Against the odds
CANCER IMAGING
OF MAN AND MONKEY
MAKING THE RIGHT MOVES
An apple a day keeps future doctors at play: Second-year medical students Jenny Lee and Bito Miki were among 14 Lowry-Moore Society members who went on an impromptu outing in October to pick apples at Eckert's Country Market in Belleville IL. Here, Lee gets a lift from Miki to reach an upper branch. The students later made caramel apples with their harvest. The Lowry-Moore Society is one of three academic societies at the School of Medicine that enable students and faculty to socialize outside of the classroom.
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Evens to lead Barnes-Jewish Hospital

RONALD G. Evens, MD, has been appointed president of Barnes-Jewish Hospital.

Previously, Evens held two high-level positions at the School of Medicine. For 28 years, he was the Elizabeth E. Mallinckrodt Professor and Head of the Department and director of the Mallinckrodt Institute of Radiology.

Evens also served a two-year term as board chairman of the Washington University Faculty Practice Plan, one of the largest multispecialty group practices in the nation.

"Ron Evens is a brilliant manager, physician and scientist," says William A. Peck, MD, executive vice chancellor for medical affairs and dean of the School of Medicine. "I have great confidence that he will continue to strengthen the ties of these two outstanding institutions."

Stanley receives Burroughs Wellcome Fund Award

SAMUEL I. Stanley Jr., MD, associate professor of medicine and molecular microbiology, has received a five-year $425,000 award from the Burroughs Wellcome Fund.

Stanley is being recognized for his research on Entamoeba histolytica, a protozoan parasite that causes 40 million cases of dysentery each year and is the third leading cause of death from parasitic diseases.

In collaboration with Ellen Li, MD, PhD, professor of medicine and associate professor of biochemistry and molecular biophysics, Stanley discovered that the parasite recognizes and binds to a modified sugar on the surface of intestinal cells. Along with other researchers, Stanley and Li also have shown that the organism secretes an enzyme that cuts through the fibrous matrix around epithelial cells, facilitating invasion.

Stanley’s laboratory now is focusing on understanding how interactions between the parasite and host lead to intestinal and liver damage.

Mapping medical careers

KATHRYN M. Diemer, MD, assistant professor of medicine, has been named assistant dean for career counseling.

In her new position, Diemer will advise medical students on career planning and choosing specialties. She also will help senior medical students apply for residencies.

Diemer, a clinical expert on bone health, is a member of the division of medical education at Barnes-Jewish Hospital. She serves as an attending physician, supervises care of patients by house officers and medical students and helps develop primary care training and continuing ambulatory education for residents.

In 1991, she was named Teacher of the Year by the Jewish Hospital Department of Internal Medicine.

At the School of Medicine, she serves on the admissions committee and is a member of the Cori Society. The Cori Society provides a forum for students and faculty to interact in informal settings.

Diemer also serves on the Women’s Affairs Committee of the American Association of Medical Colleges and is a member of the American College of Physicians and the Society for General Internal Medicine.
Revisiting the Oklahoma City bombing

IN ADDITION to the physical damage and devastation that it caused, the 1995 Oklahoma City bombing had a major impact on mental health. In a study of survivors, researchers from the School of Medicine, the University of Oklahoma and the Oklahoma State Department of Health have found that almost half suffered from postdisaster psychiatric disorders in the months after the explosion. And they were able to identify the symptoms that indicated the need for treatment.

In the Aug. 25 issue of the Journal of the American Medical Association, the investigators report that 45 percent of the survivors surveyed had psychiatric problems in the six months following the bombing. Just over 34 percent had posttraumatic stress disorder (PTSD).

"This tragic event was extremely severe both in scope and intensity," says principal investigator Carol S. North, MD, associate professor of psychiatry. "Over the years, our group has studied survivors of 13 different disasters, and the 34 percent rate of posttraumatic stress disorder after the Oklahoma City bombing is the highest in any of the studies we've done to date."

Part of the reason may have been the magnitude of the disaster. The bombing of the Alfred P. Murrah Federal Building killed 167 people, including 19 children. Another 684 people were injured. More than 800 structures in the area were either demolished or damaged, and the estimated property loss was $625 million.

For the study, the investigators randomly selected 255 survivors from a confidential registry of 1,098 survivors maintained by the Oklahoma State Department of Health — 182 eventually were surveyed. Of those surveyed, 92 percent knew someone who was injured or killed in the bombing.

Just over one-third of the survivors in the study met the official definition of PTSD, but the experience of some posttraumatic stress symptoms was nearly universal. Posttraumatic stress disorder is the classic psychiatric disorder seen in disaster survivors.

Almost all survivors had flashbacks, nightmares or other intrusive reexperience symptoms. Hyperarousal symptoms also were common.

Accolades for Ludmerer's new book

A NEW book written by Kenneth M. Ludmerer, MD, Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care, was published this fall and has received critical acclaim.

Ludmerer, who is professor of medicine and professor of history in Arts and Sciences, previously wrote Learning to Heal: The Development of American Medical Education, which examined the creation of the country's system of medical education from the Civil War through World War I.

In his new book, Ludmerer provides a broad and comprehensive history of American medical education from the beginning of the 20th century through the present era of managed care. In addition, he describes the disturbing effects of recent trends in the medical marketplace on teaching, research and patient care and suggests alternative strategies which he says would better serve the public interest.

Reviewers of Time to Heal have enthusiastically received it both as a work of scholarship and as a critique of contemporary medical education. Sherman Mellinkoff of the University of California, Los Angeles, has described it as "the most important work on medical education since the Flexner report." Sherwin Nuland of Yale University hailed it as "one of the most important publications in the fields of medical history and education ever to be published in this country or elsewhere."

The Milbank Memorial Fund held an invitational conference to discuss the implications of the book for improving medical education and practice in the 21st century; the Association of American Medical Colleges is planning a series of such conferences, and the journal Academic Medicine plans to publish a special issue on the book.
Residents unveil plan for revitalization

FOREST Park Southeast, a diverse neighborhood that reflects the city’s loss of population and businesses, is leading the city back to health, thanks to a team of dedicated residents, community planners and two $1 million donations — one from Washington University School of Medicine and BJC Healthcare and the second from Mercantile Bank.

In July, neighborhood residents unveiled a comprehensive master plan for the neighborhood revitalization. Fashioned by neighborhood residents, business owners, developer McCormack Baron and representatives from the Medical Center, the plan aims to improve housing, employment opportunities, education, social and human services, security and business activity. The concept will result in:

- the renovation and reopening of Adams School (closed since 1993) and the building of a community center that will house an early childhood center and job training programs;
- the construction of mixed-income housing on vacant properties and restoration of existing houses;
- the redevelopment of Manchester Avenue to assist existing businesses and encourage new retail opportunities;
- a new elderly-living facility that provides support services;
- the rerouting of traffic to eliminate cut-through patterns that pose security risks for residents and their children;
- a parallel human services plan to bring much-needed health, safety and employment to the neighborhood; and
- increased police patrols for the safety of neighborhood residents.

“Washington University Medical Center recognizes that revitalization of the City of St. Louis begins with revitalization of neighborhoods,” says William A. Peck, MD, executive vice chancellor and dean of the School of Medicine. “Forest Park Southeast is our neighborhood, and we are committed to restoring its well-being.”

For Robins, thrice is nice

L.E.E.N. Robins, PhD, University Professor of Social Science and professor of social science in psychiatry, received three prestigious awards earlier this year. A world leader in psychiatric epidemiology research for more than 40 years, Robins was elected to the American Academy of Arts and Sciences, honored with a special Presidential Commendation from the American Psychiatric Association and named an honorary fellow in the Society for the Study of Addiction to Alcohol and Other Drugs.

The Presidential Commendation recognized Robins’ work in the area of child development and its impact on future mental health. That work began in the 1950s, when Robins and colleagues studied medical records dating back to the 1920s from the St. Louis Municipal Psychiatric Clinic. They located patients and a randomly selected control group and compared symptoms during childhood to outcomes in adult life. The research made key observations about how psychiatric disorders early in life can affect adults.

Robins was inducted into the American Academy of Arts and Sciences in October, one of two Washington University faculty members in this year’s class. The other is Robert A. Pollak, PhD, the Herrnreich Distinguished Professor of Economics in Arts and Sciences and the John M. Olin School of Business. Robins and Pollak increase the number of academy fellows from Washington University to 22.

Robins also was among 10 new fellows in the Society for the Study of Addiction to Alcohol and Other Drugs.
Hanson is a Keck Foundation distinguished young scholar

PHYLLIS I. Hanson, MD, PhD, assistant professor of cell biology and physiology, is among five first-time recipients of the Distinguished Young Scholar in Medical Research Award from the Los Angeles-based W.M. Keck Foundation. She was selected from among 10 finalists for the award.

The Young Scholars program will provide Hanson with $1 million in research support over five years to study the molecular machinery that neurons use to communicate. The machinery permits the release of sacs of chemical signals so one neuron can talk with neighboring neurons. Hanson will determine how membrane-associated proteins direct these sacs to release their cargo and then to reform. The work may one day suggest treatments for some neuromuscular, neurologic and psychiatric disorders that result from faulty communication between neurons.

A faculty member since 1997, Hanson also has received a scholar award from the McKnight Endowment Fund for Neuroscience, a Searle Scholar Award from the Chicago Community Trust and a fellowship from the Alfred P. Sloan Foundation.

Researchers pave the way to perform protein therapy in humans

FOR decades, pharmaceutical companies have struggled to overcome the molecular equivalent of the Great Wall of China: the outer membrane of cells, which prevents all but the tiniest of proteins from entering. Now researchers have slipped a protein that's more than 200 times larger than the average drug into the cells of living mice and shown that it functions.

"For the very first time, we've introduced a large, biologically active protein into every cell of the body — including cells in the brain that are normally protected by the blood-brain barrier," says Steven F. Dowdy, PhD, who led the research team at the School of Medicine. The group published its results in the Sept. 3 issue of Science. Steven R. Schwarze, PhD, a postdoctoral fellow in Dowdy's laboratory, was lead author of the paper.

Getting full-sized, therapeutic proteins into cells would be advantageous because smaller drugs tend to interact with unintended targets. Larger proteins fit only onto the molecules for which they were designed, so they could be given in substantially lower doses, resulting in fewer side effects.

In the Science study, Dowdy and fellow investigators first attached a molecular passport known as a protein transduction domain (PTD) to a compound whose uptake by cells could be monitored. The compound was a dye called fluorescein, which turns green when exposed to fluorescent lighting. The researchers injected mice with the combined PTD-fluorescein protein and isolated cells from the animals' blood and spleen. All the cells fluoresced green. Cells in muscle and brain tissue also had soaked up the combined protein.

Dowdy and colleagues then linked a bacterial enzyme to the PTD and fluorescein. Beta-galactosidase was chosen because its activity could reveal whether an enzyme could continue to function after it had been transported into cells by the PTD.

Dowdy's team tested whether beta-galactosidase trapped inside cells of injected mice converted the enzyme's clear chemical target into a blue dye. The kidney, liver, lung and other tissues of the injected mice turned blue when exposed to the enzyme's target. The animals' entire brains also stained blue.
Saffitz named Lacy Professor of Pathology

A NEW professorship to honor Paul E. Lacy, MD, PhD, and in memory of his wife, Ellen, is in place in the Department of Pathology. Contributions from former faculty and others affiliated with the department allowed the Paul E. Lacy and Ellen Lacy Professorship of Pathology to be established. Jeffrey E. Saffitz, MD, PhD, will fill the position.

Lacy, a professor emeritus of pathology, chaired the department from 1961 until 1985. He also was pathologist-in-chief at Barnes Hospital, Jewish Hospital and St. Louis Children's Hospital at the time.

Lacy is nationally renowned for studying physiological changes that occur during early onset, or Type I, diabetes. In particular, he is recognized for developing an experimental model for transplanting insulin-producing islet cells. Destruction of islet cells triggers Type I diabetes.

Saffitz, a professor of pathology and medicine, says the professorship is an extraordinary honor because Lacy was instrumental in guiding his career after he joined the pathology department as an intern in 1978.

