1-21-1993

Washington University Record, January 21, 1993

Record

WASHINGTON UNIVERSITY IN ST. LOUIS

Vol. 17 No. 16 Jan. 21, 1993

Joseph J.H. Ackerman, Ph.D., professor and chair of the Department of Chemistry, Irene E. Karl, Ph.D., research professor of medicine, and Richard S. Hotchkiss, M.D., assistant professor of anesthesiology, examine a nuclear magnetic resonance (NMR) probe in the High Resolution NMR facility in the chemistry department. The physical chemist, metabolic specialist and intensive care unit doctor, respectively, have used NMR to change the way the medical community views bacterial sepsis, the leading cause of death in surgical intensive care units and neonatal units. Their work is the first detailed look at sepsis in a live physiological system.

Challenging conventional wisdom

Researchers dispute cause, treatment of often fatal condition

Three researchers at Washington University have teamed together to change the way scientists and physicians view an often fatal condition known as bacterial sepsis.

Sepsis is the result of infection and has been defined as the presence of bacteria and/or their products in the bloodstream. It is the leading cause of death in surgical intensive care units and neonatal units. Within the United States alone, 400,000 patients develop sepsis annually, and about 100,000 of them die. The condition is particularly deadly among patients who are immunosuppressed, or otherwise in poor health.

Common signs and symptoms are a high fever, rapid heart rate and respiration, high level of lactic acid in the blood and altered mental state. It is a multisystemic disorder that, once developed, shuts down one vital organ and body system after another.

Scientists and physicians disagree on the cause and treatment of the puzzling condition. There are two distinct and prevailing theories on its cause: one is deficient cellular energy metabolism; the other is deficient oxygen delivery to tissues, resulting in cellular hypoxia.

But now the three Washington University researchers — a physical chemist, an intensive care doctor and a metabolic specialist — have disputed these theories in a study of a rat sepsis model and have offered their own theory. The three are Joseph J.H. Ackerman, Ph.D., professor and chair of the Washington University Department of Chemistry and research professor of chemistry in medicine in the School of Medicine, Richard S. Hotchkiss, M.D., assistant professor of anesthesiology at the School of Medicine, and Irene E. Karl, Ph.D., research professor of medicine.

'Hypotheses don't hold water'

Using nuclear magnetic resonance (NMR), a molecular imaging technique, the researchers examined in vivo rat hind limb muscle of septic rats and reported no marked decreases in cellular energetics, no steep decline in blood flow, and no evidence of oxygen deficiency to the body's cells. Their work is the first detailed look at sepsis in a live physiological system. Their findings challenge conventional wisdom in treating the condition and have opened up new considerations for future treatment.

"We have solid evidence in this rat model that shows the two common hypotheses don't hold water," says Ackerman. "There are a number of key compounds used to run the energy-requiring processes of the cell, and when we look at these with NMR, we find the scoreboard in the cell looks fairly normal for these compounds. NMR gives very sensitive flow measurements as well as identification of the energy compounds. Despite the fact that sepsis caused major dysfunctions in the animals — they get extremely sick and ultimately die — in terms of cell energetics and blood flow, things look fine."

The scientists and collaborator Sheng-Kwei Song, Ph.D., research associate in anesthesiology at the School of Medicine, published their findings in Magnetic Resonance in Medicine, 25, 67-77 (1992), a journal published by Academic Press Inc. The study, part of Song's doctoral thesis in chemistry, complements an earlier one by Hotchkiss and Karl, "Re-evaluation of the Role of Cellular Hypoxia and Bioenergetic Failure in Sepsis," which was published in the Journal of the American Medical Association, March 18, 1992.

Because metabolic analysis of septic patients often reveals elevated concentrations of lactate in the blood, scientists theorized that the patients' tissues were deprived of oxygen. The oxygen deficiency in the cells had been implied as a contributing factor in multiorgan failure. But the Washington University researchers say their work indicates that, in some circumstances, these signs have been wrongly interpreted. The increased plasma lactate, they contend, isn't a sure clue that cellular hypoxia is involved. In previous

Continued on page 6

In This Issue...

Miller receives medical imaging research grants

Michael I. Miller, Ph.D., professor of electrical engineering and biomedical computing, recently received two $400,000, nationally competitive "External Research Grants" from the Digital Equipment Corp. for his work in massively parallel computation for medical imaging and scene recognition. The awards are intended to expand and enhance Miller's research being supported by his 1986 National Science Foundation (NSF) Presidential Young Investigator Award.

Electrical engineering and biomedical computing researchers at Washington University are conducting studies in three-dimensional medical imaging with massively parallel computers from Digital Equipment Corp.

Massively parallel computing breaks large computing problems into smaller pieces that can be handled in parallel by thousands of processors simultaneously. For certain types of computations, this results in much faster computation times compared with typical general-purpose computers that solve problems sequentially.

Miller and his colleagues are using the DECmpp 12000 system to develop medical imaging algorithms for positron emission tomography (PET) and magnetic resonance imaging, powerful new medical diagnostic techniques that allow scientists to view the human body in three-dimensional form. These methods enable researchers to study metabolic and physiological changes in the conscious human brain, as well as other physiological areas with far greater accuracy than current technology.

For example, PET provides vastly improved visual representation for neurological study. With three-dimensional brain mapping, a patient's actual brain

Continued on page 8

Helen Thomas, UPI White House bureau chief, to give lecture

United Press International (UPI) White House Bureau Chief Helen Thomas will deliver the CHIMES lecture at 11 a.m. Wednesday, Jan. 27, in Graham Chapel. The lecture, which is part of the Assembly Series, is free and open to the public.

Thomas was a panelist in the third presidential debate of 1992 held at Michigan State University. A 30-year veteran of the White House press corps, she is the most experienced reporter covering the presidency. During her career, she has interviewed seven presidents from John Kennedy to George Bush.

Helen Thomas

Thomas, who is known for her tough questions and aggressive style, was the only print journalist traveling with then President Richard Nixon to China during his breakthrough trip in January 1972. Later she traveled to China with Secretary of State Henry Kissinger, as well as Presi-

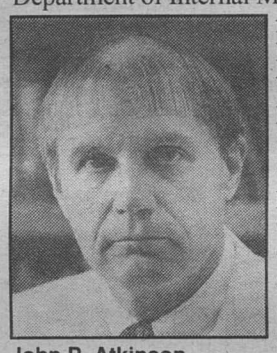
Continued on page 8

Medical Update

Atkinson and Gordon elected fellows of science association

John P. Atkinson, M.D., and Jeffrey I. Gordon, M.D., have been elected to the rank of fellow by the American Association for the Advancement of Science (AAAS). The association gives this honor to members "whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished."

Atkinson, professor and chairman of the Department of Internal Medicine and professor of molecular microbiology, was named for his pioneering research in immunology, for exemplary professional leadership in the field of rheumatology, and for inspiring contributions as a medical teacher.



John P. Atkinson

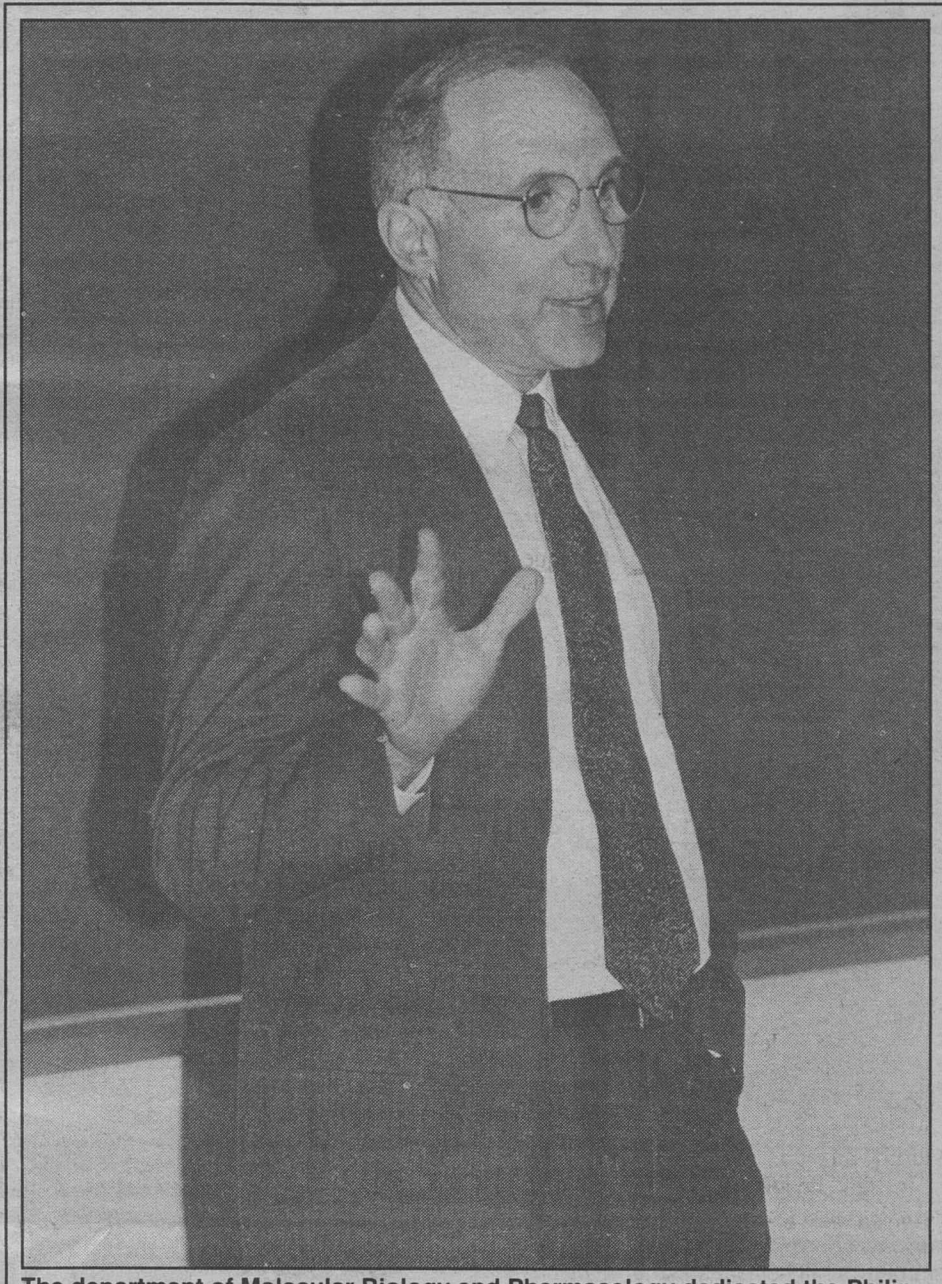
He studies the structure, function and genetics of the complement system, a group of proteins of the immune system. His research has played a key role in defining how the complement system is activated and in looking for ways to control the damage complement proteins sometimes cause by attacking the body's own cells. Atkinson discovered a complement protein in 1985 called membrane cofactor protein, or MCP, responsible for protecting body cells from their own immune system. MCP may someday be used to protect transplant organs from rejection or to trick the body into killing its own tumor cells.

