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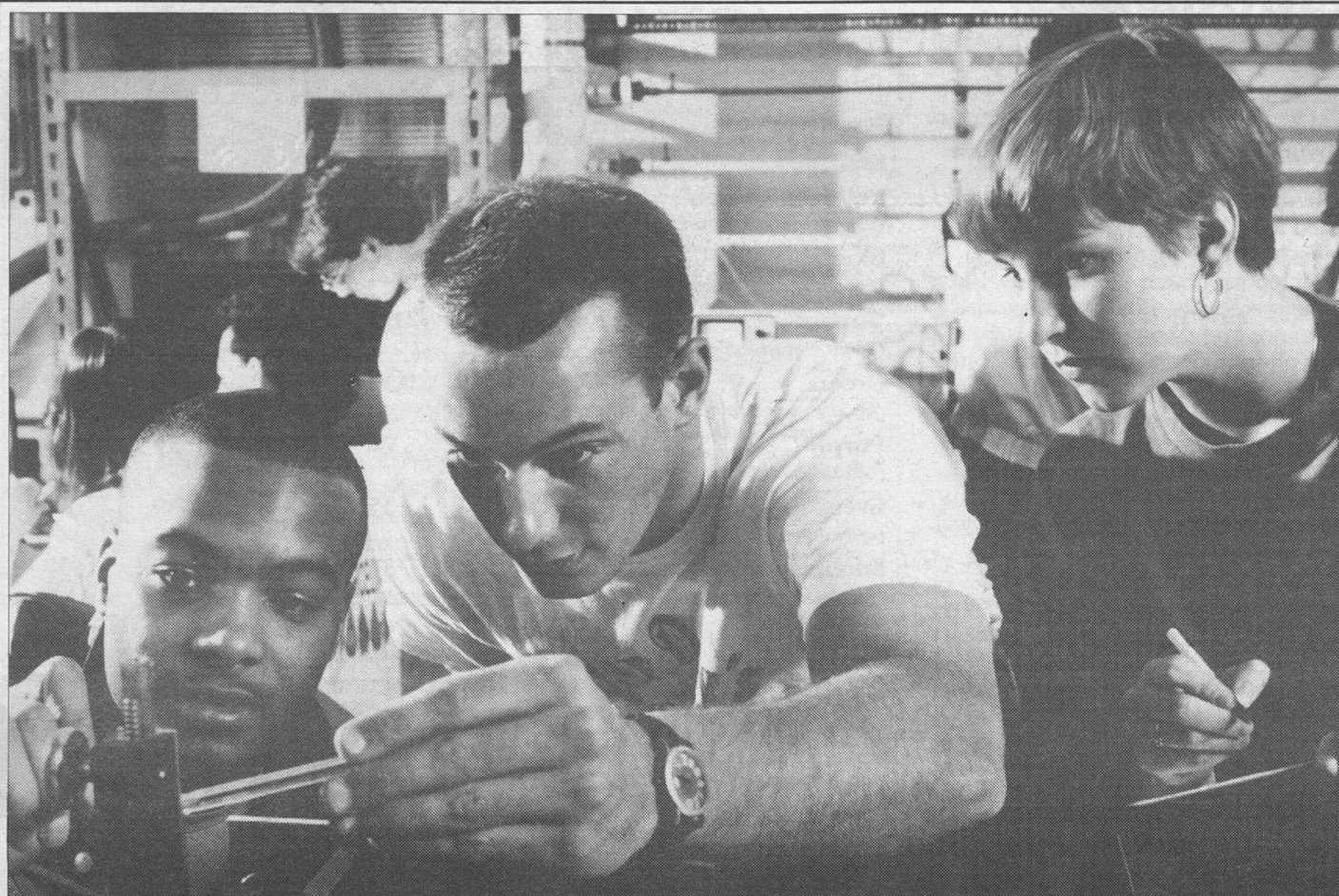
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RECORD

Washington
WASHINGTON • UNIVERSITY • IN • ST. LOUIS

Vol. 16 No. 28/April 16, 1992



Classroom simulation: School of Engineering juniors Shawn Hamilton, Curtis Brinkman and Cindy Ruff work on an open-channel flow experiment in the Fluid Mechanics Laboratory in 320 Urbauer. The three are students in ME/CE 372A, a course taught by Salvatore P. Sutura, Ph.D., professor of mechanical engineering and department chair. The equipment in the laboratory is designed to simulate problems in open-channel flow, which is the kind of fluid dynamics that occurs in a river or storm water channel.

Writer Susan Sontag will speak on fiction

Writer Susan Sontag will deliver the Adele Chomeau Starbird Memorial/Phi Beta Kappa/Sigma Xi Lecture at 11 a.m. Wednesday, April 22, in Graham Chapel. Her reading, "The Art of Fiction," is part of the Assembly Series and is free and open to the public.

Sontag, "one of the most visible intellectual figures in American life for more than two decades," according to a Time magazine article, has commented on everything from American foreign policy to the Equal Rights Amendment. She has written about art, filmmakers, writers, photography and AIDS. Her works include two novels — *The Benefactor* and *Death Kit*; a collection of short stories, *I, etcetera*; and several collections of essays, including the prize-winning *On Photography*. A new novel, *The Volcano Lover: A Romance*, will be published this year.



Susan Sontag

Her stories and essays have appeared in such magazines as *The New Yorker*. A recent story, "The Way We Live Now," published last year, was chosen for inclusion in *The Best American Short Stories of the Eighties*. Her books are translated into 23 languages.

Sontag has written and directed four feature-length films, two of them, "Brother Carl" and "Duet for Cannibals," have been published as screenplays.

Sontag received two fellowships from the Guggenheim Foundation and an Arts and Letters Award from the American Academy and Institute of Arts and Letters. In 1990 she received the Elmer Holmes Bobst Award to honor a lifetime of achievement in arts and letters.

Sontag was elected to the American Academy and Institute of Arts and Letters in 1979. From 1987-89 she was president of the American Center of PEN, the international writer's organization. She has taught philosophy, the history of religion, and literature at Harvard, Columbia, and Brown universities.