Saffitz, who studies molecules that serve as gateways into muscle cells of the heart, is a staff pathologist at Barnes-Jewish and St. Louis Children's hospitals. He also directs the division of autopsy pathology at Barnes-Jewish and leads the Lucille P. Markey Special Emphasis Pathway in the division of biology and biomedical sciences. He has earned numerous teaching awards, including the 1991 and 1994 Teacher of the Year Award, and the 1997 Outstanding Clinical Investigator Award from the American Heart Association.

Study suggests new approach to glaucoma therapy

SCHOOL of Medicine researchers believe they have identified the basis for a new way to treat glaucoma, the second leading cause of irreversible vision loss in the United States.

In the Aug. 17 issue of Proceedings of the National Academy of Sciences, the investigators report on experiments involving an animal model of glaucoma. Working in rats with elevated eye pressure, they prevented loss of retinal ganglion cells using a drug that inhibits the action of an enzyme that makes nitric oxide.

The enzyme, NOS-2, can produce excessive amounts of nitric oxide, says lead author Arthur H. Neufeld, PhD, the Bernard Becker Research Professor of Ophthalmology and Visual Sciences. Neufeld and colleagues regarded its presence as evidence that nitric oxide might be involved with the ganglion cell damage seen in glaucoma. To explore that idea, they set out to determine whether NOS-2 was causing the damage in retinal cells or appearing as a byproduct of that damage.

The investigators put a drug called aminoguanidine into the drinking water of rats with elevated eye pressure. Other rats did not get the drug. After six months, the researchers found that the untreated rats lost 36 percent of their retinal ganglion cells, whereas those that received aminoguanidine lost less than 10 percent of their retinal ganglion cells in spite of continued elevated intraocular pressure.

Although the rats treated with aminoguanidine had less damage in the retina and the optic nerve, their intraocular pressure was no different than in animals that did not receive the drug. "Aminoguanidine did not lower the elevated pressure in these animals," Neufeld says. "That's important, because it means that lowering the pressure is not what protected the retinal ganglion cells."

That fact gives researchers hope that it may be possible to treat patients whose glaucoma does not respond to pressure-lowering drugs or surgery, as well as patients who have normal-pressure glaucoma.
Keck Foundation funds spinal cord research

THE W.M. Keck Foundation of Los Angeles has awarded $900,000 to the School of Medicine for research on repairing the injured spinal cord. Dennis W. Choi, MD, PhD, the Andrew B. and Gretchen P. Jones Professor of Neurology and head of the Department of Neurology, will lead the project. The grant will support pioneering work on spinal cord transplantation. The long-term goal is to use cells derived from embryonic cells to replace lost tissue. Such transplants might enable the cord to function once more so patients could regain bladder and bowel control and perhaps even walk.

Because the spinal cord does not repair itself, the best hope for restoring lost functions lies in replacing lost tissue. Fetal cells have been used in animals, but ethical concerns and the limited availability of such cells limit practical application in humans.

Over the past two years, John McDonald, MD, PhD, assistant professor of neurology, Choi and David I. Gottlieb, PhD, professor of neurobiology and associate professor of biochemistry and biophysics, have conducted the initial studies that led to the current project. The pioneering work showed that cultured rodent embryonic stem cells can be chemically instructed to develop into nerve cell precursors suitable for transplantation into the injured spinal cord.

Embryonic stem cells are the raw material of the body, able to develop into all of the cell types needed to make a human being. Because they can reproduce themselves indefinitely, a single cell line theoretically could provide transplants for many patients. Therefore, a continual source of embryos would not be required.

Salt receives Guyot Prize

ALEC N. Salt, PhD, associate professor of otolaryngology, received the Guyot Prize from the University of Groningen in the Netherlands. Salt was nominated for his hearing studies, which helped establish new treatments at the University of Groningen's otolaryngology clinic.

Salt studies a spiral-shaped structure in the inner ear called the cochlea, which converts sounds into nerve impulses that can be processed by the brain. The sound waves are transferred to fluid within the cochlear duct, the innermost compartment of the cochlea. Salt's investigations of the duct fluid, called endolymph, may one day lead to better treatments for Meniere's disease. Meniere's disease causes periodic episodes of vertigo that may last for hours or even days, confining people to their beds.

The disease results from too much endolymph in the cochlear duct, but no one knows what causes the buildup.

Doris Duke Foundation honors DeBaun for sickle cell research

MICHAEL R. DeBaun, MD, assistant professor of pediatrics and biostatistics, has received a 1999 Doris Duke Clinical Scientist Award from the Doris Duke Charitable Foundation.

The three-year, $100,000 award supports investigators who are beginning careers as clinical researchers, especially in the areas of sickle cell anemia, heart disease, AIDS and cancer.

DeBaun studies strokes in children with sickle cell disease. About one-fifth of children with the disease have a stroke before age 12, and two-thirds have a silent stroke that goes unrecognized because the child acts normally. The telltale sign is that the child cannot keep up with schoolwork. DeBaun is trying to understand how best to identify children who have had silent strokes, the risk factors for strokes, and the best way to help these children catch up at school.

He also studies syndromes that predispose children to cancer. He is especially interested in an overgrowth disorder called Beckwith-Wiedemann syndrome and has established a registry of children with the disease to help determine the risk and frequency of cancer in this population.
During one bad week in 1993, David Hoffmann fell off a truck and slid down a ladder, severely injuring the cerebellum in his brain. Today, the 39-year-old engineer from Collinsville IL, can speak only if he thinks about every word. He can walk only if he thinks about every step. But the former all-around athlete can't play soccer with his 16-year-old son or drive a golf ball down the range.

Hoffmann, like four in every 100 people, has a movement disorder; his is the result of cerebellar ataxia. Folksinger Woody Guthrie died of Huntington's chorea, and Pope John Paul II, Attorney General Janet Reno and actor Michael J. Fox have Parkinson's disease. These disorders, with their vastly different symptoms, can affect any muscle in the body. But the problems begin in the brain.

Hoffmann has a shrunken cerebellum. This fist-sized structure in the back of the brain plans and coordinates movements. So if Hoffmann wants to move a limb, he has to plan ahead.

Parkinson patients have defects in the basal ganglia. This odd collection of structures deep within the brain turns off the control mechanisms that defy gravity when we stand or sit. If these restraints persist when a person tries to walk or rise from a chair, it's like having the handbrake on.

For more than two decades, School of Medicine researchers have studied the cerebellum, the basal ganglia and other movement centers in the brain. They have shown how these control posts normally work and what happens when they malfunction.
THE CEREBELLUM

Studies by W. Thomas Thach Jr., MD, professor of neurobiology, neurology and physical therapy, have clarified the role of the cerebellum. "It gets it all together," Thach likes to say. "The cerebellum has to decide which of our more than 500 muscles to use, exactly when to use each one, and how much strength each muscle should exert."

Thach's early work showed that different parts of the cerebellum control specific parts of the body and that output from the cerebellum also forms a map. Thus damage to one part affects the legs, as in alcoholic cerebellar ataxia, which creeps up from the toes. Essential tremor - which affects Katharine Hepburn - begins at the other end of the map, affecting the head and voice.

Scientists used to think the cerebellum watched over muscles, keeping them at the ready. Then Thach found that this center becomes active about one-tenth of a second before movement begins, as if it were involved in planning. But cerebellar neurons idled while monkeys did simple tasks such as flexing the wrist. And patients with cerebellar damage performed movements involving one or a few muscles quite well.

Experiments with prism glasses gave clues to the cerebellum's true function. These glasses bend rays of light so people must look sideways to see something that really is in front of their face. If asked to point to an object, they point sideways at first, but eventually learn to point straight ahead.

People with cerebellar damage couldn't learn the trick. Neither could monkeys whose cerebellum temporarily was inactivated by an anesthetic. Normally, the cerebellum is active when monkeys learn this hand-eye coordination task, and one type of neuron, dubbed "the teacher," is heavily involved in the process.

By monitoring the activity of cerebellar cells during manual tasks, Thach's group has discovered that some neurons fixate about how hard muscles must push while others focus on hand position. Still others seem to plan the next move. So this director in the brain can choose and train a cast for any type of production. "The cerebellum can link up muscles in new and novel ways so that, with practice, people can learn quite unnatural tasks such as driving a car or playing the guitar," says Thach, a guitarist himself.

Amy J. Bastian, PhD, PT, assistant professor of physical therapy and neurobiology, has discovered that the cerebellum also adjusts the positions of joints when nearby joints move. When you move your elbow, for example, it repositions your shoulder. "Your body is a complicated physics problem — for every action there is a reaction. The cerebellum helps keep it all straight," Bastian says. "People with cerebellar damage don't produce the correct automatic counterbalancing forces. So they produce movements that are clumsy or uncoordinated."

Bastian uses sophisticated techniques to analyze natural movements in three dimensions. By studying patients with cerebellar defects, she devises ways to simplify daily tasks. For example, she teaches patients to eat with an elbow on the table so only part of the arm must move. Then their inability to coordinate elbow and shoulder movements no longer interferes with their meal.

THE BASAL GANGLIA

Jonathan W. Mink, MD, PhD, assistant professor of neurology, pediatrics and neurobiology, is exploring the functions of the basal ganglia. These six clumps of matter...
Amy J. Bastian, PhD, PT, analyzes the movements of patient David Hoffmann during a physical therapy session.

Deep within the brain form a complex circuit. When they malfunction, symptoms range from the rigidity of Parkinson's disease to the wild movements of Tourette's syndrome.

Scientists used to think the basal ganglia initiated movement. But Mink's studies showed that the neurons fire too late to play this role. Exploring other possible functions, he trained monkeys to move an arm in two ways. Either the arm moved a weight or the weight helped move the arm. Monkeys with lesions in a pea-sized basal ganglion called the globus pallidus had little difficulty pushing the weight because they simply had to turn on muscles. But they had trouble when the weight was assisting them because they couldn't turn off the muscles. "The primary function of the basal ganglia seems to be to inhibit potentially competing motor patterns," says Mink.

This function becomes useful when you reach out to punch an elevator button. As you activate the program for reaching, the basal ganglia turn off the program that keeps your arm by your side when you're standing still. But when they malfunction, as in Parkinson's disease, they keep patients in a neurological straight jacket.

A surgery called pallidotomy, which destroys parts of the globus pallidus, is helping many Parkinson patients, and Mink performs the necessary brain mapping. He also collaborates with Bastian, who is analyzing the movements of Parkinson patients before and after the surgery and assessing the relative benefits of pallidotomy and L-dopa, the drug used to treat the disease. Meanwhile, Joel S. Perlmutter, MD, associate professor of neurology and radiology, obtains PET images from patients before and after pallidotomy. "By doing imaging studies and movement studies in the same people, we should be able to correlate the effects of treatment with changes in brain physiology," Mink says.

Patients with Parkinson's disease and essential tremor also are troubled with shaking of the hands, arms, neck and head. Therefore, Mink is heading the St. Louis arm of a multicenter trial of a thalamic stimulator. This pacemaker, when implanted below the collarbone, delivers a steady stream of electrical impulses to the thalamus, blocking unwanted movements.

Because Mink is a pediatric neurologist, he also is interested in childhood movement disorders such as Tourette's syndrome, which produces involuntary movements called tics. Because more than half of all children with Tourette's also have attention deficit disorder (ADD), Mink is participating in a multicenter trial of clonidine — which is effective against tics but also can help with ADD — and Ritalin — which treats ADD but reputedly worsens tics. "The thought is that using these two medications in combination may give the best results," Mink says.

Jonathan W. Mink, MD, PhD, works with patient Debbie Prough, who wears a thalamic stimulator.
Perlmutter, who directs the division of movement disorders, focuses on the molecular mechanisms of dystonias and Parkinson's disease. Dystonias involve muscle spasms in the eyelids, mouth, vocal cords, neck, hands or other parts of the body. The spasms occur when a person tries to use that body part.

In 1984, Perlmutter and Marcus Raichle, MD, professor of radiology, neurology and neurobiology, linked dystonia to a defect in the basal ganglia. Obtaining PET images from a man whose dystonia affected one side of the body, the researchers detected abnormal blood flow in a shell-shaped basal ganglion called the putamen.