Atkinson joined the Washington University faculty as an assistant professor of medicine and director of the rheumatology division in 1976. He became a professor in 1984 and was named chairman of the Department of Medicine in October 1992. He was an investigator of the Howard Hughes Medical Institute from 1976 to 1992 and serves on the editorial boards of several journals. His past honors include the Distinguished Teacher Award from the professional medical honor society Alpha Omega Alpha and the Arthritis Foundation's Lee C. Howley Sr. Prize for Arthritis Research.

Gordon, professor and head of the Department of Molecular Biology and Pharmacology and professor of medicine, was named for his studies on the cellular and molecular biology of cells that line the intestine and for analyses of the enzyme N-myristoyltransferase (NMT). Gordon's laboratory has used a family of genes encoding fatty acid binding proteins as models to study the atomic details of fatty acid-protein interactions and, through the use of transgenic mouse technology, to examine the differentiation and proliferation programs of intestinal epithelial cells. These latter studies have provided insights about how the intestine establishes and maintains distinct functions along its length and about the origins of intestinal cancer. In separate research, his students have used genetic, biochemical and organic chemical methods to analyze NMT and develop a new class of compounds that inhibit replication of the AIDS virus in cultured human white cells and kill certain fungi (in test tubes) that often infect patients with impaired immune function.

Jeffrey I. Gordon

Gordon became head of the Department of Molecular Biology and Pharmacology in January 1991 and has received several awards for his research, including the American Gastroenterological Association Distinguished Achievement Award.



The department of Molecular Biology and Pharmacology dedicated the Philip Needleman Library late last year. Needleman, research professor at the medical school, was head of the department from 1976 to 1989. The library honors Needleman who encouraged its use for seminars and to promote intellectual adventurism. Needleman currently is corporate vice president of research and development and chief scientist at Monsanto Corp., and president of Searle Research and Development.

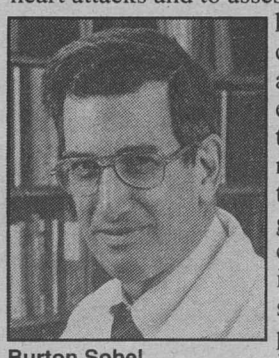
Sobel named president-elect of cardiology organization

Burton Sobel, M.D., professor of medicine and director of the cardiology division at the School of Medicine, has been named president-elect of the American Professors of Cardiology, a national organization devoted to excellence in fulfillment of the clinical, educational and investigative responsibilities of academic cardiology programs.

Sobel was elected to the position by the group's 118 members, all of whom are directors of academic cardiology programs around the country. He began serving the one-year term on Jan. 1, 1993. He will then serve as president for one year, succeeding Yale University's Barry Zarut.

The association serves as a sounding board for the field of cardiology by regularly soliciting opinions from its members about issues facing the field. Its function is to anticipate changing needs in clinical and academic cardiology, to recognize important clinical advances and to recommend ways to effectively train clinical and investigative cardiologists. Its goal is to keep the cardiology field responsive to trends and to facilitate interaction with other medical groups. The organization, currently in its fifth year, is expected to publish its research from time to time.

Sobel is known worldwide for his research contributions regarding heart function, positron tomography and enzymes and for the clinical introduction of tissue-type plasminogen activator, or t-PA, a drug used to quickly and safely dissolve blood clots that block coronary arteries and cause heart attacks. Early in his career, Sobel pioneered the use of the blood enzyme creatine kinase to diagnose heart attacks and to assess the extent of heart damage caused by an attack; tests for elevated levels of this enzyme are now considered the diagnostic gold standard. He currently is involved in several ongoing projects aimed at improving the effectiveness of clot-dissolving drugs.



Burton Sobel

Sobel has received numerous honors, including the 1992 James B. Herrick Award of the American Heart Association, the 1987 American College of Cardiology Distinguished Scientist Award, the 1984 American Heart Association Scientific Council's Distinguished Achievement Award and the 1981 Hearst Research Foundation's International Recognition Award. In addition, he was named councilor for the International Society for Fibrinolysis and Thrombolysis in 1992, and has served as a councilor for the American Society for Clinical Investigation and for the American Federation for Clinical Research.

He has published more than 600 scientific journal and textbook articles and serves on the editorial boards of several scientific journals. He has served on more than 20 national advisory committees for the National Institutes of Health and other organizations and has been a visiting professor or lecturer in the United States and abroad on more than 65 occasions.

Volunteers needed for study of treatment for non-insulin dependent diabetes

School of Medicine researchers need volunteers to participate in a study of a drug that may be effective in treating some individuals with non-insulin dependent diabetes and impaired glucose tolerance.

The drug, terbutaline, is similar to adrenaline, a naturally occurring hormone secreted by the adrenal gland in response to stress. The drug has been safely used to treat asthma and similar conditions. In addition, previous studies in men have shown that terbutaline can enhance insulin action.

Sixty sedentary men and women aged 30 to 50, who are healthy, non-smokers and taking no medication are needed for the study. Preference will be given to persons who are overweight and have a family history of diabetes. Volunteers will be tested for glucose tolerance. The study will require three four-hour morning visits over four weeks.

Medication and laboratory tests are free to participants. For more information, call Raymond E. Bourey, M.D., assistant professor of medicine, at 362-7299.

Record

Executive Director, University Communications: Judith Jasper
Executive Editor: Susan Killenberg
Editor: Deborah Parker, 935-5235, Box 1070
Editor, Medical news: Kleila Carlson, 362-8261, Medical School Box 8065
Assistant Editor: Carolyn Sanford, 935-5293, Box 1070
Contributing writers: Debby Aronson, Jim Dryden, Gerry Everding, Tony Fitzpatrick, Nancy Galofre, Jim Keeley, Juli Leistner, Nancy Mays, Dave Moessner, Joni Westerhouse, and Mike Wolf
Photographers: Joe Angeles, Tom Heine, David Kilper and Herb Weitman
Production: Galen Harrison
Record (USPS 600-430;ISSN 1043-0520), Volume 17, Number 16/Jan. 21, 1993. Published for the faculty, staff and friends of Washington University. Produced weekly during the school year, except school holidays, and monthly during June, July and August by the Office of Public Affairs, Washington University, Campus Box 1070, One Brookings Drive, St. Louis, Mo. 63130. Second-class postage paid at St. Louis, Mo.
Address changes and corrections:
Postmaster and non-employees: Send address changes to Record, Washington University, Campus Box 1070, One Brookings Drive, St. Louis, Mo. 63130.
Hilltop Campus employees: Send to Office of Human Resources, Washington University, Campus Box 1184, One Brookings Drive, St. Louis, Mo. 63130.
Medical Campus Employees: Send to Payroll Office, Washington University, Campus Box 8017, 660 S. Euclid, St. Louis, Mo. 63110.

Washington
WASHINGTON·UNIVERSITY·IN·ST·LOUIS

Washington People

Murphy fights crime using X-ray vision

When a call for assistance comes, William A. Murphy, M.D., shifts his attention from his daily responsibilities as a soft-spoken professional and becomes a master crime fighter.

But this is no comic book fantasy. The calls come from real-life law enforcement authorities who know that because of his experience and expertise, Murphy can read volumes in the X-ray films of bones where other people see only pictures of bleached calcium.

"Bones are like fingerprints," says Murphy, by day a professor of radiology at the School of Medicine's Mallinckrodt Institute of Radiology. "No two people have the same bony architecture. A person's genetics are expressed in facial features, in fingerprints and in bones. Each is unique to the individual." He explains that bone, the most durable human tissue, also stores information about an individual long after all other traces have disappeared.

Working with death investigators from local, state, national and international authorities, Murphy most frequently examines X-ray films of remains. By getting bones to tell everything they know, Murphy identifies the victims of foul play and quantifies their injuries for the police.

"Much of my forensic radiology work involves identifying people who have died," he says. "Of course, I can't just pick a person. The death investigators usually have a presumptive identification; they come to me for precision." He works mostly by comparing X-rays of the evidence with earlier, pre-mortem X-rays that have been scouted up by law enforcement officers or sometimes by Murphy himself.

In 1987, he identified a female victim in Philadelphia's grisly Heidnik case, using only limb bones found in a freezer in the murderer's kitchen. Heidnik lured mentally handicapped women into his home, then enslaved and tortured them until they died. Murphy was able to specify that the limb bones belonged to a particular victim, and his report served as a link between the murderer and the victim.

"Most remains are relatively complete skeletons, so usually there are lots of opportunities to get matching films," he says. And, surprisingly, perhaps two-thirds of the population has had a radiographic study — usually consisting of more than one X-ray film — within the past year, Murphy says. In most jurisdictions, hospitals are required to retain all X-rays of their patients for five years. Many private practices keep films for the life of the practice.

Still, Murphy says, getting a match is "sometimes easy, sometimes not." Complicating the issue is the need for identical alignment of the bones in both sets of X-rays. Exposures on the pre-mortem and post-mortem films also must be alike before a comparison can be made. Getting equivalent exposures can be especially tricky because films made in life were produced with tissue on the bone. Films of remains often record only the bone, with no surrounding tissue to influence the exposure.