The lecture is co-sponsored by the Women's Society of Washington University; the Assembly Series; the Department of English; International Writers Center; Phi Beta Kappa; Sigma Xi, the national honorary for students and faculty in the sciences; Student Union; and Washington Ripple, an undergraduate journal of politics. For more information about the lecture, call 935-4620.

Muscle physiology pioneer to give talk

Sir Andrew Fielding Huxley, O.M., F.R.S., a pioneer in nerve and muscle physiology and former master of Trinity College in Cambridge, England, will deliver the annual Erlanger-Gasser lecture on Friday, April 17.

Huxley will discuss the "All or None Law," a basic concept of nerve function, at 4 p.m. in the Carl V. Moore Auditorium of the North Building, 4580 Scott Ave. This "law" applies to certain responses of excitable cells that tend to occur fully or not at all.

Huxley was educated in England at University College School in London, Westminster School in London, and Trinity College in Cambridge. In the period from 1946 to 1952, he and Alan Hodgkin carried out a series of classical experiments that described how the movement of sodium and potassium ions across nerve cell membranes

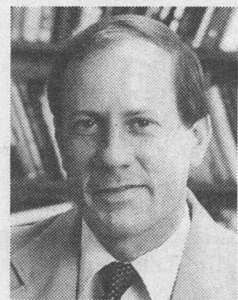
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The crumbling infrastructure Defense industry's downturn could mean upgrade of bridges

A way to help the faltering defense industry and at the same time repair and earthquake-proof the nation's bridges is proposed by a consortium of St. Louis researchers and business people.

The answer lies with a staple of the defense industry — composite materials — says John L. Kardos, Ph.D., chair of the Department of Chemical Engineering. Kardos represents the consortium that wants to convert these materials into the glue that binds together the



John L. Kardos

nation's crumbling infrastructure, primarily bridges.

Composites are materials comprising two or more individual substances that together provide greater benefit than each alone can. The composites are multilayered, lightweight synthetic materials — a variety of plastics or polymers — that are reinforced with strong fibers such as glass or carbon.

Composite materials

"We believe that the same composite materials that were developed in the aerospace companies for use in military hardware also can be used to build earthquake-proof bridges at a lower cost than is possible with current technology," Kardos says. "Moreover, it is known that the Europeans and Japanese are beginning to invest in advanced composites. The United States leads the world in this technology. It's time for us to get off our duffs and put our expertise to work."

Kardos and the Composites for Civil Structures Consortium, a group formed in 1991 with members from Washington University, McDonnell Douglas Corp., Production Products Inc., Zoltek Corp. and the Missouri Advanced Technology Institute, believe these same materials can be used to shore up the nation's 125,000 structurally deficient, decrepit bridges, introducing jobs and industrial growth throughout the nation.

Kardos testified Feb. 21, 1992, at a hearing of the U.S. House Subcommittee on Technology and Competitiveness. For 20 years, the chemical engineer was director of the Washington University Materials Research Laboratory and chair of the graduate program in materials science and engineering. He came to Washington University in 1965 to join the nation's first team of academic scientists to study composite materials.

The wings and tails of fighter bombers that performed in Operation Desert Storm are made of composites in contrast to their counterparts in Korean War and World War II aircraft, which were made primarily of aluminum and other metals. The new substances make a leaner, meaner bomber. These composite materials also make more streamlined, efficient automobiles.

"Composite materials have one-fifth the weight of steel for the same strength and are far superior in resisting fatigue," Kardos said in his testimony. "They don't corrode, are unaffected by salt and don't need to be painted. Furthermore, because of their tremendous ratios of strength-to-weight and stiffness-to-weight, these materials permit entirely new design concepts to be used for bridge structures. Chief among these are ways to make bridges virtually earthquake-proof."

Americans still have fresh visions of crumpled San Francisco Bay area bridges following the 1989 Loma Prieta earthquake. The impact of these frightening images perhaps is greatest on populations that live near major earthquake fault zones. The New Madrid Fault seismic zone is located about 160 miles south of St. Louis. It extends from the Missouri Bootheel into parts of western Kentucky, northern Arkansas and southern Illinois. In the early 19th century, this seismic zone produced the most powerful earthquakes ever to hit the continental United States. Many seismologists believe the New Madrid Fault is capable of producing another very large earthquake within the next 50 years, if not sooner.

In his testimony, Kardos cited research by Washington University's

Thomas G. Harmon, Ph.D., the Clifford W. Murphy Professor of civil engineering, and Kerry Slattery, Ph.D., assistant professor of civil engineering, that illustrates the compressive strength of composites. The engineers have performed tests showing that composite-confined concrete, which would be used for columns, piers and flanges (adjoining rims) in bridge construction, greatly increases maximum strength. This concrete also requires more energy to damage the structure compared with conventional, steel-reinforced concrete.

Big payoff predicted

While the current cost of composite materials is high, Kardos says their efficiency, low maintenance and durability make them more cost-effective in the long run than steel. And, with more commercial applications for composites, volume will increase, eventually lowering material costs.

Kardos predicts a big payoff.

"First, we will be providing new jobs," he says. "By establishing new companies and new directions for existing companies, we hope to provide an economic boost for the St. Louis area and eventually for the entire country. Once production is in full swing, we estimate that the first-year effort at McDonnell Douglas alone would generate 225 new jobs. In the St. Louis area, as many as 3,000 new jobs will be created during the initial six-year start-up period, based on the development of a single bridge structure product. Nationwide, with the spectrum of composites applications we have in mind, 100,000 new jobs are possible."

Kardos notes that the infrastructure to create a new industry out of the downsized defense-based one already is in place in the Gateway City.

McDonnell Douglas Corp., one of the world's key makers of military aircraft, has a 500,000 square-foot facility where composite materials have been designed and manufactured specifically for fighter aircraft. Zoltek Corp. has the technology to manufacture carbon fibers, a basic ingredient in composite

Summer School emphasizes foreign languages, cultures

From exploring French culture through film, to learning how to produce Spanish sounds, Washington University's Summer School is now offering students an expanded array of courses on foreign languages and cultures.