In PET studies of other dystonia patients, Perlmutter examined the brain's response to a vibrator placed on the hand. The patients were much less responsive than healthy subjects, especially in the cerebral cortex, which lies over the basal ganglia. This study implicated dopamine, a chemical that is secreted by the basal ganglia to modify the activity of the cortex.

The researchers also studied a patient with a rare dystonia that responded to L-dopa, which generates dopamine in the body. Her cortex also took little notice when a vibrator was placed on her hand. But after she took L-dopa, her cortical response became normal. "We suspect that the L-dopa acted on the basal ganglia to modify cortical responses, permitting the cortex to act in a normal fashion," Perlmutter says.

Perlmutter also was using PET to assay dopamine receptors in the brain. In 1987, he reported that a teen who had contracted Parkinson's disease by taking a drug called MPTP had more than the usual complement of dopamine receptors in his basal ganglia. But he and other researchers were puzzled to find that, while some traditional Parkinson patients also had too many, others had too few, while still others had the usual quota.

Perlmutter and Richard D. Todd, MD, PhD, the Blanche F. Ittleson Professor of Psychiatry and professor of genetics, then tracked MPTP-induced symptoms over time, explaining the puzzle and producing the first animal model for dystonia. Baboons given MPTP first developed the peculiar posturing of dystonia but later developed the tremor and shuffling of Parkinson's disease. During the dystonic phase, they had only about 70 percent of the normal number of dopamine receptors in the putamen. Three to four months after they received MPTP, they had five to six times the normal number. But by the time they developed Parkinson symptoms, the number was down to normal.

Many early Parkinson patients also turned out to have dystonic symptoms and may have fewer dopamine receptors than healthy people. The missing receptors may belong to a subclass called D2, and the deficiency might be sufficient to produce dystonia, Perlmutter says.

Scientists used to think that dopamine deficiency also accounted for the symptoms of Parkinson's disease. But Perlmutter recently showed that monkeys whose striatum (which contains the putamen) was completely unable to make dopamine had dystonia instead. So additional factors must produce Parkinson symptoms.

Another recent study has shed light on the uncontrollable jerky movements that develop after Parkinson patients take L-dopa for several years. When such dyskinesia patients were placed in a PET scanner, L-dopa activated their thalamus, which receives input from the globus pallidus.

The PET and movement studies of patients before and after pallidotomy may help resolve this issue and explain why pallidotomy eliminates L-dopa-induced dyskinesias. These studies and all of the other research on movement disorders would be impossible without the participation of patients like Hoffmann. "There are two ways to look at a movement disorder," Hoffmann says. "You can ask why this disease is happening to you, or you can accept it and get on with life. I feel fortunate to be associated with the doctors here. I hope the knowledge they get from studying me will help many other people with movement disorders."
Center helps survivors of childhood heart disease face new medical challenges as adults

BY KLEILA CARLSON
At age 23, Angela Eggers has surpassed her life expectancy by nearly two decades. She was born with a complex combination of cardiac defects known as tetralogy of fallot. This malady can include pulmonary valve narrowing, a “hole in the heart” between the left and right ventricular chambers, right ventricular thickening and misalignment of the aorta.

Eggers, who began her fourth semester at St. Louis Community College this fall, had open heart surgery at age 13 months, and has had several cardiac catheterizations. At birth, her pulmonary valve was completely blocked off, with essentially no pulmonary artery, and she had a tiny non-functioning right ventricle. Today, her heart functions on just a single ventricle.

Eggers spent much of her childhood perceiving herself as an outcast because her heart condition caused her to miss so much school and prevented her from participating in any physical activity. She says the worst time was during high school, when she constantly needed to use an oxygen tank and an electric wheelchair.

“It’s something I grew up dealing with,” she says with a shrug today. “I’m supposed to be using an electric cart at school now, but I have no way of getting it to and from campus, so I just walk and take my time. I stop, I rest, and I try to always have something to drink with me.”

A serious complication of Eggers’ illness is that she has severe cyanosis, or “blueness,” particularly of her hands, feet, lips and tongue, caused by the mixing of oxygen-rich blood with blood low in oxygen. The condition severely limits her physical activity and has caused her fingers to club.

She also has chronic bronchitis and arthritis, is frequently short of breath, and experiences episodes of dizziness and coughing.

“I have been told that for my age group, there is no one who has not ultimately died from this (condition) or had surgical treatment, which may mean a heart-lung transplant,” says Eggers, as she sips a soft drink at a Central West End coffee shop. Eggers is matter-of-fact about her condition and says that she lives one day at a time.

“The doctors say they don’t know why I’m still here — my life expectancy was age 4,” she quips. “But they also say I’m doing really well and to keep it up.”

A medical enigma of sorts, Eggers is among a population of patients that didn’t exist a decade or more ago, says Philip A. Ludbrook, MD, professor of medicine and radiology and director of the Center for Adults with Congenital Heart Disease at the School of Medicine and Barnes-Jewish Hospital. Prior to that time, patients like Eggers who were born with severe structural abnormalities of the heart often did not survive childhood.

“These are people who have grown into adolescence or even adulthood despite their congenital heart disease,” says Ludbrook, who received postdoctoral training in both pediatric and adult cardiology. “These patients have survived childhood and adolescence thanks to the skills and achievements of modern cardiac surgeons and cardiologists and are now pushing the limits of what we can do with their hearts today.

“Most of them have had multiple open heart surgeries, making them poor candidates for cardiac transplantation because of extensive chest adhesions or scarring from prior open heart surgeries, thoracic deformity, other organ disease, or poor general health.”

About 50 percent of the center’s nearly 600 patients are referred by pediatric cardiologists at St. Louis Children’s Hospital; 25 percent are referred by cardiologists within and outside of the community, and the other 25 percent come by self-referral, word of mouth, the World Wide Web and other sources. The center, the largest of its kind in the area, serves a multistate region that includes Kentucky, Iowa, Indiana, Illinois, Kansas and Missouri.
Rewarding demands

Ludbrook says providing such specialized care is rewarding and also demanding, because while the patients are very appreciative they also have many needs and dependencies.

Congenital heart disease is frequently accompanied by other serious maladies, such as neurological disease, psychiatric illness, orthopaedic ailments, dental disease and obstetric/gynecologic problems. So Ludbrook and his colleagues, Daniel P. Kelly, MD, professor of medicine and molecular biology and pharmacology, and Philip M. Barger, MD, instructor in medicine, frequently refer their patients to various other medical and surgical specialists for consultation. “We are fortunate at this institution to have available the most highly skilled consultants in every specialty — physicians who are experts in their fields and also dedicated, compassionate and willing to go the extra mile for patients with such major conditions,” says Ludbrook.

Ludbrook is especially sensitive to the needs of young women for whom he cares. Many of them want to become mothers, and pregnancy is extremely risky for women with congenital heart disease. A chief complication is Eisenmenger’s Syndrome, or pulmonary hypertension. Mothers-to-be who have Eisenmenger’s Syndrome face a chance of dying during pregnancy, having a stillbirth, or both.

“We now have lots of young women who have survived their teens and are in their 20s, and naturally they are hoping to have children,” he says.

“We make sure that our pregnant patients receive special obstetric care by our colleagues in high-risk obstetrics, and we prepare for their deliveries by being there, on the spot, in case cardiovascular calamities happen.”

Pregnancy has brought triumph and tragedy to the center. Late last year, Ludbrook and his colleagues were celebrating because one of their young patients with Eisenmenger’s Syndrome had successfully delivered a healthy baby girl. She had a complicated pregnancy requiring constant, intensive care by the congenital heart and high-risk obstetric centers. They were so enthused, in fact, that they had written about the case and were preparing to submit it to the medical literature. Then, about 10 weeks after her delivery, the patient died suddenly at home in bed.

“Pregnancy is very tough to deal with medically and emotionally, on a personal level,” says Ludbrook. “It drags on the emotions because the young women are often so desperately keen to carry their babies.”

Equally emotional can be the much anticipated, yet intimidating, wait for a patient to receive an organ transplant. Though not all patients with congenital heart disease are suitable candidates for organ transplantation, some do qualify. Ludbrook currently has a 30-year-old patient, born with a ventricular septal defect that was never repaired, who is waiting for a heart-lung transplant. The woman has developed Eisenmenger’s Syndrome and is on oxygen 24 hours a day.

“She feels very conspicuous with her oxygen tank, but she pushes herself everyday to continue working,” Ludbrook says. “She can do little exercise — she can only walk from her car to her office; ultimately she will die from complications of Eisenmenger’s Syndrome if we can’t get her transplanted.”

At this time, Ludbrook says there are only a few medical centers in North America — including those in Pittsburgh, Tucson, Stanford and Toronto — that do a significant volume of heart-lung transplants for congenital heart disease patients. Even “busy” centers may perform only three or four heart-lung transplants a year.

“The practice and science of heart-lung transplantation lags behind other organ transplant surgery, but our highly reputed transplant group here is very keen to change that,” Ludbrook says.

Alec Patterson, MD, Joseph C. Bancroft Professor of Cardiothoracic Surgery, and Thoralf M. Sundt III, MD, assistant professor of cardiothoracic surgery, are working to implement a combined heart-lung transplant service to complement the highly successful heart and lung transplant programs that already exist at the Medical Center.
Resources and resourcefulness

Even if an organ transplant becomes a reality for one of Ludbrook's patients, the question of who pays for the procedure can be complicated. Many of Ludbrook's patients don't have reliable health insurance, if they have it at all. The very nature of their illness makes it difficult, if not impossible, to hold a steady job from which they would receive such benefits as medical or dental insurance.

"We have no hesitation in providing care without charge for patients who have no insurance," says Ludbrook. "But what if on their first visit they need an electrocardiogram, lab work, an echocardiogram and a series of chest X-rays — that can amount to several thousand dollars in one visit. They simply cannot afford that out of pocket."

The center's nurse coordinator, Kathy Junge, who is on call for patients round-the-clock to triage their medical emergencies or talk them through a personal crisis, says that patients' lack of insurance is the most frustrating aspect of her job.

"I try to find resources for them and I'm able to do some things, but I certainly don't work the wonders that I would like," says Junge. "Our patients are not representative of the typical cardiology patient. It's a population that is growing rapidly, so they will have to be dealt with. Insurance companies will have to accommodate this group somehow because they do survive, often with many needs, and they do have functional lives."

Greg Schrameyer, 32, of St. Charles, is proof that patients with congenital heart defects live and thrive. Schrameyer is the father of a 1-year-old and a computer graphics whiz who recently launched his own company, Roundtable Studio.

Schrameyer was diagnosed at age 3 months with transposition of the great vessels, a severe congenital heart anomaly in which arteries to the lungs and systemic circulation are connected to the incorrect ventricles. Schrameyer has an implanted pacemaker to control the rhythm of his heartbeat, he exercises and is meticulous about his diet and health care.

Even more impressive, however, is his exuberant outlook on life and the vision he has for others with serious illness.

"I could never go on a roller coaster as a kid," says Schrameyer. "When I got my pacemaker, that was the first thing I asked my doctor about, and he said "yes." All of my life I wasn't allowed to play in competitive sports, PE class was modified for me, and I even had to stay inside during recess in the wintertime.

"But I always tried to involve myself in other ways. If I couldn't play the sport, then I could be a timekeeper. I couldn't run cross-country in high school, but I managed the cross-country team and rode along on my bike. I always tell people: 'Don't sit on the sidelines. There are other aspects to that activity that you can go out and do.'

"As a computer graphics specialist, I see so much going on electronically right now, and I have conceptualized ideas about activities that I could never do. I would love to find ways to create and promote these activities for others who have physical limitations because of what I have experienced with my heart."
The first question a person diagnosed with cancer often asks is, “How serious is it?” Decades ago, the answer often came late — after the anesthetic wore off and a surgeon described what had been removed.

Times and technology have changed. More than half of the clinical imaging tools used by Washington University's Mallinckrodt Institute of Radiology (MIR), an international leader in the imaging of cancer, had not been fully developed or did not exist 25 years ago. These advances now help doctors detect cancer earlier and more precisely.

