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Record

Dec. 10, 2004

Volume 29 No. 17



Washington University in St. Louis

Scientists grow norovirus in lab

Is common cause of food poisoning

By MICHAEL C. PURDY

School of Medicine scientists have become the first to successfully grow a norovirus in the lab.

In humans, noroviruses are a highly contagious source of diarrhea, vomiting and other stomach ailments that made headlines two years ago after a series of repeated outbreaks on cruise ships. These viruses are a major cause of human disease worldwide.

Researchers showed that the mouse norovirus MNV-1 could be grown inside cells from mice with defective immune systems. Their findings make it much easier to learn about the mouse virus and may help other researchers seeking to duplicate the accomplishment with human forms of the virus.



Virgin

In a study published in November in the online journal *Public Library of Science-Biology*, scientists who developed the new technique reported it may

already have led them to a good target for vaccine development.

"By looking at the mouse virus we'd grown in the lab, we were able to identify a part of the capsid, the virus' protein shell, that is essential to its ability to cause disease," said senior author Herbert W. "Skip" Virgin, M.D., Ph.D., professor of pathology and immunology and of molecular microbiology. "If this part of the capsid has an equivalent in human noroviruses, altering or disabling it may give us a way to produce forms of the viruses that are

See Lab, Page 6



Campaign celebration Chancellor Mark S. Wrighton receives a standing ovation as he prepares to address the hundreds who gathered Dec. 3 at the Renaissance Grand Hotel in downtown St. Louis for a gala celebration marking the success of the Campaign for Washington University. Attendees were treated to an evening of food, presentations and music and dancing with the Steve Schankman Orchestra. The campaign, the fund-raising initiative launched to secure the resources needed to realize the University's potential for the good of generations to come, ended June 30 with \$1.55 billion in gifts and commitments and a record 165 new endowed professorships.

Mental-health center earns advanced designation

By JESSICA MARTIN

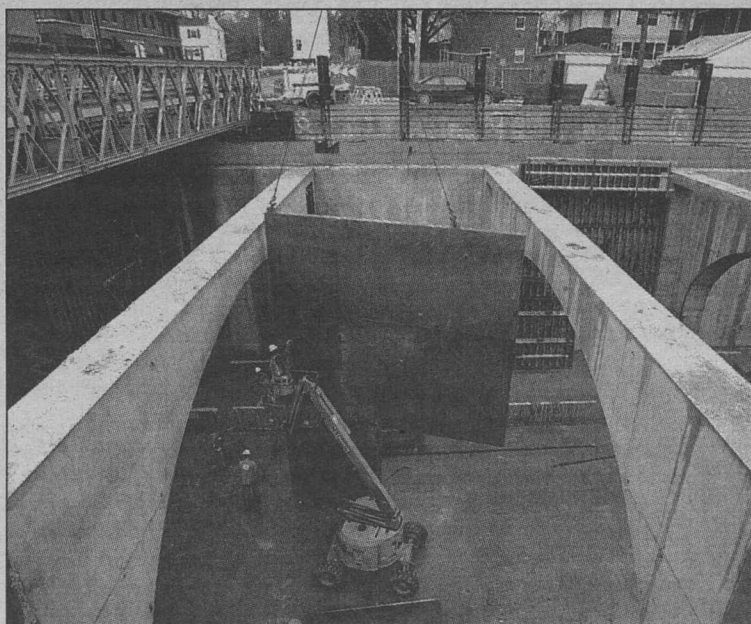
The Center for Mental Health Services Research (CMHSR) in the George Warren Brown School of Social Work has received funding from the National Institute of Mental Health (NIMH) to become the nation's first Advanced Center for Interventions and Services Research at a school of social work.

CMHSR will celebrate its new designation and expanded research agenda during an opening and reception from 1-2:30 p.m. Jan. 11 in the Brown Hall Lounge. Visitors can hear about the center's current and future research from CMHSR leaders.

"We are proud and excited to have received support for this next, more ambitious phase of our research," said Enola K. Proctor, Ph.D., center director and the Frank J. Bruno Professor of Social Work Research.

"This advanced center provides critical core support to our faculty as they test new ways to meet the mental health needs of the most vulnerable members of our society — those served by publicly funded social service agencies. Finding out how to improve the quality of their mental

See Center, Page 6



As viewed looking north, at Forest Park Parkway just east of Big Bend Boulevard, construction crews work on a new MetroLink station. Metro is anticipating that the cross-county expansion project will be finished in mid-2006.

MetroLink project moves toward 2006 completion

By ANDY CLENDENNEN

Just like the little engine — or mass transit train — that could, the MetroLink cross-county expansion just keeps on chugging along.

And December should bring more of the same as Metro chugs toward an anticipated project-completion date in mid-2006.

Mass excavation efforts will continue at the Skinker Avenue station at the intersection of Skinker and Forest Park Parkway. Concrete work is scheduled to begin at the Skinker tunnel.

Construction of the station entrance, at the southwest corner of that intersection, will continue, as well as substructure work for a

pedestrian bridge. Concrete work will also continue at the tunnel west of DeBaliviere Avenue.

At the two other new stations adjacent to University campuses — the University City/Big Bend Boulevard and Forsyth stations, concrete work will continue, and shoring and excavation work will continue for a tunnel between Big Bend and Kingsland Avenue. Concrete work will continue in the tunnel between Big Bend and Pershing Avenue.

As with any major construction endeavors, minor side irritations will pop up once in a while. Again, the same holds true for the coming months.

The pedestrian crossing of See MetroLink, Page 2

Mother Nature's nuclear reactor described by WUSTL researchers

By TONY FITZPATRICK

To operate a nuclear power plant like Three Mile Island, hundreds of highly trained employees must work in concert to generate power from safe fission, all the while containing dangerous nuclear wastes.

On the other hand, it's been known for 30 years that Mother Nature once did nuclear chain reactions by her lonesome.

Now, University researchers have analyzed the isotopic structure of noble gases produced in fission in a sample from the only known natural nuclear chain reaction site in the world in Gabon, West Africa, and have found how she does the trick.

Analyzing a fragment of Gabon-site rock that's less than one-eighth of an inch, Alexander Meshik, Ph.D., senior research scientist in the Department of Physics in Arts & Sciences, has calculated that the precise isotopic structure of xenon in the sample reveals an operation that worked like a geyser. The reactor, active 2 billion years ago, worked on a 30-minute reaction cycle, accompanied by a 2.5-hour dormant period, or cool-down.

In a recent issue of *Physical Review Letters*, Meshik and his University collaborators wrote: "This similarity (to a geyser) suggests that a half an hour after the onset of the chain reaction,

See Reactor, Page 6

Olin Cup entrepreneurship contest winners named; Luminomics is 1st

In this year's Olin Cup entrepreneurship competition, the Olin School of Business has awarded a total of \$70,000 in seed investment capital to two startup businesses.

The awards were announced Dec. 2 at a reception in Simon Hall.

The Olin Cup for first place, along with \$50,000 in seed money, went to Luminomics, a biotechnology company that develops regenerative drug therapies for degenerative diseases.

An award of \$20,000 went to The Blessing Basket, a not-for-profit company that imports baskets made by weavers in undeveloped countries.

An honorable mention was given to Core Devices, maker of a portable anesthesia machine.

"We've created an open, inclusive environment for team formation," said Kenneth A. Harrington, managing director of the Skandalis Center for Entrepreneurial Studies, which sponsors the competition. "A business startup idea can be submitted from anywhere in the University or community, and funding will be made available to teams having only one Olin student or recent alumnus on the team."

"But we are also actively searching for sponsors and cor-

See Olin, Page 6

Happy holidays!

The Record will not be published again until Jan. 21. We hope you and your family have a wonderful holiday season.



Thomas distinguished professorship Edward S. Macias, Ph.D. (center), executive vice chancellor and dean of Arts & Sciences, was installed as the inaugural Barbara and David Thomas Distinguished Professor in Arts & Sciences in a ceremony Dec. 1 in the Arts & Sciences Laboratory Science Building. Chatting with Macias and his wife, Tedi, at the event is John F. McDonnell, retired chairman of the board of McDonnell Douglas Corp. and vice chairman of the University's Board of Trustees. In nearly 35 years at the University, Macias has served in numerous roles, including University provost, chair of the Department of Chemistry in Arts & Sciences and director of the Summer School.

Detjen named University trustee

David W. Detjen, J.D., a partner in the New York office of Alston & Bird LLP and co-chair of the law firm's New York international group, was named a member of the University's Board of Trustees at its Dec. 3 meeting.

The announcement was made by Chancellor Mark S. Wrighton.

At the meeting, trustees heard a presentation on career planning and placement by James E. McLeod, vice chancellor for students and dean of the College of Arts & Sciences, and John A. Berg, associate vice chancellor for undergraduate admissions. Their report dealt with the importance of career planning to students and their families, as well as strategies and programs being implemented to continue to provide strong service to students during their college years.

A report on the University's self-study for the just-completed North Central Association accreditation visit was presented by Gerhild Scholz Williams, Ph.D., associate vice chancellor for academic affairs, chair of the Department of Germanic Languages and Literatures, and the Barbara Schaps Thomas and David M. Thomas Professor in the Humanities; and by James W. Davis, Ph.D., professor of political science. Williams and Davis co-chaired the coordination of the accreditation visit and the preparation of the detailed self-study.

In his report to the trustees, Wrighton noted several significant accomplishments during the past few months, including the selection of Aaron Ciechanover, M.D., D.Sc., to receive the 2004 Nobel Prize in chemistry. Ciechanover, the Research Distinguished

Professor of Biochemistry at Technion-Israel Institute of Technology, has been a visiting professor of pediatrics in the WUSTL School of Medicine since 1987.

Wrighton reported that applications for the fall 2005 freshman class are strong and currently are ahead of last year, as are applications for early decision students. Campus visits by high-school seniors are up, a good sign of continuing interest in the University.

Noted were the recent installations of four faculty members to endowed professorships created during the just-completed Campaign for Washington University. Altogether, 165 professorships were established during the campaign.

Wrighton briefed the trustees on the appointment of Joel Seligman, J.D., dean of the School of Law and the Ethan A.H. Shepley University Professor, as president of the University of Rochester; and on the search for a successor to Olin School of Business Dean Stuart I. Greenbaum, Ph.D., also the Bank of America Professor of Managerial Leadership.

Wrighton gave the trustees an update on discussions regarding the establishment of the Richard A. Gephardt Institute of Public Affairs, which will continue to enhance the University's outreach into the community through public service by students and other members of the University community.

The trustees received standing committee reports on buildings and grounds/real estate, development, educational policy, Hilltop finance, research-graduate affairs,

undergraduate life, audit, medical finance, university finance, and the Alumni Board of Governors.