"Our emphasis on more language courses is to get people to come here who already know a foreign language and can take intermediate and advanced courses. Other students who enroll in our courses will be interested in international cultures," says Stamos Metzidakis, Ph.D., director of the Summer School and associate professor of French.

Creating a "foreign language atmosphere" during summer school sessions is something "that's been done successfully at other universities for years," notes Metzidakis. "There is no reason on earth for us not to be doing the same thing."

The school's new foreign language offerings include a five-week course, titled Special Topics in French Language and Literature: Phonetics and Civilization, to be taught beginning July 13 by Rene Kochmann, one of the school's visiting faculty scholars. Kochmann, a specialist in the teaching of French as a foreign language, is a faculty member at the University of Tours in France.

The school's other visiting faculty members, both from France, are Pascal Auscher of the Universite de Rennes and Bruno Torresani of the Centre de Physique Theorique in Marseille. They will each teach a mathematics course.

During the French course, Kochmann will show five classic French films and use them for class discussion. Metzidakis says the course will examine how the French people relate to each other as well as the phonetics of their language. The advanced course is for undergraduate French majors, graduate students in the field, and high school French teachers. Also making a debut on the summer schedule is an advanced conversational French course, along with new courses in Greek, Italian, contemporary Japanese business practices, Hispanic culture and civilization, the history of Spain from 1492-1992, and Spanish phonetics. For the first time in many years, the school is sponsoring courses on the language, history and politics of Arabic countries.

Joseph Schraibman, Ph.D., professor of Romance languages and literatures, will teach the Spanish Phonetics and Phonemics course, which also is designed for advanced students, including high school teachers. The course, scheduled for June 8 through July 10, will help students understand Spanish phonemes and transcribe sounds by using phonetic symbols. Another course, titled Hispanic Culture and Civilization I, will examine the political, social and cultural life of contemporary Spain and selected areas of Latin America. Angel Tuninetti, a doctoral candidate in Romance languages and literatures, will teach the course.

To further the Summer School's international focus, Metzidakis says the school will sponsor cultural activities for international students. Among the events will be free showings of classic films from France, Italy, Israel and other countries, in Room 219 Ridgley Hall. Students will be able to view television news broadcasts from other countries too. These opportunities are offered to students on a regular basis during the academic year, but they have never been offered during summer school before now, Metzidakis notes.

Foreign languages are not the only emphasis of this year's programs. The Summer School continues to sponsor its popular High School Summer Scholar Program in addition to special audit courses. The high school program is designed to introduce high school seniors to the challenges and rewards of college life. Students who have completed their junior year may enroll in selected freshman and sophomore courses and earn college credit.

In the special audit courses, students pay \$250 and do not receive college credit. Topics for these courses range from American politics to opera theatre.

Among Metzidakis' future plans is to revive the American Freedom Summer Institute for high school students. Under the plan, scheduled for summer 1993, approximately 100 high school seniors will stay on campus for four weeks to study how freedom was conceived in the United States. The seniors, who will be supervised by high school social studies teachers, will attend daily classes taught by prominent Washington faculty. Metzidakis says he hopes to use Washington's Center for the History of Freedom as a "potentially rich resource of information and activity already on campus."

For more information on Summer School courses, call 935-6777.

Math team places 12th in national contest

Washington University placed 12th in the nation during the William Lowell Putnam Mathematical Competition. The contest is known as the most prestigious event for undergraduates in mathematics.

This year 2,325 students from 383 colleges and universities in the United States and Canada competed for team and individual awards.

Each college or university may enter as many students as it wishes, but faculty coaches must designate, in advance, the three students who will constitute the school team. Although these contestants form a team, they work individually.

The three members of the Washington team were Adam Costello, a junior in computer science-electrical engineering, Jeremy Tyson, a sophomore in mathematics, and Marc Wallace, a senior in mathematics.

The team was coached by Carl M. Bender, Ph.D., professor of physics, and Richard H. Rochberg, Ph.D., professor of mathematics.

In all, 13 students from Washington University competed. "We had seven students place in the top 200 and six more in the top 500, which is absolutely superb," says Bender.

William Chen, a senior, placed 19th in the country; Jeremy Strzynski, a freshman, placed 54th; and Scott Nudleman, a sophomore, placed 77th.

"Preparing for this exam is a whole education in mathematics. The experience is absolutely invaluable; it covers material outside of the regular courseload," Bender says.

Since the beginning of the school year, the students and coaches met every week for several hours to solve practice problems. Previous Washington teams have performed well in the Putnam competition, having won first place four times in the last 15 years, as well as second place four times. The competition is open to all undergraduates.

ANNUAL FEES FOR PARKING PERMITS

	1991-92	1992-93		1993-94		1994-95
Permit type	(Current Year)	Previously Announced	Revised Rate	Previously Announced	Revised Rate	(Extended Year)
Red <i>(faculty, staff)</i>	\$350	\$410	\$390	\$430	\$410	\$430
Yellow <i>(faculty, staff, non-residential students)</i>	180	230	210	250	230	250
Blue <i>(fraternity and Millbrook apartments)</i>	180	230	210	250	230	250
Brown <i>(South 40 residence hall students)</i>	120	230	210*	250*	230*	250*
Green <i>(faculty, staff, graduate students)</i>	120	155	135	170	155	170
Purple <i>(off-site shuttle faculty, staff, students)</i>	45	90	70	110	90	110
Evening <i>(after 4 p.m.; faculty, staff, students)</i>	30	40	35	50	40	50
Summer School <i>(faculty, staff, students)</i>	30	40	35	50	40	50

*This increase will cover debt service on the new South 40 parking facility. The cost is currently included in housing charges, but will be covered only by parking fees after this year (1991-92).