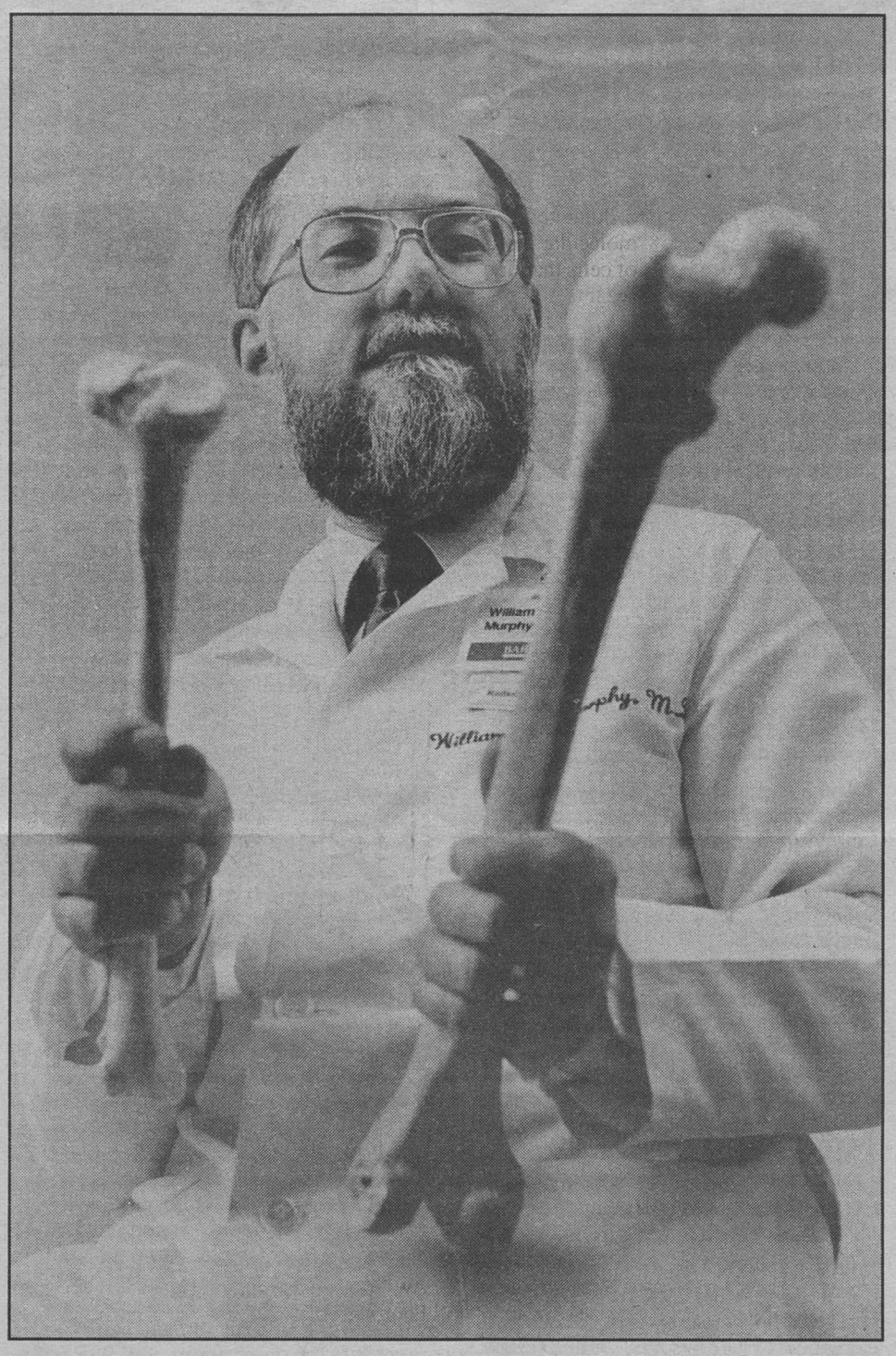
Before Murphy makes an identification, every element of the films he reviews must match: "No discordance can go unexplained," he says. He uses the shape and size of bones as well as the patterns in the cortex (the outer layer) and trabecula (the interior meshwork of interconnecting bony spicules, or tiny cross lines within bones).

Sometimes, a single observation immediately tells Murphy that he has a positive identification. For example, "two identical pieces of metal, such as a surgically implanted screw, in exactly the same place just wouldn't occur by chance," he says. Even with that kind of evidence, he still checks all other elements for concordance before making a positive identification.

Michael Graham, M.D., medical examiner for the City of St. Louis, says he calls upon Murphy's expertise perhaps once a month to establish identifications, interpret X-rays, determine the presence and nature of injuries suffered by a victim or set the length of time between injury and death. "He tells us who people are and how they died," Graham said. Graham rarely uses any other radiology expert. "When you have the best," he says, "there's no reason to change."

Murphy's interest in forensic radiology began during a three-month hiatus from medical school in 1969, when he served an externship in the Philadelphia medical examiner's office. That experience intrigued him, and ever since, word of his abilities has been spreading.

In addition to identifying bodies, Murphy separates human remains from the non-human. In one St. Louis County case involving a family dog that repeatedly brought home bones, Murphy was able to classify the bones as human remains and set the police on the trail of an execution-style homicide. "Once you know the anatomy, separating the human from the non-human is not difficult," although some animal bones may closely resemble human bones, he says.



"Bones are like fingerprints. No two people have the same bony architecture."

A third aspect of Murphy's work in forensic radiology involves documenting injury. During the era of "dare-devil" television, when amateurs attempted wild and dangerous stunts to get attention, Murphy documented the fatal injuries sustained by a parachutist who tried to land on the Gateway Arch. The sky diver touched down successfully but was blown off by a puff of wind. The would-be star slid down one leg of the arch to a horrible death. Murphy's testimony about the nature and extent of those injuries may well have contributed to the demise of the genre.

He also testified in the celebrated Gerald Smith murder case, detailing the extent of the damage done by Smith to his girlfriend's skull. Smith was later executed for his horrific crime.

Neither shy nor bothered by the gory details of some of his work, Murphy nonetheless testifies in court only rarely. Most often his written report is enough. When he is called to the stand, he works to instruct the jury or the judge in how to read the X-rays, then lets them reach their own inescapable conclusions.

Three times each year, Murphy lectures on his forensic work as part of a course titled "Medical-Legal Death Investigators' Training Course." Sponsored by St. Louis University, the course draws pathologists, coroners, medical examiners, and police investigators from around the country. He has taught in the course since 1978, training as many as 90 students at each session. Exposure there is one way in which his renown as a forensic radiologist has spread.

He contributes all of his professional time and expertise in forensic radiology as community service. Except in those cases that involve major travel or other large expense, Murphy doesn't charge for his services, even if he must drive to Illinois or to an outlying Missouri county. "It's my way of putting something back into the community," he says. "Everybody can find a way of using his skills to contribute to the community. That's all I'm doing."

If the work produces no monetary remuneration, each case supplies professional satisfaction. And there have been other rewards. Murphy recently has been approached to bring his expertise to bear on a case in which anthropologists are studying the remains of an individual unearthed in the American west. Preliminary studies suggest an age for the specimen of about 8,000 years.

Even more exciting is Murphy's invitation to consult as a paleoradiologist on the famous case of the "Ice Man" of the Tyrolean Alps. Found almost perfectly preserved, the Ice Man has been dated to about 5,350 years ago, meaning that he lived in about 3300 B.C. The specimen has been dated to the late Neolithic by means of carbon dating techniques and an almost pure copper ax found with him. Murphy already has made a first trip to Innsbruck, Austria, and plans to spend a year involved in an investigation to determine the Ice Man's skeletal structure and where it fits in the human perspective.

Because one of Murphy's avocational interests is in history, the two new endeavors promise to provide him with a welcome opportunity to learn more about antiquities. "This broadens my entire perspective, opens up a whole new territory," he says.

Paleoradiology and forensic radiology are all in addition to Murphy's primary profession of medical radiology. As co-director of the musculoskeletal section at Mallinckrodt, Murphy and his colleague, Louis A. Gilula, M.D., oversee what is probably the largest such group in the world. That administrative responsibility combines with his clinical, teaching and research duties to occupy the great majority of his professional time.

"Between two-thirds and three-fourths of my work is clinical — at Mallinckrodt Institute, the patient comes first," Murphy says. He also is instrumental in training residents in radiology, postdoctoral fellows and physicians from other specialties in the intricacies of radiologic medicine. At the Mallinckrodt Institute, the practice of mammography is administered by the musculoskeletal section, and the recent awareness of the importance of mammograms in the early detection of breast cancer has meant a subsequent increase in responsibility for Murphy and his colleagues.

For the past two years, Murphy has served as program chairman for the annual meeting of the Radiologic Society of North America (RSNA), responsible for the scientific program. In that position, he organizes 70 radiological scientist volunteers into 12 subcommittees to evaluate 3,500 abstracts and oversee 1,350 presentations.

The RSNA gathering is the world's single largest medical meeting, attracting more than 50,000 registrants. Regularly held in Chicago, it fills every hotel room in that city and overwhelms even O'Hare airport. "There's something to do every week," Murphy says of his contribution to the meeting. Before the 1992 meeting began, he was at work planning the scientific presentations for 1993.

Do professional responsibilities of this magnitude leave any time for anything else? "Oh yes," says Murphy, "I'm a father. That takes up all the rest of my time." His wife and three children — Abby, Larry and Ryan — see him almost every evening, and the family often travels together.

But even sleep, Murphy admits, is sometimes occupied by the demands of his careers. "I suppose I dream about it," he says, "though I don't usually remember the dreams." In a world that includes the likes of Heidnik, et. al., that's a lucky break.

— Steve Kohler

Calendar

Jan. 21–30

Lectures

Thursday, Jan. 21

Noon. WU Student and Employee Health Service and the Office of Women in Science and Medicine seminar, "Women's Stories," Sue Sobel, instructor in social work in psychiatry. Wohl Hospital Bldg. Aud. For more info., call 362-3528.

Noon. Dept. of Genetics seminar, "Genome Sequence Analysis in *C. elegans*," Robert H. Waterston, prof., Dept. of Genetics, WU School of Medicine. Genetics Library, Room 816 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Chemistry seminar, "Tyrosyl Radical in Atherosclerosis," Jay W. Heinecke, prof., WU Dept. of Medicine Lipid Research Center. Room 311 McMillen Laboratory. (Coffee: 3:40 p.m. outside Room 311 McMillen.)

4:30 p.m. Dept. of Mathematics colloquium, "Analytic Hypoellipticity, Nonlinear Eigenvalues and Nilpotent Group Representations," Michael Christ, prof., U. of California, Los Angeles. Room 199 Cupples I Hall.

Friday, Jan. 22

9:15 a.m. Pediatric Grand Rounds, "Computer Assisted Decision Making — The Demise of the Greek Oracle," Michael G. Kahn, asst. prof., WU Department of Medicine. Clopton Aud., 4950 Children's Place.

Noon. Office of Minority Student Affairs and the Student National Medical Association present the Dr. Martin Luther King Jr. Noonday Seminar, "Why Spousal Abuse and Domestic Violence are Civil Rights Issues for All People," with panelists Larry Davis, assoc. prof. of social work, George Warren Brown School of Social Work; Beverly H. Lee, attorney, Advocate Services for Abused Women; and Calvin B. Terrell, asst. director, Emergency Medical Services, DePaul Hospital. Erlanger Aud., McDonnell Medical Sciences Bldg.

