Battling Brain Cancer
Top Employee Honored  Robyn Roth, senior electron microscopy technician in cell biology and physiology, has been named the 2000 Dean’s Distinguished Service Award recipient. A 23-year employee, Roth was nominated for the honor by John E. Heuser, MD, professor of cell biology and physiology. Roth works in Heuser’s laboratory, producing deep-etch electron micrographs (see inset), and she provides fundamental technical training in the process for scientists from around the world.
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See page 36

Class Notes Update Yourself!
Your classmates would like to hear what you've been doing. Please take a moment to complete the postage-paid reply card on page 36.

2001!
Straight "A" student Lindsay Upschulte of Sparta, IL has neurofibromatosis (NF1), an inherited disorder that predisposes patients to certain types of brain tumors. Lindsay, who is legally blind, plays piano on a braille keyboard and has participated in trampoline and tumbling events at national meets and the Junior Olympics. Predisposition disorders like NF1 provide clues for research into the basic science of brain cancer, allowing clinician-scientists like David H. Gutmann, MD, PhD, to develop better treatments for these debilitating tumors. For more on this story, turn to page 12.

A team of surgeons works to remove, reshape and reconstruct the cranium of a 4-month-old baby.

Successful diagnosis and treatment of brain cancer requires equal parts clinical, laboratory and surgical expertise.

The teenager's quest for independence is at odds with a chronic condition.

Staff at the School of Medicine's machine shop turn ideas into reality using an eclectic array of materials.
The Human Genome Project has assembled and published a nearly completed physical map of the human genome—the genetic blueprint for a human being. The map, which is more than 95 percent complete and covers 96 percent of the genome, appeared in the Feb. 15, 2001 issue of *Nature*.

Organized by researchers at Washington University School of Medicine in St. Louis, with contributions from laboratories throughout the world, the map provided the basis for the selection of clones for sequencing, and in turn provided the scaffold on which the draft human genome sequence was assembled.

After the multiple centers involved in the public effort sequenced pieces of DNA, these pieces could be positioned with respect to one another to determine where particular pieces fit with other pieces on a chromosome.

"In assembling the sequence, it is key to map the pieces back to their proper places in the genome," says Robert H. Waterston, MD, PhD, the James S. McDonnell Professor and head of genetics and director of the Genome Sequencing Center. "The physical map was a critical guide for the assembly of the human genome sequence."

The public effort to sequence the genome has relied on this map-based approach. The map also was a key component in the construction of the working draft of the genome sequence that was announced June 26, 2000.

Mapping was important because more than 50 percent of the genome is repetitive. Some regions of DNA have sequences that are up to 98 percent identical to one another even though they may be physically located millions of base pairs apart or even on different chromosomes.

"That's where we could have had problems without a map-based approach," says John D. McPherson, PhD, associate professor of genetics and co-director of the Genome Sequencing Center. "So many parts of the genome look exactly like other parts that if you work only with small pieces, it's tempting to try to stick similar pieces from different parts together. The physical map allows us to work with large pieces and to know where the little ones are supposed to go."

Early in the public mapping effort, each of the centers in the genome consortium worked on maps for particular chromosomes. But it soon became clear that making a fingerprint map of the entire genome would be greatly beneficial to the international effort, so the mapmakers joined together their data from around the world to create one accepted map, accessible to all.

The physical map continues to assist those researchers who are finishing the genome sequence and will provide a resource for years to come.
Purdy is recipient of Gold Medal Award

JAMES A. PURDY, PHD, professor of radiology in radiation physics, recently received the 2000 Gold Medal Award from the American Society for Therapeutic Radiology and Oncology (ASTRO). The award was presented at the society's annual meeting in Boston.

Established in 1958, ASTRO is the world's largest society of radiation oncologists and scientists. Each year, it presents a gold medal to highlight members' outstanding contributions to radiation oncology.

Purdy is known for his work on radiation oncology quality assurance issues and in computer-aided radiation therapy, particularly 3-D conformal radiation therapy (3-D CRT) and intensity-modulated radiation therapy (IMRT). These specialized treatment techniques use computers to generate 3-D images of tumors and surrounding anatomy, allowing physicians to aim radiation at tumors while sparing healthy tissue.

Purdy serves as associate director for quality assurance at the School of Medicine's Mallinckrodt Institute of Radiology Radiation Oncology Center and is chief of its physics section. He also is director of the national 3-D Quality Assurance Center.

The center, funded by a multicenter grant from the National Cancer Institute, oversees quality control of 3-D CRT clinical trials.

Purdy is a past chairman of the American College of Medical Physics (ACMP) and a past president and former member of the board of directors of the American Association of Physicists in Medicine (AAPM).

Children's Health

But seriously, folks – nitrous oxide reduces pediatric pain

To children and their parents, a trip to the emergency room for stitches can mean not only the pain of an injury but also anxiety about the procedure.

In a new study, researchers at the School of Medicine determined that nitrous oxide (sometimes called laughing gas) is more effective in sedating young children during facial suturing than the more traditional use of an oral pain medication. The study, which appears in the January 2001 issue of *Annals of Emergency Medicine*, examined 204 children ages 2 to 6. Lacerations requiring sutures contribute to as many as half of emergency department visits by injured children.

"The nitrous oxide worked very well at reducing anxiety in the age group we studied," says Jan D. Luhmann, MD, assistant professor of pediatrics in the division of emergency medicine. "Prior to this study, nitrous oxide had not been commonly used in pediatric emergency units. We knew of its widespread and successful use by dentists in the outpatient setting, so we postulated that it would work well in our setting, too."

Luhmann said the method also showed fewer side effects such as irritability and dizziness and reduced recovery time from approximately an hour to less than 5 minutes when compared to the oral pain medication midazolam.

The children studied received one of four different kinds of care: 1) standard care, which included comforting and topical anesthesia augmented with injected lidocaine if needed; 2) standard care and oral midazolam; 3) standard care and nitrous oxide; or 4) standard care, oral midazolam and nitrous oxide. Videotapes of the procedures were blindly scored to assess distress at the beginning of the procedure and during wound cleaning, lidocaine injection, suturing and recovery. The doctors who inserted the sutures and were blinded to the method of sedation administered to their patients noted adverse effects. Parents also completed questionnaires.

Both the parents and physicians scored the use of standard care combined with nitrous oxide as the highest of all the care methods in reducing pain and anxiety. The standard care, oral midazolam and nitrous oxide method ranked second.
Top professors were honored recently by medical students at a ceremony held at the Eric P. Newman Education Center. (front row, from left) Rosa Maria Davila, MD, Class of 2002 Professor of the Year; Jane Phillips-Conroy, PhD, Class of 2003 Professor of the Year; Krikor Dikranian, MD, PhD, Class of 2003 Stanley J. Lang Lecturer of the Year; Jason Kaufman, Class of 2003 Teaching Assistant of the Year; (back row, from left) Erika C. Crouch, MD, PhD, Class of 2002 Coursemaster of the Year; Madeline D. Kraus, MD, Class of 2002 Lecturer of the Year; Robert S. Wilkinson, PhD, Class of 2003 Coursemaster of the Year. Twenty other faculty received Distinguished Teaching Awards.