Phased-in Hilltop parking increases to be spread over additional year

Washington University Hilltop parking fees will increase next year on a revised schedule. These increases are less than those previously announced, and the University has decided to extend the current fee schedule through 1994-95, according to Richard A. Roloff, executive vice chancellor.

The slower rate of increase results from a delay in anticipated costs for a new parking facility. Under the new schedule, the rates through 1994-95 are as shown in the table above. This replaces the original three-year fee schedule announced in July 1991.

The green permit lottery for faculty, staff and graduate students will be held again this year. A date for the lottery will be announced in a mailing to be sent out this summer.

For undergraduate students, permit procedures will be revised. The new procedures will allow returning students to add the cost of parking to their tuition and fees bill and to pick up their permits at the fall class registration site. Faculty, staff and graduate students also will have the option to purchase permits earlier than in previous years.

Construction of a new parking facility will begin this summer at a site directly north of the current parking deck along Throop Drive. It will accommodate about 500 cars when completed in the summer of 1993. Although architectural plans and bids have not been finalized, estimates of costs are approximately \$4.5 million.

Traditionally, all funds collected from parking fees and fines cover the capital and operating costs associated with parking.

Faculty and staff will again be able to opt for payroll deduction as a means of buying parking permits. In addition, anyone may use a credit card (Visa or Master Card) to purchase a permit.

For those who wish to continue parking at a lower cost, the off-site shuttle is the most reasonable option, with regular and timely shuttle service between the University and the off-campus parking site.

Rates for daily and monthly parking permits will increase from \$1 and \$18, respectively, to \$1.50 and \$25 on July 1, 1992.

The parking enforcement program initiated during the current fiscal year will continue, including the towing of cars with multiple unpaid tickets and refusal to sell permits in future years to those who have not settled such violations.

"We are pleased that the University has found a way to spread out the necessary parking increases over an additional year, since this will make it easier for faculty, students, and staff to factor these costs into their personal budgets over the next few years," said Jean Gaines, chair of the Transportation Advisory Committee.

"We also are encouraged by the role that the Transportation Advisory Committee has played in hearing concerns from the campus community regarding parking and transportation," Gaines noted. "We continue to seek ideas and concerns and to discuss them in ways that are sensitive to the needs of the University and to members of the campus community."

Performing arts present comedy on dining

"The Art of Dining," a play all about food, will be performed by students at 8 p.m. April 23-25 and at 2 p.m. and 7 p.m. April 26 in Mallinckrodt Center Drama Studio, Room 208.

The comedy, written by Tina Howe, a noted playwright, is about a man who leaves his law firm to open a restaurant with his wife in their house. But as fast as his wife can cook the food, he eats it. The plot revolves around making food, serving food and the social rules of eating.

"(The play) is about appetite," Howe writes. "It's what the food represents that makes it mouth-watering, not its myriad ingredients."

Director Seana Manning, a graduate student in the Performing Arts Department, describes the play as a "light-hearted caricature of how people eat

food, make food and enjoy food in public.

"And," she hints, "you can't put food on stage without having a food fight somewhere."

With this production, the students plan to use the studio space in a way it's never been used before, Manning said. "We want to take the audience out to dinner, at least metaphorically," she added.

The nine-member cast features graduate drama students Melanie Dreyer, Winston Bull and senior drama majors Kelly Hobbs, Nicki Sarich, Lauren Golden, Meredith Welsh and Adena Brumer. David Baecker, a freshman drama major, also is in the play.

Tickets are \$7 for the general public and \$5 for students. For more information, call 935-6543.

NOTABLES

Jaron L. Blocher, a junior in civil engineering, received the first annual Concrete Council Scholarship from the Concrete Council of Greater St. Louis. Blocher was awarded the \$500 scholarship at the council's annual Quality Concrete Awards Dinner held at the Frontenac Grand Hotel. Blocher was selected by the Washington University Department of Civil Engineering faculty. The Concrete Council is an industry group dedicated to educating the public about the proper uses of poured-in-place Portland Cement concrete in all aspects of construction. Approximately 50 St. Louis area industries comprise the council.

William H. Gass, Ph.D., director of the International Writers Center and David May Distinguished University Professor in the Humanities, published an essay titled "Happy Families Are Alike" in CenterStage, the program for a production of Henrik Ibsen's "A Doll's House" by Baltimore's CenterStage Theater. The

essay first appeared in The New York Times.

Krishna Ladha, Ph.D., assistant professor of managerial economics, received the Public Choice Society's Duncan Black Award for writing the best article that appeared last year in Public Choice, a distinguished academic journal. Ladha's article, "A Spatial Model of Legislative Voting with Perceptual Error," was selected the 1991 winner by the editors of Public Choice.

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.

Bridges — *continued from p. 1*

materials, and can do so in a re-established 80,000 square-foot facility at the Missouri Research Park near St. Louis. Production Products is a minority business enterprise that, under a sub-contract with McDonnell Douglas, fabricates composite parts. The Missouri Advanced Technology Institute, representing the seven research universities in southwestern Illinois and all of Missouri, facilitates projects larger than individual faculty or university centers can undertake with their own resources.

And the Washington University School of Engineering and Applied Science offers more than 25 years of training engineers in composite materials and a long history of working with firms that use composites. Thus, says Kardos, the consortium is poised for action.

"We plan to develop a center with the goal of refining present manufacturing techniques and developing new ones," Kardos says. "This will allow the cost-effective manufacture of civil structures from composite materials. The center would assist existing and new companies in establishing manufacturing operations to serve this very large multibillion dollar market nationwide. We expect that contractual arrangements between the center and McDonnell Douglas, Zoltek and Production Products will permit the center to use the

specialized facilities already in place at these companies."

But, Kardos notes, forming an impressive consortium with great technical expertise and experience will not, by itself, get the job done.

"We need a financial boost to get us up and running," he said in his testimony. "We believe our consortium would require some 20 to 30 million federal dollars over a six-year period. But, we would be putting a commercial product into a \$50 billion annual market (for bridge repair), and the consortium would be self-sustaining at the end of six years. Thus, the American taxpayer would benefit from an economy boost which is more than 1,000 times the federal investment.