About David W. Detjen

Detjen, in addition to his role with Alston & Bird, is executive editor of the *International Law Practicum*, a publication of the New York State Bar Association, and several books ranging from how to arrange joint ventures with international partners to *The Germans in Missouri, 1900-1918: Prohibition, Neutrality, and Assimilation*, published in 1985.

Detjen is a member of the American Bar Association, the New York State Bar Association, the Bar Association of Metropolitan St. Louis, the Association of the Bar of the City of New York and the German American Law Association.

A 1970 graduate of Arts & Sciences at WUSTL, Detjen earned a degree from the University's School of Law in 1973. He serves as a member of that school's national council, and in 1998 he received the school's distinguished alumni award.

While a law student, he was editor in chief of the *Washington University Law Quarterly* and was elected to the Order of the Coif. He also studied law and history at the Eberhard-Karls-Universität in Tübingen, Germany.

Alston & Bird has more than 700 attorneys in five major markets, representing companies such as UPS, Verizon Wireless, Bertelsmann AG, Wachovia Corp., BellSouth Corp., Delta Airlines Inc., AFLAC and The Prudential Insurance Co. of America.

and communications systems that will be used for MetroLink operations.

Residents in that area who park their cars in their garages and need their vehicles during those days need to have their cars out of the garages before 7 a.m.

These dates and times may change in the case of bad weather or unforeseen conditions.

To receive a daily update on progress of the alley work, contact Jon Soucy with Metro Project Communications at jsoucy@metroslouis.org or 982-1400, ex. 2709.

Law dean advisory committee named

By ANDY CLENDENNEN

Chancellor Mark S. Wrighton has appointed an advisory committee to assist him in the search for the next dean of the School of Law.

Joel D. Seligman, J.D., dean of the School of Law and the Ethan A.H. Shepley University Professor, announced recently that he would be leaving Washington University to become president of the University of Rochester. He is scheduled to step down here June 30.

The Advisory Committee on the Appointment of the Dean of the School of Law is charged with identifying 3-5 individuals with the intellectual, administrative, personal and leadership qualities sought for the new dean, said Wrighton, who hopes to complete the appointment process by July 1.

Wrighton has named Daniel L. Keating, J.D., the Tyrell Williams Professor of Law and dean for academic affairs, to chair the committee.

Other committee members are: Jane Harris Aiken, J.D., the William M. Van Cleve Professor of Law; Janet L. Bolin, associate

dean of admissions and financial aid in the School of Law; Michael R. Cannon, J.D., executive vice chancellor and general counsel;

Glenn L. Dalton, president of the RKD Group; Rebecca S. Dresser, J.D., the Daniel Noyes Kirby Professor of Law; Jean C. Hamilton, chief judge, U.S. District Court, Eastern District of Missouri, and a member of the law school's national council; Edward F. Lawlor, Ph.D., dean of the George Warren Brown School of Social Work; Stephen H. Legomsky, J.D., D.Phil., the Charles F. Nagel Professor of International and Comparative Law;

Ned O. Lemkemeier, J.D., member of the Board of Trustees, partner with Bryan Cave LLP, and chair of the law school's national council; Sasha E. Polonsky, student in the School of Law; Nancy C. Staudt, J.D., professor of law; and William H. Webster, member of the Board of Trustees and the law school's national council and senior partner with Milbank, Tweed, Hadley & McCloy LLP.

The University has hired a consultant to assist in the search process; he is Jerry H. Baker of Baker-Parker Inc. in Atlanta.

Martin Luther King's legacy honored via campus events

By NEIL SCHOENHERR

"Be the Change" is the theme of the University's annual celebration honoring Martin Luther King Jr. at 7 p.m. Jan. 17 in Graham Chapel.

Chancellor Mark S. Wrighton will begin the program with a welcome and remarks. The evening will include performances by Vashon High School's drum line, the YMCA Boys Choir, the University's Vision Gospel Choir and Black Anthology, as well as testimonials from University students.

A reception in the Women's Building Formal Lounge will follow the program.

The celebration is sponsored by Black Anthology, the Black Student Council, Bon Appétit, Campus Y, the Catholic Student Union, Cornerstone, the Disability Resource Center, the Office of Greek Life, the Department of Psychology in Arts & Sciences, the Office of Residential Life, the Office of Student Activities, Student Union and the Wesley Fellowship.

This is the 18th year the University has supported a King tribute.

The celebration is free and

open to the public. For more information, call 935-5970.

Other MLK events

Among other campus events is the **Black Law Students Association's** annual Martin Luther King Jr. commemorative speaker event.

Susan R. Jones, professor of clinical law and supervising attorney of the Small Business Clinic at George Washington University, will present "Dr. Martin Luther King Jr.'s Legacy: An Economic Justice Imperative" at 11 a.m. Jan. 19 in Anheuser-Busch Hall.

Jones is senior editor and past editor in chief of the *American Bar Association Journal of Affordable Housing and Community Development Law* and author of *A Legal Guide to Microenterprise Development*.

For more information, call 935-4958.

The Business Minority Council

will present a talk about King's contributions toward equality in education and the workplace and how his efforts have affected African-Americans in the business world. The event will be at 3 p.m. Jan. 22 in Simon Hall.

For more information, call 935-7301.

Campus Watch

The following incidents were reported to University Police Dec. 2-8. Readers with information that could assist in investigating these incidents are urged to call 935-5555. This information is provided as a public service to promote safety awareness and is available on the University Police Web site at police.wustl.edu.

Dec. 3

1:45 a.m. — Residential Technology Services reported a computer-hacking incident in progress in Gregg House. A resident was contacted to establish the originator of the illicit computer action. It is believed that this resident wasn't the perpetrator, but that the computer connection was being used as a ghost server for the actual perpetrator. An investigation is continuing.

Dec. 6

3:37 p.m. — A suspicious envelope postmarked from Algeria was received by an occupant of the Angelica building at 700 Rosedale Ave. The item was conveyed to the University Police station to conduct a further investigation, which is continuing.

Additionally, University Police responded to two reports each of property damage and auto accident, and one report each of larceny, lost article, disturbance and suspicious person.

MetroLink

Some alleys closed during construction

— from Page 1

Forest Park Parkway at Williams Avenue in University City is closed. All pedestrians should use the pedestrian underpass at Wellesley Avenue.

And Forest Park Parkway is closed between Union Boulevard in the city of St. Louis and Brent-

wood Boulevard in Clayton. The parkway is scheduled to reopen in 2005. Motorists are encouraged to use Interstate 64 (Highway 40) or Olive Boulevard as alternate routes.

Even the alleys of some housing units are being impacted.

From Dec. 7 and running for about two weeks, alleys behind homes on the south side of Pershing, between Williams and the east end of the alley, are closed from 7 a.m.-5:30 p.m.

This closure is necessary while Metro's contractor constructs an underground room for signaling

School of Medicine Update

Heart responds to fasting by remodeling mitochondria

By GWEN ERICSON

School of Medicine researchers have identified a previously unsuspected response by mouse heart muscle cells to fasting conditions: the cells' power generators, the mitochondria, appear to remodel and consume extra internal walls or membranes in an effort to supply energy to the rest of the cell.

Partially consumed are the specialized internal membranes mitochondria use to generate energy-rich compounds for the cell, making the mitochondrial strategy appear to create more problems than it might solve. Nevertheless, the response appears to help maintain healthy heart function throughout caloric restriction.

"It is likely that the changes in the membranes make the mitochondria more energy efficient and serve as an adaptation to nutritional deprivation in mammals," said Richard Gross, M.D., Ph.D., senior author and professor of medicine and director of the Division of Bioorganic Chemistry and Molecular Pharmacology in the Department of Medicine.

The findings, scheduled to be reported in an upcoming issue of the journal *Biochemistry* and now available through advance online publication, may have implications for human cardiovascular health.

In its studies of mouse heart muscle, the research team found levels of two members of a class of lipids (fatty molecules) called phospholipids fell dramatically when food was withheld. For one type of phospholipid, levels decreased by 20 percent after only four hours of fasting; and for the other, levels dropped a remarkable 40 percent after 12 hours of fasting.

The changes in phospholipids occurred mainly in the mitochondria, which are highly abundant in heart muscle cells and account for most of the phospholipid content of the cells. Mitochondria serve to break down many types of fats to produce the high-energy cellular fuel ATP, which is essential for a multitude of cellular processes, including the regular contraction of the heart muscle.

"What we measured was a massive change in heart lipid composition," Gross said. "In part, it confirms what science has come to recognize — mitochondria are quite dynamic and change shape in response to nutritional and hormonal cues. But we are the first to report that mitochondria essentially remodel their own membranes, and thereby their physical properties, by dynamically altering their use of phospholipids."

A phospholipid decrease of the magnitude reported is all the

more surprising because phospholipids comprise essential components of all cellular membranes and have previously been thought to be preserved except in cases of extreme starvation.

The researchers' data also reveals that after feeding resumes, the phospholipid levels in heart muscle cells rise back to normal levels, indicating that mitochondria readily rebuild their membranes.

During this recovery period, another class of lipid, triglyceride, a common source of energy for many types of cells, peaks high above its normal level in heart muscle cells.

"The rise of triglyceride isn't easily explained by nutritional conditions, because after feeding resumes, the heart shouldn't need to increase its levels of fats," Gross said. "It's as if the heart retains a memory of deprivation and doesn't want to get caught unprepared again."

The next step for the research team will be to study the changes in shape and structure of mitochondria and to relate these to changes to lipid metabolism.

The response by heart mitochondria might lend a partial explanation to a pattern discerned in studies of ischemic heart patients, who have restricted blood flow to the heart.

"While we have to be careful in drawing definitive parallels between mouse lipid dynamics and human lipid dynamics, it is interesting to note that the majority of sudden death in ischemic heart patients occurs in the early morning hours when people have typically had a long fast and are subject to a vast array of hormonal influences during the sleep-wake cycle," Gross said.

"The alterations in heart muscle energy utilization during fasting may setup a deleterious situation in the hearts of ischemic heart patients."

The research team uncovered the fluctuations in cellular lipids through an innovative new technology it developed called "shotgun lipidomics." As the name suggests, in comparison to other techniques, shotgun lipidomics has the speed and coverage of a shotgun blast. From a simple one-step extraction of lipids in tissues, the team can obtain in minutes highly accurate measurements of the various cellular lipids, which previously have been notoriously fragile, time-consuming to analyze and hard to quantify.

"Through the efforts of people in our division like Xianlin Han, who has worked hard to perfect the technology, we have been able to open up fresh avenues of investigation using shotgun lipidomics," Gross said.