Researchers suspect link between welding and Parkinson's disease

Scientists have identified the first clue that welding might trigger the early onset of Parkinson's disease (PD). A research team led by neurologist Brad A. Racette, MD, found that 15 professional welders developed typical clinical and neurological signs of the disease an average of 15 years earlier than the general population. The study was featured in the January 2001 issue of the journal *Neurology*.

"This research doesn't prove that welding causes PD," explains Racette, an assistant professor of neurology at the School of Medicine. "But it's suspicious that the majority of these patients had a much younger age of onset. Our theory is that we have identified a group of people who probably would have developed the disease eventually, but something in the welding environment caused them to develop symptoms earlier."

Parkinson's disease is a progressive movement disorder that affects more than 1 million Americans. It is characterized by slowness of movement and tremors that affect one side more than the other.

Although genetics can account for some cases, 80 percent of PD patients lack a family history of the disease. Scientists therefore have hypothesized that environmental factors are largely responsible. However, no such factors have been identified.

Racette and colleagues set out to determine whether welding is in fact an environmental contributor to Parkinson's disease. They identified 15 professional welders among patients in the school's Movement Disorders Center. Then they compared the welders' medical histories and clinical symptoms with those of control PD patients.

They found no clinical differences between the welders and typical PD patients. The two groups had the same severity and frequency of symptoms and responded similarly to levodopa, a drug used to treat the disease. The only statistically significant difference was average age of onset: 45 for the welders, 15 years younger than for the control group.

The researchers also imaged the brains of two of the welding patients and 13 control patients. People with PD typically have lower levels of a neurotransmitter called dopamine in certain regions of their brains. Using a technique called fluorodopa positron emission tomography (FDOPA PET), the researchers determined how much dopamine the brain could take up. With that information, they assessed the extent of Parkinson-like deterioration. Again, the FDOPA PET scans revealed no significant difference between the welding and control groups.

"These results are really exciting because we may soon be able to identify the first environmental cause of PD," says Racette. That information may help determine whether welders should take precautionary measures and also will help researchers begin to unlock the underlying cause of this debilitating disorder.
Young named Hamm Professor

RECONSTRUCTIVE AND COSMETIC SURGEON

V. Leroy Young, MD, has been named the first William G. Hamm Professor of Plastic Surgery. The chair was established by a bequest from Hamm, an alumnus and noted plastic surgeon who died in 1998.

A leading expert on breast reconstruction and augmentation, Young studies the properties of various breast implants to learn how long they last and whether they have potentially harmful long-term effects. Other research interests include the health benefits of breast reduction and liposuction. In 1999, he was first author of a report on the safety and effectiveness of ultrasound-assisted liposuction.

Young serves as chief of surgery at Barnes-Jewish West County Hospital. In addition to breast surgery and liposuction, his specialties include cosmetic and reconstructive facial surgery and skin cancer treatment. He serves on the American Society of Plastic Surgeons board of directors and is committee chair for the Silicone Implant Research Committee of the Plastic Surgery Education Foundation. He also is an examiner for the American Board of Plastic Surgery.

Welcome to Web Bugs, a new, interactive web site for hematology/oncology pediatric patients, their families, school personnel and interested people in the community. The friendly bug characters that decorate the site guide its users to a number of helpful resource pages, including one where patients can share their stories or ask the experts a question. Another provides back-to-school information for both patients and school personnel, as well as a bulletin board that lists upcoming events, and links to other sites relevant to pediatric cancer and blood diseases. Visit the site, which was created by the division of hematology/oncology in the department of pediatrics, at: http://webbugs/

American Association for the Advancement of Science (AAAS) fellows named

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS) has bestowed its highest honor on four School of Medicine faculty. AAAS fellows are elected for their efforts on the behalf of the advancement of science or its applications that are scientifically or socially distinguished.

Daniel E. Goldberg, MD, PhD, professor of medicine and molecular microbiology and Howard Hughes Medical Institute Assistant Investigator. Goldberg was honored for his research on the metabolic processes that enable the malaria parasite to thrive inside red blood cells. He has identified several promising drugs to fight malaria.

Jeffery W. Lichtman, MD, PhD, professor of anatomy and neurobiology. Lichtman's studies on the structure of the human brain and its neuromuscular synapses suggest that stimulating patients’ muscles while using blocking agents can save lives and avoid paralysis.

His study of synapses also has shown the importance of one's experiences in forming the brain’s vital connections, especially in the early stages of childhood development.

Philip D. Stahl, PhD, Edward Mallinckrodt, Jr. Professor and head of cell biology and physiology. Stahl was honored for his contributions to understanding the mechanisms of endocytosis and intracellular trafficking of proteins. These cellular processes are important to a wide variety of cell functions.

Thomas A. Woolsey, MD, professor of anatomy and neurobiology of cell biology and physiology, and of neurology and neurological surgery. Woolsey’s research focus is higher brain function in humans and the flow of blood to the brain. His studies of brain flow have been linked to other research in the areas of brain development and stroke.
Hultgren named Stoever Professor of Molecular Microbiology

SCOTT J. HULTGREN, PHD, has been named the Helen Leibrink Stoever Professor in Molecular Microbiology. The chair was established with a bequest from Stoever, a Washington University alumna who died in 1998.

Helen Stoever suffered from osteoarthritis from an early age, and she wished to contribute to advances in medical research that would ease the suffering of others.

Hultgren studies how bacteria infect people. He focuses on *Escherichia coli*, which causes urinary tract infections. At least half of American women have this problem at some point during their lives, and many find that the disease keeps coming back, even after treatment.

*E. coli* are able to cause disease because they are covered with fine hairs, called pili, whose sticky tips snag onto the bladder lining. The bacteria can cling and multiply rather than being swept away by the flow of urine. The pili are assembled inside the cell from thousands of protein subunits.

Hultgren discovered that a protein called a chaperone plays an essential role in pilus assembly. The chaperone marshals the subunits, molding them into the proper shape so they lock together to form a pilus. The research may lead to a drug to disable the chaperone. Unable to produce pili, *E. coli* could not infect the bladder.

The business end of the pilus is an adhesin, which locks onto a receptor in the bladder wall. Using its knowledge of pilus assembly, Hultgren's group obtained the adhesin for use as a vaccine. It primes the immune system to produce antibodies that block the adhesin on invading *E. coli*, marking the bacteria for destruction.

The vaccine has completed the first stage of human trials.