Noon. Dept. of Cell Biology and Physiology seminar, "Post-transcriptional Regulation: An Emerging Paradigm for Control of Extracellular Matrix Production," William C. Parks, asst. prof., WU School of Medicine. Room 423 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Anatomy and Neurobiology seminar, "Retinal Cell Transplantation: Potential for Recovery of Visual Function," Martin Silverman, research asst. prof., WU departments of ophthalmology and visual sciences and anatomy and neurobiology. Room 928 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Earth and Planetary Sciences colloquium, "The Origin of Archean Anorthosites and Their Implications for Planetary Evolution," William C. Phinney, NASA's Johnson Space Center. Room 362 Natural Science Bldg.

4 p.m. Division of Hematology-Oncology seminar, "Superantigen Function in Mouse Mammary Tumor Virus Infection," Susan Ross, prof., Dept. of Biochemistry, U. of Illinois College of Medicine, Chicago. Room 8841 Clinical Sciences Research Bldg.

Saturday, Jan. 23

9 a.m. Dept. of Anatomy and Neurobiology seminar, "A Beginner's Guide to Transgenic Mice: C. Trapping and Farming," Joshua Sanes, assoc. prof., WU Dept. of Anatomy and Neurobiology; and John Merlie, prof., WU Dept. of Molecular Biology and Pharmacology. Erlanger Aud., McDonnell Medical Sciences Bldg.

Monday, Jan. 25

4 p.m. Dept. of Biology seminar, "Parallel Mechanisms of Initiation by RNA Polymerases II and III," Stephen Buratowski,Whitehead Institute, Cambridge, Mass. Room 322 Rebstock Hall.

4 p.m. Graduate Program in Immunology seminar, "Assembly of MHC Molecules," Hidde L. Ploegh, prof. of biology, Center for Cancer Research, Massachusetts Institute of Technology. Third Floor Aud., St. Louis Children's Hospital, 400 S. Kingshighway.

4 p.m. Social Thought and Analysis lecture, "The Relationship Between Language and Earnings," Barry Chiswick, Dept. of Economics, U. of Illinois. Room 149 McMillan Hall.

Tuesday, Jan. 26

12:10 p.m. Program in Physical Therapy Brown Bag Research Seminar, "Analysis of Hip Muscle Length in Healthy Boys and Boys with Duchenne Muscular Dystrophy," Jeanine Schierbecker, MHSPT Neurological Clinical Specialist, Dept. of Neurology, WU School of Medicine. Steven J. Rose Conference Room, third floor, East Bldg.

4 p.m. Molecular Microbiology seminar, "Adenovirus ProteinsThat Counteract Immunosurveillance," William Wold, chair, Dept. of Molecular Microbiology and Immunology, St. Louis University School of Medicine. Cori Aud., 660 S. Euclid Ave.

Wednesday, Jan. 27

8 a.m. Dept. of Obstetrics and Gynecology Grand Rounds, "Rape — What They Don't Teach You in the Emergency Room," Michelle DeVera, chief resident, WU School of Medicine. Clopton Aud., 4950 Children's Place.

11 a.m. Assembly Series presents the CHIMES Lecture with Helen Thomas, UPI White House bureau chief. Graham Chapel.

4 p.m. Dept. of Biochemistry and Molecular Biophysics seminar, "Biochemical Models From Insects," John H. Law, prof. and chair, Dept. of Biochemistry, U. of Arizona, Tucson. Cori Aud., 660 S. Euclid Ave.

4 p.m. Dept. of Mathematics Analysis Seminar, "All About Balls," John D'Angelo, prof., U. of Illinois, Urbana. Room 199 Cupples I Hall.

4 p.m. The Joint Center for East Asian Studies at Washington University and the University of Missouri-St. Louis present a colloquium, "Japan: The Domestic Politics of Internationalization," Frances McCall Rosenbluth, prof. of political science, U. of California, Los Angeles. Room 30 January Hall.

Thursday, Jan. 28

Noon. The WU Student and Employee Health Service and the Office of Women in Science and Medicine seminar, "Public Speaking and Ways Women are Socialized to Respond," Janet Saunders, president, The Clayton Consulting Group. Wohl Hospital Bldg. Aud. For more info., call 362-3528.

Noon. Dept. of Molecular Biology and Pharmacology seminar, "Mutagenesis of Cysteine Residues in the Human Gonadotropin α Subunit: Roles of Individual Disulfide Bonds in Secretion, Assembly and Biologic Activity," Madoka Furuhashi, WU School of Medicine. The Philip Needleman Library, Room 3907 South Bldg.

2:30 p.m. Dept. of Mechanical Engineering colloquium, "Interval Analysis of Mechanical Systems," Andrew D. Dimarogonas, William Palm Professor of Mechanical Design, WU Dept. of Mechanical Engineering. Room 100 Cupples II Hall.

4 p.m. Dept. of Chemistry seminar, "Superdeformation and Identical Rotational Bands in Nuclei: Chance Cancellations or a New Nuclear Symmetry?" Mark Riley, prof., Dept. of Physics, Florida State U. Room 311 McMillen Laboratory. (Coffee: 3:40 p.m. outside Room 311 McMillen.)

4:15 p.m. Dept. of Philosophy colloquium, "Vulgar Pragmatism: An Unedifying Prospect," Susan Haack, prof. of philosophy, U. of Miami, Fla. Alumni House Living Room.

Friday, Jan. 29

9:15 a.m. Pediatric Grand Rounds, "Update: Peripheral Nerve Surgery," Susan E. Mackinnon, prof. of surgery, WU School of Medicine. Clopton Aud., 4950 Children's Place.

Noon. Dept. of Cell Biology and Physiology, "Membrane Dynamics in the Macrophage," John E. Heuser, prof., Dept. of Cell Biology and Physiology, WU School of Medicine. Room 423 McDonnell Medical Sciences Bldg.

4 p.m. Dept. of Music lecture, "The Use of Chordal Instruments in Late 16th- and Early 17th-century Ensemble Music," Paul O'Dette, lutenist. Room 8 Blewett Hall Annex.

Performances

Friday, Jan. 22

8 p.m. Performing Arts Department presents "Washington University Dance Theatre." (Also Jan. 23, same time, and Jan. 24, 2 p.m.) Edison Theatre. Cost: $7 for the general public; $5 for seniors, students and WU faculty and staff. For more info. or reservations, call 935-6543.

Saturday, Jan. 23

8 p.m. Edison Theatre "Stage Left" Series presents Blue Rider Theatre performing "Frida: The Last Portrait." (Also Jan. 24, same time.) Drama Studio, Room 208 Mallinckrodt Center. Cost: $12 for the general public; $10 for seniors and WU faculty and staff; and $8 for students. For more info. or reservations, call 935-6543.

Films

Friday, Jan. 22

7 and 9:30 p.m. Filmboard Feature Series presents "The Player." (Also Jan. 23, same times, and Jan. 24, 7 p.m.) Room 100 Brown Hall. Cost: $3. **For 24-hour Filmboard hotline, call 935-5983.**

Midnight. Filmboard Midnight Series presents "Blue Velvet." (Also Jan. 23, same time, and Jan. 24, 9:30 p.m.) Room 100 Brown Hall. Cost: $3.

Monday, Jan. 25

7 and 9 p.m. Filmboard Classic Series presents "Strike Me Pink." (Also Jan. 26, same times.) Room 100 Brown Hall. Cost: $3.

Wednesday, Jan. 27

7 p.m. The Middle Ages Film Series presents "Virgin Spring." Room 219 South Ridgley Hall.

Thursday, Jan. 28

7 p.m. Dept. of Asian and Near Eastern Languages and Literatures presents the Chinese Film Series, "A Girl From Hunan" (English subtitles). Room 219 South Ridgley Hall.

Friday, Jan. 29

7 and 9:30 p.m. Filmboard Feature Series presents "Raising Cain." (Also Jan. 30, same times, and Jan. 31, 7 p.m.) Room 100 Brown Hall. Cost: $3.

Midnight. Filmboard Midnight Series presents "Heathers." (Also Jan. 30, same time, and Jan. 31, 9:30 p.m.) Room 100 Brown Hall. Cost: $3.

Exhibitions

"Bruce Nauman: Light Works." Exhibit opening: 7 p.m. Jan. 29. Exhibit continues through March 21. Washington University Gallery of Art, upper gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 935-5490.

"Selections From the Gift of Mr. and Mrs. Edwin Grossman." Through Jan. 29. Olin Library, Special Collections, Level 5. Hours: 8:30 a.m.-5 p.m. weekdays. For more info., call 935-5495.

"Works of Graphic Satire." Through Feb. 19. Olin Library, Special Collections, Level 5. Hours: 8:30 a.m.-5 p.m. weekdays. For more info., call 935-5495.

"Washington University Art Collections — 19th- and 20th-century European and American Artists." Through May. Gallery of Art, lower gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 935-4523.