“New, noninvasive imaging methods have dramatically improved our ability to determine the size, location and spread of lung cancer and other cancers,” says Joel D. Cooper, MD, the Evarts A. Graham Professor of Surgery and head of the division of cardiothoracic surgery. “This information is essential for predicting how well patients will do, selecting appropriate treatments and testing new treatments in clinical trials.”

Some of the imaging tools in use at the School of Medicine and Barnes-Jewish Hospital include:

**PET**

Positron emission tomography, which the radiology department began using for research in the 1970s, captures tumor cells in action. PET is widely used for the clinical evaluation of patients with various cancers. PET accurately gauges the severity and spread of cancer by revealing the metabolic activity of tissues using small amounts of a radioactive compound.

A patient originally diagnosed with cancer of the right lung (*). The cancer has spread to lymph nodes between the lungs and to the spine as revealed by the red and blue spots that indicate different amounts of radiolabeled glucose within tumor cells. The red spots highlight actively growing metastases.

A commonly used compound is a form of sugar called F-18 fluorodeoxyglucose, which concentrates in actively growing cancer cells that require more energy than normal cells. PET imaging gives radiologists a way to detect cancer in early, more treatable stages — sometimes months before a tumor becomes evident on anatomic imaging such as computed tomography.

“If PET is negative, the likelihood of a patient having cancer is really low, which is very important information to have,” says Farrokh Dehdashri, MD, associate professor of radiology. Dehdashri and other radiologists in the division of nuclear medicine routinely use PET to visualize esophageal cancer, lung cancer and colorectal cancer. PET also may suggest that a cancer is widespread and not surgically treatable.
Cancer cells frequently bear a surface protein that allows them to spit out chemotherapeutic drugs before the medicine can cause its intended damage. David Piwnica-Worms, MD, PhD, professor of radiology and associate professor of molecular biology and pharmacology, uses a technique that resembles PET — single photon emission computed tomography — to determine whether women with breast cancer have an abundance of p-glycoprotein. Women whose tumor cells are covered with the protein may be poor candidates for chemotherapy — knowledge that would allow doctors to switch to other treatments.

Cells lacking p-glycoprotein appear on images because they are unable to rid themselves of a specific compound. Piwnica-Worms has used the same compound to suggest that a pair of gateways into the brain work in a complex way to prevent harmful substances from reaching the central nervous system. Gaining an understanding of how the gateways function may improve chemotherapy efforts because the gateways, which involve p-glycoprotein, also block chemotherapeutic drug entry.

Computed tomography images help verify the presence of kidney and pancreatic cancer, among others. Investigators here also are taking advantage of developments in image processing and science to test potential advances in tumor imaging, which include CT dosimetry for gynecological treatments. About half of all women diagnosed with cervical cancer that hasn't spread far beyond the cervix are alive within five years of its discovery. These women usually receive multiple sessions of external radiation therapy and brachytherapy, which involves placing rod-shaped applicators containing radioactivity close to cancerous tissue.

To improve survival, Jeffrey F. Williamson, PhD, professor of radiology, and his colleagues are developing ways to image women's pelvic anatomy during brachytherapy treatment. These images, combined with those taken at other times during treatment, will allow radiation oncologists to assess the total doses of radioactivity reaching healthy and cancerous tissue.

Using an aluminum applicator with retractable shields that protect healthy tissue from radiation exposure, Williamson and Gary Christensen, DSc, at the University of Iowa, have begun a small study in which they create composite images for each woman to determine the total radiation doses received. The investigators will mathematically modify individual CT images from each patient so that tissue structures line up with the identical structures in a magnetic resonance image taken prior to treatment. "The hope is that we can use the composite images to identify the 50 percent of women who don't get physically effective treatment, and then do something about it," Williamson says.
Elizabeth G. McFarland, MD, assistant professor of radiology, works with colleagues at MIR, the division of gastroenterology and Vital Images, Inc., a Minneapolis-based software company, to develop 3-D endoscopic-like images of the colon from CT images. McFarland and her colleagues are conducting a clinical trial funded by the National Cancer Institute to compare the 2-D and 3-D images of CT colonography to traditional colonoscopy for the detection of colorectal polyps, which are precancerous growths of the colon.

A gastroenterologist normally removes suspicious-looking polyps after viewing the colon's walls using a colonoscope. By comparison, the spiral CT colonography technique under investigation allows polyps to be viewed from any angle in a noninvasive way.

The 2-D, CT colonography images are produced by scanning patients using spiral CT, which rotates around their abdomen and pelvis. The images are transferred to a specialized computer workstation, and a 3-D rendering of the torso is created. Radiologists then view the colon from various vantage points as they scroll through the 2-D and 3-D images. McFarland's group plans to conduct a larger trial comparing spiral CT colonography to traditional colonoscopy and to investigate other technical applications.

A computer-controlled surgical device, MRI and X-ray images are being combined to access areas deep within the brain. This technique may one day allow better biopsies or drug delivery to brain tumors. Ralph Dacey Jr., MD, the Edith and Henry G. Schwartz Professor and head of neurological surgery, performed the world's first magnetic brain surgery last December. Sitting at a computer console, he controlled superconducting magnets that guided a small magnet at the catheter's tip to a tumor in a young man's brain. Real-time X-ray images enabled him to track the magnet's movement along a path displayed on a monitor. Dacey and his colleagues planned the path using MRI images taken before the surgery. When the catheter reached the tumor, Dacey introduced a biopsy tool. The Magnetic Surgery System allows a catheter to follow an indirect route to a tumor or other brain site, avoiding regions that would normally be penetrated with a manually inserted surgical tool aimed straight at a target.

Magnetic resonance imaging is a mainstay for viewing the complex anatomy of the brain and for detecting tumors there and in other internal organs because of the sharp detail it provides. The noninvasive procedure also gives a frame of reference for methods such as functional MRI (fMRI), which highlights active brain regions. Additional uses of MRI that may influence future cancer care include high resolution BOLD venography (HRBV). A variation of fMRI, HRBV may provide a way to measure tumor growth by visualizing how many veins a tumor has to carry away its waste products. The blood oxygen-level dependent (BOLD) method developed at the medical school highlights very low oxygen concentrations present in capillaries and veins.

The method could help doctors decide which regions of a tumor to biopsy, or provide a way to assess the effect of drugs designed to destroy the...
Ultrasound uses sound waves above the audible frequency to detect and characterize tumors. Doctors commonly evaluate the liver, kidney, pancreas and reproductive organs, using US. Echoes reflected off of normal and abnormal tissues are captured by a computer to create 2-D images. Radiologists interpret these images to determine whether a mass is a solid tumor (appears gray) or a benign, fluid-filled cyst (appears black). "Ultrasound is superb at distinguishing solid tumors from benign cysts. Since cysts are very common and can be confused with tumors on other types of scans, this is an extremely valuable role for ultrasound," says William Middleton, MD, chief of diagnostic ultrasound at MIR.

Imaging specialists also use US to guide the placement of needles during biopsies of tumors in the breast, liver and many other organs. And US guides the placement of radioactive pellets during prostate cancer treatment.

In a variation called endoscopic ultrasonography, doctors use a probe on the end of a fiber-optic endoscope to look at abnormalities from the intestine. This allows them to differentiate between tumors, cysts and stones in the bile duct, pancreas and other abdominal organs. Endoscopic US also can visualize rectal tumors and determine whether they have spread.

The Future

Even as current imaging tools prove their value in cancer care, investigators are considering the next generation. These will create composite images that take advantage of the unique information provided by different imaging methods while overcoming their individual limitations.

A team of neurosurgeons, radiologists and radiation oncologists already is successfully treating certain brain tumors using composites developed from MRI and CT scans. Creating the composites is time-consuming. But the final products give patients an option to brain surgery that has comparable outcomes.

Doctors at the Gamma Knife Center at Barnes-Jewish Hospital use the composites to direct 201 beams of radiation onto a precisely defined region of a patient's brain where a tumor is located. Composites of MRI and CT also are being used for 3-D radiation therapy of other cancers.

Eventually, imaging machines will perform multiple types of scans or readily swap scan information. Additional imaging compounds that can highlight unique characteristics of tumors also are being developed. These and other advances will help even more patients in their battles against cancer.
Biomedical researchers and primatologists benefit by working in tandem to learn about human evolution and disease

BY CANDACE O'CONNOR

Last February, a paper appeared in the journal *Nature* supporting a connection that AIDS researchers had long suspected. The study traced the origins of human HIV-1 to a particular subspecies of central African chimpanzees carrying the simian, or SIV, version of the virus. Most likely it was transmitted to humans through injuries incurred during hunting and butchering of chimps for food.

The study's principal investigator, Beatrice Hahn, a virologist from the University of Alabama at Birmingham, also noted that scientists still need to understand the full extent of SIV infection and the frequency of primate-to-human transmission. To do that, they will have to screen hundreds of adult chimpanzees living in the wild, as well as humans in surrounding areas. These screenings, Hahn added, will require the close cooperation of biomedical researchers like herself and primatologists who work in the field.

Right away, this comment struck a chord with primatologist Jane Phillips-Conroy, PhD, professor of anatomy at the School of Medicine and of anthropology in Arts and Sciences. Over the past 25 years, she has studied two populations of African primates: 120 to 150 grivet (or green) monkeys and more than 500 baboons. Each year, she and her students travel to Ethiopia’s Awash National Park to trap and tranquilize these animals, then take blood samples and body measurements; donning masks and gloves, they carefully pry open their jaws to acquire dental impressions that help determine the animals’ ages. They also make palm prints so they can recognize each animal again and ear tag them.

Most recently, they have even done some testing that no other team in the world has attempted. To examine the brain chemistry that underlies baboon behavior, Phillips-Conroy has been drawing samples of cerebrospinal fluid to study the levels of various neurotransmitters: dopamine, noradrenalin and especially serotonin.

Altogether, their observations provide an extraordinarily detailed long-term picture of the social behavior and biology of these primates. Such data are what is needed to understand the distribution and spread of viruses and disease in wild populations. However, biomedical researchers, who are typically well-funded, do not themselves undertake such long-term studies on individually identified animals in the wild, while primatologists who do such work compete for funds from a relatively small funding pool. (Less than $1 million was available for all field primatology research funded by the National Science Foundation in 1998.) Consequently, Phillips-Conroy says a collaboration between the two could provide much needed support for long-term research. Recently, she published an article in the *International Primat Society Bulletin* and in *Science* highlighting the benefits of this kind of collaboration.

"It is very much to the advantage of biomedical researchers to engage in this kind of interaction," says Phillips-Conroy. "Rather than
just saying, 'We've got 300 samples of sera from green monkeys,' they can put their results in a context of behavior and demography and temporal continuity. Otherwise, they don't know what the group structure is, what the age and sex of the animal is — you can't really get to any level of interpretation about what is going on in terms of the virus and the way in which it is transmitted."

In fact, Phillips-Conroy already has had a fruitful history of this kind of collaboration with the New England Regional Primate Research Center and Beatrice Hahn's group in Alabama. In 1994, she worked with Hahn and other biomedical colleagues to show the first evidence of cross-species SIV transmission in the wild: the infection of a yellow baboon in Tanzania with SIV from African green monkeys living in the same habitat.

Today, she continues to do fieldwork that in addition to serving her own research interests in primate biology and behavior exists as a potential resource for researchers who are interested in viral evolution and transmission. The key to acquiring this information in both cases, she says, is careful, long-term study of individually recognized animals.

SIV in green monkeys

Although many African grivets are infected with SIV, no one would ever know it from looking at them. In these monkeys, the virus does not cause disease.

"That is the interesting thing," says Phillips-Conroy. "This virus developed some kind of equilibrium with its host in nature, but when another similar simian virus escaped from its natural host and entered a non-natural host — a human — it did cause disease."

Biomedical researchers began looking closely at this SIV infection a decade ago. Phillips-Conroy and her former supervisor from graduate school, Clifford Jolly, PhD, became co-directors of the primate study in the early 1980s. Since that time, she and Jolly have made annual treks to Awash to capture baboons and grivet monkeys.