In 1998, Hultgren received both the prestigious Eli Lilly Award and a Nobel Fellowship.

Raihle, Petersen share in prize

THREE PIONEERS IN THE FIELD of cognitive neuroscience have won the 2001 University of Louisville Grawemeyer Award for Psychology.

The first awarding of the $200,000 prize for outstanding contributions to the field of psychology is to Michael I. Posner, PhD, Marcus E. Raichle, MD, and Steven E. Petersen, PhD, who collaborated in the mid-1980s to advance the ability to isolate and measure the brain's mental functions.

Posner is founding director of the Sackler Institute at Weill Medical College of Cornell University in New York City. Raichle and Petersen are professors at Washington University in St. Louis with many academic appointments, including psychology, neurobiology, radiology, neurology and neurological surgery.

The three scientists combined ways to assess mental operations and make images of the brain, a step that led to discoveries of neuroanatomical networks that support language and attention processes.

Their findings continue to affect the study of the brain through imaging. Work in the field potentially could help children with developmental language disorders, attention disorders, dyslexia and other learning disabilities, and adults with schizophrenia, dementia and aphasia.

Raichle co-directs the radiological sciences division of Mallinckrodt Institute of Radiology. Petersen is chief of the School of Medicine's neuropsychology division.
Outstanding leaders in medical student education receive honors

THE SCHOOL OF MEDICINE recently recognized the first recipients of the Samuel L. Goldstein Leadership Awards in Medical Student Education. Honors were bestowed on Thomas H. Gallagher, MD, assistant professor of medicine, Robert S. Wilkinson, PhD, professor of cell biology and physiology, and a joint award was given to Kathleen A. McGann, MD, assistant professor of pediatrics, and Angela M. Sharkey, MD, associate professor of pediatrics.

The selection committee gave special recognition to Kenneth M. Ludmerer, MD, professor of medicine, for his contributions to medical education. Ludmerer has published two books on the history of medical education, both of which were nominated for a Pulitzer Prize and a Bancroft Prize.

The awards were established in memory of Samuel L. Goldstein, a long-time friend of the medical school, in recognition of faculty who have contributed in an outstanding manner to medical student education. The recipients were selected by a committee of their peers after a formal nomination process. The honors will be awarded annually.

GENETICS

Researchers sequence first plant genome

SCHOOL OF MEDICINE SCIENTISTS are part of a team that has generated the first complete DNA sequence of a plant, the genome of Arabidopsis thaliana, a type of flowering mustard.

Because Arabidopsis is a widely studied model organism, its sequence will enable scientists to study genes that control basic plant functions.

The Arabidopsis Genome Initiative, an international consortium, performed the research that was reported in the December 14, 2000 issue of Nature.

Under the direction of Richard K. Wilson, PhD, associate professor of genetics, the School of Medicine's Genome Sequencing Center played a two-part role in the project. During the early stage, it constructed a genome map that was used by all the sequencing centers. In collaboration with Cold Spring Harbor Laboratory in New York State and the John Innes Centre in the United Kingdom, it then sequenced chromosomes 4 and 5. Arabidopsis has five chromosomes in all.

Arabidopsis is a small plant that grows readily in the laboratory. Its unusually compact genome has just 125 million base pairs — the building blocks of the genome — compared with wheat's 15 billion. Both plants have approximately the same number of genes — Arabidopsis has 25,498, the researchers discovered — but wheat contains many more repeated sequences.

Information gained from the sequence may provide a basis for improving important crop plants through breeding or genetic engineering. Such improvements might include foods that last longer on supermarket shelves, are lower in fat or higher in protein, or are tastier.

It may also help make crops harder. Sequence analysis suggests that cell signal pathways that respond to bacteria, parasites and other external threats are more abundant in plants than in other organisms.

Scientists are comparing the Arabidopsis sequence to other fully sequenced genomes, including those of yeast, fruit flies and roundworms. By uncovering the genetic basis for similarities and differences between organisms, such work may shed light on evolution.

“Gaining a better understanding of the functions genes perform in cells, plant or animal, helps us understand how to diagnose and treat human disease,” Wilson says.
Through a delicate procedure that is part surgery and part sculpture, Judith M. Gurley, MD, helps a baby with a cranial deformity get headed in the right direction.

BY CANDACE O'CONNOR

Above: Judith M. Gurley, MD, with her young patient, Brian Bauman.
Illustration: The shape of baby Brian's head, before (white) and after the surgery that reshaped his skull.
Soon after Brian Bauman was born, his parents heard the chilling news that something was amiss. The shape of his head was wrong—perhaps a result of his difficult birth—but might correct itself with time. Instead, Jeff and Karen Bauman of Granite City, Illinois, watched day by day as their son’s abnormally narrow skull bulged more visibly in the forehead and in the back.

Their pediatrician sent them to St. Louis Children’s Hospital, where doctors diagnosed sagittal synostosis, a condition that occurs once in every 4,000 to 5,000 births. Brian’s cranial bones had fused prematurely, so he lacked the usual infant “soft spot.” His brain, restricted from growing side to side, was forced to push forward and backward, giving his head an elongated shape. Left untreated, Brian eventually might suffer from headaches, and his skull deformity would worsen. He would have a hard time lying on the back of his head and wearing a hat or bike helmet.

Surgery was the only solution, but the prospect made the Baumans anxious. Their older son, Brandon, now a healthy 4-year-old, was born prematurely and had numerous medical problems. A second son, Blake, had died when he was six weeks old after an Illinois clinic misdiagnosed his bronchial pneumonia as an allergic reaction.

Still, the family decided to go ahead with the delicate procedure in which a neurosurgeon would peel back Brian’s scalp and remove his skull piece by piece. Then a plastic surgeon would reshape those pieces before reattaching them to the remaining skull. “It is just something that has to be done. We don’t want him to suffer,” says Jeff Bauman, a union carpenter.

For the surgery, the family turned to Judith M. Gurley, MD, assistant professor of plastic and reconstructive surgery, who joined the Washington University faculty in 1999—one of a talented cadre of women who are breaking new ground in traditionally male surgical subspecialties. In fact, when Gurley first came to the School of Medicine in 1998 for a pediatric craniofacial fellowship, she was one of a few American women in her field.

At her first meeting with the Baumans, Gurley explained the risks and benefits of surgery. Although she and her partner, Jeffrey L. Marsh, MD, professor of plastic and reconstructive surgery, have performed dozens of similar procedures—10 per year on average—without incident, there is a small risk of serious complications. A few centers have reported fatal bleeding incidents; every child who undergoes the procedure needs a blood transfusion.

To minimize risks and achieve the best cosmetic result, children with sagittal synostosis should have the surgery as early as possible. Infant skull bones are malleable, so the surgeon can use special scissors and bone-bending forceps to re-form the pieces.