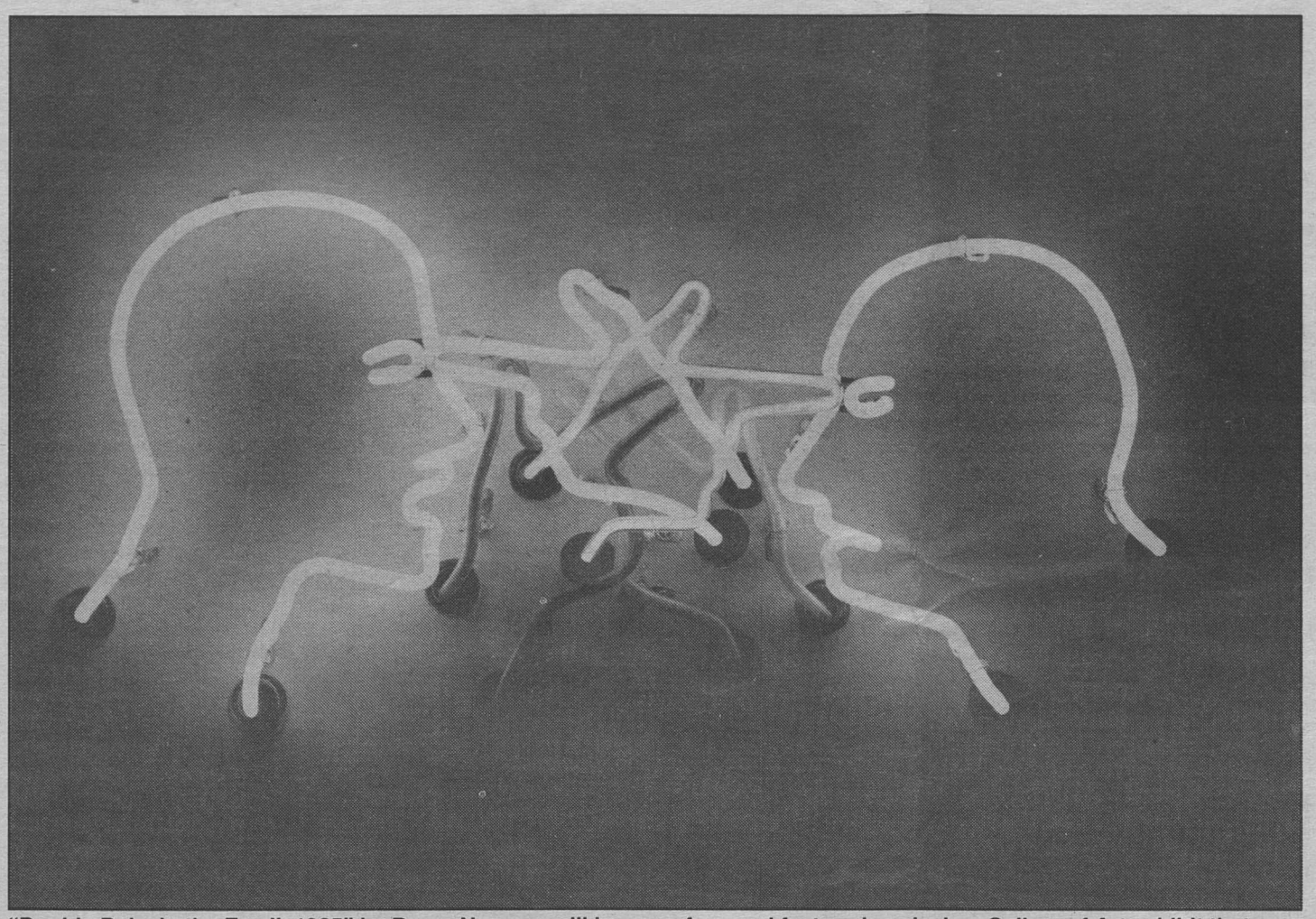
"Goddesses and Queens." Through July 3. Gallery of Art, lower gallery, Steinberg Hall. Hours: 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 935-4523.

Calendar guidelines

Events sponsored by the University — its departments, schools, centers, organizations and its recognized student organizations — are published in the Calendar. All events are free and open to the public, unless otherwise noted.

Calendar submissions should state time, date, place, sponsor, title of event, name of speaker(s) and affiliation, and admission cost. Quality promotional photographs with descriptions are welcome. Send items to Marie Doss at Box 1070 (or via fax: 935-4259). Submission forms are available by calling 935-8533.

The deadline for all entries is noon Tuesday one week prior to publication. Late entries will not be printed. The Record is printed every Thursday during the school year, except holidays, and monthly during the summer. If you are uncertain about a deadline, holiday schedule, or any other information, please call 935-8533.



"Double Poke in the Eye II, 1985" by Bruce Nauman will be one of several featured works in a Gallery of Art exhibit that celebrates the artist. "Bruce Nauman: Light Works" will be on display Jan. 29 through March 21. The above work was created with neon and glass tubing on a white aluminum background.

Exhibit spotlights artist's works in fluorescence, neon

Works in neon and fluorescent light by Bruce Nauman, one of the most innovative conceptual artists to emerge out of the 1960s, will be on display Jan. 29-March 21 at the Gallery of Art in Steinberg Hall. The exhibit is titled "Bruce Nauman: Light Works."

This is the first St. Louis exhibit of Nauman's work in more than 20 years. The only other local exhibit of Nauman's work was in 1971 at the Helman Gallery in downtown Clayton. That gallery later became the Greenberg Gallery.

The centerpiece of the Washington University exhibit is a reconstruction of "Helman Gallery Parallelogram," a 16-by-24-foot room with oblique angles that is flooded with an eerie, acidic green fluorescent light. The visitor enters the room down a long, narrow corridor and is perceptually disoriented by the light and unusually shaped space.

Another work featured in the exhibit is one of Nauman's earliest titled "Window or Wall Sign," a neon spiral with the slogan "The true artist helps the world by revealing mystic truths." Nauman has said of this work, "Once written down, I could see that the statement was, on the one hand, a totally silly idea and yet, on the other hand, I believed it. It's true and it's not true at the same time. It depends on how you interpret it and how seriously you take yourself. For me it's still a very strong thought."

Nauman has worked with a wide variety of media since his career began in the mid-1960s. His work has included performances, sculptures, holograms, films, drawings and prints. No matter what the medium, Nauman often focuses on social and political themes by exploring them through words, sounds and puns. Much of his work centers on the manipulation of words and sounds.

Nauman first used neon in his work while a student at the University of California, Davis, where he received a master's of fine arts degree in 1966. He was interested in signage as a part of the advertising milieu and recognized its potential for social commentary when exhibited in a museum or gallery setting. Nauman describes his neon and fluorescent works as signs not sculptures.

"Light Works" coincides with a growing interest in Nauman's work. A major international retrospective of Nauman's work, organized by Washington D.C.'s Hirshhorn Museum and Sculpture Garden and the Walker Art Center in Minneapolis, is scheduled to travel in 1993 to five museums in Europe and the United States.

The Gallery of Art is open from 10 a.m. to 5 p.m. weekdays and 1 to 5 p.m. weekends.

For more information, call 935-4523.

Goddesses, queens grace coins in exhibit

Forty coins and medallions covering 2,500 years of history are on display in the Gallery of Art in Steinberg Hall until July 3. The exhibit, titled "Goddesses and Queens," depicts women from the time of ancient Greece and Rome to the modern era in Europe and the United States.

An opening reception will be held from 7 to 10 p.m. Friday, Jan. 29, in the Gallery of Art. The reception is free and open to the public.

The coins are part of the University's John Max Wulfing Numismatics Collection, one of the five largest coin collections in the United States.

The exhibit includes coins from the earliest Greek colony in southern Italy, which date to approximately 520 B.C., to the U.S. dollar honoring Susan B. Anthony that was issued in 1979.

In classical Greece, the head or figure of Athena, Artemis and other goddesses often was used on coins. After the reign of Alexander the Great, later Hellenistic kings began using their own portraits on coins as a way to project their power. Consequently, the number of female images, whether goddesses or queens, diminished. In Rome the same pattern occurred, with goddesses being replaced by political leaders. Women of the Roman dynasties occasionally were represented on honorary issues.

Images of kings were commonly used in medieval and later Europe. The only women who appeared on coins were queens or empresses, such as Elizabeth I of England or Maria Theresa of Austria.

However, the first coins in the United States used the female personification of Liberty. The figure had been used by the Romans and was called Libertas. This image remained popular in the United States until the 20th century, when portraits of presidents gradually replaced it.

The only actual woman depicted on a U.S. coin was Susan B. Anthony. The Susan B. Anthony dollar was issued in 1979, but was withdrawn two years later because of numerous technical problems. Since then, no woman, personified ideal or actual person, has been portrayed on U.S. coinage.

The Gallery of Art is open 10 a.m. to 5 p.m. weekdays and 1 to 5 p.m. weekends. For more information, call 935-4523.

Grant brings saxophonist Oliver Lake home to create new work and teach about jazz

Jazz saxophonist Oliver Lake, a native of St. Louis and a member of the acclaimed New York City-based World Saxophone Quartet, will be in residence at Washington University this year.

The University's African and Afro-American Studies Program and Edison Theatre have received a $134,090 grant from the Lila Wallace-Reader's Digest Arts Partners Program to fund a community project that includes the residency. The grant period begins Feb. 15, 1993, and ends Jan. 31, 1995. Lake will be in St. Louis from Feb. 15-21 to begin work on the project.

As part of the residency, which the University will organize with the local arts and education communities, Lake will create a new work based on the Black Artists Group, a multidisciplinary artists organization that was active in St. Louis from 1968-1972. Lake is a founding member of the group.

Lake has been commissioned to write the new work for the East St. Louis Lincoln High School Jazz Band. Lake and the band, along with other artists, will perform the piece at Edison Theatre for the final St. Louis performance, which will feature jazz, dialogue, dancing and gospel singing, among other elements.

During his stay in St. Louis, Lake also will conduct master classes and workshops, participate in programs designed to help individuals understand his work and jazz as well as perform with artists from St. Louis and elsewhere. The University's partners in the Oliver Lake project are the Missouri Historical Society, the Forum for Contemporary Art, the New Theatre and Grand Center.

"An award of this size demonstrates Lila Wallace-Reader's Digest's belief in the importance of this project to our community in building an audience for jazz and brings national attention to St. Louis and its contribution to this American art form," said Jo Ann Collins, the African and Afro-American Studies administrator who wrote the grant application.

Washington University is one of eight colleges and universities that recently received grants totaling $580,310 from the Lila Wallace-Reader's Digest Arts Partners Program, which is administered by the Association of Performing Arts Presenters of Washington, D.C. The arts partners program supports strong working partnerships between organizations, artists and community groups. In 1991 the arts partners program awarded the University a $3,630 planning grant for the Lake project.

Sports

Men's Basketball

Last Week: Missouri-Kansas City 101, Washington 62; Washington 83, MacMurray 63; Johns Hopkins 68, Washington 58

This Week: Carnegie Mellon University, 8 p.m. Friday, Jan. 22, St. Louis; Case Western Reserve University, 3 p.m. Sunday, Jan. 24, St. Louis.

Current Record: 7-7

The Bears had an up-and-down week, sandwiching a strong win over MacMurray between road losses to Division I Missouri-Kansas City and University Athletic Association (UAA) rival Johns Hopkins University. The 10-point loss to Johns Hopkins was particularly costly as it dropped the Bears from the UAA leaderboard.

In their first game against a Division I opponent in two years, the Bears managed to stay within 48-34 at the half. But the bigger and quicker Kangaroos outscored the Red and Green 46-20 after intermission to pull away. Senior forward Charlie Borsheim, LaCrosse, Wis., led the Bears with 15 points and six rebounds. Borsheim again earned game-high honors against MacMurray, pouring in 22 points. He also tied a school record with six steals. Freshman Kevin Folkl, St. Louis (SLUH), came off the bench to contribute 18 points. Borsheim, who is averaging a Bear-best 19.9 points per game, delivered a game-high 20 points in the Bears' Sunday loss to Johns Hopkins.

Women's Basketball

Last Week: Washington 69, Catholic 50; Washington 71, Johns Hopkins 56

This Week: Carnegie Mellon University, 6 p.m. Friday, Jan. 22, St. Louis; Case Western Reserve University, 1 p.m. Sunday, Jan. 24, St. Louis.