With impetus from the new interest in SIV transmission, Phillips-Conroy and her colleagues focused on discovering how often grivets were SIV positive as a function of their age and sex. The results, published in the Journal of Medical Primatology, were decisive — and visible. As male grivets become sexually mature, they grow long canine teeth, they become more muscular, and their scrotum turns bright turquoise blue.
"When we looked at males who were adult, with all their teeth in, not all of them were SIV positive," says Phillips-Conroy. "But when we looked at the ones who were the heaviest — who also had the longest canine teeth and the brightest blue scrotum — those males were SIV positive. So SIV status was clearly related to breeding behavior."

Among the females, all of the adults were SIV positive, as were most of those in the next age class down — the stage when females begin to breed. So clearly this had to be a sexually transmitted virus. Just as plainly, it could not be a virus that is passed from mother to infant, since young grivets are not infected.

Everything the researchers had learned about these grivets over the years supported these conclusions. After watching the animals, they knew that grivet females are born into a group of 15-20 monkeys and stay in it throughout their lives. Males, on the other hand, migrate to other groups as they become sexually mature.

"Because we identify these animals in a number of ways and trap them year after year, we were able to show that males captured in the group they were born into were SIV negative," says Phillips-Conroy. "But when we caught these same males several years later, after they had migrated, they had become SIV positive."

A bit of detective work turned up comparable evidence among the female grivets. Through testing, the primatologists found that young females who were not yet breeding were all SIV negative. But those who had begun to breed were SIV positive. Even if they didn't see a baby, the team could tell that a female had reproduced by the state of her nipples; elongated nipples meant that she had already suckled an infant.

"We were able for the first time in the wild to tie SIV transmission to reproductive behavior both in males and females," says Phillips-Conroy. "So long-term research on animals that we can identify from year to year is important for being able to trace the mechanism of transmission of a disease and the ages at which animals become infected."

Baboon aggression and human behavior

Long-term study of primates is useful not only in tracing the evolution of a virus, it is also critical if scientists are to achieve a deeper understanding of the range of human behavior from aggression to affiliation.

In her own research, Phillips-Conroy studies the behavior of primate relations by focusing on two types of Ethiopian baboons: the dark-furred, dark-faced olive baboon; and the gaudier hamadryas or "sacred" baboon, with its gorgeous white fur cape, pink face, and big pink bottom. The two species are as different in social organization as they are in appearance.

Like grivet monkeys, olive baboon females live in the same group all their lives, while males migrate at maturity. The groups have little obvious internal structure at first glance, with males showing little interest in females except during their monthly period of sexual swelling. Young males can mate with a female when her swelling first begins; but when she is fully swollen — and most fertile — an adult male takes over, monopolizing her until she begins to deflate.

Among hamadryas baboons, males are interested in females whether they are sexually receptive or not. In fact, a unit consists of one male and his coterie of females — a kind of harem. The females must remain close to the males at all times or risk punishment.

"He will make sure his females stay with him by staring at them; they are also triggered to follow by his bright pink bottom," says Phillips-Conroy. "If they don't follow him, he will escalate his attempts to persuade
them and, if all else fails, ultimately bite them. That usually produces the desired following response."

Early primatologists noticed some of these behaviors and concluded that hamadryas baboons were violent creatures. They focused on the rare incident when the large males — their teeth gnashing and capes flying — would fight with each other for control of a harem. But Phillips-Conroy and other researchers have reached a different conclusion.

"The affiliative aspect of hamadryas society was rather poorly appreciated," she says. "Compared to olive males, hamadryas males interact with females a lot and, unlike olive baboons, do not leave the group they were born into."

Her team also has been looking at a hybrid zone between these two baboon groups, in which interbreeding occurs. Given the radically different social systems of these baboons, how did this hybridization take place? In the 1960s, a Swiss team proposed that hamadryas males who lack their own units migrate into the olive population where females are plentiful and largely unguarded, then kidnap an olive female and take her home.

But Phillips-Conroy and her group found some problems with this theory. For one thing, the core of the olive group is a strong network of female relatives — all bound to protect each other. A hamadryas male bent on abduction would have a tough time facing their wrath. The real explanation for hybridization is quite different.

"We found that hamadryas males do occasionally leave their own groups and migrate to olive baboon groups. But instead of grabbing a female, they hang out there and are slowly accepted as members of the olive baboon group," she says.

It is interesting to see how hamadryas behavior adapts to this new social setting, she adds. These males still form their customary harems — but they tolerate their females ranging much farther away than they would have in their own society. And at the female's period of maximal sexual swelling, they may temporarily lose their control over her and she may mate with an olive male.

Against the backdrop of this information about olive, hamadryas and hybrid baboons, Phillips-Conroy decided a few years ago to begin testing baboon neurotransmitter levels, especially serotonin, to see how they correlated with known behaviors. In human studies, people who are aggressive risk-takers tend to have lower serotonin levels. So she and others had hypothesized that since olive males migrate and most hamadryas do not, the olives might have lower levels. The actual results were surprising, says Phillips-Conroy, because they so strongly confirmed the hypothesis. Up to this time, she says no one had looked at the relationship between behavior and neurotransmitter levels in wild primates — and for good reason. Lab facilities in the wild, like all aspects of life, are extremely primitive. Cerebrospinal fluid sampling is a highly invasive procedure that must be done only by the most skilled of hands. To date, Phillips-Conroy's remains the only project in the wild where such studies have been done.

"We found that hamadryas males and hybrids have much higher levels of serotonin than olive baboons," she says. "This fits with our new view of them, which emphasizes the greater importance of affiliation in their lives compared to the rarer occurrences of aggression."

Altogether, she adds, through their long-term study of behavior and genetics — along with these neurotransmitter results — they have come to a very different understanding of how olive and hamadryas baboons behave. The two groups are actually much more different than scientists had ever imagined. And an understanding of their behavior may eventually add an important dimension to our understanding of human evolution.
CALCUTTA, India, boasts nearly 12 million inhabitants, one-third of whom lack adequate housing and access to sanitary facilities. Since the mid-1800s, when John Snow performed the epidemiological studies which identified the connection between fecally contaminated water and cholera, it has been known that this combination is ideal for the spread of disease.

Not surprisingly, seven of the eight pandemics of cholera that have occurred in recorded history originated in the deltaic region of the Bay of Bengal. So what better place to study *Vibrio cholerae*, the bacterium that causes cholera?

I did my summer research rotation at the National Institute for Cholera and Enteric Disease (NICED). The opportunity became available because of the collaboration between Douglas E. Berg, PhD, Alumni Professor in Molecular Microbiology at the School of Medicine, and G. Balakrish Nair, deputy director of NICED. Dr. Nair, who was my host at the NICED, has devoted his career to the study of cholera and has played a critical role in many significant findings regarding the ecology of *V. cholerae*.

My research project focused on studying the long-term survival of nutrient-deprived *V. cholerae* in saline environments, and whether such forms of *V. cholerae* play a role in the pattern of emergence and re-emergence that the disease displays. I also collected samples for future molecular genetic studies regarding antibiotic resistance in *V. cholerae*.

I highly value my summer experience abroad, thanks to the Forum for International Health and Tropical Medicine. I gained tremendous insight working in a laboratory in another country, with coworkers from another culture, and would recommend it to anyone. It gave me an opportunity to reflect on the methodologies and underlying assumptions we use in the United States, while helping me to understand some of the hurdles faced by researchers in other countries.

— Paul Robben, WUMS II
work or research abroad discuss their experiences. Topics have ranged from problems created by malnutrition in Africa to the introduction of a cervical cancer-screening program in Vietnam. The series has been a success, with many students from all classes attending throughout the year.

We also looked outside the Medical Center — to alumni — for support of our new group. Our goal was to provide information for medical students who want opportunities to study health and medicine in other countries. With the help of Ruth Bebermeyer, director of alumni and constituent relations in the Office of Alumni and Development, we contacted alumni who had been or were currently involved in international health through collaborative projects and who had time spent abroad. We received 25 responses from those who said they would be willing to help students who are interested in overseas electives. This information and that from students who have completed foreign rotations is being entered into databases to serve as a resource.

We also saw a need to improve administrative procedures and financial support for fourth-year students who want to study abroad. We worked with the administration and faculty to formalize requirements for off-site rotations that should improve the quality of these experiences.

The School of Medicine has an outstanding reputation for supporting student initiatives. The help that we received in establishing our new student organization, and the speed with which our requests were met, has confirmed this for all of us. Last fall, Gary J. Weil, MD, professor of medicine and associate professor of molecular biology, proposed establishing a new competitive grants program to pay partial travel expenses for students planning to do foreign electives. A committee composed of administrators, faculty members and students prepared a formal proposal that was submitted to William A. Peck, MD, executive vice chancellor for medical affairs and dean. He approved the request for five $1,000 travel grants per year for the next two years, along with additional money to support an annual student symposium on foreign rotations.

Last May, FIHTM organized a regular luncheon to provide an opportunity for fourth-year students returning from international rotations to discuss the educational benefits and challenges they experienced. More than 100 students attended. Support from the dean’s office will help us expand this event to an annual symposium that will be open to students and faculty. The symposium will begin with a guest speaker, and students will present short lectures or posters to illustrate their overseas experiences. This will increase visibility of foreign opportunities and stimulate medical students to consider whether they want to do an overseas rotation during their training.

For additional information on FIHTM events and to learn more about international health from other institutions and organizations, access our web site at http://medicine.wustl.edu/~fihtm. At present, the site provides information on foreign rotation opportunities available through the School of Medicine and other institutions, a list of speakers in the lecture series, links to tropical disease sites and traveler’s information. We plan to add updates about the international health program at the medical school and offer summaries and photos of student experiences abroad. Links to sites covering news in international health and public health also will be added, and the database of international contacts will be made available to medical school students and faculty.

With support from faculty and administrators, FIHTM has progressed significantly over the past year. We have moved from a concept to become an organization with defined goals. We have a new grants program, a symposium on foreign rotations, improved procedures for off-site elective rotations, a lecture series, and a web site with growing databases and links to resources related to international health. We hope these activities will excite the Washington University community about issues in international health. With each first-year class full of students with new interests and ideas, FIHTM should be able to continue to expand its horizons in the coming years.
Alumni & Development Report

Ira and Judy Gall:
A legacy of unfailing generosity lives on

by David Linzee

WHEN Ira Gall was a resident at Barnes Hospital in the early 1950s, the pay for young doctors was $10 a month. He and his wife, Judy, who was in social service at The Jewish Hospital of St. Louis, would often meet to share a meal in the Barnes cafeteria. Free meals were a perk for those like Gall, who was on the house staff at Barnes, but they were only for staff because in those days Jewish Hospital was a separate institution. "He would load up his tray with food enough for both of us," Mrs. Gall recently recalled with a smile.

Through the years, the Galls compensated both Barnes Hospital and the School of Medicine handomely for those purloined extra helpings. Gall, who is a clinical professor of obstetrics and gynecology, has taught medical students and residents for many years. He also serves on the School of Medicine's National Council and he and Mrs. Gall are life members of the Eliot Society. Recently the couple made a gift to establish an endowed chair of reproductive endocrinology in the Department of Obstetrics and Gynecology.

"This gift allows us to conduct a worldwide search and to bring into the department a world-class scientist," says James R. Schreiber, MD, Elaine and Mitchell Yanow Professor and Head of the Department. "I am confident that the new chair will bring new knowledge in the field of reproductive endocrinology."

The Galls' relationship with Barnes Hospital and the School of Medicine began in 1952 when the couple moved here from their hometown of Cincinnati so Gall could begin his residency. "I looked at a lot of places before coming to St. Louis," he says. "Barnes was the deciding factor."

Gall was on the house staff from 1952 to 1957. "I had a wonderful residency. The ob/gyn program was excellent — and still is. The head of the department was Dr. Willard Allen. He was a very learned man, but also very easy to talk to." He and Gall became close; in fact, Allen delivered two of the Galls' three sons.

Another important friendship begun at Barnes was with Mitchell Yanow, MD. Gall and Yanow created a practice together in 1954, forming Obstetrics & Gynecology, Inc., one of the first professional corporations in Missouri. Their fruitful and lifelong partnership ended in 1998 when Yanow died. The corporation continues to flourish, however, with nine partners, six of whom are women.