“The older the child is the more difficult the surgery, because you can’t bend the bone and you need a saw to shape every piece,” says Gurley. “That increases the operative time, increases the blood loss and makes it a much more laborious procedure.”
Surgey Day Arrives
So on October 30, a few days shy of his four-month birthday, Brian Bauman and his parents are in a waiting room at Children's Hospital. At 17 pounds, he is a husky baby—and since midnight he has not been allowed to eat. Now it is nearly lunchtime, and he is beginning to whimper. His mother soothes him. Brandon is not with them; he is back home feeling “scared and angry,” his mother says, because he remembers Blake’s death—and fears the same thing will happen to Brian.

With cheerful words of reassurance, anesthesiologist Julian Yepes, MD, whisks Brian away to the operating room. Yepes will spend one to two hours anesthetizing the baby, hooking up his intravenous lines, placing a catheter in his bladder, inserting a breathing tube and swaddling him in a heating blanket that will keep him warm during surgery. Then the stage is set for neurosurgeon Jeffrey G. Ojemann, MD, assistant professor of neurological surgery, to begin his part of the procedure.

In the blue-and-white world of the operating room, any other color stands out sharply. On this day before Halloween, several members of the OR team—which also includes a scrub nurse, circulating nurse and neurosurgery fellow Tord D. Alden, MD—wear jaunty orange headgear.

To begin, Ojemann makes an ear-to-ear incision. Working forward and backward, he peels away Brian’s scalp, exposing his skull from his eyebrow bone to the back of his neck. On the exposed skull, he draws a pattern of lines and dots that will provide a blueprint for his cuts. He starts his saw, which is tethered to a foot pedal; whining like a dentist’s drill, it slices neatly through the skull bone. Brian’s forehead bone comes off first, then others—four in all. What remains is a strip down the middle of Brian’s skull and a section above each ear, where the reshaped pieces will later be reattached.

The process, which looks routine in Ojemann’s hands, is actually fraught with risks. The surgeon has to saw through bone without disturbing major blood vessels or the brain’s protective lining—a process made easier by the saw’s safety features. Still, Ojemann says, “in such a small child, even a small blood loss can be fatal, so we must make absolutely sure the lining is free from the bone. We take great pains to do that before we make our cuts.”

Reshaping the Skull
When Ojemann is done, Gurley and her surgical assistant, craniofacial fellow Delora Mount, MD, are summoned to the operating room for the next phase of surgery. The procedure they will use is only three decades
old, developed by French plastic surgeon Paul Tessier, MD. Studying each section of Brian's skull in turn, Gurley squeezes, snips, bends and stretches, casting occasional glances at the CT-scan posted on the wall.

This bone manipulation gives Gurley an affinity with orthopaedic surgeons. "In fact, a lot of people call craniofacial surgery 'orthopaedic surgery of the face,'" she says. "I have always liked working with bone, since human form is largely dependent on the bone that supports our soft tissue. And I enjoy making changes that are visual."

That aesthetic sense gives Gurley another kind of kinship: with painters, sculptors and other artists. As a University of North Carolina undergraduate, she took figure drawing classes; today, she still paints in her spare time. Medicine and art intersect in plastic surgery, which brings the two together in "the perfect combination," she says.

But the experience that clinched Gurley's interest in pediatric craniofacial surgery occurred during her residency at the University of Chicago, when she twice traveled to Central America with surgical teams on missions of mercy. There, she had the chance to operate on desperately poor children long overdue for medical care.

Today, she is hard at work on tiny Brian Bauman: inspecting each reshaped piece of skull, then holding it up to his head with an appraising look to see how it will fit. Using a surgical saw, she also makes barrel-stave cuts in his eyebrow bone and in the portion of skull above each ear.

These cuts will allow the constricted brain to reshape itself, expanding side to side. Finally, she begins attaching the skull pieces to these serrations with dissolving plates and screws.

The reconstructed skull is a patchwork quilt of pieces, with gaps in between. Within three months, the skull bone will grow back and fill in these spaces. Meanwhile, this extra room will give the brain more breathing space, but it will also make Brian's head more vulnerable. A week after surgery, Brian will begin wearing a helmet for protection until his bone has fully regrown.

Just after 5 p.m.—little more than five hours after it began—Brian's surgery is nearly finished. Gurley pulls his scalp back up and deftly stitches it together. She wraps his head in gauze, as he has lost a good deal of blood and more will drain. The scar will be watertight within 48 hours. The baby will only need to spend three days in the hospital.

"Isn't he beautiful?" asks Gurley, admiring Brian's skull. Next she will hurry out to talk to his waiting parents. The mother of a toddler herself, she can imagine how they feel.

"It is fascinating to see parents before and after surgery," she says. "Beforehand, no matter how gently you describe the procedure, they are petrified. Afterwards, there is such a sense of relief—and every single one has been glad they did it."

**Follow-up Visit**

Early in January, Brian is back at Children's Hospital for his two-month visit. His head measurements are perfect, Gurley says, and with his chubby face and round skull, he has a whole new look. "It's amazing," says Karen Bauman. "He looks like his dad now—he never did before." Their older son Brandon is relieved but still protective, she adds. "He'll tell me, 'Mom, watch his head.'"

The only vestige of surgery is a thin pink scar running across the top of Brian's head, from one small ear to the other. Already, his downy blond hair is covering it up, and soon it will be hidden completely.

If he ever goes bald, that old scar may one day reappear. But otherwise, Brian Bauman will never have any reason to recall the extraordinary surgery that changed his appearance and his life. 

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*Brian is now a healthy baby, and happy—until it's time to measure his new hat size!*

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Outlook  Spring 2001
Neuro-oncology

Defining the unique genetic characteristics of brain tumors may lead to better diagnosis and therapy

Brain cancer — the very words evoke fear.

And for good reason. Despite advancements in detection and treatment of other tumor types, brain cancer continues to be one of the deadliest forms of the disease. But thanks to technological advances and scientific breakthroughs, the field is ripe for progress.

That's why, roughly five years ago, neuro-oncologists at the School of Medicine joined forces to tackle this most formidable of cancer frontiers. Today, their multidisciplinary approach incorporates a wide range of clinical and laboratory expertise.

With access to the Alvin J. Siteman Cancer Center and cutting-edge technologies, researchers at Washington University are pooling their resources with several goals in mind: to understand how and why cells grow abnormally and divide uncontrollably in order to develop better treatments; to discover ways to predict who will become sick so that early detection is more feasible; to appreciate differences between types of brain tumors so that more targeted treatments can be applied to specific tumors, and to improve surgical strategies.

BY GILA Z. RECKESS
Difficult and deadly challenges

According to the American Brain Tumor Association, about 13,000 Americans die each year from brain cancer. Brain tumors are the third leading cause of cancer-related deaths in people ages 20–39 and are even more common in adults ages 40–70. They are the second leading cause of cancer-related deaths in children.