Current Record: 13-1

Extending their win streak to eight games, the Bears closed out their non-conference schedule with victories over Blackburn and Catholic and then solidified their UAA lead by topping Johns Hopkins. The Red and Green are now 13-1 overall and 3-0 in conference play.

Guard Carolyn Royce, Clayton, Mo., who is completing her eligibility as a graduate student, enjoyed a sensational week. Royce tallied 16 points and team-highs with eight rebounds and four assists against Blackburn, then followed up with a game-high 14 points against Catholic, and finished with a season-best 18 points versus Johns Hopkins. Against Hopkins, Royce was successful on all four of her 3-point field goal attempts. Junior point guard Sarah Goldman, Nashville, Tenn., continued her hot streak by averaging 16.7 points per game for the week.

University announces 1993-94 tuition, fees for undergraduates

Undergraduate tuition and fees at Washington University next fall will be $17,776 for the 1993-94 academic year — a 5.1 percent increase above the current year, according to Chancellor William H. Danforth.

For 1993-94, tuition will be $17,600 plus a $176 required student activity fee, for a total of $17,776 in tuition and mandatory fees. Tuition is generally reported as the combined amount of tuition plus mandatory student fees. This is important to note when comparing tuition and fees of different universities.

Tuition and fees for 1992-93 are $16, 918, and include a $168 required student activity fee.

For 1993-94, typical room and board charges will be $5,574. The total 1993-94 charge (tuition, fees, room and board) is 4.7 percent greater than the corresponding charge in 1992-93.

In a letter to parents, Danforth said the University has "been able to attract an outstanding faculty and maintain a relatively low student-faculty ratio, while offering a wide range of courses and programs to allow students maximum flexibility."

However, he said the cost of providing this quality of learning environment is high. He cited rising costs for competitive faculty salaries and benefits and for quality library and laboratory services. Additionally, "governmental support of student aid has not kept pace with need or with inflation."

Danforth emphasized that the University remains committed to a strong financial aid program. About half of the University's undergraduates receive need-based aid from federal, state and institutional sources, with awards averaging approximately $13,500 per student.

The University also offers the Cost Stabilization Plan (CSP) to help lessen families' financial burden. The CSP allows monthly installment payments over as many as 10 years at competitive fixed interest rates.

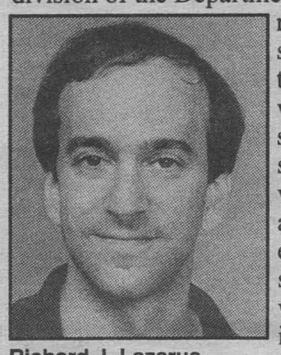
Correction

In the Jan. 14 issue of the Record, a profile about Martha N. Ozawa, Ph.D., incorrectly stated that she came to Washington University as an associate professor. In fact, Ozawa began working at the University as a professor.

Faculty members serve on Clinton transition team

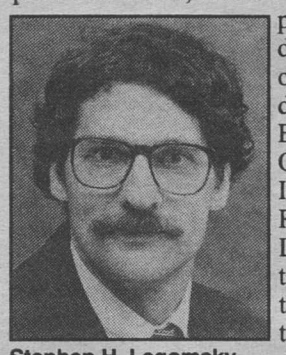
Three Washington University faculty members served as consultants to President Bill Clinton's transition team.

Richard J. Lazarus, J.D., associate professor of law, co-authored a report on the environment and natural resources division of the Department of Justice. The report assessed short- and long-term problems within the division. Lazarus said he interviewed political appointees, existing career section chiefs as well as people in industry and environmental organizations to forecast the division's future. He spent two weeks in Washington, D.C., compiling the report.


Richard J. Lazarus

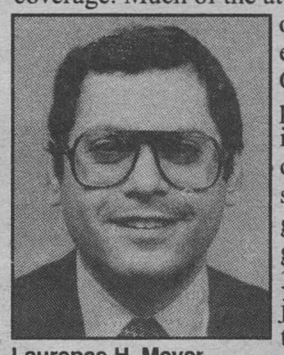
"It was a lot of fun," he said. "It was a non-partisan effort to debrief the outgoing administration and make way for a smooth transition."

Stephen H. Legomsky, J.D., Ph.D., professor of law, worked on a three-person team that drafted a report on the justice department's Executive Office for Immigration Review. Legomsky's team examined the organization, structure and independence of the office and looked at ways to expand opportunities for aliens to obtain representation.


Stephen H. Legomsky

Legomsky never had to leave St. Louis to get the job done. "We relied on a series of conference calls and faxes to draft the report," he said.

Laurence H. Meyer, Ph.D., professor of economics, began providing expertise to the Clinton campaign well before the election. Meyer gave a qualitative assessment of Clinton's economic proposals, which was mentioned frequently in campaign speeches and in national news coverage. Much of the attention focused on Meyer's estimate that Clinton's proposed marginal investment tax credit would spur economic growth and generate 300,000 new jobs in its first two years — all without raising the nation's budget deficit.


Laurence H. Meyer

"Nobody expected his tax credit proposal to offer this big of a bang for the buck," Meyer said.

Special insights provided by unusual research triangle — *from page 1*

isolated muscle preparations, Karl has shown conclusively that increased lactate can occur in sepsis without oxygen deficiency. The increase in lactate could be due to other factors such as a primary increase in glucose uptake into the cell or an increase in the breakdown of muscle proteins.

The key instrumentation in the recent study was nuclear magnetic resonance, a nondestructive and noninvasive technique. NMR allowed the scientists to look at an intact living system as opposed to isolated cells, cell culture or the muscle in isolation. With NMR, the scientists were able to examine the rats while they were alive and septic, enhancing the results because they better indicate what actually goes on during sepsis. There have been no NMR analyses of humans with sepsis.

Nuclear magnetic resonance gives a picture of bodily chemical processes by focusing on the interaction between atomic nuclei and a magnetic field. Using NMR, the Washington University team was able to monitor the activity of such high-energy phosphate molecules as ATP and phosphocreatine, and, by monitoring inorganic phosphate, determine the level of intracellular pH. They found levels of all these metabolically critical compounds to be essentially normal. Also with NMR, they were able to monitor the movement of heavy water — water enriched in the naturally occurring hydrogen isotope deuterium — in rat muscle to directly measure the rate of muscle blood flow. The blood flow, though decreased slightly from the control group, was not implicated as the major cause of sepsis.

Changing therapy

One of the baffling aspects of sepsis is that physicians can successfully stop the bacterial infection with antibiotics, but still lose the patient to sepsis.

"So many patients die of this condition in intensive care units, even though their bacterial infection is cured," says Karl, a specialist in metabolism. "At postmortem, there is no conclusive evidence of what killed the patients."

One of the current approaches to treating sepsis — in response to the oxygen deficit theory — is to prescribe drugs that increase oxygen delivery to the cells. Drawbacks include possible heart damage from overworking the heart and lung damage from increased water in the lungs. Another treatment, based on the inadequate cellular energy theory, is giving patients nutrients that would more effectively produce high-energy phosphates, the energy currency of the cell. The Washington University work indicates that such therapy is not effective because it does not address the underlying abnormality that drives the septic process.

The Washington University researchers recently have detected what may be a major cause of cell injury and death during sepsis. Their initial studies indicate that the concentration of calcium within the cell is markedly increased. Calcium is a critical regulator of a host of cellular processes, and in high concentrations it is a potent cellular toxin. In a separate experiment from the study that appeared in Magnetic Resonance in Medicine, the researchers have examined smooth skeletal muscle of septic rats and detected a two-fold increase of muscle intracellular calcium. They were able to alleviate this effect with an agent known to lower calcium.

Their finding is significant because septic patients often have low levels of calcium in their blood. In response, physicians sometimes prescribe therapy to increase serum calcium.

"From our evidence, treating a septic patient with calcium supplements would seem to be a miscalculation," says Ackerman. "A potential treatment might be to kill the bacteria and then, if intracellular calcium is up, try to lower it."

Collaborative approach

There is a substantial body of research on sepsis, but little consensus — or collaboration among different institutional laboratories — on what course to follow in successfully treating the condition. The Washington University effort to understand and treat sepsis is rare in two ways — the use of NMR and the special insights brought to the problem by the three researchers. Ackerman is an award-winning NMR pioneer who has developed innovative experimental techniques since the 1970s. Hotchkiss, the practicing medical doctor, was drawn to Washington University to collaborate with Ackerman using NMR to study sepsis. And Karl, an expert on lactate and mitochondrial metabolism, is a biochemistry specialist who has performed many metabolic assays on samples from septic patients.

"The understanding of sepsis calls for a truly collaborative approach, and we've assembled a very unusual research triangle here," says Ackerman. "We've been drawn together because of our long interest in sepsis problems. The work is a good example of the type of cooperation envisioned by Washington University's David Kipnis, who has strongly encouraged and supported interdisciplinary collaboration."

Hotchkiss, an anesthesiologist and critical care specialist, estimates he treats between 50 to 100 sepsis patients yearly in the intensive care units of the Washington University-affiliated Barnes and Jewish hospitals.

"There are children dying of sepsis as well as older people," Hotchkiss points out. "The problem is getting worse with an infusion of immunosuppressed patients due to organ transplantation and AIDS. NMR can be an important tool because it enables scientists to investigate sepsis under conditions which are likely to exist in the patient. It's vital to get a core of researchers together nationally to finally come to grips with the problem."

— Tony Fitzpatrick

News In Brief

Biggs appointed chairman, CEO of TIAA-CREF organization

The boards of trustees of TIAA and CREF recently announced the appointment of John H. Biggs, Ph.D., as chairman and CEO of the $112 billion pension and insurance organization. Biggs, a Washington University trustee, has been president and chief operating officer of TIAA-CREF since Feb. 1, 1989. Previously Biggs served as a CREF trustee.

Biggs succeeds Clifton R. Wharton Jr., who recently was nominated as U.S. deputy secretary of state in the Clinton administration. Thomas W. Jones was named to succeed Biggs as president and chief operating officer. Jones has been TIAA-CREF executive vice president for finance and planning since October 1989.

A native of St. Louis, Biggs earned a bachelor's degree in classics from Harvard University and a doctorate in economics from Washington University. He has an extensive background in insurance, investments, finance and university administration. From 1977 to 1985, Biggs was vice chancellor for finance and administration at Washington University, where he was responsible for several financial innovations in tuition payment plans and early retirement incentive arrangements.

Biggs is chairperson or a member of the investment committee of several not-for-profit institutions, including the Washington University Endowment, the National Bureau of Economic Research Endowment and the American Institute of Archaeology.