Check-mate it out Second-year medical students Eugenia Garvin (left) and Louise Yeung examine a bronze work by Arts & Sciences anthropology doctoral student Blaine Maley. The piece was among 30 on display at an art show held Nov. 18 at the Bernard Becker Medical Library's King Center. Garvin and Yeung, along with fellow second-year student Yamini Virkud, coordinated the show, which also included poetry readings, photography, painting, drawing, quilting, pottery and calligraphy by University students, faculty and staff. The well-attended show raised money for the Center of Creative Arts' Urban Arts Program in St. Louis.

Research finds differences in gene usage dramatically change bacteria's 'lifestyles'

By MICHAEL C. PURDY

When and where a bacterium uses its DNA can be as important as what's in the DNA, according to School of Medicine researchers.

Scientists found significant differences in two bacterial organisms' use of a gene linked to processes that govern a form of antibiotic resistance. The distinction alters the bacteria's "lifestyles," or their ability to survive in different environments.

Researchers say the finding shows that understanding such changes will likely help development of new treatments for disease-causing microorganisms.

"These differences in gene usage are harder to look for, but we're not going to understand these organisms fully unless we take into account this other dimension," said senior investigator Eduardo Groisman, Ph.D., professor of molecular microbiology and a Howard Hughes Medical Institute investigator.

The study appeared the week of Nov. 29 in the online edition of the *Proceedings of the National Academy of Sciences* and in print Dec. 7.

One of the bacteria studied, *Salmonella enterica*, is a leading cause of food poisoning and illness related to animal husbandry. The other, *Escherichia coli*, can cause illness but more typically plays a beneficial role in the human digestive system.

The two are closely related genetically. Less than 20 percent of *E. coli*'s genes are not found in *Salmonella* and just over 25 percent of *Salmonella*'s genes lack counterparts in *E. coli*.

Groisman's research had previously focused on how differences in gene content made *Salmonella* a persistent source of illness. He identified several areas in the bacteria's DNA known as "pathogenicity islands" — clusters of genes unique to *Salmonella* that help it cause illness.

When complete gene maps for both bacteria became available in recent years, his interests expand-

ed to understanding how the bacteria might use identical genes differently.

Salmonella and *E. coli* share the gene for an antibiotic resistance regulatory protein called PmrA. By controlling when other proteins are produced, PmrA can make the cell wall more resistant to damage from the antibiotic polymyxin B.

The PmrA protein normally activates in response to high iron levels.

In a paper recently published in *Genes and Development*, Groisman's lab established that another protein, PmrD, also can activate PmrA in response to low magnesium levels.

In the new study, Groisman's lab discovered that *E. coli* has a different version of PmrD that is unable to turn on the PmrA protein in response to low magnesium.

"We're not really sure what the significance of low magnesium is, but there are some indications that it may be important to the bacteria's ability to survive in white blood cells or outside of the host in soil or water," Groisman said.

When scientists transplanted the *Salmonella* form of PmrD

into *E. coli*, the bacteria gained the ability to resist polymyxin B in low magnesium environments.

Based on data still to be published, Groisman suspects that many other aspects of microbial lifestyle are affected by differences in regulation of identical genes.

He notes that the idea of different organisms making altered use of the same genes sprang from recent analyses of the human genome.

"Humans not only appear to have far fewer genes than expected, there also seem to be fewer genes that are unique to human DNA than anticipated," Groisman said.

In addition to instructions for building proteins, DNA contains stretches of code that affect when genes are turned on and off. As life becomes more complex over the course of evolution, Groisman said, these regulatory sections appear to take up larger portions of the DNA, allowing genes to be turned on and off in ways that are more intricately responsive to the environment and other factors.

Human DNA, Groisman speculated, may be heavily packed with the factors that allow a more complex, richer use of genes also found in other organisms.

Cooper honored by British surgical society

By GILA Z. RECKESS

Joel D. Cooper, M.D., the Evarts A. Graham Professor of Surgery and chief of the Division of Cardiothoracic Surgery, has been awarded an honorary fellowship of the Royal College of Surgeons of England, which is internationally recognized as one of the world's leading authorities in surgery.

Cooper was presented this distinction in a recent ceremony at the Royal College Headquarters in London.

Cooper's extensive accomplishments in lung surgery



Cooper

He also pioneered a procedure called lung-volume reduction surgery, in which surgical removal of the most-damaged portions of the lung dramatically improve quality of life for patients with severe emphysema.

include leading the team that performed the first successful lung transplant in the world in 1983, and then leading the first successful double lung transplant in 1986.

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Washington University in St. Louis

University Events

Callaway, Graae to bring evening of cabaret Jan. 15

BY LIAM OTTEN

Between them, singers Liz Callaway and Jason Graae boast 11 Broadway shows, more than 65 recordings and dozens of film and television appearances.

They also boast a friendship that has survived more than 20 years of showbiz. (The pair met as cast-mates in a 1980 off-Broadway production of *Godspell*. Callaway was paid \$18 per week. St. Louis native Scott Bakula starred as Jesus.)

At 8 p.m. Jan. 15, Edison Theatre's OVATIONS! Series will present these "musical pals" in *Backstage Broadway Buddies*, an intimate cabaret-style evening of standards and stories, solos and duets, gossip and sentiment.

Callaway, who performed at Edison Theatre in 2002 with *Godspell* composer Stephen Schwartz, is a Chicago native and daughter of journalist John Callaway.

She made her Broadway debut in Stephen Sondheim's *Merrily We Roll Along* and has also appeared in *The Three Musketeers*; *Miss Saigon*, for which she originated the role of Ellen; *Baby*, for which she earned a Tony Award nomination; and *Cats*, where she spent five years playing Grizabella.

In addition to *Godspell*, Callaway has appeared off-Broadway in *The Matinee Kids*, *1-2-3-4-5*, *No Way To Treat a Lady*, *Brownstone*, *Marry Me A Little* and *The Spitfire*



Callaway



Graae

Grill, for which she received both a Drama Desk Award nomination and a Drama League Award nomination.

Sibling Revelry, a cabaret show she created with sister, Ann Hampton Callaway, was recorded live for DRG Records and won both a Back Stage Bistro Award and a MAC Award from the Manhattan Association of Cabarets & Clubs.

Callaway can be heard on more than 30 recordings, including three solo albums: *The Beat Goes On* (featuring music of the '60s), *The Story Goes On: Liz Callaway On and Off-Broadway* and *Anywhere I Wander: The Music of Frank Loesser*.

She performed the title character's singing voice in the animated feature *Anastasia*, and her song "Journey to the Past" was nominated for a 1998 Academy Award.

Other film work includes the singing voice of Princess Jasmine in Disney's *The Return of Jafar* and *Aladdin* and the King of Thieves as well as vocals for *The Swan Princess*, *Lion King 2: Simba's Pride*, *Beauty and the Beast* and *The Brave Little Toaster*

Goes to Mars.

She received an Emmy Award for hosting *Ready To Go*, a daily children's program on CBS in Boston.

Graae, dubbed "the undoubted master of humorous song" by *New York Magazine*, has starred on Broadway in *A Grand Night For Singing*, *Falsettos*, *Stardust*, *Snoopy!* and *Do Black Patent Leather Shoes Really Reflect Up?*

Off-Broadway shows include *Hello Muddah, Hello Fadduh* (for which he received a Drama Desk Nomination), *Forever Plaid*, *Olympus on My Mind*, *All in the Timing* and many more.

In Los Angeles, he spent a year as Houdini in the U.S. premiere of *Ragtime*, won an Ovation Award for *Forbidden Broadway Y2KLA!* and was recently nominated for a second Ovation for the role of Moonface in the revival of *Anything Goes!*

Graae made his opera debut as Njegus in *The Merry Widow* with the Los Angeles Opera and his Metropolitan Opera House debut as vocal soloist in Twyla Tharp's *Everlast*. He has recorded more than 35 original cast albums and studio CDs, including two solo discs, *You're Never Fully Dressed Without A Smile: Jason Graae Sings Charles Strouse* and *Jason Graae: LIVE At The Cinegrill*.

On television, he has been featured as Dennis on HBO's *Six Feet Under* and also appeared on *Rude Awakening*, *Friends*, *Frasier* and *Sabrina the Teenage Witch*, among many others.

Graae has been featured twice with the Boston Pops on PBS, and for five years he was the voice of Lucky Charms Cereal's Lucky the Leprechaun.

Recent film roles include the Disney animated feature *Home on the Range* and the forthcoming *On Edge* with Jason Alexander.

Tickets — \$28; \$24 seniors and WUSTL faculty and staff; \$18 for students and children — are available at the Edison Theatre Box Office and through all MetroTix outlets.

For more information, call 935-6543.

Blood Drive • How We Sense Infection • Mouse Models

"University Events" lists a portion of the activities taking place Dec. 10-Jan. 24 at Washington University. Visit the Web for expanded calendars for the Hilltop Campus (calendar.wustl.edu) and the School of Medicine (medschool.wustl.edu/calendars.html).

Exhibits

Architecture Exhibition. Soccer field competition student entries. Through Dec. 20. Givens Hall. 935-6200.

Lectures

Friday, Dec. 10

9:15 a.m. Pediatric Grand Rounds. "Respiratory Viruses for the 21st Century — Three Stories." Gregory Storch, prof. of pediatrics, of medicine and of molecular microbiology. Clopton Aud., 4950 Children's Place. 454-6006.

Noon. Cell Biology & Physiology Seminar. "RGS Proteins — Functions and Therapeutic Potential." Richard R. Neubig, prof. of pharmacology, U. of Mich. McDonnell Medical Sciences Bldg., Rm. 426. 362-1668.

4 p.m. Dept. of Music Lecture. "Onyx Club Revue: Jazz and White Masculinity in the Early Swing Era." Patrick Burke, asst. prof. of music, Music Classroom Bldg., Rm. 102. 935-4841.

Saturday, Dec. 11

8:30 a.m.-3 p.m. Internal Medicine CME Course. "Coding for Physician Services: Hospital Setting." Cost: \$165 for physicians, \$140 for allied health professionals. Eric P. Newman Education Center. To register: 362-6891.

Monday, Dec. 13

Noon. CSNSI & Neurology Research Seminar. Kelvin Yamada, assoc. prof. of neurology, asst. prof. of pediatrics. Maternity Bldg., Schwartz Aud. 362-9460.

4 p.m. Immunology Research Seminar Series. "Poised on a Knife Edge: Balancing Immunity Versus Virulence During Chronic Herpesvirus Infection." Herbert "Skip" Virgin, prof. of pathology & immunology, Eric P. Newman Education Center. 362-2763.

Tuesday, Dec. 14

8:30 a.m.-4:30 p.m. Center for the Application of Information Technology Two-day Workshop. "The Politics of IT Project Management." (Continues 8:30 a.m.-4:30 p.m. Dec. 15.) Cost: \$1,195, reduced fees available for CAIT organizations. CAIT, 5 N. Jackson Ave. 935-4444.