In the normal body, cells constantly divide, grow and die. These processes are genetically hard-wired by a number of critical genes that maintain the balance between cell life and death. But sometimes a cell escapes from the programmed routine of development and death—it grows rapidly and abnormally and forms a cancer. These abnormal cells perpetuate and accumulate genetic mutations and then can metastasize (grow and spread) to other areas of the body.

The brain poses a unique set of challenges. Early detection of brain cancer is more difficult—and arguably more important—than in most other organs. Despite improvements in brain imaging, it is not cost-efficient to offer routine brain scans, even for individuals over the age of 55 who are at the greatest risk. Symptoms often are subtle or difficult to diagnose. These tumors can therefore grow undetected for many years and become resistant to therapy.

Late diagnosis is made even more frightening by the fact that the brain is more difficult to treat than any other organ. It has its own protective wall, the blood-brain barrier, that keeps out unwanted elements. Unfortunately, it often also blocks chemotherapy and radiation treatment, and poses a unique challenge for surgery.

In theory, the best way to get rid of an unwanted bundle of cells is simply to remove it. But, once again, the brain is defiantly difficult. It is a complex system of interwoven cells, each specialized for different but equally vital functions and each connected to other cells through an intricate network of communication. Even if the tumor hasn’t begun to spread, the surgical risks could outweigh the benefit.

To more effectively treat this devastating cancer, physicians and scientists are working to develop tumorspecific therapies and to discover ways of identifying individuals who are most likely to respond to a given treatment.
Arie Perry, MD, uses special DNA fragments to probe tumors for genetic regions of interest.

Banking on the future

Early diagnosis of brain cancer is as challenging as it is critical. Though there are some genetic or immune diseases that predispose certain individuals to brain cancer, as well as evidence that points to environmental risk factors like radiation, few cases fall into any such category. For the most part, there is no way to predict who will develop a brain tumor.

For several years, surgeons at the School of Medicine have been collecting frozen samples of tumor tissue from consenting patients and saving them in the Siteman Cancer Center Tumor Repository directed by Mark A. Watson, MD, PhD, assistant professor of pathology. After a biopsy is done, a sample of tissue can be stored indefinitely for experimental analysis.

"By successfully freezing cells, you can get a series of samples and go back to look at them when the right tools are available," says Keith M. Rich, MD, associate professor of neurological surgery, of radiology, and of anatomy and neurobiology, who uses the samples for his own research.

The goal of the tumor bank is to provide a resource of biological specimens that can be used to develop genetic profiles of brain tumors. In the same way that a fingerprint distinguishes individuals from one another, the genetic makeup of each specific type of tumor distinguishes it from other forms of cancer. With a large bank of tissue samples, researchers hope to understand the distinguishing characteristics between different tumors and to develop tailored treatment strategies for individual patients.

Taking the genetic inventory

To produce these molecular profiles for specific grades of brain tumors, researchers employ a genetic technology called GeneChip analysis. The technology, also referred to as DNA microarray, is provided by the Multiplexed Gene Analysis Core at the Siteman Cancer Center, led by Watson and William D. Shannon, PhD, assistant professor of medicine and of the division of biostatistics. It allows researchers a panoramic view of cancer gene expression, thousands of genes at a time.
“Fingerprinting” cancer

By studying the unique genetic signatures of tumor tissue, today’s research paves the way for tomorrow’s medicine

MEDICAL PUBLIC AFFAIRS GRAPHIC

By studying the unique genetic signatures of tumor tissue, today’s research paves the way for tomorrow’s medicine.

FISH “fingerprints”
The FISH process uses special DNA probes to detect whether there is an abnormal number of specific genes in a tumor.

GeneChip “fingerprints”
A panoramic view of gene expression, GeneChip-encoded data inventories the activity of thousands of genes at a time. The genetic data of tumor tissue samples are compiled and compared with healthy tissue (below).

“Technologies like the GeneChip provide us a unique perspective into the genetic domain,” says Watson. “We now can step back and take inventory on a larger scale, which nicely complements our traditional approach of examining suspect genes one at a time.”

The resulting, comprehensive list of active genes is useful both for basic science and clinical research: It helps to identify groups of patients that might respond to different treatments already available and also leads to frequent discoveries of new genes that can then be examined more critically in the laboratory. Watson and his colleagues already have begun to classify tumors using this method and are compiling genetic profiles that may help predict clinical behavior and response to therapy.

In this pursuit to distinguish unique characteristics of particular types of tumors, Arie Perry, MD, assistant professor of pathology, enlists the help of another useful technique, fluorescence in situ hybridization, or FISH. Perry uses specially designed fragments of DNA to probe individual tumors for specific genetic regions of interest. These DNA probes deposit a red or green fluorescent dye wherever those genetic regions are present and these colored signals, or dots, are then visible through a microscope.

Normal cells have two copies of each gene. Once a gene has undergone FISH, Perry can simply examine a tissue sample and count the dots: two red dots or two green dots signify that the gene of interest is intact, or healthy; numerous dots suggest that the gene is amplified, or more active than it should be; fewer than two mean that the gene has been deleted off the chromosome. Either of the latter two scenarios might indicate tumor growth.

“In the future, I think we’ll still be looking under the microscope to make a diagnosis,” says Perry. “But by adding techniques like FISH, we’ll be able to get a lot more information from our diagnosis that will be useful to the patient.”

His optimism is well-founded. For years, researchers have been puzzled by one form of brain tumor called oligodendrogloma. Though most patients with oligodendrogloma respond well to chemotherapy, a significant percentage do not. Using FISH, Perry and others have discovered that tumors with specific genetic losses — fewer than two red dots — on two different chromosomes, 1p and 19q, are more likely to respond to therapy and yield a better prognosis.
Unlocking the secrets of the cancer cascade

Determining which patients will respond to treatment is just the beginning. To really get to the bottom of brain cancer, scientists need to understand why tumors differ from one another and then develop a treatment alternative specifically targeted to the resistant types.

At the heart of cancer research is the desire to understand the cascade of genetic signals and mishaps that allow a cell to become cancerous. Unfortunately, research with human tumor specimens cannot sufficiently answer this question.

It is impossible to determine from a diseased cell which genetic changes were necessary and sufficient for that cell to become cancerous. Techniques like GeneChip analysis can provide a list of changes that occurred, but many of them might have been merely incidental.

Using cells from animals such as mice, researchers can study pre-cancerous cells and watch as they form a tumor. They also can systematically manipulate the genes of a cancerous cell to see, from the other side of the equation, which manipulations might reverse or improve the process.

"With a mouse, we can make single, surgically placed genetic changes and then find out what the consequences of these alterations are on brain tumor formation," explains David H. Gutmann, MD, PhD, associate professor of neurology. "Animal models also present the opportunity to test potential therapies within the natural context of a living creature." With humans, scientists are restricted to studying the effects of new treatments on cells in a petri dish, removed from the living environment.