"We were both workaholics," Gall says of the duo who delivered 100 babies in an average month. Gall can recount numerous occasions when he thought he had the night off so he and his wife could attend the theater, only to be called into the hospital. Sometimes he would not return home for two or three days. "At that time, there was no shared (on call) responsibility in medicine that you have now," he explains. "In the 50s, if it was your patient, you were there. You counted yourself lucky if you could manage a week's vacation a year."

In addition to their clinical practice, Gall and Yanow were highly successful entrepreneurs. In 1970 they founded Medicine Shoppe International, Inc., the nation's leading operator of community-oriented franchised pharmacies. Unlike many drugstores, Medicine Shoppe pharmacies handle medical supplies and prescriptions only, rather than developing film or selling magazines and cosmetics. Prices are kept low. Today there are more than 1,200 Medicine Shoppes in the United States and 127 overseas. The chain has been owned by Cardinal Health, Inc., since August 1995. "We're pleased that they've continued our policies," says Gall.

Gall and Yanow also had another interest: giving to the School of Medicine. Like Gall, Yanow was a member of the Eliot Society, and he and the late Mrs. Yanow preceded the Galls in endowing a chair in the Department of Obstetrics and Gynecology. Gall says he learned about the importance of giving from his father, who came to the United States from Lithuania at age 5 and went to work at 13. "My father was a small merchant," says Gall. "It's a sign of what good parents he and my mother were that we children never knew we weren't well off."

Growing up in the Depression, Gall was deeply impressed by his father's unfailing generosity. "Whatever he made, he gave a part
Ira and Judy Gall have generously supported the Department of Obstetrics and Gynecology at the School of Medicine.

to charity. It wasn't a lot in dollars, but it was a high percentage of his income.

Gall says he was fortunate to marry a woman who shares his ideas about giving and community service. When they met, Gall was an intern at Cincinnati General Hospital, and Mrs. Gall was a full-time volunteer at Jewish Hospital, across the street.

When the couple moved to St. Louis, Mrs. Gall went to work at Jewish Hospital here. Her first job was assisting World War II refugees who settled in the United States. "They came straight from the camps in Europe," she says. "These people had lost their homes in the war, and as late as 1952 they were still being resettled. Some had no family here, and it was difficult for them to find a place to live."

Her compassion for the victims of World War II stayed with her long after she left the position to raise her three sons. She was one of the founders and a major donor of the Holocaust Museum and Learning Center at the Jewish Federation in Creve Coeur. The Galls traveled widely in search of ideas for the museum, visiting similar institutions all over the United States as well as the sites of concentration camps in Europe. They say that what distinguishes the museum is the connections it makes between the St. Louis Jewish community and the Holocaust. Some of the museum's docents are camp survivors.

From the time she moved to St. Louis, Mrs. Gall has supported numerous local causes. "When you come to a new city and people take you in, you want to give back to the community," she says. For many years she volunteered at the Miriam School in Webster Groves, a school for children with learning disabilities. She also chaired its school board and a successful capital campaign to raise funds to build a new school. Among her current projects is Metropolitan Employment and Rehabilitation Services, or MERS, a statewide agency that offers training, employment and rehabilitation services to former felons. This year she also was named a Woman of Achievement by KMOX radio and the Suburban Journals.

Gall has served as vice chief of staff at St. John's Mercy Hospital and is also a member of the hospital's board. He also is a lifetime trustee of Temple Israel and a former board member of Jewish Federation.

Together, the couple enjoy traveling and have visited China, Japan and Israel. A trip to South Africa was particularly memorable. "Our timing there was less than perfect," Gall says dryly. After a long flight the Galls arrived in the midst of turmoil as the African National Congress was assuming control, and were confined to their hotel for several days.

Another favorite recreation is the theater. Mrs. Gall serves on the board of Repertory Theatre of St. Louis, and she and her husband attend performances at all the major theaters in town.

Though Gall retired from obstetrics in 1986, he maintains his practice in gynecology and is chairman of the board of Obstetrics and Gynecology, Inc. "I had delivered 10,000 babies by the mid-1980s," he says. "I thought it was time to give someone else a chance."

Still, Gall says he isn't ready for full retirement yet. "I'm going back to my early years," he says. "When I was a fellow at Barnes, I was interested in infertility. Now I've returned to it." He finds the field much changed for the better. "Back then, a third of infertile couples could be helped. Now, 40 years later, three-fourths or more of couples are successful in having a child."

He looks for that progress to continue and even to accelerate in the future, and for rapid advancements to be made in the fight against birth defects and childhood diseases. "Reproductive endocrinology has been and will continue to be a very fruitful area," Gall says. "If the field had existed in my day, I probably would have pursued it."

Not that Gall has any regrets. "If I had to do over again I'd still become a doctor," he says. "It's a privilege to practice medicine."
The Honorable Continuum

by Ruth Bebermeyer

"The Honorable Continuum" is a series of profiles highlighting the accomplishments of Washington University School of Medicine graduates and faculty who embody an unbroken tradition of excellence — from emeriti professors to current students, from medical graduates to current and former house staff and fellows.

In the footsteps of his namesake

When his parents chose their family physician's first name, Othello, for their son's middle name, they could not have known that James O. Davis, MD '45, would grow up to have a distinguished career in medicine and be elected to the National Academy of Sciences. Davis left his native Tahlequah OK, to earn a PhD in zoology from the University of Missouri in 1942. He transferred from the medical program there to complete his MD at Washington University School of Medicine.

During his internship at Barnes Hospital, Davis was inspired by the legendary Barry Wood, MD, to study the physiology of congestive heart failure. He spent 20 years carrying out research at the National Heart Institute, including nine years as chief of the section of experimental cardiovascular disease in the laboratory of kidney and electrolyte metabolism. His work resulted in a landmark discovery — that the renal hormone renin mediates the secretion of aldosterone, which sustains edema not only in congestive heart failure but also in cirrhosis and nephrosis.

His group was the first to block this renin-angiotensin system, which led to the development of several drugs used extensively in the treatment of heart disease and hypertension.

Davis' love of teaching drew him back to the University of Missouri at Columbia in 1966, where he chaired the Department of Physiology in the School of Medicine and continued his research on hypertension. Throughout his career he trained many postdoctoral fellows who now hold positions in academic medicine. Those who have worked with him speak admiringly of the unfailing reliability of his work and the humility and grace with which he has carried it out.

Among his many honors are the Franz Volhard Award from the International Society of Hypertension, of which Davis served as president during 1980-1982, and the Carl J. Wiggers Award for Cardiovascular Research from the American Physiological Society. The James O. Davis Distinguished Professorship in Cardiovascular Research was established in his honor at the University of Missouri in 1987; he was designated a Sesquicentennial Professor there in 1989.

Retired since 1983, Davis and his wife, Florrilla, enjoy time with their children and grandchildren. Their daughter, Janet, has a master's degree in cellular physiology. Their son, James Lawrence, has a degree in electrical engineering from Stanford and is a 1977 alumnus of the Washington University School of Medicine. He is a cardiologist in St. Louis.

Student reaches beyond the rainbow

Heather M. MacLennan, WUMS IV, isn't in Kansas anymore — although she speaks fondly of her hometown, Lindsborg, and its Swedish heritage. Her talents and goals have taken her a long way from the rural community where she graduated in a high school class of 44 and was a National Merit Commended Student.

MacLennan received a four-year scholarship to Harvard, where she majored in biochemical sciences and graduated magna cum laude in 1996, with highest honors awarded for her senior thesis. She participated in a research project at Boston Children’s Hospital, which resulted in publications in Developmental Genetics and Developmental Biology. Other undergraduate honors included the Elizabeth Cary Agassiz Merit Award each year, two Howard Hughes summer research fellowships, and the Academic All-Ivy League award in 1995 and 1996. The Cambridge Public Schools gave her an award for volunteer teaching in 1996.
Along with her academic achievements at Harvard, MacLennan managed to play violin in the orchestra and star in both indoor and outdoor track and field, training three hours a day year-round and becoming the Ivy League medalist in the long and triple jumps. She enjoyed the camaraderie of the track team and found athletics an exhilarating outlet that helped balance her intense academic study.

Initially contemplating a teaching career (both her parents are college professors), MacLennan became interested in medicine during a summer stint as a certified nursing assistant caring for nursing home residents in Lindsborg. She says, “I wanted to be able to do more for them.” After interviewing at a number of medical schools, she was convinced that Washington University was the place for her because, “everybody made me feel incredibly welcome.”

The Bernard T. Garfinkel Distinguished Alumni Scholar, MacLennan has continued her exemplary record, earning letters of commendation in anatomy, physiology and histology during her first year. A Howard Hughes research fellowship in 1997 enabled her to spend the summer at Northwestern University. In 1999 she received the McGraw Hill Book Award for academic excellence. She has been active in community service projects, among them the Drug Education Project, the Perinatal Project and the Pediatric Outreach Program and Liver Support Group.

MacLennan looks forward to the next big steps in her journey: graduation next May, followed a week later by marriage and, soon after that, beginning her pediatric residency.

**Physician thrives on rural practice**

Ask Anita Holtz, MD ’90, how she came to work on an Indian reservation and she replies, “It’s closer than Africa.”

During her last year of medical school she did an elective in a hospital in rural South Africa and discovered that she loved working there. Now chief of staff at the 21-bed Crownpoint Indian Hospital on the Navajo reservation in northwest New Mexico, Holtz thrives on the variety and challenge of practicing family medicine.

In one night on call she may deliver a baby, take care of acutely ill children, admit an elderly patient with fever and confusion, and stabilize a gunshot victim in the emergency room and prepare them for the flight to the trauma center in Albuquerque. In spite of warnings by some professors that family practice would be boring, she says emphatically, “I am not bored!”

Holtz also holds a bachelor’s degree from Washington University with a double major in biology and psychology. A *summa cum laude* graduate, she is a member of Phi Beta Kappa and Alpha Omega Alpha, and was awarded the Alpha Omega Alpha Book Prize for outstanding achievement throughout medical school and the Lange Medical Book Prize for high scholastic achievement.

She did her residency at the Department of Family and Community Medicine at the University of Missouri in Columbia, serving as chief resident during her final year.

Holtz began work on the reservation in 1993, the same year that she became board certified in family medicine. The Crownpoint facility includes an outpatient clinic as well as hospital and emergency services. Many of her patients speak only Navajo. Telephones are rare, and a substantial number of her patients do not have running water or electricity, relying on wood stoves for heat. For Holtz, the social and cultural differences provide an additional level of complexity and richness.

She has provided a WUSM student the same sort of positive experience she appreciated by serving as a preceptor for a summer elective in primary care medicine.

In her limited leisure time, Holtz enjoys camping and backpacking and revels in the scenery nearby at Santa Fe, the Grand Canyon, and in Colorado and Utah. She likes to grow vegetables, a challenge in the high desert climate. Most of all, she likes to spend time with her daughter, Audrey, 4, her Navajo partner, Joyce, and their five-month-old daughter, Kendra.
Hubert takes over as WUMCAA president

John W. Hubert, MD '75, assumed leadership of the Washington University Medical Center Alumni Association (WUMCAA) on July 1, 1999.

Hubert, a cardiologist, has been in private practice in St. Louis for 18 years. A faculty member since 1978, he is a clinical instructor of medicine. He is president of Metro Heart Group of St. Louis, Inc., and on the medical staffs of Barnes-Jewish, Christian (NE & NW), St. Joseph and St. Luke's hospitals, DePaul Health Center, St. Mary's Health Center, Missouri Baptist Medical Center and St. John's Mercy Medical Center.

Hubert says one of his goals for the coming year is to stir his classmates from 1975, many of whom live and practice in the St. Louis metropolitan area, into becoming more involved in the association and attending their 25th reunion in May 2000.

"I think more than anything we need to continue to develop ways to attract more alumni involvement," says Hubert. "Once we graduate from medical school — unless we are on the more active clinical faculty — a sort of detachment from the school and the alumni association can occur.