"Our hope is that policy-makers can see the technology is in place to transform one kind of economic machine into another with gains in employment and productivity," Kardos added. "And we hope it is clear that if the United States does not make this transition with composite materials, our world competitors surely will." — *Tony Fitzpatrick*

Muscle —

continued from p. 1

generate nerve impulses. Their formulations have stood the test of time remarkably well. They were awarded the 1963 Nobel Prize for physiology or medicine for this work, a prize shared with Sir John Carew Eccles. For the past 40 years, Huxley has worked on muscle contraction, where his outstanding contributions have dominated the field and led to much of our understanding of how muscle contracts.

The Erlanger-Gasser Lecture is sponsored by the Department of Cell Biology and Physiology in honor of Joseph Erlanger, M.D., and Herbert Gasser, M.D.

Correction

In the April 9 issue of the Record, it was stated that foamcore damages the ozone layer (because it is made with chlorofluorocarbons, or CFCs). However, Fome-Cor brand foamboard, made by Monsanto Co., does not contain and is not made with CFCs. In fact, Monsanto has never used CFCs. As of January 1990, the entire industry was ordered to phase-out the use of CFCs in the production of foamboard within four years. The University bookstore stocks the Fome-Cor brand foamboard, as well as Primex foamboard, which also is safe for the environment. In addition, the bookstore carries recycled chipboard from Crescent, which is not harmful to the ozone layer.

Jaynes' pioneering work recognized

Edwin T. Jaynes, Ph.D., the Wayman Crow Distinguished University Professor of physics, was honored during a Bayesian statistics conference held on campus April 10-11. Some 70 scholars from around the world attended the Seminar on Bayesian Inference in Econometrics and Statistics.

Jaynes, who joined the Washington University faculty in 1960 as an associate professor, is retiring at the end of the 1992-93 academic year. He is an international leader in the development of predictive statistical mechanics. His invention of the maximum entropy inference method has had a profound impact throughout physics and many other fields of science. Areas where this method is used include nuclear magnetic resonance imaging, ancient tree ring cycles, astronomy and economics.

"Drawing inferences from incomplete information is something most of us try to do every day with varying success," said Clifford M. Will, Ph.D., professor and chair of physics. "Ed Jaynes' pioneering work has shown how it is possible at least to determine the 'best' inference, and although it has not filtered down to the buyer on the used-car lot, it has strongly influenced fields from the physical to the social sciences. Ed's colleagues in the physics department are delighted at this recognition by the field of econometrics."

As part of the conference, a dinner

for Jaynes was held April 10 at the Top of the Sevens in Clayton. Among those who recognized Jaynes and his pioneering work during the dinner were Martin H. Israel, Ph.D., dean of the Faculty of Arts and Sciences, and Robert L. Virgil, D.B.A., dean of the John M. Olin School of Business and executive vice chancellor for University Relations.

The Bayesian statistics seminar, which has been held twice a year for the last two decades, is funded by the National Science Foundation and the National Bureau of Economic Research. The School of Business and the departments of Economics, Biostatistics and Physics sponsored the seminar's first visit to Washington University.

Bayesian statistics has become an important tool for analysis and decision-making in business, economics, physics, medicine and other areas. Its framework allows statisticians to combine subjective information with observational information to improve statistical inferences and forecasts.

A symposium in honor of Jaynes also will be held May 15-16 at the University of Wyoming in Laramie. The symposium theme — Probability and Physics — was chosen to focus on those connections found throughout the bulk of Jaynes' work. Jaynes also will be honored during the 12th MaxEnt (Maximum Entropy) Workshop, to be held July 19-24 in Paris.

Law school fares well in national contest

Washington University recently sent two teams to the final rounds in national law student skills competitions, twice placing in the top four out of more than 100 law schools around the country.

A team of Washington University law students made it to the "Final Four" in the American College of Trial Lawyers National Trial Competition, held March 20-22 in San Antonio, Texas. Teri Cotton, a second-year student, and Lyle Gregory, a third-year student, with alternate Michael Gilfarb, a third-year student, advanced to the semifinal round in the competition, one of the most prestigious lawyering skills competitions in the country. Northwestern University was the overall winner.

Judge David Mason of the St. Louis Circuit Court served as the team's faculty adviser. Mason is a 1983 graduate of Washington University's School of Law and competed on the 1983 team that won the national competition.

Another team of Washington University law students advanced to the "Final Four" in the American Bar

Association Client Counseling Competition, held March 27-29 in Portland, Ore. Sherry Gutnick and Charles Jellinek, both second-year students, and alternate Walker Filbert, a third-year student, placed third in the country out of the 100 law schools participating. Susan Carlson, J.D., visiting professor of law, served as the team's faculty adviser. Southern Methodist University won the competition.

The University's law school traditionally has fared well in both competitions. Since entering the American College of Trial Lawyers National Trial Competition in 1979, Washington has advanced to the nationals 11 times, capturing the national championship in 1983 and 1986. No school in the country has won the national title more than twice.

This year marked Washington University's third trip to an American Bar Association (ABA) national championship "Final Four." The School of Law won the ABA National and International Client Counseling Competition titles in 1986. The school also won the ABA Negotiation Competition in 1990.

Competition for Fulbright grants opens

The U. S. Information Agency, the J. William Fulbright Foreign Scholarship Board and the Institute of International Education announce the opening on May 1 of the 1993-94 competition for Fulbright Grants and other grants for graduate study abroad in academic fields and for professional training in the creative and performing arts.

About 650 Fulbright Grants are awarded each year. Full grants provide round-trip international travel, maintenance for the tenure of the award and tuition waivers. Travel grants provide round-trip international travel to the country where the student will pursue study or research. All grants include health and accident insurance.

For all grants, applicants must be U.S. citizens at the time of application and hold a bachelor's degree or its

equivalent by the beginning date of the grant. All applicants are required to have sufficient proficiency in the language of the host country to carry out their study or research. The deadline for applications is Sept. 25.