In addition, he is a trustee of The Danforth Foundation, and serves as a director of the National Bureau of Economic Research, McDonnell Douglas Corporation, Ralston Purina Co. and the Life Insurance Council of New York.

University makes world news as host of presidential debate

Washington University made news around the world when it hosted the first presidential debate of 1992.

The Office of Public Affairs received more than 600 clippings from key newspapers that specifically mentioned Washington University in their coverage of the Oct. 11 debate. Of the 600 clippings, 300 came from newspapers in Australia, Canada, England, France, Germany, Hong Kong, Italy, Japan, Korea, South Africa and Taiwan.

Broadcast and cable coverage included ABC, NBC, CNN, CSPAN, NPR and more than 30 television channels in major U.S. cities.

Faculty interviewed by the media included Susan Carlson, J.D., visiting associate professor of law, James Davis, Ph.D., professor of political science, Thomas Eagleton, LL.B., University Professor of Public Affairs, Wayne Fields, Ph.D., professor of English and dean of University College, John Gilmour, Ph.D., assistant professor of political science, and Robert Salisbury, Ph.D., Sidney W. Souers Professor of American Government.

News Analysis

News Analysis contains excerpts from the For Expert Comment service. The service, which provides timely faculty comments to media across the country, is distributed by the Office of University Communications.

Recent EPA report shows smoking is 'everyone's business'

Edwin B. Fisher Jr., Ph.D., professor of psychology and director of the Center for Health Behavior Research, is one of the nation's leading experts on smoking. He co-authored chapters in the 1989 Surgeon General's annual report on smoking and has conducted smoking cessation clinics for 14 years. He comments here on the Environmental Protection Agency's (EPA) recent report, which asserts that second-hand smoke is a proven human carcinogen, putting it in the same class as asbestos, radon and benzene.

"This report takes us another step in making it clear that smoking is everyone's business," says Edwin B. Fisher Jr. "Traditionally in the United States people leave one another alone as long as one person's behavior is destructive only to himself or herself. But the minute your fist touches my nose, it becomes my business. The point is that the person you don't want to offend by asking to stop smoking may be hurting you. This raises other questions, such as how do we encourage those we live with to quit? Or, even, how do we weigh smoking when thinking about spending our life with someone?

"For 30 years the cigarette companies have stood blindly in the face of an avalanche of evidence and have denied it all. The reason: cigarettes are two to four times more profitable than any other of the cigarette companies' products.

"This report gives non-smokers added ammunition to ask others not to smoke in their presence. It should accelerate restrictions on smoking in public. Most important, it should encourage those who still smoke to quit."

Introducing new faculty members

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

Ernst Ungewickell, Ph.D., associate professor of pathology, comes to Washington from the Max-Planck-Institut für Biochemie in Martinsried, Germany, where, as a group leader, he was primarily involved in research. He also was associated with the Ludwig-Maximilians-University of Munich, where he taught courses in biochemistry. His research interests are focused on intracellular membrane and protein trafficking and the cytoskeleton. He has received fellowships from the European Molecular Biology Organization and the German Research Foundation to do postdoctoral studies in the United States and England. He is the author of numerous articles published in journals and has written book reviews as well. Among his honors is a 1981 Heisenberg Award from the German Research Foundation to study receptor-mediated endocytosis at the Medical Research Council in Cambridge, England. A native of Berlin, Germany, he received a diploma in biology, which is equivalent to a master's degree in America, in 1974 and a doctorate in biochemistry in 1976, both from the Free University in Berlin.

For The Record

For The Record contains news about a wide variety of faculty and staff scholarly and professional activities.

Of note

Donald A. Branson, senior project leader in the Information Systems Department and a Washington alumnus, was awarded second place in a contest to develop a computer program for the recognition of handprinted characters. The contest was sponsored by Dr. Dobb's Journal, a computer publication. …

Chancellor **William H. Danforth** was one of five individuals who received a St. Louis Business Journal Award for 1993. Since 1980, the newspaper has presented the awards to individuals and companies for their business and civic contributions to the St. Louis area. In a two-page article, the Business Journal cited Danforth for leading the University to national prominence. The recipients received the awards during a reception in Simon Hall's May Auditorium. …

The Washington University chapter of the Golden Key National Honor Society, which recognizes upperclass students' academic excellence, inducted three new members. They are: **Jason E. Fritts,** a senior majoring in electrical engineering, and **William Weeks IV,** a junior majoring in electrical engineering and physics. Because of his contributions to the community, the University and to students, **James E. McLeod,** dean of the College of Arts and Sciences, was inducted as an honorary member. …

Gregory A. Grant, Ph.D., associate professor of biochemistry in medicine and of molecular biology and pharmacology, was elected president of the Association of Biomolecular Resource Facilities' executive board. The association is an incorporated, non-profit organization composed of more than 240 laboratory facility directors throughout the world. …

Hal W. Pedersen, a doctoral candidate in the School of Business, was awarded a $10,000 doctoral grant from The Society of Actuaries. The grant, one of four given to students nationwide for the 1992-93 academic year, encourages research of interest to the actuarial profession. Pedersen's grant will support research in option pricing theory and the term structure of interest rates. …

Sylvia M. Turnbough, senior personnel specialist in the Office of Human Resources on the Hilltop Campus, graduated from St. Louis Community College at Meramec's Women's Career Development Program. She earned a certificate by successfully completing four business-related courses in English, mathematics, oral communications and human behavior. The courses were designed to foster personal and professional growth. …

Robert Wykes, D.M.A., professor emeritus of music, received a Newly Published Music Prize from the National Flute Association for his divertimento work titled "Three Facets of Friendship." The piece was written for musicians playing the flute and clarinet. Wykes received the prize during the association's meeting in Los Angeles, Calif. The work is published by Fallen Leaf Press.

Speaking Of

During the Acoustical Society of America's (ASA) 124th meeting held in New Orleans, La., **William W. Clark**, Ph.D., associate professor of physiological acoustics in the Department of Speech and Hearing at the Central Institute for the Deaf, gave an invited address at a special session for society members. The title of his address was "The ASA's Role in Preventing Non-occupational Hearing Loss in the United States." The ASA meeting also featured a talk by **Julius L. Goldstein**, Ph.D., research professor of electrical engineering in the department. His talk was titled "Changing Roles in the Cochlea: Bandpass Filtering by the Organ of Corti and Additive Amplification on the Basilar Membrane." …

Joseph Davis, Ph.D., visiting assistant professor of Jewish thought, gave a presentation on "Radical Philosophical Skepticism Among Ashkenazic Jews in the 16th Century" at the Association for Jewish Studies' annual conference held in Boston, Mass. …

Paul Michael Lützeler, Ph.D., professor of German and comparative literature and director of the European Studies Program, delivered lectures on German and European literature in Trier, Bonn and Berlin in Germany as well as New Haven and New York. He also lectured on the topic during the annual conventions of the German Studies Association and the Modern Language Association, held in Minneapolis and New York, respectively. …

At the International Shakespeare Globe Centre in London, **Henry I. Schvey**, Ph.D., chair of the Performing Arts Department and professor of drama, gave a lecture titled "On Directing Othello." He also has been invited to direct the Globe's Summer Acting Programme. …

During the First All Scandinavian Goldsmiths' Symposium in Lahti, Finland, **Heikki Seppa,** professor emeritus of fine arts, delivered a talk on "The Difference Between the Metalsmith-Craftsman and the Artist." He also received a Gold Medal from the Goldsmiths' League of Finland for "loyal participation in the field of metalsmithing for more than 50 years." As an adjunct professor for three months at Finland's Goldsmiths' School, he lectured on "America: The Forerunner in Design Ideas, Nonsense and Results."

On assignment

The Oxford Center for Postgraduate Hebrew Studies awarded a Skirball Fellowship to **James S. Diamond**, Ph.D., adjunct professor of Hebrew literature. He is teaching and conducting research on modern Jewish writing at the center this semester.

To press

Prentice Hall published *MELAB: Computer Programs for Mechanical Engineers*, a book by **Andrew D. Dimarogonas,** Ph.D., William Palm Professor of Mechanical Design. The book includes software for mechanical design, vibrations and numerical analysis. …

C.V. Mosby recently published the fifth edition of *The Diabetic Foot.* **Marvin E. Levin,** M.D., clinical professor of medicine, is lead editor. …

Maxine I. Lipeles, J.D., professor (part-time) of environmental policy and regulation in the School of Engineering, co-authored the first casebook devoted exclusively to hazardous waste law. The casebook, titled Hazardous Waste, is part of a four-volume series of Environmental Law casebooks published by Anderson. …

Rowman & Littlefield Publishers Inc. recently published *Rethinking Masculinity: Philosophical Explorations in Light of Feminism*, a book of essays co-edited by **Larry May**, Ph.D., professor of philosophy.

Etc.

"Refraction," a video by **Van McElwee**, lecturer in performing arts, was shown at the Sixth Australian International Video Festival held in New South Wales. Several of his videotapes are now being distributed by London Video Access in the United Kingdom and Heure Exquise! in France, both video art distribution companies that cover Europe, the United States and Latin America. His video titled "Refraction" was included in the electronic image section of the London Film Festival.

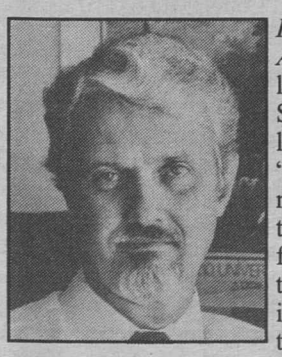
Guidelines for submitting copy:

Send your full name, complete title, department, phone number, and highest-earned degree, along with a typed description of your noteworthy activity to For The Record, Campus Box 1070. Items must not exceed 75 words. For more information, call Carolyn Sanford at 935-5293.

Campus Authors

The following are recent releases available at the Campus Bookstore in Mallinckrodt Center on the Hilltop Campus or at the Washington University Medical Bookstore in the Olin Residence Hall. For more information, call 935-5500 (Hilltop Campus) or 362-3240 (Medical School).