Noon. Molecular Microbiology & Microbial Pathogenesis Seminar Series. "TRIM5alpha: A Mediator of Innate Intracellular Resistance to Retroviruses." Joseph G. Sodroski, prof. of pathology, Dana-Farber Cancer Inst., Harvard U. Cori Aud., 4565 McKinley Ave. 747-2132.

4 p.m. Anesthesiology Research Seminar

How to submit 'University Events'

Submit "University Events" items to Genevieve Podleski of the Record staff via:

- (1) e-mail — recordcalendar@wustl.edu;
- (2) campus mail — Campus Box 1070; or
- (3) fax — 935-4259.

Deadline for submissions is noon on the Thursday eight days prior to the publication date.

Series. Basic Research Seminar. Jim Lederer, dept. of surgery, Harvard U. Clinical Science Research Bldg., Rm. 5550. 362-8560.

4 p.m. Medical Humanities & Social Science Talk. "Taking the 'Nox' Out of Nomenclature: Poisons, Drugs and Side Effects in Thirteenth- and Fourteenth-century France." Walt Shalick, prof. of history and of pediatrics. Brookings Hall, Rm. 100. 935-5340.

Wednesday, Dec. 15

4 p.m. Biochemistry & Molecular Biophysics Seminar. "Beyond Crystallography, Functional Protein Dynamics From Site-directed Spin Labeling." Wayne Hubbell, prof. of chemistry & biochemistry and of ophthalmology, U. of Calif., Los Angeles. Cori Aud., 4565 McKinley Ave. 362-0261.

Thursday, Dec. 16

Noon. Genetics Seminar Series. "Algorithmic Improvements in Linkage Analysis: Modeling Genotyping Error and Linkage Disequilibrium." Goncalo Abecasis, asst. prof. of biostatistics, U. of Mich. McDonnell Medical Sciences Bldg., Rm. 823. 362-2139.

4 p.m. Cell Biology & Physiology Lecture. Erlanger-Gasser Lecture. "Mouse Models for Cancer." Anton I.M. Berns, prof., Nederlands Kanker Instituut, Amsterdam. McDonnell Medical Sciences Bldg., Rm. 426. 362-6812.

Friday, Dec. 17

9:15 a.m. Pediatric Grand Rounds. "Hypertension: Managing Without a Nephrologist?" Anne Beck, asst. prof. of pediatrics. Clopton Aud. 4950 Children's Place. 454-6006.

Monday, Dec. 20

Noon. Molecular Biology & Pharmacology Seminar. "Molecular Assembly of Hippocampal Synapses." Ann Marie Craig, assoc. prof. of anatomy & neurobiology. South Bldg., Rm. 3907, Philip Needleman Library. 362-0183.

Tuesday, Dec. 21

4 p.m. Anesthesiology Research Seminar Series. Ling-Gang Wu, National Institutes of Health, Bethesda, Md. Clinical Sciences Research Bldg., Rm. 5550. 362-8560.



Through the perilous fight The Concert Choir of Washington University, under the direction of John Stewart, director of vocal activities in the Department of Music in Arts & Sciences, performs the national anthem before the Dec. 5 NFC battle between the St. Louis Rams and the San Francisco 49ers at the Edward Jones Dome. The 80-some members of the choir, which will also be in concert at 8 p.m. tonight in Graham Chapel, remained to watch the game from the sidelines. The Rams won, 16-6.

Thursday, Jan. 6

Noon. Center for Health Policy Ethnic & Racial Disparities in Health Care Brown Bag Seminar Series. "Telemedicine to Improve Care and Reduce Disparities in Rural Missouri." Karen Edison, Center for Health Policy, U. of Mo. Simon Hall, Rm. 241. 935-9108.

Monday, Jan. 10

4 p.m. Immunology Research Seminar Series. "Cancer Immunomodulation: Molecular Mechanisms and Therapeutic Implications." Robert D. Schreiber, Alumni Professor of pathology & immunology, Eric P. Newman Education Center. 362-2763.

Thursday, Jan. 13

4 p.m. Ophthalmology & Visual Sciences Seminar. "Immunologic Control of HSV-1 Latency and Implications for Herpes Keratitis." Robert L. Hendricks, prof. of ophthalmology, of immunology and of molecular genetics & biochemistry, U. of Pittsburgh. Cori Aud., 4565 McKinley Ave. 362-1006.

7:30 p.m. American Technion Society Lecture. "Research Towards Understanding and Preventing Irregular Heart Rhythms and Sudden Death." Yoram Rudy, Fred Saigh Distinguished Professor of Biomedical Engineering. Whitaker Hall. To register: 725-7330.

Monday, Jan. 17

7 p.m. University Commemoration Celebration for Martin Luther King Jr. "Be the Change." Graham Chapel. 935-5970.

Wednesday, Jan. 19

11 a.m. School of Law "Access to Justice" Public Interest Law Speakers Series. Black Law Students Association Martin Luther King Jr. Commemorative Speaker. "Dr. Martin Luther King Jr.'s Legacy: An Economic Justice Imperative." Susan R. Jones, prof. of clinical law, George Washington U. Anheuser-Busch Hall. 935-4958.

Sunday, Jan. 22

3 p.m. Business Minority Council presentation. Martin Luther King Jr.'s contribution toward equality in education and the workplace and his effect on African-Americans in the business world. Simon Hall. 935-7301.

Monday, Jan. 24

4 p.m. Immunology Research Seminar Series. "How We Sense Infection: Toll-like Receptors and the Forward Genetic Analysis of Innate Immunity." Bruce Beutler, prof. of immunology, Scripps Research Inst. Eric P. Newman Education Center. 362-2763.

Music

Friday, Dec. 10

8 p.m. Concert. Concert Choir of Washington University. John Stewart, dir. Performance dedicated to the memory of William R. Kohn, prof. emeritus in the School of Art. Graham Chapel. 935-4841.

Monday, Dec. 13

8 p.m. Concert. Flute Choir. Jan Smith, dir. Graham Chapel. 935-4841.

8 p.m. Concert. Small Chamber Ensemble Extravaganza. Elizabeth Macdonald, dir. Holmes Lounge. 935-4841.

Friday, Dec. 17

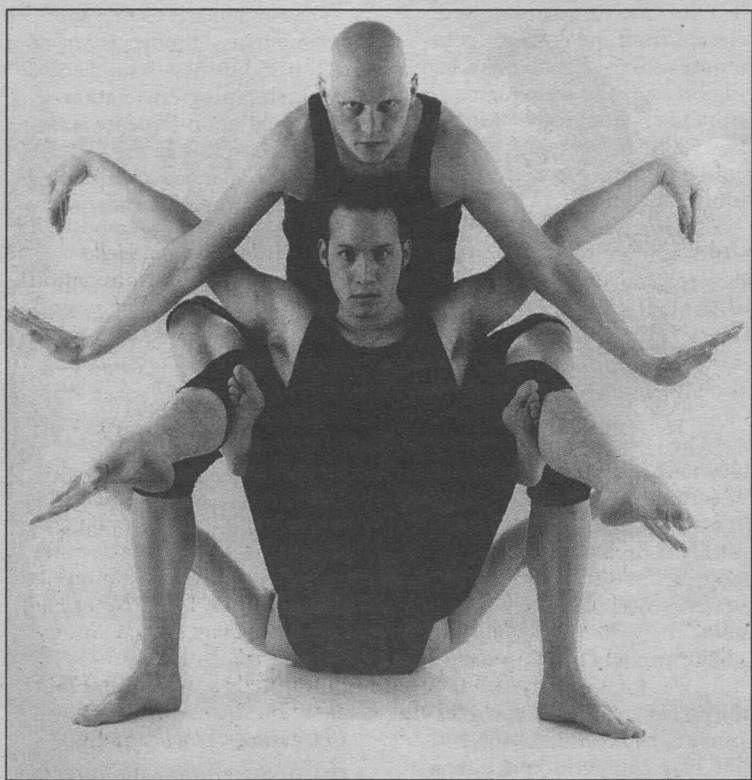
8 p.m. Washington University Opera. *Winter Evening of Opera.* Jolly Stewart, dir. Umrath Hall Lounge. 935-4841.

Sunday, Dec. 19

3 p.m. Choral Sing-along. Handel's *Messiah*. John Stewart, dir. Graham Chapel. 935-4841.

Sunday, Jan. 23

8 p.m. Organ Concert. In celebration of the Graham Chapel renovation. James Kibbie, organist, U. of Mich. Graham Chapel. 935-4841.



Galumph, a New York-based dance trio that combines physical comedy, acrobatic choreography and striking visual effects, will come to Edison Theatre Jan. 15 as part of the ovations! for young people series.

ovations! for young people presents Galumph Jan. 15

By LIAM OTTEN

A three-headed human fly? Tatem poles that come to life? Velcro-helmeted weirdoes who defy the laws of physics?

Is this a horror movie or a comic book?

No, it's Galumph, a New York-based dance trio whose daring combination of physical comedy, acrobatic choreography and striking visual effects is quickly earning a national following.

In January, the troupe will descend upon St. Louis for a special, one-time-only matinee at Edison Theatre.

The performance, presented as part of the Edison Theatre ovations! for young people series, will begin at 11 a.m. Jan. 15.

According to anthropologists, "galumphing" is the manifestation of the seemingly inexhaustible store of play-energy one finds in children, puppies, kittens and other higher life forms.

"We galumph when we hop instead of walk," writes Stephen Nachmanovitch in *Free Play: Improvisation in Life and Art*, "when we take the scenic route instead of the efficient one."

Galumph the dance company delivers a fast-paced, athletic mix of art and entertainment, obliterating boundaries between the ridiculous and the sublime.

The troupe was formed in 2002 by Andy Horowitz and Greg O'Brien, artists-in-residence at Binghamton University. Rounding out the team is Marlon Torres, a former child television star in his native Venezuela.

Horowitz and O'Brien have performed together for more than 20 years, having met as students at Binghamton (then the State University of New York-Binghamton) in 1982. They formed their first troupe, The Sticks, in 1986 and in 1987 commenced a 15-year run with dancer Paul Gordon as The Second Hand Dance Company.

The duo's performing and choreographic credits include *Serious Fun* at Lincoln Center in New York; *Just for Laughs* in Montreal; *The Staat Schowberg* in Amsterdam; *Man-Made* at New York's Joyce Theater; Ireland's Galway Arts Festival; and Spoleto-USA in Charleston, S.C., among many others.

Other projects range from "Ecstasy," an MTV video with the band Rusted Root, to a Japanese television commercial, the British game show *The Generation Game* and more than 1,000 workshops and lecture demonstrations for children.