For anyone interested in participating, there will be two information sessions held this month. The information sessions will be at 4 p.m. on Monday, April 20, and Tuesday, April 21, in the Stix International House. Colette Winn, Ph.D., chair of the Fulbright Selection Committee and associate professor of French, and Michele Shoresman, Ph.D., Fulbright adviser and associate director of the International Studies Office, will be present to answer any questions. For more information, call 935-5477 or 935-5958.

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CALENDAR

LECTURES

Thursday, April 16

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

Noon. Dept. of Genetics Seminar, "Genetic Studies of an Amish Mennonite Population," Brian Suarez, prof., WU Dept. of Psychiatry. Room 816 McDonnell Medical Sciences Bldg.

Noon. Dept. of Molecular Biology and Pharmacology, "Very High Resolution Determination of the Three Dimensional Structure of Rat Intestinal Fatty Acid Binding Protein," James Sacchettini, asst. prof., Dept. of Biochemistry, Albert Einstein College of Medicine. Room 423 McDonnell.

2:30 p.m. Dept. of Mechanical Engineering Seminar, "A Compact High-Order Euler Solver For Unstructured Grids," David W. Halt, doctoral candidate, WU Dept. of Mechanical Engineering. Room 100 Cupples II.

4 p.m. College of Arts and Sciences, Romance Languages and Jewish and Near Eastern Studies Lecture, "Resonances of the Converso Problem in Spanish Literature," Albert Sicroff, prof. emeritus, Queens College and City University of New York. Women's Bldg. Lounge.

4 p.m. Dept. of Earth and Planetary Sciences Presents the Charles W. Buescher Memorial Colloquium, "The Solar System's Beginning: About Grains, Garlic and Gehlenite," John A. Wood, prof., Dept. of Earth and Planetary Sciences, Harvard U. Room 102 Wilson Hall.

4 p.m. Dept. of Chemistry Presents the 34th Joseph W. Kennedy Memorial Lecture, "Organometallic Chemistry in Biology: The Role of Vitamin B12," Jack Halpern, Louis Block Distinguished Service Professor, U. of Chicago. Room 458 Louderman Hall.

5 p.m. Division of Biology and Biomedical Sciences Research Discussion for Students, "Diabetes Research Opportunities at Washington University," David James, asst. prof., WU Dept. of Cell Biology and Physiology. 423 McDonnell.

8 p.m. Dept. of English Colloquium, "Milton's Talent: The Authorial Icon in the Tonson Era," Joseph Loewenstein, assoc. prof., WU Dept. of English. Hurst Lounge, 201 Duncker Hall.

Friday, April 17

11 a.m. Dept. of Chemistry Lecture, "Reactivity Patterns of Transition Metal Polyhydride Complexes," Jack Halpern, Louis Block Distinguished Service Professor, U. of Chicago. 311 McMillen.

Noon. Dept. of Cell Biology and Physiology Seminar, "Understanding Insulin Action Using the Glucose Transporter GLUT-4 as a Model System," David James, WU Dept. of Cell Biology and Physiology. Room 423 McDonnell.

2 p.m. Committee on Comparative Literature, Dept. of Romance Languages and Literatures, and the Latin American Studies Program Present a Lecture, "The History of the History of Latin American Literature," Roberto Gonzalez-Echevarria, prof. of Spanish, Yale U. Hurst Lounge, 201 Duncker Hall.

4 p.m. Dept. of Music Lecture, "The Aesthetic Formalisms of Balanchine, Stravinsky, and Russian Poetics," Marianne Kielian-Gilbert, Dept. of Music, Indiana U. Room B-8 Blewett Hall.

4 p.m. Dept. of Cell Biology and Physiology Presents the Erlanger-Gasser Lecture, "The All or None Law," Sir Andrew Huxley, Trinity College, England. Moore Aud., 4580 Scott.

4 p.m. Program for Cancer Research Seminar, "Regulation of c-fos Gene Expression," Brian Safer, Protein Biosynthesis Section, National Institutes of Health. Third Floor Aud., Children's Hospital. 400 S. Kingshighway.

Monday, April 20

4 p.m. Dept. of Biology Seminar, "Studies on Transcript Elongation by RNA Polymerase II in vitro Using Pure DNA and Chromatin Templates," Donal Luse, Dept. of Molecular Genetics and Biochemistry, U. of Cincinnati. 322 Rebstock.

4 p.m. Dept. of Immunology Seminar, "Protein Traffic in Polarized Epithelial Cells: Lessons from the Polymeric Immunoglobulin Receptor," Keith Mostov, asst. prof., Dept. of Anatomy, U. of California-San Francisco. Third Floor Aud., Children's Hospital.

4 p.m. Dept. of Biochemistry and Molecular Biophysics Seminar, "Mechanisms of Macromolecular Recognition," Stephen Sligar, Dept. of Biochemistry and Chemistry, U. of Illinois-Urbana. Cori Aud., McDonnell Bldg.

4 p.m. Dept. of Chemistry Seminar, "Enantiomerically Pure Dihydropyrimidinones in Asymmetric Synthesis," Joseph Konopelski, prof., U. of California-Santa Cruz. 311 McMillen.

4 p.m. Dept. of Psychology Colloquium, "Implicit Memory," Suzanne Corkin, Dept. of Brain and Cognitive Sciences, Massachusetts Institute of Technology. Room 102 Eads.

8 p.m. School of Architecture Presents the Eugene J. Mackey Jr. Memorial Lecture, "The Seaside Story," Robert Davis, developer, Seaside, Fla. Steinberg Hall Aud.

Tuesday, April 21

11 a.m. Dept. of Electrical Engineering Seminar, "Characterization and Calibration of Antenna Arrays for High Resolution Direction of Arrival Estimation," Michael Koerber, WU grad student. Room 305 Bryan Hall.