Mouse models already have helped Gutmann and his colleagues begin to understand the most common — and one of the most deadly — types of brain cancer, astrocytoma. Patients with a genetic disease called Neurofibromatosis 1 (NF1) often develop astrocytomas. The gene mutated in these patients, NF1, helps regulate a molecule called RAS. In collaboration with researchers at the University of Toronto, Gutmann's team has developed a strain of mice, called B8, that has more RAS turned on in its astrocytes. The mice get sick and die of classic astrocytomas at around 3 or 4 months of age.

By manipulating the activity of potential culprit genes that may be altered during tumor development, the researchers hope to isolate the correct sequence of necessary changes required for the cell to become cancerous.

Such research into the underlying mechanisms of brain cancer, combined with the latest diagnostic tools, sets the stage for a new era in neuro-oncology therapeutics.

"Using this multidisciplinary approach, we already have made great strides toward piecing together this complex puzzle," says Gutmann. "Underneath all the laboratory and clinical work is the hope that we will make life better for patients with brain cancer."

Minimally invasive surgical procedures may prove safer

While researchers labor to uncover new diagnostic and treatment strategies for brain cancer, exciting surgical options already exist at Barnes-Jewish Hospital.

One advancement is a technique that uses the power of magnets to maneuver around healthy and indispensable areas of the brain. The technology, the Magnetic Surgery System (MSS), was first tested on a human patient in 1998 at the School of Medicine and Barnes-Jewish Hospital.

"This is a fundamentally new way of manipulating surgical tools within the brain that promises to be minimally invasive," says Ralph G. Dacey Jr., MD, the Edith R. and Henry G. Schwartz Professor and head of neurological surgery. "It should be a safer way of doing brain surgery because it allows us to use a curved pathway to reach a target. Therefore we can go around sensitive structures, such as those that control speech or vision, instead of going through them."

Another alternative to traditional surgery is the Gamma Knife. Despite its name, the Gamma Knife is not a knife at all. In fact, the whole point of this tool is to avoid making an incision. Instead, the machine surrounds a patient's head and emits 201 beams of gamma radiation from multiple directions. Alone, each beam is harmless. But when they converge at a particular point, their combined strength is sufficient to treat a diseased mass of tissue. Surgeons can therefore target a specific area of the brain and avoid damaging cells along the way.

Barnes-Jewish Hospital houses the only Gamma Knife within a 250-mile radius of St. Louis.
A Difficult Age for Diabetes

The teenager's quest for independence is at odds with a chronic condition

BY HOLLY EDMISTON
KEVIN LAMMERT JR. seems like a typical 17-year-old high school senior—he's looking forward to graduation this spring and to attending college next year. But Kevin has one concern that sets him apart from his peers. He has diabetes, a chronic medical condition that demands a level of personal responsibility that isn't required of most teens.

Individuals with diabetes must monitor their blood sugars and diet on a daily basis, take regular medication and routinely seek treatment for their disease. The teenage years, typically a time for breaking away from authority, can make this necessary vigilance and dependence a source of tension between teens with diabetes, their families and the doctors and other medical professionals who care for them.

In a recent study, researchers at the School of Medicine reached out to these teens and their families to help them open the lines of communication and develop better problem-solving skills. They targeted teens who had consistently poor metabolic control and who had routinely missed clinic appointments. Using a home-based approach that combined psychology and social work, the researchers worked with 18 families over five-week periods. The two-year study was supported by the Washington University Diabetes Research and Training Center, one of six centers nationwide funded by the National Institute of Diabetes and Digestion and Kidney Diseases.

"Diabetes is all-encompassing," says Michael A. Harris, PhD, research associate and staff psychologist in the department of pediatrics' division of endocrinology and metabolism. "It's chronic, includes dietary issues, requires medication, and can pose both acute and long-term danger. It touches on every aspect of a person's life, including family and peer relationships as well as school and general day-to-day functioning."

It can be hard for teens to deal with their diabetes, he says, for the same reason that it can be difficult to be a teenager. Teenagers want autonomy, and diabetes forces them to interact with and rely on others, most notably their own parents.

"Teens with diabetes need their parents to help them get supplies and to take them to appointments," says Harris. "Every three months, they are required to communicate with the medical team."

And the challenges are not just psychological. The hormonal changes of puberty also can make diabetes biologically unstable.

"It's about being different," Harris explains. "Teenagers just want to go the football game or to McDonald's, they don't want to stop to think: 'Did I take my insulin?' or 'What can I eat at this restaurant?'"

Kevin Lammert agrees. "Not wanting everyone to know I have diabetes for fear of being looked
down on and the extra planning and preparation it takes to do things with friends are the most difficult things about having this disease," he says.

More serious health risks that teens face, such as drug or alcohol abuse, pose an even greater risk for diabetics. Alcohol and drugs affect blood sugars, and for someone with diabetes, these behaviors can result in long-term physical damage.

But teenagers shouldn’t have to face these issues alone. Goals of the home-based intervention study included helping teens and their families to understand that diabetes is a family issue and to change behaviors as they occur at home.

Each family that participated in the study completed a baseline questionnaire before intervention, underwent 10 family therapy sessions, and completed two post-study follow-ups. The teens chosen for the study represent those who are most at risk for hospitalization, medical complications and other poor outcomes, such as missing school due to illness. Most of the families studied had already undergone other medical and psychological interventions without success. Harris wanted to determine why these particular families struggled and what could be done to help them.

Debi Mertlich, MSW, a graduate of the university’s George Warren Brown School of Social Work, conducted the majority of the home-based interventions. The twice-weekly visits lasted one and one-half hours, and each was videotaped for later review by Harris.

The therapists met with families at their homes to obtain a more accurate picture of each family’s lifestyle and to assess its impact on management of the teen’s diabetes—from the types of food in the pantry to interaction between particular family members.

In one case, Mertlich was able to accompany a family to the grocery store to help them make healthier food choices. In another, she met with the friends of a teen with diabetes to educate them about the disease.

This informal approach puts teens and their families at ease, making the overall goal of improving the youth’s metabolic control more attainable.

Learning Curve

The researchers found that many factors contribute to poor diabetes management. In some cases, economic difficulties prevented families from seeking proper care; other families were dealing with multiple life stresses, putting the management of diabetes lower on the list of concerns. Simply put, they were dealing with the same challenges that many families face, but with the added burden of a serious medical problem.

“In the study, we learned that parents are often fearful and frustrated around the issue of a teenager’s diabetes,” says Mertlich. “That frustration sometimes leads them to either attempt to overcontrol the situation or to just drop out and let the teen handle it. The key, she says, is to teach parents and teens to communicate better so that the parent can continue to stay involved by providing structure, while the teenager is given the freedom to manage his or her own diabetes.