As Galumph, Horowitz, O'Brien and Torres have toured widely, performing at venues around the world and earning a prestigious Edinburgh Festival Critic's Choice Award. They have been featured on MTV, Showtime, A&E and *The Late Show With David Letterman*, among many others, and in Jerry Lewis's 2002 Muscular Dystrophy Association Telethon.

Ovations! for young people presents affordably priced — and family friendly — matinee shows by nationally and internationally recognized performing artists. The series compliments the signature Edison Theatre OVATIONS! series, which serves both the University and the St. Louis community by providing the highest caliber national and international artists in music, dance and theater, performing new works as well as innovative interpretations of classical material not otherwise seen in St. Louis.

Edison Theatre programs are supported by the Missouri Arts Council, a state agency, and the Regional Arts Commission, St. Louis.

Tickets are \$7 and are available at the Edison Theatre Box Office and through all MetroTix outlets.

For more information, call 935-6543.

'Tis the season

Music ensembles to present concerts throughout December

The Department of Music in Arts & Sciences will conclude its fall season with a host of December concerts.

The Concert Choir of Washington University — under the direction of John Stewart, director of vocal activities — will perform works composed across six centuries at 8 p.m. today in Graham Chapel. The performance will be dedicated to former choir member William R. Kohn, professor emeritus in the School of Art, who passed away Nov. 13.

Representing the Renaissance is Tomás Luis de Vittoria's famed "O Magnum Mysterium," followed by a contemporary setting of the same tune by American composer Morten Lauridsen.

Also in the concert are works by Baroque composers Thomas Weelkes and Antonio Lotti; by 19th- and 20th-century composers Charles V. Stanford, Sergei Rachmaninoff, Francis Poulenc and Joseph Canteloube; and a 2003 setting of "My Soul's Been Anchored."

At 8 p.m. Dec. 13, the music department will present a "Small Chamber Ensembles Concert" in Holmes Lounge. Elizabeth Macdonald, director of strings, will conduct the performance, which will feature a variety of small student-chamber ensembles. The program will include string quartet selections by Franz Schubert, Antonín Dvořák and Maurice Ravel; "Cries of London" for viols and voice by Thomas Weelkes; and tangos for cello, arranged by Macdonald.

Also at 8 p.m. that evening, the Washington University Flute Choir, directed by Jan Smith, will perform a concert in Graham Chapel.

The Washington University Opera, directed by Jolly Stewart and conducted by John Stewart, will present Mozart's short comic opera *The Impresario* at 8 p.m. Dec. 17-18 in Karl Umrath Hall

Lounge. The performance will also feature additional Mozart arias weaved into the story line.

Finally, the music department will host its annual sing-along of George Frideric Handel's oratorio *Messiah* at 3 p.m. Dec. 19 in Graham Chapel.

The performance, which will last about an hour, will include the Christmas portion of *Messiah* as well as the "Hallelujah Chorus."

Those who wish to may sit in special sections arranged according to voice type (soprano, alto, tenor, baritone), though those who choose not to sing are also

welcome to attend. Copies of the music will be available for those who do not bring their own scores.

John Stewart will direct the performance; William Partridge will be the organist. Soloists will be all students or recent graduates of the music department's Vocal Performance Program; they will include soprano Megan Higgins; mezzo-soprano Deborah Stinson; tenor Clark Sturdevant; and baritone Nathan Ruggles.

All concerts are free and open to the public. For more information, call 935-4841.



Holiday print sale Island Press, the School of Art's nationally renowned professional printshop, will host its second-annual holiday sale from 11 a.m.-4 p.m. Dec. 19 in Bixby Hall. The event will feature works by dozens of internationally renowned artists — including James Bartsch, Chakaia Booker, Michael Byron, Hung Liu, Shimon Okshteyn, Franco Mondini Ruiz, Jane Sauer and Catherine Wagner — at discounts of 30 percent to 50 percent off list prices. Among the works offered will be *Louie Louie* (above), a soft-ground etching by Rocky Toner. For more information, call 935-6571.

Sports

Swimmers, divers shatter school records

The men's and women's swimming and diving teams continued their strong performances at the Wheaton College Invitational. The women broke two more school records on the final day of competition, bringing their two-day total to six, en route to a third-place finish at the Invitational. The women posted 591 points, behind University of Wisconsin-Milwaukee (600) and host Wheaton (801.5).

The men placed fourth with 539 points, behind University of Wisconsin-Stevens Point (580), UW-Milwaukee (710.5) and Wheaton (760.5).

Freshman Tina Deneweth set a school record in the 100-yard butterfly, recording a time of 57.01. The mark also automatically qualified her for the NCAA Championships. The second women's record that fell on the day came courtesy of the 200-medley relay team. The foursome of freshman Meredith Nordbrock, junior Allie Boettger, Deneweth and junior Jenny Scott clocked an NCAA "A" cut time of 1:47.28.

Nordbrock and Scott also automatically qualified for NAAs in an individual event. Nordbrock took first place in the 100 backstroke. Scott earned an NCAA "A" cut in the 200 free with a time of 1:53.59.

Nordbrock set two school records on the first day of the Invitational; she broke the mark in the 200 back (2:08.06) and the 200

On the Web

For complete sports schedules and results, go to bearsports.wustl.edu.

IM (2:08.97). She was a part of four school records and seven NCAA qualifying times for the weekend.

Juniors Michael Slavik and Eric Triebe paced the men's squad. Both swimmers provisionally qualified for the NAAs in two freestyle events: Slavik in the 50 free (21.13) and 200 free (1:42.07) and Triebe in the 50 free (21.01) and 200 free (1:43.00).

A day earlier, both competitors earned NCAA "B" cuts in the 100 free. The 200-medley relay squad of Slavik, Triebe, freshman Geoff Hart-Cooper and junior Alex Antilla posted a time of 1:34.96 to earn an NCAA "B" cut.

Slavik, Antilla, sophomore David Stein and Triebe also teamed up in the 400-free relay to provisionally qualify with a time of 3:06.73.

On the weekend, the women broke six school records and posted 14 NCAA qualifying times. The men set a pair of school records and tallied 10 NCAA qualifying times.

Men's basketball team takes third place

The men's basketball team won the consolation championship at the Bill Merris Tip-Off Classic in Jacksonville, Ill. Despite a school-record 16 3-pointers, the Bears

fell in the opening game of the tournament to Benedictine University, 100-95.

The Bears broke the record of 15 3-pointers, which they reached three times. Senior Rob Keller finished the game with a career-high 26 points while junior Mike Grunst had a career-high 19 points.

In the consolation championship, the Bears improved to 4-3 with an 86-70 win over Principia College Dec. 4. WUSTL followed record 3-point performance with 12 more against Principia.

Michael Faherty led five Bears in double figures with 15 points.

Women's hoops team wins two more games

The No. 4 women's basketball team won a pair of games at the Colorado College Classic. With the two wins, the Bears improved to 7-0. WUSTL defeated host Colorado College, 79-60, Dec. 3. Alicia Herald paced the Bears with a career-high 20 points and eight rebounds. Senior Kelly Manning finished with 18 points, six rebounds, four assists and three steals.

WUSTL wasted little time taking control of the next day's 86-42 win against Pomona-Pitzer Colleges. The Bears tallied the game's first 11 points, led by Danielle Beehler's six points during the run, en route to a 48-16 halftime cushion. Beehler finished with 13 points in 19 minutes of action. In all, 12 players scored for WUSTL. Senior Nicole Wylie matched Beehler with a game-high 13 points off the bench.

Monday, Jan. 24

8 p.m. Concert. Washington University Chamber Orchestra. Elizabeth Macdonald, dir. Umrath Hall Lounge. 935-4841.

And more...

Friday, Dec. 10

7 p.m.-1 a.m. Tango/Swing/Salsa Dance Event. Umrath Hall Lounge. 935-6098.

Saturday, Dec. 11

2 & 3:30 p.m. Tango Workshop. Brigitta Winkler, tango instructor, Berlin. (Also 2

& 3:30 p.m. Dec. 12.) Cost: \$20. Mudd Hall Multipurpose Room. 935-6098.

Tuesday, Jan. 11

1-2:30 p.m. Center for Mental Health Services Research Open House. Brown Hall Lounge. 935-5687.

Monday, Jan. 24

11:30 a.m.-4:30 p.m. Blood Drive. Co-sponsored by Phi Delta Theta fraternity and Kappa Kappa Gamma sorority. (Also 11:30 a.m.-4:30 p.m. Jan. 25, Mallinckrodt Student Center, Lower Lvl. The Gargoyle, and 5-10 p.m. Jan. 26 & 27, Wohl Student Center, Friedman Lounge.) Mallinckrodt Student Center, Lower Lvl., The Gargoyle. 291-4741.

Lab

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weak enough to serve as vaccines."

According to the U.S. Centers for Disease Control and Prevention, noroviruses are involved in about half of all food poisoning cases and annually cause about 23 million cases of acute gastroenteritis in the United States.

Norovirus disease is characterized by frequent vomiting and diarrhea over the course of 1-2 days. The most infamous norovirus, the Norwalk virus, was first identified after a 1968 outbreak at a school in Norwalk, Ohio. The Norwalk virus also caused a series of repeated outbreaks on cruise ships in 2002 and in military personnel in Afghanistan.

Although such infections rarely lead to serious or life-threatening illness in the United States and other Western countries, they spread rapidly, are difficult to prevent from spreading and can create considerable discomfort. Dehydration from the diarrhea and vomiting induced by the virus sometimes leads to hospitalization in the elderly, the young or those with weakened immune systems.

In the developing world, these viruses are a major cause of human illness.

All previous attempts to culture human noroviruses in tissues in the laboratory have been unsuccessful.

"As a group, noroviruses have defied characterization for decades because there just hasn't been a way to get the virus to grow outside of a human host," Virgin said.

In 2003, Christianne Wobus, Ph.D., and Stephanie Karst, Ph.D., two postdoctoral fellows in Virgin's lab, identified MNV-1, the first known mouse norovirus. Virgin's group showed that the mice's ability to fight MNV-1 relied heavily on the innate immune system, the branch of the immune system that attacks invaders soon after they enter the body.

In the newly published study, Virgin's group reveals that MNV-1 likes to infect cells of the innate immune system. In tests in mice, the researchers found the virus thrived in macrophages, immune-system cells that normally engulf and destroy pathogens, and in dendritic cells, sentry-like cells that pick up and display proteins from pathogens.

"We think there may be dendritic cells just beneath the lining of the human gut that are providing the gateway the virus needs to cause disease," Virgin said.

To grow the virus in the lab, researchers took dendritic cells and macrophages from mice with defective innate immune systems and exposed them to the virus.

"The virus grew beautifully," Virgin said. "It's a very facile and robust system."