"I would like to preserve more of those connections, whether it be through educational or social avenues. I think there are opportunities for those of us practicing in St. Louis to arrange events that we share an interest in and increase our participation in the alumni association."

In addition, Hubert says the alumni association must continue to communicate to medical students that it is interested in them and their activities, and that WUMCAA can provide much needed financial support for student-run projects.

"Our alumni group has tremendous resources, not only financial, but also in terms of general support," says Hubert. "And we are eager, interested and open to suggestions from students on any creative ventures they might want to undertake. We applaud their efforts and want to encourage the continued growth and support of student-run projects and programs."

Hubert received his undergraduate degree in chemistry from Wabash College in Crawfordsville IN. After graduating from medical school, he completed an internship and residency in internal medicine and also a fellowship in cardiology at The Jewish Hospital of St. Louis.

He is a diplomate of the American Board of Internal Medicine, a fellow of the American College of Cardiology, and a member of a number of professional societies including the American Medical Association and the Missouri State Medical Association.

Scholars in Medicine Program - part of a partnership

The Scholars in Medicine Program has been initiated by Phillip E. Korenblat, MD, HS '65, and his wife, Arleen, to show their commitment to the School of Medicine.

The program initiated by the Korenblats will enable private donors to help students pursue their medical education. Many bright, deserving students cannot pursue their educational goals without financial assistance. Private sponsors will make it possible for the medical school to provide the essential aid to give these students an equal chance.

"Financial barriers should not keep students out of the best medical schools," says Korenblat, a former house officer who trained in allergy and immunology in 1965. For Korenblat, the opportunity to complete his residency at the School of Medicine was a treasured experience.

"I often ask what can I do as a former house officer to repay my teachers (many of whom are my colleagues now) and repay the institution that helped me obtain the skills in medicine I now possess," he says.
WUMCAA holds annual meeting

THE annual meeting of the Washington University Medical Center Alumni Association was held in the Eric P. Newman Education Center auditorium on May 6, 1999, during the Annual Reunion. President Dolores Tucker, MD '74, presided.

Tucker reviewed the activities of the past year and reported on the distribution of funds by the Executive Council during the 1998-1999 year. The council made allocations totaling $275,156, including $134,050 for Distinguished Alumni Scholarships, $45,000 for Continuing Medical Education, $34,400 to buy computers for the media center and other study areas, $8,000 for student support in summer primary care preceptorships, and the remainder to a variety of student organizations and community service projects.

Tucker then presented the slate of new officers and executive council members for 1999-2000 submitted by the nominating committee to succeed members whose terms expired on June 30. The newly elected officers and members are:

- Vice-president: Harlan Muntz, MD '77
- Treasurer: Micki Klearman, MD '81
- Local Alumni to serve three-year terms: Donald R. Bassman, MD '75, Walter F. Benoisr, MD '72, Charlene Gottlieb, MD '72, Steven Shields, MD '86
- Local former house staff to serve three-year terms: Steven Shields, MD '71-'74
- Out-of-town alumni/HS to serve one-year terms: Kathy Liu, MD '79, Joseph K.T. Lee, MD '73, Richard Bohannon, MD '58, Arthur J. Schneider, MD '68, HS '74
- Steve T. Yedlin, MD '75
- Representatives to Alumni Board of Governors to serve two-year terms: Linda Fisher, MD, HS '75-'78, James Marks, MD '65

Four alumni will have Distinguished Alumni Scholarships named for them: Robert S. Karsh, MD '52, Mary L. Parker, MD '53, Gary A. Ratkin, MD '67, and Stuart Weiss, MD '54.

"While the average debt of students graduating from the School of Medicine is less than the national average, we would like to offer an opportunity to partner with scholarship sponsors to further reduce the debt burden of our students," says W. Edwin Dodson, MD, associate vice chancellor and associate dean for admissions and continuing medical education. "Financing a medical school education is a partnership. The Scholars in Medicine Program brings a new partner to the table."

A minimum commitment of $2,500 annually can make a significant difference in a student's future. Any larger gift fulfills a greater percentage of the student's total financial need. Sponsors can see their investment pay dividends as the students grow intellectually, professionally and personally. They also enjoy the recognition of membership in the Eliot Society.

The program's first sponsor-student match is Ann Flipse, MD '59, and first-year medical student Cathy Hermann.

"Meeting my sponsor, Ann Flipse, gave me the wonderful opportunity to be able to thank her in person for her generosity," says Hermann. "I was able to learn a little more about her life as well and what the medical school was like when she was a student here. It has been nice to put a face with the name and to have someone interested in how my education progresses."

Philpotts offer challenge

FOR the second time in four years, Gordon W. Philpott, MD '61, and his family will offer a challenge grant. The challenge is to encourage alumni, former house staff and friends to participate in annual giving to any area of the School of Medicine. The grant will support the school's scholarship program. For more details, watch your mail and check the Alumni & Development section of the winter issue of Outlook.

1998 FIGURES

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"On the Shoulders of Giants"

Milder looks back at ophthalmology

by Ruth Bebermeyer

ON THE Shoulders of Giants (The Story of the Washington University Department of Ophthalmology and Visual Sciences) is one of two new books by Benjamin Milder, MD '39. Published by Walsworth, it is the product of years of research and interviews with faculty, former residents and fellows associated with the department. Many will find their stories in the book, written with Milder’s characteristic eye for humor.

His second new release, a collection of light verse, is unapologetically intended to provoke laughter. The Good Book Also Says is a New Testament sequel to his 1995 publication, The Good Book Also Says... Light Verse to Illuminate the Old Testament. Both are published by Time Being Books.

Milder has been writing most of his life and even his most serious subjects bear his light touch. Twenty years ago he co-authored The Fine Art of Prescribing Glasses Without Making a Spectacle of Yourself. It won the American Medical Writers Association AMMY award (the medical text equivalent of the Pulitzer Prize) for best new book of the year in medical science. His medical publications include books and journal articles on a variety of ophthalmological topics (lacrimal pathology and function, dacryocystography, optics and refraction low vision aids, eye injuries in sports).

He edited a teaching manual and taught courses sponsored by the American Academy of Ophthalmology for 26 years. In 1993 he and his son, Barry, co-edited Ophthalmology Clinics of North America. He has turned out at least a thousand verses, some of which have appeared in The Best of Medical Humor as well as in various medical journals and newspapers across the country. Milder is currently teaching a course called "Ogden Nash is Alive and Well: Light Verse in the 20th Century" through Washington University’s Lifelong Learning Program.

Now professor emeritus of clinical ophthalmology, Milder has had a long and distinguished career in St. Louis, where he began private practice in 1946. The Department of Ophthalmology presented him with the Distinguished Alumnus Award in 1992; the Washington University Medical Center Alumni Association gave him the Alumni/Faculty Award in 1994.

Two of Milder’s four sons followed him into medicine and also are Washington University alumni. Barry graduated from the School of Medicine in 1973 and practices ophthalmology in St. Louis; Michael graduated in 1970 and is an oncologist in Seattle. Another son, Morton, is a writer in New York, and Laurence is a rabbi in Bangor ME. Milder’s wife, Jeanne, is an accomplished pianist and teacher.

Complimentary copies of On the Shoulders of Giants will be made available to former residents and fellows of the Department of Ophthalmology and to libraries at all medical schools in the country. Others who would like a copy may contact Steve Coburn, executive director of the Department of Ophthalmology and Visual Sciences, Room 701, McMillan Bldg., 660 S. Euclid, St. Louis, MO 63110. The Good Book Also Says will be available in bookstores.
Bernard Robins, MD '52, received the Edward J. Ill Award from the Academy of Medicine in New Jersey at its annual awards dinner in May, in recognition of his distinguished service as a leader in the medical profession and in the community. The academy provides executive and continuing medical educational services for medically related and specialty organizations in the state. Robins is president of the State Board of Medical Examiners and a past president of the Essex County Health Organization, the Cold Brook Theatre and Arts Foundation, Jewish Family Service Agency of Central New Jersey, and the Jewish Family Service Agency of Somerset, Hunterdon and Warren Counties. For 10 years he was secretary of the Medical Society of New Jersey, and he has been on the boards of a number of professional and community organizations, among them the American Diabetes Association, the Camp Nejeda Foundation and the Philharmonic Orchestra of New Jersey.

Albert P. Scheiner, MD '53, is one of six School of Medicine alumni and 300 experts invited to contribute to the centennial edition of The Merck Manual: Diagnosis and Therapy. A specialist in developmental pediatrics, his work appears in the section on Mental Retardation. Since his retirement several years ago, the Scheiners live in Providence RI.

Three alumni from the 60s, Dick D. Briggs Jr., MD '60, Robert H. Gelber, MD '66, and Steven B. Raffin, MD '68, were among the contributors to The Merck Manual, published this year. Briggs, professor of medicine at the University of Alabama, Birmingham, contributed to the Special Procedures (Pulmonary) section. Gelber, a specialist in public health in San Francisco, contributed to the section on leprosy, and Raffin, a gastroenterologist in Rancho Cordova CA, contributed to the Bezoars and Foreign Bodies section.

Frances Block Judd, PT '71, has begun Renaissance Therapy Associates, a Hipppotherapy program which helps children and adults with special needs. She lives on a ranch in Sebastopol CA, near Bodega Bay north of San Francisco. Her son, Mike, 23, graduated two years ago from the University of California at Berkeley; twins Rob and Jay, 22, graduated in June from UC San Diego and UC Davis, respectively. Sarah, 4, is progressing.

Peter C. Brazy, MD '72, professor of medicine at the University of Wisconsin in Madison, contributed to two sections of The Merck Manual: Abnormal Renal Transport Syndromes and Anomalies in Kidney Transport.


Michael B. Kimmey, MD '79 was named president-elect of the American Society for Gastrointestinal Endoscopy at the annual meeting in Orlando last May. He will assume the presidency in May 2000. Kimmey is professor of medicine and assistant chief for clinical affairs for the division of gastroenterology at the University of Washington in Seattle. He also serves as director of gastrointestinal endoscopy and section chief of gastroenterology at the University of Washington Medical Center. An accomplished teacher and researcher, he has published extensively. His research focuses on endoscopic ultrasonography and ERCP. He lives in Seattle with his wife and two children.

Daniel H. Hechtman, MD '86 was a contributor to the section Diagnostic Cardiovascular Procedures (Invasive Procedures) in The Merck Manual.

Gina Maria Musolino, PT '87, received her doctorate in education, with a specialization in health care education, in December 1998. She currently is an assistant professor with Florida Gulf Coast University in Ft. Myers.

Douglas M. Hansell, MD '88, MPH, has been named chief medical officer and vice president for medical affairs at Emerson Hospital in Concord MA. He previously served as senior project manager at the Massachusetts General Hospital, where he was responsible for the design, implementation and direction of several operational and quality improvement projects.

Arun Rangaswami, MD '90, was awarded the John Tupper Excellence in Teaching Award at the University of California at Davis commencement ceremony on June 11, 1999. The winner is selected by graduating medical students from the clinical and preclinical faculty of the School of Medicine.

Al Taylor, HAP '90, administrator of Milan General Hospital in Milan TN, has been named a fellow in the
American College of Healthcare Executives (ACHE), an international professional society representing nearly 30,000 health care executives.

Brenda Toner, DT '90, has been named clinical coordinator of the Community Medical Center Bridges Program, an outpatient residential program in Missoula MT for individuals who have a traumatic brain injury.

Lisa Weiberg, PT '91, and husband Jeff announce the birth of Micah Jon on Sept. 28, 1998. Lisa works at the Minneapolis Clinic of Neurology as an outpatient physical therapist.

Julia Ann Hopson, PT '95, has completed a nine-month rotation in acute care and returned to outpatient clinic work at Trinity Medical Center in Rock Island IL. She recently bought a house and enjoyed a vacation in Hawaii.

Karen C. Stark, MD '96, was honored at the annual alumni and resident day at the Jones Eye Institute, Department of Ophthalmology at the University of Arkansas for Medical Sciences in Little Rock in May. A second-year resident, she received first place honors for her research project entitled "Immunodetection of MHC-II Positive Retinal Microglia in Infants and Newborn Rats Following Oxygen Exposure." Stark is married to James Stark, MD, a radiologist, and they are the parents of a son, Henry.