Through their participation in the study, Kevin’s parents, Debbie and Kevin Sr., have learned how important it is to respect their teenager’s independence. “I’ve learned to stand back and assist only when asked,” says his mom, though she admits this can be difficult.

Overall, parents in the study reported improved performance by their teens, but the teenagers themselves said things remained unchanged after treatment. No significant change in health status has been noted. “Every family I’ve worked with has agreed that they were able to communicate and problem-solve better while I was there,” says Mertlich.

“Now we have to find a way to make that last longer.”

To do so, the researchers will further analyze the data to determine the qualities of the families who did show improvement. In a future study, Harris and Mertlich hope to apply a broader approach that will expand the treatment group and include collaboration with systems beyond the family, such as schools and hospitals.

As for Kevin, he reports that the study taught him the importance of developing good health habits for life, and that he must attain the discipline to make that goal a reality. Assuming new responsibilities and learning to balance them—part of any young person’s life—makes him not so different after all.
Unique health care and research tools are made to order, right around the corner

MEDICINE
SHOP

BY DAVID LINZEE
IN A SMALL BUILDING ON SCOTT AVENUE, the air smells of oil and machinery. The equipment and floor are very clean, except for a pile of bright steel shavings at the foot of a lathe. Manuals and tools crowd workbench shelves, and banks of small compartments reach to head-height. On the wall hangs a calendar featuring glossy color photos—not of girls in swimsuits, but of heavy construction equipment.

The machine shop at the School of Medicine is not your average university department. Its existence, however, is critical to the medical professionals it serves. Financially independent, the machine shop works on a contract basis with individual researchers to produce devices as small as an assistive pump for implantation in a premature baby's heart, and as large as an arm for hoisting an electric motor.

"At a medical center, there's an intense need for someone who can create gadgets," says Harold Burton, PhD, professor of anatomy and neurobiology. At Washington University, that need is filled by manager John Kreider and the staff of the machine shop, who fabricate novel equipment for researchers and physicians. The machine shop's inventions help neurobiologists study the brain and geneticists sequence the genome. They aid pediatricians in correcting birth defects and radiologists in treating tumors. In addition, the machine shop provides railings, grates and other fixtures that make the medical campus safer.

"The machines they make work," says Burton.

Kreider, a burly, bearded man, wears workboots and carries a sheathed pocket knife on his belt. His large hands bear the nicks that come from working with machinery.

He gained his early experience working on automobiles, trucks and airplanes, and he earned a degree from Ranken Technical College. He joined Washington University in 1980, and he and his staff of six have been located at the medical school since 1992, when a number of university machine shops merged into a central facility.

Each development process is unique. Some researchers bring in a machine they have purchased and ask the shop to modify it. One such device is a Cuisinart which Kreider's team customized so that it can be used in spraying coatings onto the time-release particles to be packed into drug capsules. Other researchers bring in a plan or sketch of what they need. "John and his guys are good to bounce ideas off," says Joseph T. Strong, research engineer at the Genome Sequencing Center. "Often, they'll improve the design, changing it to make it easier to fabricate."

In other cases, the scientists have no idea what sort of machine they need, they can only describe what they want it to do. "We get them to tell us the whole process," Kreider explains, "even the seemingly unimportant details. Sometimes we go to the person's lab to see for ourselves." Gaining this in-depth understanding of the task helps the machinists avoid costly design errors.

Elaine Mardis, PhD, assistant professor of genetics and director of technology development at the Genome Sequencing Center, for whom the machine shop has made or modified much equipment over the years, notes that the School of Medicine is lucky to have such a facility. "We'll be in a meeting at another center and we'll say, 'Oh, we can just have this made on campus,' and our colleagues' jaws will drop. They'll ask, 'You have guys who can do this?'

Kreider and his team thrive on the steady stream of new people bringing different kinds of challenges to the shop. "What we like most about the job," he says, "is the variety."
THE PANCREAS DIGESTION CHAMBER

Researchers use this device to break down tissue so they can obtain islet cells. Islets, cellular masses in the pancreas, are the source of insulin. Pancreatic tissue is put into a chamber and agitated. Glass balls and enzymes break down the tissue, freeing the islet cells for collection.

"This is the method of choice for islet cell isolation today," says Barbara Olack, research associate in general surgery. It is being used by the School of Medicine and the nine other centers involved in a worldwide study of the Edmonton Protocol for islet transplantation, a therapy the scientists hope will free many diabetics from the need to take insulin.

BRAILLEREADER

The braillereader aids scientists studying the human brain. Harold Burton’s group images brain activity of sighted and blind volunteers as they read in order to learn more about the areas responsible for language, touch and visual information. The volunteers perform language tasks inside a magnetic resonance scanner. Sighted people look at visual displays projected onto a mirror. For the blind, Kreitler came up with the braillereader. It is a housing made of plastic, because metal introduced into the MR scanner produces shadows on the image. Inside is a cardboard fanfold that feeds words embossed in braille one at a time to the subject.

The studies will help Burton’s group determine whether loss of sight leads to new functions in certain brain areas and expansion of areas used for touch, and may contribute to methods for evaluating and rehabilitating the visually impaired.

AND NOW FOR A REALLY GREAT GRATE

A stainless steel grate in the sidewalk in front of the West Building was designed and installed by the machine shop to prevent fires. There is an electric substation in the basement, and warm air exhausts through the grating. In cold weather, people waiting for the bus like to stand on it. Too many of them, unfortunately, drop trash and cigarette butts.

These items used to fall through the grating that was then in place. Small fires occasionally started. If one of them had reached the electric substation, it could have turned into a very big fire. The new grate catches the debris and eliminates that danger.
A robot the machine shop built, the plaque picker, transfers samples of genetic material. Since it was developed in 1994, it has saved researchers at the Genome Sequencing Center countless hours of drudgery.

To prepare a strand of DNA for sequencing, scientists chop it up into manageable lengths. They then copy each length so that many people can work on it. The copying, or cloning, is done by inserting the DNA into bacterial cells. Many such samples are grown on a single petri dish. When they are ready for harvesting, the plaque picker takes a picture of the petri dish, and translates the data into coordinates showing where each sample is on the dish. Its robotic arm then speedily and accurately transfers them to wells in a tray.

"People used to do this by hand, using toothpicks," says Eric T. Stuebe, research engineer. "Having robots do the task has freed up technicians for work that is less tedious."

The Genome Sequencing Center’s gel loader is another device the machine shop developed to help researchers make the most efficient use of the high-speed (and high-cost) sequencers. Though rendered obsolete by newer technology, the gel loader was used to prepare samples of DNA, relieving technicians from performing a tedious and time-consuming task.