Comparisons of MNV-1 and human noroviruses have revealed many similarities in gene sequence, structure and overall arrangement of the genome. But Virgin acknowledged that differences between mouse and human physiology may significantly alter MNV-1's interactions with its host.

For example, mice do not appear to be able to vomit. Additionally, researchers aren't sure yet whether MNV-1 can make mice with normal immune systems sick.

"The bottom line is that this mouse model provides us with a very useful way to examine certain similar aspects of the noroviruses," Virgin said. "Among other things, we'll be using it to look at how the capsid protein enables infection, viral replication processes and the receptors on host cells that enable the virus to infect specific cell types."

Olin

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porate partners who are interested in the promotional aspects of our program, including prominent representation on the new Olin Cup Web site."

One of the primary goals of the Olin Cup competition, Harrington said, is "cross-campus collaboration" among WUSTL's top-ranked business, medical, law, engineering and other schools and among the vibrant and diverse business community leaders in the St. Louis area.

Luminomics was founded by Jeffrey S. Mumm, Ph.D. The company creates disease models and performs high-throughput screens to discover small molecules that stimulate cellular regeneration. Lead compounds capable of stimulating regeneration in the model system will be used to identify regenerative therapies for humans.

Luminomics is focused on four major neurodegenerative disorders, but the platform can be applied to any degenerative disease state or condition, said Mumm, who earned a doctorate in biology and biomedical sciences from the University. Accordingly, the company is partnering with other companies to provide tailor-made disease models and screening-outsource services for their specific degenerative targets.

Reactor

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unbounded water was converted to steam, decreasing the thermal neutron flux and making the reactor sub-critical."

("Critical" means that a fissionable material has enough mass to sustain a reaction.)

"It took at least 2.5 hours for the reactor to cool down until fission Xe (xenon) began to retain," the researchers continued. "Then the water returned to the reactor zone, providing neutron moderation and once again establishing a self-sustaining chain."

Prior to this calculation, it was known that the natural nuclear reactor operated 2 billion years ago for 150 million years at an average power of 100 kilowatts. The WUSTL team solved the mystery of how the reactor worked and why it didn't blow up.

Meshik and his collaborators, Charles M. Hohenberg, Ph.D., professor of physics, and Olga Pravdivtseva, Ph.D., senior research scientist in physics, used a selective laser combined with sensitive, ion-counting mass spectrometry to concentrate on the sample's moderator, a uranium-free mineral assembly of lanthanum, cerium, strontium and calcium called aluminophosphate.

The xenon found and analyzed provides the story of this ancient natural nuclear reactor. Meshik and his colleagues inferred from the xenon analysis the mode of operation and also the method of safely storing nuclear wastes, particularly fission xenon and krypton.

"This is very impressive, to think this natural system not only went critical, but it also safely stored the waste," Meshik said. "Nature is much smarter than we are. Nature is the first genius."

"We have all kinds of problems with modern-day nuclear reactors. This reactor is so independent, with no electronics, no models. Just using the fact that water boiled at the reactor site might give contemporary nuclear reactor researchers ideas on how to operate more safely and efficiently."

In 1952, Paul Kuroda predicted that if the right conditions existed, a natural nuclear reactor system could go critical. Twenty years later, noticing that uranium ore

The company is aggressively marketing the technology for out-licensing while pursuing drug discovery-based in-house research designed to capture sizeable portions of the degenerative disease market and bring a minimum of 25 times return on investment in the next five years.

The Blessing Basket Project was founded by Theresa Wilson, whose team includes Olin School undergraduate and graduate students. The first nonprofit entry in Olin Cup history, The Blessing Basket — 501(c)3 pending — is a social entrepreneurship venture started more than a year ago in pilot locations in six developing countries.

The Blessing Basket pays weavers in undeveloped countries the prosperity wage (which is multiples higher than the local average), imports high-quality baskets and sells them via its Web site, direct sales and retail relationships. Revenues above expenses are reinvested into additional product and economic/community development projects.

Core Devices, founded by John Izuchukwu, received an honorable mention for its portable anesthesia machine. The machine is designed to facilitate the delivery of care outside traditional hospital settings.

Likely applications include civilian and military operations, as well as private physician clinics, rural hospital settings and austere environments anywhere in the world.

Judges and team mentors for

the Olin Cup competition were selected from the St. Louis community as well as nationally, Harrington said, and were matched with Olin School teams. More than 50 business-school teams registered in this year's competition.

Ten teams made it to the semi-finalist round; five teams were selected as finalists.

Those finalists made two-minute "elevator pitches," prepared detailed business plans and made final presentations to the Olin Cup judges.

"The Olin Cup competition adds to the vibrant St. Louis start-up community," Harrington said. "It's truly amazing to see how quickly companies form when people from different disciplines create a collaborative environment."

The annual Olin Cup Competition was founded in 1987 as part of The Hatchery entrepreneurship course at the Olin School. The Olin Cup competition as a separate entity was launched in 2002, with a new emphasis on life sciences, medicine and technology startups, as well as other student-started ventures.

To date, the competition has resulted in the formation of more than 50 new businesses by Olin School business students and alumni.

An event Feb. 10 will mark the opening of registration for new teams for the next Olin Cup entrepreneurship competition. Teams may then register at www.olin.wustl.edu/cel/olincup/register.cfm.

The Skandalis Center for Entrepreneurial Studies is one of the Top 25 business-school entrepreneurship programs nationwide, based upon *Entrepreneur Magazine's* comprehensive rankings. It is a member of the Ewing Marion Kauffman Foundation National Consortium for Life Science Entrepreneurship.

The Kauffman Foundation recently selected WUSTL as one of eight U.S. universities to share \$25 million in grants through a program designed to make entrepreneurship education available across campus and transform the way entrepreneurship is viewed, taught and experienced. WUSTL received a grant of \$3 million.

Center

Opened in 1994; has done pioneering work

— from Page 1

health care has enormous potential to ensure treatment to persons whose disorder currently goes undetected, to extend evidence-based care to those who have been poorly served and to reduce racial disparities in care."

CMHSR opened in 1994 as the nation's first NIMH-funded social work research development center. Its research projects represent some of the pioneering clinical epidemiological, service-systems and quality-of-care research in mental health and social services.

The center's future work will build on its prior decade of mental-health research in the social services.

"The center's research agenda is built around projects with Missouri's Children's Division and Division of Senior Services and Regulation," said J. Curtis McMillen, Ph.D., center associate director and associate professor of social work.

"It includes a range of projects and studies designed to enhance quality improvement research methodology. With this new center, we are moving from studying how mental-health issues are handled in these sectors of care to devising and implementing strategies to improve services."

"Ultimately, we hope to develop system modifications for public social-service agencies that will result in better detection of mental disorder and access to treatment."

In addition to Proctor and McMillen, CMHSR's investigators include 35 Ph.D./M.D.-level researchers from around the University and across the nation.

The center has engaged the expertise of a variety of disciplines, including social work, anthropology, epidemiology, gerontology, health economics and policy, journalism, public health, library science, biostatistics, business, medicine, psychiatry, psychology, law, bioethics and sociology.

"From the perspective of the school, the launching of this new center is exciting not only for the advanced mental health services research that will be produced, but also for the outreach to social-services agencies to improve the quality of services delivered," said Edward F. Lawlor, Ph.D., dean of the School of Social Work and the William E. Gordon Professor.

For more information about the center or the open house, call the center at 935-5687 or go online to gwbweb.wustl.edu/users/cmhsr.



Alexander Meshik holds a tiny piece of rock from the only known natural nuclear chain reaction site in the world — in Gabon, West Africa. Olga Pravdivtseva and University colleague Charles Hohenberg collaborated on an isotopic analysis of a tiny portion of the sample that reveals how this natural nuclear reactor worked.

from the Oklo mine was depleted in 235 Uranium, it was discovered that the site had once been a natural nuclear reaction system.

"The big question we addressed was: When it reached criticality, why didn't it blow up?" Meshik said. "We found the answer in the xenon."

There were two major theories on how the reactor operated. One held that the system burned up highly neutron-absorbing impurities such as rare Earth isotopes or boron, and because of that the system shut down regularly, and different parts of the reactor might have operated at different times.

The other involved the role of water acting as a neutron moderator. As the temperature of the reactor went up, water was converted to steam, reducing the neutron thermalisation and shutting down the chain reaction. The chain reaction re-started only when the reactor cooled down and the water increased again.

Analysis of the xenon, the largest concentration of xenon ever found in any natural material, confirmed the water method. It also revealed the role of aluminophosphate as the system's waste absorber.

Xenon is extremely rare on Earth and very characteristic of the fission process. Chemically inert, the element has nine isotopes and is abundant in many nuclear processes.

"You get a big diagnostic fingerprint with xenon, and it's easy to purify," said Hohenberg, who

noted the importance of aluminophosphate in the natural nuclear reactor.

"More krypton 85, a major waste from modern nuclear reactors, is getting piped into the atmosphere each year," he said. "Maybe this natural mode can suggest a safer solution."

Can there be a natural nuclear reactor in actual operation today?

"Today, even the largest and richest uranium deposit cannot become a reactor because the present concentration of 235 U is too low — only about 0.72 percent," Meshik said. "However, because 235 U decays much faster than 238 U, in the past, 235 U was more abundant."

"For example, 2 billion years ago, 235 U was five times higher, about 3 percent, approximately the concentration of enriched uranium used in modern commercial reactors."

Another vital condition for self-sustaining nuclear reaction is the high content of a moderator to slow the neutrons, Meshik said. Water, carbon, most organic compounds, silicon dioxide, calcium oxide and magnesium oxide are all natural neutron moderators.

Also, the concentrations of neutron absorbers — iron, potassium, beryllium and especially gadolinium, samarium, europium, cadmium and boron — should be low.

"Only when all of these requirements are met can a self-sustaining chain reaction occur," Meshik said.

Notables

Zwerling Wrighton honored by YWCA

BY ANDY CLENDENNEN

Risa Zwerling Wrighton was honored at the YWCA's annual Leader Lunch and inducted into the Academy of Leaders at the 24th annual event Dec. 9 at the Millennium Hotel in St. Louis.

Each year, the YWCA Leader Lunch event honors 10 or more outstanding professional women for the important role they play in business, politics, education, science and technology, the arts, professions and racial justice.

Along with honoring "special leaders" from St. Louis, the YWCA selects a "future leader" (a senior from a local high school) and a "racial justice" honoree.

"I was thrilled to learn that I received the award, especially because I was nominated by the senior management of (Magellan Health Services)," said Zwerling Wrighton, wife of University Chancellor Mark S. Wrighton. "It was rewarding to know that my co-workers recognized that I not only worked hard for the company, but also was involved in the community."

At Magellan, the largest provider of employee assistance programs and managed behavioral health services in the country, Zwerling Wrighton manages a group responsible for acquisition, development and implementation of programs to assist employers in maintaining the well-being and productivity of their work forces.