4 p.m. Dept. of History and Jewish and Near Eastern Studies Presents "The Meaning of the Revolutions in Eastern Europe and the Former Soviet Union," Mark Talisman, political consultant, Washington, D.C. Lambert Lounge, Room 303 Mallinckrodt.

6 p.m. International Writers Center Presents a reading by Polish poet Adam Zagajewski. Steinberg Hall Aud. For info., call 935-5576.

Wednesday, April 22

8 a.m. Dept. of Obstetrics and Gynecology Grand Rounds, "Seizure Prophylaxis in Pre-eclampsia: The Controversy," Ivana Vettraino, chief resident, WU Dept. of Obstetrics and Gynecology. West Pavilion Amphitheater, Barnes Hospital.

11 a.m. The Women's Society of Washington University and Assembly Series Present the Adele Chomeau Starbird Memorial Lecture/Phi Beta Kappa/Sigma Xi, "The Art of Fiction: A Reading," Susan Sontag, noted author and social critic. Graham Chapel. For info., call 935-4620.

Noon. Dept. of Biology Lecture, "Role of Aromatic Amines in Higher Plants," Hector Flores, Pennsylvania State U. 309 Rebstock Hall.

4 p.m. Dept. of Biology Lecture, "Underground Plant Metabolism: Roots as Chemical Factories," Hector Flores, Pennsylvania State U. Room 309 Rebstock Hall.

4 p.m. Dept. of Biochemistry and Molecular Biophysics Seminar, "Mechanisms of Macromolecular Recognition," Stephen Sligar, Dept. of Biochemistry and Chemistry, U. of Illinois-Urbana. Cori Aud., McDonnell Bldg.

Thursday, April 23

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

Noon. Dept. of Molecular Biology and Pharmacology and Dept. of Pediatrics Seminar, "Mammalian Sperm Receptor Genes and Glycoproteins," Paul Wassarman, chair, Dept. of Cell and Developmental Biology, Roche Institute of Molecular Biology. 423 McDonnell.

1:10 p.m. George Warren Brown School of Social Work Lecture, "Issue of Inclusion in The Women's Movement: A Social Work Perspective," Nancy Humphreys, dean, School of Social Work, U. of Connecticut. Brown Hall Lounge.

2:30 p.m. Dept. of Mechanical Engineering Colloquium, "Experiments on Boundary Layer Receptivity," David Parekh, McDonnell Douglas Research Laboratories. Room 100 Cupples II.

4 p.m. Dept. of Earth and Planetary Sciences Colloquium, "Mountain Belts of Venus: Comparison With Earth," John Suppe, prof., Dept. of Geological and Geophysical Sciences, Princeton U. Room 102 Wilson Hall.

4 p.m. Dept. of Political Science Honors Convocation and First Annual Thomas H. Eliot Memorial Lecture, "Political Elites in Washington and Chicago," John Heinz, Coon Professor of Law, Northwestern U. and distinguished research fellow, American Bar Foundation. Room 200 Eliot Hall.

4 p.m. Dept. of Chemistry Seminar, "Lipase Catalyzed Syntheses of Enantiomerically Pure Compounds," Romas Kazlauskas, prof., McGill U. Room 311 McMillen.

4:30 p.m. Dept. of Mathematics Colloquium, "K1 of Exact Categories," Clayton Sherman, prof., Southwest Missouri State U. 199 Cupples I.

4:30 p.m. Divisional Cell and Molecular Biology Student Sponsored Seminar, "Replication, Silencing, and Epigenetic Inheritance of Transcriptional States," Jasper Rine, Dept. of Molecular and Cell Biology, U. of California-Berkeley. Erlanger Aud., McDonnell.

6 p.m. Dept. of Germanic Languages and Literatures, Dept. of Philosophy and Religious Studies Program Lecture, "Moral Choice and the Ecological Crisis," Carl Amery, German author and cultural critic. Women's Bldg. Lounge.

Friday, April 24

9:15 a.m. Pediatric Grand Rounds, "Pancreatitis in Childhood," Mark Lowe and Jerry Rosenblum, asst. professors of pediatrics, WU School of Medicine; Division of Gastroenterology and Nutrition, St. Louis Children's Hospital. Clopton Aud., 4950 Audubon Ave.

11 a.m. Dept. of Mathematics Ph.D. Oral, "Characterization of the Besov Spaces via the Commutator Operator of Coifman, Rochberg and Weiss; a Multiplier Theorem for the Semigroup of Contractions," Maciej Paluszynski, WU grad student. Room 199 Cupples I.

Noon. Human Studies Committee Educational Seminar, "Nazi Doctors and Their Crimes Against Humanity," Ernest Prentice, asst. dean for research, U. of Nebraska. Wohl Aud., Wohl Hospital Bldg.

April 16-25

Noon. Dept. of Cell Biology and Physiology Seminar, "Polypeptide Growth Factors: Diversity of Expression and Activity," Thomas Deuel, WU prof. of medicine, biochemistry and molecular biophysics, and director of oncology. 423 McDonnell Bldg.

1 p.m. School of Engineering and Applied Physics Seminar, "Magnetic Resonances in Recorded Transitions," M. Nick Johnson, grad student, WU Dept. of Electrical Engineering. Room 305 Bryan Hall.

3 p.m. Dept. of Mathematics Seminar, "Spectral Decomposition and Almost Everywhere Convergence," Earl Berkson, prof. of mathematics, U. of Illinois. Room 199 Cupples I.

PERFORMANCES

Thursday, April 23

8 p.m. Performing Arts Dept. Presents "The Art of Dining." (Also April 24, 25, same time, and April 26 at 2 and 7 p.m.) Mallinckrodt Center Drama Studio. Cost: \$7 for general public; \$5 for students, senior citizens and WU faculty and staff. For more info., call 935-6543.

Friday, April 24

8 p.m. Edison Theatre Presents "Michael Moschen in Motion," (Also April 25 at 2 and 8 p.m., and April 26 at 2 p.m.) Michael Moschen, new wave juggler. Edison Theatre. **All shows sold out except for April 25 children's show at 2 p.m.** Cost: \$7. For more info., call 935-6543.

