — according to their parents' background — raises serious policy questions, Ozawa charges.

"I would think that by now we should no longer treat children according to how we perceive their parents," she says.

"Shouldn't the government be investing equally in all children regardless of their parents' work history?"

Ozawa calls for the federal government to take a more direct approach in funding AFDC and to devise a payment method that would not be influenced by a state's particular condition. She calls for Congress to try again to pass the failed Fiscal Federalism and the Partnership Act of 1987. That act would have created a nationwide minimum payment level that, coupled with food stamps, would bring a family to within 10 percent of the federal poverty line.

Ozawa notes that other industrialized countries, such as Germany and Japan, long ago instituted equal income support payments for all children.

Another plan Ozawa supports is a federal tax credit for children, an across-the-board tax refund for each child in a family, similar to the current bill before Congress. She envisions a plan where tax-paying families would receive an annual tax break and lower-income families who aren't taxed would receive a cash refund.

Refocus on the child

Along the way, Ozawa notes, the public's focus of the program changed — from the child to the parent — but the funding method remains the same. She suggests the program refocus on the child and update the payment plan.

As an increasing number of states consider reducing their AFDC payments, Ozawa believes it's time for the federal government to stop its passive partnership in AFDC funding. She believes the current funding methods create an unfair distributional system that goes against what should be this nation's goal: to nurture all children to their maximum potential.

"I really question if we can afford to go on like this," says Ozawa. "If we are so concerned about the future of our competitiveness, then we simply must begin to invest more in our children." — *Nancy Mays*