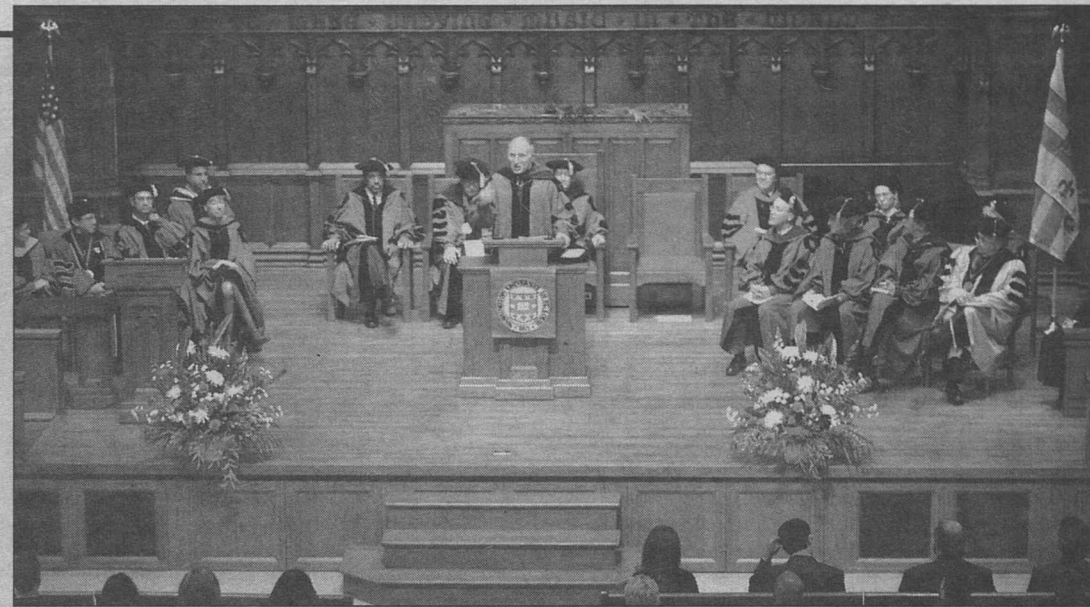
A strong believer in a keeping work and life balanced, Zwerling Wrighton shares the same commitment on behalf of students at Washington University. She created the Home Plate program, which pairs freshmen with local families to help recapture the experiences

they miss as students away from home.

She spends most evenings at Harbison House, where she co-hosts dinners honoring distinguished faculty and visiting dignitaries, as well as events with students, civic groups and WUSTL supporters.

"There were times in my life, when I was working and raising my two daughters as a single parent, when all I could do was try to keep our own lives going," she said. "Later, after I remarried and my children were older, it was great to discover that I had the psychological energy, experience and opportunity to make a bigger difference in this world — to help others beyond my own family."

"That is a wonderful place to be in life — when you can see beyond your own need."



December degrees Philip Needleman, Ph.D., University trustee and science partner for Prospect Ventures, delivers an address during the December Degree Candidate Recognition Ceremony Dec. 5 in Graham Chapel. A reception for the more than 130 degree candidates who attended the ceremony, along with their families and friends, and faculty and administrators, followed in Mallinckrodt Student Center. Needleman chaired the School of Medicine's Department of Pharmacology from 1976-1989 and was senior executive vice president, chief scientific officer and chairman of research and development at Pharmacia Corp. (formerly Monsanto/Searle) from 1989-2003. In addition to Needleman's address, Mark S. Wrighton gave the Chancellor's Message to the degree candidates.

Obituaries

Van Duyn, 83; poet laureate, former instructor in English

BY SUSAN KILLENBERG MCGINN

Mona Van Duyn, a former instructor in the Department of English in Arts & Sciences, a Pulitzer Prize-winner and the nation's first female poet laureate, died Wednesday, Dec. 1, 2004, of bone cancer at her home in University City, Mo. She was 83.

Van Duyn, who started writing poetry at age 5, earned a bachelor's degree from Northern Iowa University in 1942 and a master's from the University of Iowa in 1943.

That same year, she married Jarvis Thurston, Ph.D., now professor emeritus and former chair of the WUSTL English department.

In 1947, she and Thurston founded *Perspective: A Quarterly of Literature* while they were teaching at the University of Louisville.

When Thurston joined the WUSTL English faculty in 1950, the magazine moved with them to St. Louis. Van Duyn and Thurston produced it from St. Louis until it ceased publication in 1975.

Van Duyn lectured in English in University College from 1950-

1967. She later served as poetry consultant for the Olin Library Modern Literature Collection and as the Visiting Hurst Professor of English in 1987.

She also taught poetry workshops as a visiting professor in the English department's master of fine arts Writing Program in 1983 and 1985.

Van Duyn produced nine volumes of poetry, including *To See, To Take* (1970), for which she won the National Book Award for Poetry in 1971.

She served as poet laureate from 1992-93. In April 1991, she won the Pulitzer Prize in poetry for her seventh book, *Near Changes* (1990).

"Mona wrote about what she knew — which were mostly everyday things and not-so-everyday books — and then put her thoughts down as simply and plainly as possible, considering the intricacies of her rhyme schemes and stanza forms," said William H. Gass, Ph.D., the David May Distinguished University Professor Emeritus in the Humanities. "Yet the calm lines didn't add up to the ordinary. Strange things happened in them: 'We slapped the smirking mother and the swollen father and went to live in museums and anthologies.'"

"Her tears, which she could unashamedly shed in her poems,

from POSTCARDS FROM CAPE SPLIT

Why am I dazzled? It is only another harvest.
The world blooms and we all bend and bring
from ground and sea and mind its handsome harvests.

— Mona Van Duyn

Poet Laureate of the United States 1992-93
Teacher and Literary Editor Washington University

A plaque in recognition of Mona Van Duyn was hung, by coincidence, on Dec. 1, the day she died. The plaque hangs outside Duncker Hall, home of the Department of English, next to one honoring the University's other U.S. poet laureate, Howard Nemerov.

were made of two parts salt water and one part vinegar," Gass continued. "Her poems were wise because she didn't pretend. She made sure her bitterness was beautiful. She made sure bad things could go out in a good dress. Good things she saw through like sonar through seas."

"After breaking our knuckles digging in bleak rock, she said 'some of us sat and waited with whatever was in the world.' She

was someone to sit with. And had a hand to hold."

The Academy of American Poets named her a fellow in 1980 and one of its 12 chancellors in 1985.

A member of the American Academy and Institute of Arts and Letters, she was elected to the American Academy of Arts and Sciences in 1996.

The funeral service was private.

Mark Smith named director of Career Center

BY NEIL SCHOENHERR

Mark W. Smith, J.D., has been named director of The Career Center, announced James E. McLeod, vice chancellor for students and dean of the College of Arts & Sciences.

Smith, currently the associate dean for students in the School of Law, will begin his new position Jan. 1.

"I am very excited about this new opportunity," Smith said. "I have met with most of the people in The Career Center and am very impressed with everyone there."

"It is very clear to me that the University has made The Career Center a focus point. I look forward to the challenge."

At the law school, Smith taught legal research and writing, business law and pre-trial procedure courses.

Before joining the University he was an attorney at the international law firm of Bryan Cave in St. Louis. He practiced primarily in the labor and employment area, with an emphasis on federal court litigation. Smith also has extensive experience with general corporate mergers and acquisitions and estate planning.

In 1999, Missouri Gov. Mel Carnahan appointed Smith to the St. Louis Board of Police Commissioners, where he served as president.

Smith earned an undergraduate degree from Harvard University in 1982 and a law degree from WUSTL in 1986.



Van Duyn

Townsend, 82; professor emeritus in physics, alum

BY SUSAN KILLENBERG MCGINN

Jonathan (Jack) Townsend, Ph.D., professor emeritus of physics in Arts & Sciences and a University alumnus, died Monday, Nov. 29, 2004. He was 82.

Townsend earned a bachelor's degree in physics in 1943 from the University of Denver and a master's in 1948 and a doctorate in physics in 1951, both from WUSTL. His doctoral dissertation was on positron studies.

He was named an assistant professor in 1951 and promoted to associate professor in 1957. He retired as professor emeritus in 1987.

Richard E. Norberg, Ph.D., professor of physics in Arts & Sciences, who knew Townsend for more than 50 years, referred to

him as "an electronics wizard."

According to Norberg, Townsend designed electronic instrumentation to meet other people's research needs around campus, not just in physics.

"He took a very individualistic approach to designing electronics," Norberg said. "He was a very hard worker and a valued associate. He is often credited in graduate students' and other faculty's papers for his contributions to their research."

He played a major role in the design of electronic instrumentation for the University's early nuclear magnetic resonance (NMR) and electron spin resonance (ESR) research in the 1950s.

Interdepartmental research on NMR and ESR between George E. Pake, Ph.D., a former professor

and chair of physics, and Norberg, with Arts & Sciences' Samuel I. Weissman, Ph.D., professor emeritus of chemistry, and Barry Commoner, Ph.D., former professor of biology, drew heavily on Townsend's skills.

"What he really loved was making things work," Norberg said.

"He was the guy who made things work — electronic devices, mechanical devices. He built the apparatus not only for research but also for teaching purposes."

After retiring, Townsend continued to work with students in the freshman laboratory.

He was preceded in death by his wife, Patricia Bassford Townsend.

Among the survivors are a daughter, Victoria Townsend

Behrens; and a grandson, Michael Robert Behrens.

The interment was private.

Virgil Loeb memorial scheduled for Dec. 11

A memorial service for Virgil Loeb Jr., M.D., will be at 11 a.m. Dec. 11 in Graham Chapel. Loeb, professor emeritus of clinical medicine, died Tuesday, Oct. 26, 2004. He was 83.

Loeb was a hematologist and medical oncologist and former national president of the American Cancer Society. He also was a founding member of the community advisory board for the Site-man Cancer Center.

Washington People

For Barton H. Hamilton, Ph.D., it's all about the questions.