MUSIC

Thursday, April 16

8 p.m. Dept. of Music Graduate Flute Recital with Margaret Currie. Fontbonne College, Room 110 Fine Arts Bldg. Free. For info., call 935-5581.

Saturday, April 18

8 p.m. Dept. of Music Graduate Voice Recital with soprano Jerril Roumpf and pianist Gail Andrews. Graham Chapel. Free.

Monday, April 20

8 p.m. Dept. of Music Presents the String Chamber Music Concert. Graham Chapel. Free.

Tuesday, April 21

8 p.m. Dept. of Music Presents a Schubert Sonata Recital with Seth Carlin, WU prof. of music, on the fortepiano. Sheldon Theatre, 3648 Washington Ave. Free.

Thursday, April 23

8 p.m. Dept. of Music Presents a Vocal Jazz Ensemble Concert. Steinberg Hall Aud. Free.

Saturday, April 25

8 p.m. Dept. of Music Presents a Black Composer Repertory Chorus Concert. Steinberg Hall Aud. Free.

EXHIBITIONS

"Master of Fine Arts I." Through April 19. 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." April 24 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.

"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.

"Joseph Beuys Video Collection." Through April 26. Gallery of Art, lower gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 935-5490.

"The Book as Patient, Crisis of the Printed Text." Through May 15. Glaser Gallery, 7th Floor, Medical Library, 660 S. Euclid Ave. Hours: 9 a.m.-5 p.m. weekdays. For info., call 362-7080.

FILMS

Friday, April 17

8 and 10:30 p.m. Filmboard Feature Series Presents "Jesus of Montreal." (Also April 18, same times.) Room 100 Brown Hall. \$3.

Monday, April 20

3 p.m. Dept. of Russian Presents "Autumn Marathon." Room 219 South Ridgley. Free.

7 and 9 p.m. Filmboard Classic Series Presents a double feature, "The Undead," and, "Viking Women vs. the Sea Serpent." (Also April 21, same times.) Room 100 Brown Hall. \$3.

Tuesday, April 21

7 p.m. Dept. of Asian and Near Eastern Languages and Literatures Presents "Judou," a Chinese film. Room 100 Busch Hall. Free.

Friday, April 24

7 p.m. Gay and Lesbian Association of Student Social Workers Presents "An Early Frost." Brown Hall Lounge. Free.

8 and 10:30 p.m. Filmboard Feature Series Presents "Young Frankenstein." (Also April 25, same times.) Room 100 Brown Hall. \$3.

SPORTS

Monday, April 20

3 p.m. Baseball. WU vs. U. of Missouri-St. Louis. Kelly Field.

Saturday, April 25

1 p.m. Baseball. WU vs. Blackburn College. Kelly Field.

MISCELLANY

Thursday, April 16

8:30 a.m. Computer Integrated Manufacturing Center Seminar, "Total Quality Management," Dale Besterfield, principal, Besterfield and Assoc. STIM Lab, 1144 Hampton. Cost: \$50 for WU faculty and staff. For info., call 935-4444.

7 p.m. Catholic Student Center Holy Thursday Mass. Catholic Student Center, 6352 Forsyth Blvd. For more info., call 725-3358.

Friday, April 17

7 p.m. Catholic Student Center Good Friday Service. Catholic Student Center, 6352 Forsyth.

Saturday, April 18

1 p.m. International Office and Women's Society Sponsor the annual Easter Egg Hunt. Stix International House. For reservations, call 935-5910.

9 p.m. Catholic Student Center's Easter Vigil Mass. Catholic Student Center, 6352 Forsyth.

Sunday, April 19

11 a.m. Catholic Student Center's Easter Sunday Mass. Catholic Student Center, 6352 Forsyth Blvd. For more info., call 725-3358.

Monday, April 20

8:30 a.m. Center for the Study of Data Processing Seminar, "Information Engineering: Concepts," Pacific Information Management Inc. Room 229 Prince Hall. Cost: \$50 for WU faculty and staff. For more info., call 935-5380.

8:30 a.m. Center for the Study of Data Processing Seminar, "Effective Communications." (Through April 21, same time.) Curt Hartog, assoc. dir., Center for the Study of Data Processing. Room 232 Prince Hall. Cost: \$100 for WU faculty and staff. For info. call 935-5380.

8:30 a.m. Center for the Study of Data Processing Seminar, "VAX/VMS System Management." (Through April 24, same times.) Laine Educational Enterprises. Digital Consulting, 11861 Westline Industrial Drive. Cost: \$250 for WU faculty and staff. For info., call 935-5380.

Tuesday, April 21

8:30 a.m. Computer-Integrated Manufacturing Center Seminar, "Industrial Bar Coding." (Through April 22, same time.) Scott Cardais, president, Data Collection Technologies Inc. STIM Lab, 1144 Hampton Ave. Cost: \$100 for WU faculty and staff. For info., call 935-4444.

8:30 a.m. Center for the Study of Data Processing Seminar, "Information Engineering: Business Modeling." (Through April 23, same time.) Pacific Information Management Inc. Room 229 Prince Hall. Cost: \$100 for WU faculty and staff. For more info., call 935-5380.

5:30 p.m. Information Session for adults considering entering or returning to college. Bixby Gallery, Bixby Hall. Free. For reservations, call 935-6777.

Wednesday, April 22

4 p.m. Phi Beta Kappa Initiation. Formal Lounge, Women's Bldg. For info., call 935-6737.

Friday, April 24

10 a.m. Fourth Annual Amyotrophic Lateral Sclerosis-Phi Delta Theta Golf Tournament. Norwood Hills Country Club, off Lucas and Hunt Road. Cost: \$150. Includes lunch, 18 holes of golf, prizes, hors d'oeuvres, and drinks. For info., call 935-3109.

Calendar Deadline

The deadline to submit items for the April 23-May 2 calendar of the Record is April 17. 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 Marilyn Chill, Box 1070, or by electronic mail to p72245CM at WUVMC.