Signals From the Heartland is the title of a new book by **Tony Fitzpatrick**, senior science editor in the Office of Public Affairs. In the book Fitzpatrick provides a portrait of America's heartland through his profiles of some unique heroes: Midwestern naturalists, farmers and scientists who are deeply involved in saving and restoring the environment. Fitzpatrick, a Midwest native, limits his focus to Missouri and Illinois. The author explores Midwestern ecosystems, urban and suburban sprawl, the changing American farm, shrinking wetlands and significant hidden swamps. His guides in these journeys are real people working on real problems and their voices are loud and clear. (Walker Publishing Co. Inc., New York)



Interests and Institutions: Substance and Structure in American Politics is a collection of essays written over the last 30 years by **Robert H. Salisbury**, Ph.D., Sidney W. Souers Professor of American Government. The author, a leading analyst of interest group politics, believes that "politics consists of *interests* — groups, organizations or motivated individuals — pursuing public policy objectives. One cannot truly understand how an institution functions without studying what groups do in each institutional context," he says. The book contains his essays on interest group theory, macropolitical analyses, perspectives on Democratic theory, interests and institutions in the local community, and the paradox of interest groups in Washington. (University of Pittsburgh Press)

Opportunities & personnel news

Hilltop Campus

The following is a list of positions available on the Hilltop Campus. Information regarding these and other positions may be obtained in the Office of Human Resources, Room 126 North Brookings Hall, or by calling 935-5990.

Department Secretary, Part-time

930073. *Center for Computer Systems Design.* Requirements: Some college; typing 50 wpm with accuracy. Duties: answer telephone, greet callers; maintain calendars, schedules and files; make travel arrangements, type routine correspondence and classwork; assist in fiscal activities of center - coordinate journal search via Washington University School of Medicine Library, assist in annual report preparation, assist in coordination of research progress reviews, coordinate center technical report distribution; assist in departmental accounting procedures; maintain office supplies. Clerical tests and three letters of recommendation required.

Programmer

930091. *Olin Library.* Requirements: Bachelor's degree in computer science; demonstrated experience in coding and debugging C programs; working knowledge of the UNIX environment including TCP/IP networking; knowledge of object-oriented programming technologies such as C++; knowledge of PC programming environments (DOS and WINDOWS); experience implementing client-server applications. Resume and three letters of recommendation required.

Researcher

930110. *Development Services.* Requirements: Bachelor's degree, liberal arts background preferred; strong research and writing skills. Application, resume and three letters of recommendation required.

Library Technical Assistant (Binding)

930116. *Olin Library.* Requirements: Two years of college-level study or equivalent experience; physical stamina (including lifting boxes filled with books); ability to work with details in an organized and accurate manner; ability to work with materials in foreign languages; reading knowledge of one foreign language preferred; typing 30 wpm with accuracy. Clerical tests and three letters of recommendation required.

Administrative Assistant

930125. *Chemical Engineering.* Requirements: High school graduate, some college preferred; typing 50 wpm with accuracy; as much as five years office experience would be beneficial, especially if the person interacted with others. Some supervisory experience is required. Clerical tests and three letters of recommendation required.

Administrative Assistant

930126. *Alumni & Development Programs.* Requirements: Associate's degree or equivalent knowledge; specialized secretarial and business training; detail work experience necessary; five years general office experience; good command of grammar and punctuation; able to deal with multiple priorities; good telephone manner; mature, well groomed, pleasant personality; must be able to work occasional evenings and weekends; able to mix well with alumni and parents. Clerical tests and three letters of recommendation required.

Reference Librarian, Part-time

930128. *School of Business.* Requirements: Master's degree. Responsible for all operations in the library during the weekend; implement and interpret policy. Working hours each semester: noon to 6 p.m. Saturday; 1 to 6 p.m. Sunday; and 3:15 to 7:15 p.m. one weekday. Resume and three letters of recommendation required.

Administrative Coordinator, CRO Program

930129. *Research Office.* Requirements: Minimum of two years of college, bachelor's degree preferred. Support the associate vice chancellor for research and the director of the medical school's corporate research opportunities program by assembling scientific and marketing information, drafting correspondence, managing special project development, drafting reports, employing data base searching and data base management skills. Must be capable of smooth written and verbal interaction with medical school faculty, Research Office technology transfer (patents and licensing) staff, and representatives from R&D or legal departments of companies. Initiative and judgment and mature communications skills required. Deadline is Feb. 15. Resume and three letters of recommendation required to: Associate Vice Chancellor for Research, Washington University, Campus Box 8013, 724 S. Euclid Ave., St. Louis, Mo. 63110.

Director, Sponsored Projects Services

930130. *Research Office.* Requirements: Bachelor's degree. Supervise and provide services in the area of federal and nonprofit research funding to the University. Experience needed in principles of management of public funds by universities, government contracting practices, government regulations affecting research universities. Supervision of personnel to grade 10 required; interact and problem solve with faculty, administrators, agency personnel; monitor and analyze public policy, develop management systems to promote smooth function between different university departments; supervisory and position-specific experience required. Deadline is March 15. Send resume and contact information for three references to: Associate Vice Chancellor for Research, Washington University, Campus Box 8013, 724 S. Euclid Ave., St. Louis, Mo. 63110.

Director

930131. *Research Office.* Requirements: Master's degree, doctorate degree preferred. Direct a new program to generate corporate support for medical research; develop a networking capability through personal interaction with medical school faculty and corporate R7D managers. Interact with research office staff involved with technology transfer (patents and licensing). Graduate-level training in science or business required; up-to-date technical knowledge of several of the following areas required: biotechnology, pharmacology, medical devices and medical imaging; ability to extrapolate from scientific interest to commercial application required; strong synthetic and analytical skill and presentation abilities needed. Deadline is March 15. Applicants should send a CV and cover letter containing names, titles, addresses and phone numbers of three references to: Dr. Susan E. Cullen, Ph.D., Associate Vice Chancellor for Research, Washington University, Campus Box 8013, 724 S. Euclid Ave., St. Louis, MO 63110

Assistant Receptionist/Clerical Assistant

930137. *Office of Financial Aid.* Requirements: One year of college-level study; typing 40 wpm with accuracy; ability to work industriously and accurately in a well-organized manner; ability to maintain efficiency and composure under pressure, especially from multiple phone calls and frequent student requests; ability to work with a friendly, courteous manner; ability to maintain accurate and orderly records; ability to change or work on two or more projects simultaneously. Clerical tests and three letters of recommendation required.

Medical Campus

The following is a partial list of positions available at the School of Medicine. Employees who are interested in submitting a transfer request may contact the Human Resources Department of the medical school at 362-4920 to request an application. External candidates may call 362-7195 for information regarding application procedures or may submit a resume to the Human Resources office located at 4480 Clayton Ave., Campus Box 8002, St. Louis, Mo. 63110. The medical school does not disclose salary information for vacancies.

Electrician II, Facilities

930368. Requirements: Three years experience in electrical field or two years in technical school and electrical wiring experience. Prefer National Electrical Code Certification.

Medical Research Technician, Pathology

930374. Requirements: Bachelor's degree. Prefer experience in protein fractionation analysis, cellular fractionations and molecular biological techniques.

Clerk I, Surgery, Part-time

930420. Schedule: 18 hours a week, flexible hours. Requirements: High school graduate/equivalent, one year college preferred. Must be able to work independently and interact with medical staff; prefer typing speed of 20 wpm. Will perform a variety of basic clerical and office-related duties.

Medical Secretary I, Pediatrics

930451. Requirements: High school graduate/equivalent with a thorough knowledge of medical terminology; capable of operating routine office equipment; good interaction skills; typing 60 wpm; CRT and dictaphone experience.

Departmental Accounting Assistant, Neurology

930459. Requirements: One year college. Prefer individual with knowledge of Washington University Systems (Payroll, FIS, Grant Management); good math aptitude; accuracy and attention to detail a must; typing speed 30 wpm preferred; PC experience. Will be responsible for ordering all goods and services, paying all invoices and maintenance of all accounts and grants.

Programmer Analyst II, Neurological Surgery

930466. Requirements: Master's degree; two years experience with FT UNIX (SYS V) and C programming; strong math skills desirable. Prefer applicant with experience with silicon graphics workstations and real time optical sensing.

Medical Assistant, Pediatrics, Part-time

930471. Schedule: As-needed basis. Requirements: High school graduate/equivalent; RMA preferred. Desire individual with one year college and two to three years experience in a medical office setting.

Data Control Coordinator, Otolaryngology

930478. Requirements: Two years college, bachelor's degree preferred. Should be experienced with computer and data base management; elementary programming skills; experience on personal computer and WordPerfect. Will be responsible for developing, maintaining and using computerized data bases for clinical and basic research.

Statistical Data Analyst, Internal Medicine

930481. Requirements: Bachelor's degree, master's degree preferred. Would prefer an individual with experience in data manipulation and analysis. Desire individual with two years research experience in psychiatric and/or medical epidemiology.

Animal Caretaker Technician I, Comparative Medicine

930483. Schedule: Some weekends, holidays and overtime. Requirements: High school graduate/equivalent. Must be able to work with and handle animals. Manual skills and dexterity very important. Must be able to lift 50 pounds; valid driver's license required.

Histology Technician I, Ophthalmology

930495. Requirements: High school graduate/equivalent, bachelor's degree preferred. Prefer experience with paraffin sections, plastic sections and TEM; some histology experience. Will hire one full-time or two part-time persons.

Tool advances brain disease research — *from page 1*

dimensions are superimposed over an "idealized" stored computer image of a brain, customizing the image for improved diagnostics. Other uses of this tool include advanced research into the fields of schizophrenia, Alzheimer's disease, tumors and epilepsy.

"Massively parallel computing is perfect for our research because the computer's processors work together, mimicking the manner in which image formation and, therefore, image reconstruction occurs," said Miller, who has used his Presidential Young Investigator grant to purchase massively parallel processor technology to speed up visualization development.

Before massively parallel computing, scientists relied on Fourier analysis, a mathematical technique. "Massively parallel systems allow us to go beyond Fourier analysis and provide us with a greater accuracy in medical diagnostics."

Washington University also is collaborating with researchers at BELLCORE Corp. and Brown University in developing medical imaging and scene recognition applications. The alliance was initiated to provide researchers with supercomputing facilities across a high-speed network using multimedia tools.

"Software running on massively parallel systems is in great demand for all applications," said Charles Wilson, director of Digital Equipment Corp.'s Massively Parallel Systems Group. "For example, scientists are looking for more powerful applications to interpret electromagnetic information. Digital's third-party software development program is focused on providing solutions for those applications as well as others as quickly as possible."

The DECmpp 12000 can be expanded to include more than 16,000 processors that can perform up to 1.2 billion floating point operations per second (GigaFLOPS), a measure of scientific computing power.

Thomas — *from page 1*

dents Gerald Ford, Ronald Reagan and Bush. She has covered every economic summit.

Her honors include the 4th Estate Award in 1984, presented by the National Press Club "to recognize an individual for excellence and outstanding contributions to American journalism during an entire working career."

Prior to being named bureau chief, Thomas wrote radio news for 12 years for UPI, covering the federal government.

CHIMES is a junior class leadership honorary. The lecture is co-sponsored by the Assembly Series and Student Union. For more information, call 935-4620.