Keiko Kono, HAP '99, began a one-year administrative fellowship at Sarasota (Florida) Memorial Hospital in July.

IN MEMORY

John E. Hobbs, MD '27, died Aug. 3, 1999, in Eugene OR, at the age of 97. He was an emeritus professor of clinical obstetrics and gynecology at Washington University School of Medicine and had been on the faculty for more than 50 years. His wife, Dorothy, died in 1994. He is survived by two sons, John Hobbs Jr., and Donald Hobbs, MD '65.

George E. Zukiwovich, MD '33, died at his home in La Jolla CA, on July 5, 1999, at the age of 95. He practiced ophthalmology in San Diego for many years and was an associate professor at the University of California there. He was a colonel in the U.S. Army Medical Corps during World War II and was stationed in Honolulu at the time of the Pearl Harbor attack. His wife, Shirley, preceded him in death. He is survived by a daughter, Jill.

Thomas Haynes Roberts, MD '38, died July 6, 1999, at the age of 87 at his home in San Francisco following a long illness. His activity had been limited since a stroke he suffered in 1988. He retired from general practice in 1983. During World War II he served three years in the U.S. Army Medical Corps. In 1994 Saint Francis Memorial Hospital awarded him a Certificate of Recognition for providing 50 years of quality medical care to patients. He is survived by his wife of 61 years, Alice, two sons and a daughter.

Susan Vedder Hybarger, NU '41, died at the Veterans Administration State Home in Raymond MS of pneumonia on May 25, 1999. She was 91. During World War II she was chief surgical nurse of General Hospital #211, and received six medals and citations for her service in North Africa, Italy and France. She is survived by a sister.

Harlan I. Firminger, MD '43, died July 22, 1999, in Denver from complications of a stroke suffered on New Year's Day. He was 80. He was professor emeritus of pathology at the University of Colorado. His wife, Jane, and three daughters survive. James Haddock, MD '43, a psychiatrist, died July 12, 1999, at his home in Webster Groves MO, following a brief illness. He was 79. Before retiring in 1985 he had been in private practice for 45 years in St. Louis County. He also was an instructor in psychiatry at Washington University School of Medicine and at the University of Missouri School of Medicine in Columbia. He served as a captain in the Army Medical Corps from 1944 to 1946. His wife of 55 years, Dorothy, survives, along with two daughters and three sons.

Frances Chappell Wilson, MD '43, died of leukemia on July 16, 1999, at St. Joseph's Hospital in Tampa FL, where she had been the first female staff physician and the area's first female ophthalmologist. She practiced for 51 years, retiring only six months ago because of failing health. She was 80. Her husband, Byron Gibbs Wilson, died in May 1998, four months after they celebrated their 50th anniversary. He was a dentist who had become paraplegic in 1961 after falling as he stepped off an airplane and the stairs were not in place. She is survived by a son, two daughters and five grandchildren.

Robert D. Lange, MD '44 died in Knoxville TN, on March 1, 1999.

Ruth Ronat Stansbrough, NU '48, of University City MO, died Sept. 4, 1998, of lung cancer.

Helen H. Glaser, MD '47, HS '48-'50, died of a brain tumor at her home in Atherton CA, on Oct. 2, 1999. She was 75 years old. Glaser had practiced psychiatry in Palo Alto for nearly 25 years and pioneered studies in the treatment of children with behavioral difficulties.

A native of St. Louis, Glaser followed in the footsteps of her parents, the late Drs. Armin C. and Aphrodite J. Hofsommer in attending Washington
University School of Medicine. After residency training in pediatrics at St. Louis Children’s Hospital, Glaser practiced part-time with her father and later moved to Denver.

While evaluating children with behavioral difficulties, she noted that a number of them had a history of sniffing airplane glue or other solvents, which had previously gone unrecognized. She and a colleague published a paper in the *Journal of the American Medical Association* in 1962 calling attention to the problem of glue sniffing.

In 1963, Glaser moved to Boston, where she was appointed assistant director of the child health division and patient care coordinator at the Children’s Hospital Medical Center. She later moved to California and served as assistant medical director of the Children’s Hospital at Stanford University Medical Center.

Glaser began a four-year residency in 1970 in adult and child psychiatry. Until her retirement in 1997, she was in private practice and supervised psychiatric residents at Stanford, where she was an associate clinical professor of psychiatry.

In 1997, on the 50th anniversary of her graduation from medical school, she received the Alumni Achievement Award from her alma mater. She also was the recipient of the Aphrodite Jannopoulo Hofsommer Award for Outstanding Achievement in Medicine. The award honors Glaser’s mother, the first woman admitted to the School of Medicine.

She is survived by her husband of 50 years, Robert J. Glaser, MD, HS ’44–’47, former dean of the Stanford medical school; three children, Sally L. Glaser, Palo Alto; Joseph Glaser II, Nashville TN; and Robert J. Glaser Jr., Colleyville TX; a brother, Armin Hofsommer Jr., Saratoga CA; and four grandchildren.

A private memorial service was held. Contributions may be made to the Helen H. Glaser Scholarship Fund for women medical students, c/o Dean’s Office at Washington University School of Medicine, St. Louis MO 63110, or to the Lane Medical Library, Stanford Medical School, Palo Alto CA 94305.

Helen Price Siders Hensel, NU ’48, died of a stroke on March 22, 1999. She had lived in a nursing home in St. Louis for a number of years.


Barbara Dye, NU ’53, died June 1, 1999 in St. Louis.

Pat Worthington Keys, NU ’55, died Jan. 18, 1999, of diabetes complications. She had lived in St. Charles MO.

Sydney E. Salmon, MD ’62, a hematologist and oncologist, died of pancreatic cancer at his home in Tucson on Oct. 6, 1999. He was 63. In 1976 Salmon established the Arizona Cancer Center at the University of Arizona, one of 30 comprehensive centers nationwide, and was its director until last August. Last January a new addition to the center facilities was named in his honor. Salmon had been at the University of California at San Francisco. Prior to joining the faculty in San Francisco, he had been a cancer researcher with the Public Health Service in Boston and a special fellow at the National Institutes of Health. His specialty was treating multiple myeloma, a cancer of the bone marrow. An assay which he developed was the first to enable scientists to clone human tumor cells and identify the most effective drug for an individual patient rather than using a battery of drugs. Most recently he had co-invented a technique for rapid screening of cancer-fighting peptides which significantly speeds up the search for effective cancer treatments. Salmon had served as president of the American Society of Clinical Oncology and of the Association of American Cancer Institutes. He is survived by his wife, Joan, three sons and two daughters.

Lewis H. Koplik, MD ’65, died on May 11, 1999, of a pulmonary embolism, a complication of an automobile accident he suffered in Atlanta in late April. He was 59. At the time of the accident, he was in Atlanta to receive the prestigious National Abortion Federation’s Christopher Tietze Lifetime Humanitarian Award. A retired gynecologist, Koplik was known for his commitment to women’s reproductive rights, and had founded the Abortion and Reproductive Health Services Clinic in Albuquerque in 1973. It later became Planned Parenthood of New Mexico. Koplik was also known for his volunteer work with Jewish prisoners in the Central New Mexico Correctional Facility. When he learned that Jewish services were not available to the inmates, he organized weekly services at the prison and led services there each week for nearly two decades. He was a native of New York and a third generation physician. He is survived by his wife, Emily, a daughter, Sara, and a son, Joel. The family requests that memorial gifts be made to Planned Parenthood of New Mexico, 1804 Carlisle NE, Albuquerque NM 87110.

Pacelli E. Brion, MD, HS ’68, died in St. Louis on Aug. 24, 1999 at the age of 60 following a long illness. He was the former director of psychiatry at Lutheran Hospital and had practiced in the St. Louis area for 25 years. Survivors include his wife, Noemi, and three children.
Readjust Your Portfolio... Here's a Tax-Wise Option

As you review your personal financial plan, you may find that a Washington University Charitable Gift Annuity can be helpful to you if you are age 60 or older. Here's one way you can modify your plan and make a significant gift to the School of Medicine:

Example:
If you are age 70 and create a $50,000 Gift Annuity with long-term appreciated securities which have a cost basis of $25,000, you will receive the following benefits:

- **Rate of Return**: 7.5%
- **Guaranteed annual income for life**: $3,750
  - Ordinary income: $1,852
  - Capital Gain Income: $949
  - Tax-Free Income: $949
  (for the first 15.9 years; then the entire amount becomes taxable income)
- **Federal income tax charitable deduction**: $19,857 *

You may also fund this Gift Annuity with cash and receive similar benefits, including tax-free income of $1,898. (There would be no capital gain income.)

Annuities may be used to endow and name many important programs such as scholarships, research funds and professorships.


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**Sample Rates of Return**

<table>
<thead>
<tr>
<th>Single Life</th>
<th>Age</th>
<th>Rate</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>62</td>
<td>6.8%</td>
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</tr>
<tr>
<td>64</td>
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<td>86</td>
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</tr>
<tr>
<td>88</td>
<td>11.4%</td>
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</tr>
<tr>
<td>90</td>
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<table>
<thead>
<tr>
<th>Two Life</th>
<th>Age</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 &amp; 60</td>
<td>6.3%</td>
<td></td>
</tr>
<tr>
<td>60 &amp; 65</td>
<td>6.3%</td>
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</tr>
<tr>
<td>65 &amp; 65</td>
<td>6.6%</td>
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<tr>
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<tr>
<td>70 &amp; 75</td>
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<tr>
<td>75 &amp; 75</td>
<td>7.3%</td>
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</tr>
<tr>
<td>75 &amp; 80</td>
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<tr>
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<td>80 &amp; 85</td>
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</tr>
<tr>
<td>85 &amp; 85</td>
<td>9.0%</td>
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</tr>
</tbody>
</table>

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Advice from your tax or legal advisor should be sought when considering these types of gifts.

*Amount of charitable deduction may vary slightly.*
Charitable Gift Annuities

☐ Washington University is already included in my estate plans — I would like to become a Robert S. Brookings "Partner."

☐ I am age 60 or over. Please send me a personalized, confidential calculation using the following birthdate(s) to illustrate the very attractive benefits that I will receive from a Washington University Charitable Gift Annuity. I would like a calculation based on a theoretical gift of:

$__________________  ☐ Cash ☐ Securities ($__________________)  
(minimum $5,000)  Cost Basis

First Beneficiary Birthdate _____________________________
Second Beneficiary Birthdate ___________________________

☐ Please send me your booklet on Charitable Gift Annuities.

☐ Please send me your booklet on other Life Income Plans at Washington University.

☐ Please send me information on making a bequest to Washington University School of Medicine.

☐ Please send me information on named endowment opportunities.

☐ Please have David C. Jones, Paul Schoon, Lynnette Sodha, or Mike Touhey from the Washington University Planned Giving Office call me.

Name _________________________________________________
Address ________________________________________________
City / State / Zip _________________________________________
Daytime Phone ___________________________________________

(Fold this form and seal edges with tape to mail.)

Use this postage-paid card to let us know what's new with you. Share your news about awards and honors, promotions, community activities and more. Contact Ruth Bebermeyer at (314) 286-0020 or e-mail bebermer@msnotes.wustl.edu.

Update Yourself!

Name ______________________________________________________
Address ___________________________________________________
Specialty ____________________________ Class/HS Year _________
E-mail ____________________________ (May we list your e-mail address in our web page directory?) ☐ Yes ☐ No
MAY 11-13
2000

Mark your calendars now and plan to meet your classmates in St. Louis at Reunion 2000!

Find information on the web at:
http://medschool.wustl.edu/alumni

Registration materials will be mailed in February.

M.D. CLASSES OF:
'40 '45 '50
'55 '60 '65
'70 '75 '80
'85 '90
Cat Caper: Protective Services employees Marc Hudson, left, and Ken Zimmerman, right, recently spent more than an hour rescuing a stray kitten that had crawled into the undercarriage of an employee's car and hitched a ride from Interstate 55 and Broadway to the Medical Center. The black and white female kitten, affectionately named Bandit, found a home with Protective Services employee Kim Prophete, center, her husband and their six children.