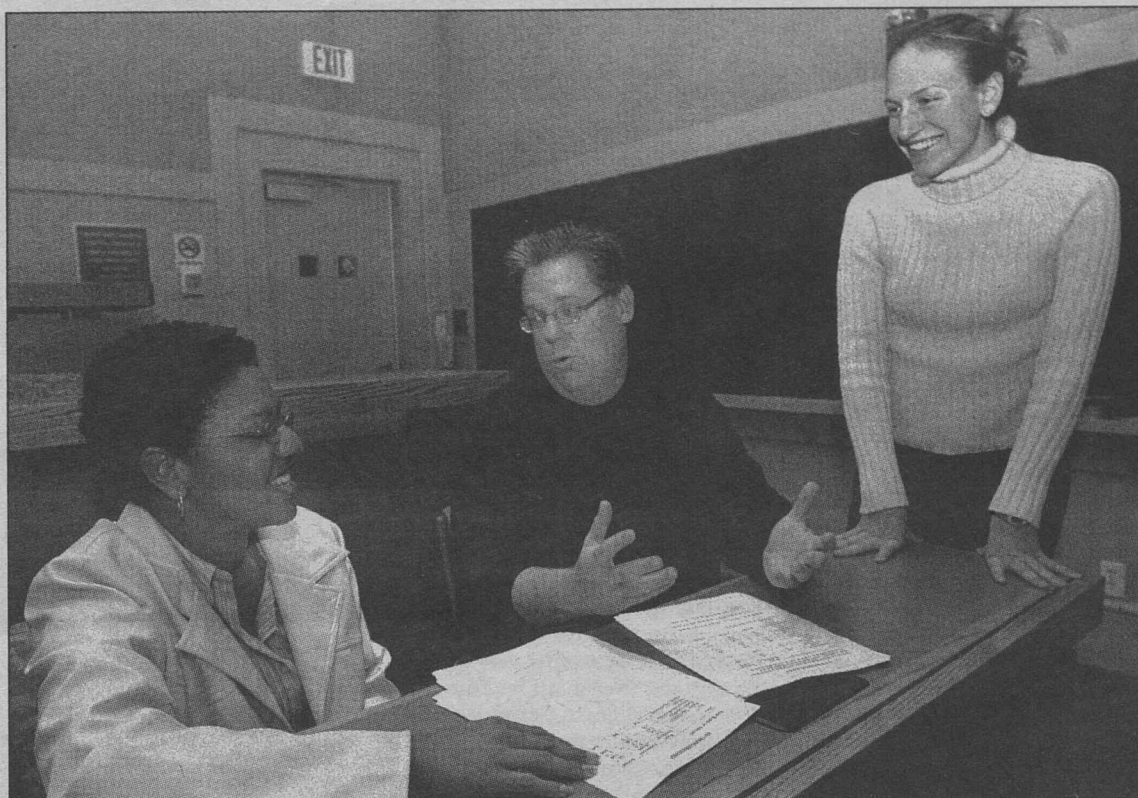
It's the quest for answers that drives Hamilton, the Robert Brookings Smith Distinguished Professor of Entrepreneurship in the Olin School of Business, to teach, research and mentor.

A professor of economics, management and entrepreneurship at the Olin School since 1996, Hamilton jams his time between classes with researching, mentoring students and junior faculty, and taking care of his 11-month-old twins, Bogdan and Nina.

"I love doing research. I come to work every day challenged," Hamilton says. "This is the best job in the world. Really, you come to work every day and you have some question that you're trying to answer or some set of questions you're trying to answer, and you're around a bunch of smart people that all have similar quests that they're on."

"I've never said, 'Gosh, I wish I was doing something else,'" he adds. "I've never seen another job I'd rather do."

Teaching and research go hand-



Barton H. Hamilton, Ph.D., talks business with students Nicole Brown (left) and Erica Greenberg. Kenneth A. Harrington, managing director of the Skandalis Center for Entrepreneurial Studies, says Hamilton "is a great colleague and one of the reasons that I enjoy being at Washington University."

Seeing it through to completion

Barton Hamilton delights in helping students make business ideas reality

in-hand, Hamilton says.

"I think what makes a university great — and certainly what I think is a strength of the Olin School of Business — is we have really high-caliber research. We're research-focused, and that's part of the reason I wanted to come here and why I like it here so much."

Hamilton came to the Olin School from McGill University, the leading English-language institution in Montreal, where he taught economics and conducted economic research for five years. When a referendum for secession of the Quebec province from Canada failed by a slim margin, Hamilton decided it was time to leave before the issue arose again.

"I figured I didn't want to be in a place that didn't value some of its institutions," he says.

Besides, the Canadian chill was a bit of a shock to the Santa Barbara, Calif., native. Hamilton majored in economics at the University of California, Berkeley, after writing in his entrance-exam essay that he wanted to be an economics professor.

"How a 16-year-old ever got the idea that he wanted to be an economics professor, I have no idea," Hamilton says. He suspects his interest in statistics and econometrics — applying statistical tools to economic data — grew out of his childhood passion for baseball statistics.

After graduating from Berkeley in 1985, Hamilton went straight into a graduate program at Stanford University, from which he earned a doctorate in economics in 1993.

In addition to a preoccupation with RBIs and ERAs, Hamilton gained a youthful admiration for his grandfathers, both successful entrepreneurs.

His paternal grandfather was an early aviation pioneer who later sold his aircraft business to what became Hamilton Sunstrand. Hamilton's maternal grandfather had a catering business that catered the building of the Hoover Dam and the burgeoning movie business in the 1930s.

That gold rush-like period between the two world wars offered many opportunities for people in California.

"What's interesting to me about entrepreneurship is some people were able to take advantage of that and be successful," Hamilton says. "It's kind of like what we had in

enter the Olin Cup, in which her team placed as a semifinalist.

"Bart is an academic, but he still has a good understanding of the real business world, and he enjoys working with startups," Coulter says. "And he thinks like an entrepreneur. I think that's a rare quality, and especially in an academic."

Clifford Holekamp's second-prize Olin Cup-winner in 2000, Foot Healers, led to Holekamp's inclusion in the *St. Louis Business Journal's* 2003 "30 Under 30" list of movers and shakers.

"Professor Hamilton was instrumental in starting my business," says Holekamp, who incorporated his podiatry/foot-care business the day of his M.B.A. Class of 2000 graduation. Hamilton nominated him for a Kupke Entrepreneurship Award, which

"Bart is an academic, but he still has a good understanding of the real business world and he enjoys working with startups. And he thinks like an entrepreneur. I think that's a rare quality, and especially in an academic."

LORI COULTER

the '90s with the Internet bubble."

As a professor of entrepreneurship, Hamilton guides undergraduate and master of business administration students through their business plans as part of the Hatchery entrepreneurship class and now the Olin Cup competition.

"There's nothing more exciting than seeing somebody pick a dream and, through a little bit of interacting with them in and outside the classroom, forming that idea into something they're actually going to start," Hamilton says. "And what's exciting is seeing people actually take the plunge and start the business. It's risky."

"Your friends who have their M.B.A.s and other WashU undergraduate degrees are going out working for consulting firms or investment banks, and you're starting a swimsuit business or a podiatry business."

Former Hamilton student Lori Coulter says, "Bart recognized my passion for entrepreneurship early and helped to develop my critical thinking skills."

Her Lori Coulter TrueMeasure swimwear company was hatched in the 2003 Olin Cup competition. During coursework for her 1999 M.B.A., Coulter worked with Hamilton on a business plan for a previous startup idea. Hamilton later encouraged her to return to

came with \$5,000. The idea Holekamp developed with Hamilton in the Hatchery course was rated by *Inc. Magazine* in 2003 as one of the top five ideas to watch, Holekamp says.

"I think (Hamilton) really embodies what the Olin ideal is supposed to be," Holekamp says. "He's great for providing an intellectual give-and-take, and there's something beyond the intellectual in that he really cares. He wants you to be a success in life as well as in business."

As exciting as it is to watch students succeed, Hamilton has never considered starting his own business. He's more than content to teach undergrads and graduate students, as well as executives enrolled in the Olin School's executive education programs.

"Teaching executives is a lot of fun because they really challenge you to make what you're talking about real-world relevant," he says. "Also it forces you into thinking about problems in a different way on the research side."

In his research, Hamilton has studied many facets of economics, especially labor and health-care economics.

"It's a big part of the economy," Hamilton says. "We've been in an era over the past 15 years when there's been a transformation of

the business of medicine. There's just a lot of interesting business and economic questions there, and they're real important."

He and co-researcher Brian P. McManus, Ph.D., are working on a long-term research project about infertility treatments that will ultimately result in several papers.

Their research studies the effect that lack of insurance coverage for such procedures has on access to care, quality of care and outcomes; what role competition plays; and what role the government should play.

"Those are all very interesting questions," Hamilton says.

They expect the research to gain understanding not only of infertility treatments, but also more-general lessons about medical markets, says McManus, an assistant professor of economics at the Olin School since fall 2001.

"Bart has a very good sense of which microeconomic issues are important and might yield fruitful research opportunities, says McManus. "He has a great ability to use data and statistical methods to present a coherent and strong analysis of economic issues."

On the personal side, "Bart is a very warm and generous guy," McManus says. "He has done a lot to welcome me — and other junior faculty — to Olin."

Kenneth A. Harrington, managing director of the Skandalis Center for Entrepreneurial Studies and a senior lecturer in entrepreneurship, says Hamilton has "a unique combination of teaching, research and interpersonal skills. He is a great colleague and one of the reasons that I enjoy being at Washington University."

Outside of work, Hamilton and his wife, Ursula, are big St. Louis Rams fans and enjoy going to games and training camp — at least, they did before the twins were born.

But he hasn't given up his lifelong offbeat hobby of keeping pet reptiles, including several red-foot tortoises that live in the family's back yard during the summer.

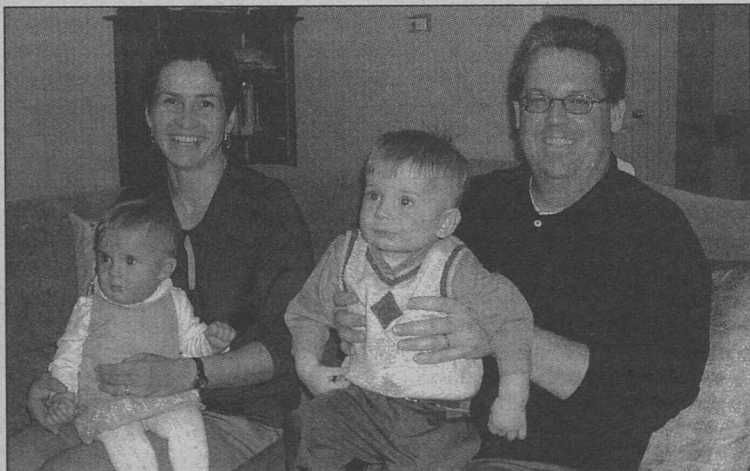
"Some people like to go fishing," he says. "I like to go lizard-catching."

Barton H. Hamilton

Title: Robert Brookings Smith Distinguished Professor of Entrepreneurship

Family: Wife, Ursula Kopij; twins, Bogdan and Nina

Education: Bachelor's degree in economics, University of California, Berkeley, 1985; doctorate in economics, Stanford University, 1993



Bart Hamilton and his wife, Ursula Kopij, enjoy Thanksgiving Day with their twins, Bogdan (right) and Nina.