The DNA samples were sealed in a chamber and pressurized, which forced them into narrow tubes called capillaries. The capillaries fed them into slab gels. To prepare the slab gel, researchers squeezed gel into a narrow space between glass plates. The comb, another machine shop product, made channels in the gel. The DNA samples were loaded into these channels.

In sequencing, different color fluorescent dyes are tagged to each base — the smallest unit of genetic information. As an electric current drew the samples through the slab gel and a laser beam lit them up, a portion of genetic code appeared on the sequencer’s screen in the form of a bright beaded curtain, creating what has become one of the most familiar images of the genome era.

This device helps V. Nathan Ravi, MD, PhD, assistant professor of ophthalmology and visual sciences and of chemical engineering, explore the question of why almost everyone needs bifocals after age 40. To study the aging process in the eye, Ravi’s lab needed a mechanical simulation of the ciliary body, the part of the eye that alters the shape of the lens so that a person can focus on near and far objects.

A donor lens and attached muscle tissue are fixed to the ends of eight stainless steel arms with micromechanical sensors at the center of a double ring. When the top ring is turned clockwise or counter-clockwise, the arms attached to the lower ring move in or out. By simulating the natural movement of the eye as it shifts focus, the device helps Ravi’s group investigate the biomechanics of focusing, and understand why this process grows less efficient with age. The research may contribute to development of an artificial lens implant which would eliminate the need for bifocals.
As I sit here writing about myself and my journey to Washington University and where it would perhaps lead me . . . a million thoughts flood my mind. Yet here I am trying to put it all in the right perspective.

I am a physician from India who joined the field of medicine with a few precious dreams and thoughts. The motivation behind those thoughts and dreams was neither extraordinary nor original, but reflected a compelling desire to effect a change in the ailing health care system of my country—a change born out of the embrace of greater technology to create an effective health care system.

But what was not realized by me—a then-17-year-old, naive pre-med student—was that physicians alone neither can nor should be expected to change the system. Physicians, in my country as in every other country, are one of the greatest knowledge assets, and they are perhaps the wheels that turn the health care system. But to look after the health of individuals is their goal; to look after the system as a whole requires managerial expertise, with all its inherent financial and operational intricacies.

As this realization gradually dawned on me through my several years of medical school, it began to change my orientation. My goal remained the same, but the means had changed. I began to feel the lack of managerial training to be a major stumbling block in the path of my dreams, and this was my final impetus to seeking an education in health administration.
While analyzing health administration programs, I had a very simple approach. Just as an industry-specific management education works better than one that is generalized, I realized that institutions that had a large service base of delivery of health care would be more aware of the woes specific to this industry and would thereby be in a better position to impart the relevant health care management training. Having decided that, the combination of a large health system, Barnes-Jewish Hospital, along with the excellence that has been the trademark of Washington University School of Medicine, seemed the best choice. As I write this, I am at the end of the first year of a two-year master's degree program, and I believe that the decision that I made was the right one. With every day of my schooling here, I seem to be one step closer to my goal. Every day here to me is a discovery, an answer to more of the queries that I had carried with me to this school.

I do hope that at the end of this two-year program, I will be equipped with skills that will render me fit to embark upon the difficult goal that I have set for myself - spreading this knowledge and ensuring its application to upgrade the health system of my own country. To many people, India is the land of the snake charmers. But really, it is yet another developing country struggling and striving each day to provide its people with better and more comprehensive health care.

My country still faces many of the medical problems that have long been eradicated in the United States. But the biggest ill to plague our system is the absence of a well-designed, coordinated health care system. My country has a large number of brilliant clinicians and health care professionals, and it is due to their unselfish efforts that we owe the existence of health care in my country. But unfortunately, these well-meaning souls seldom get the required and deserved support from the system. Thus, despite their best efforts, the health of the people has not substantially improved. As a clinician, I have faced this same problem myself on numerous occasions. Every time I see India's health care providers working against all odds to prevent the health of my nation from falling apart, my resolve to create and upgrade the system becomes only stronger.

I do realize that the health care system in the United States is not perfect. But I believe that I have a lot to learn from this system—both from its follies and its successes. It is these successes and learning from each failure that I want to carry back to my country and apply to some of our more pressing health care challenges.

On various occasions, I am asked whether I would consider remaining in the United States, and to every one of these queries I emphatically reply in the negative. I feel that I am here on a mission of learning and to find applications of this learning to resolve the issues of health care in my own country. That is my goal and that is the purpose of my visit to the United States. In the last seven years, I have changed my orientation several times; every time the change was to help me achieve my goal faster. But my goal itself has remained unchanged. To stay in the United States would be to give up this goal and my dreams, and I believe one should never give up one’s dream.

Therefore, I will complete my education, return to my country and begin my long and difficult journey of making a difference in India.

Through it all I will always carry this university, its education and its warmth as a trusted ally and guide. I believe that there is no greater way to pay homage to your place of education than to go out into the world and apply those teachings to bring about positive change.

Therefore, I will complete my education, return to my country and begin my long and difficult journey of making a difference in India.

Betoshini Chakraborty, MBBS, received her medical degree from Bangalore University in India. She is a student in the School of Medicine's Health Administration Program (HAP).
Authors bring “Austen-tatious” literary tradition to life

TED BADER, MD '80, went to medical school because of his interests in biology and psychology, anticipating that he would enjoy the “Sherlock Holmes” aspect of diagnosis—and he has not been disappointed. Now a gastroenterologist with Colorado Permanente Medical Group in Denver and associate clinical professor at the University of Colorado Medical School, his medical detective work is apparent in his 1995 textbook, *Viral Hepatitis: Practical Evaluation and Treatment*, now in its third edition. A review of the first edition in the New England Journal of Medicine called it “an invaluable reference book for busy clinicians.” Bader is also editor-in-chief of a bi-monthly newsletter, *Practical Hepatitis Update*, which goes to 130,000 primary care physicians.

With all this, he never dreamed of writing a fictional book until he and his wife, Marilyn, both avid readers, watched the A&E version of Jane Austen’s *Pride and Prejudice* on television and compared it with the book to see how closely it followed the original. The characters intrigued them, and Ted began to research Jane Austen’s writing for clues about what she thought the characters’ futures might hold. For their own amusement, Ted and Marilyn discussed possible scenarios, combined their writing talents (she has a home publishing business doing newsletters and promotional pieces for local companies), and co-authored a sequel, *Desire and Duty*. Published by Revive Publishing with a foreword by Austen scholar Professor John McAleer of Boston College, *Desire and Duty* went on to win first place in the 1998 national Small Press Book Awards competition and the Silver Award for fiction from the Colorado Publishers Association. Big Star Entertainment of Toronto, Canada, has purchased the movie rights, a television mini-series is in the works, and Ted has written the screenplay version. The Baders describe learning to write together, learning to sit down and make recommendations on each other’s writing, as a “good marital exercise.” Their latest collaboration, published in November 2000 and titled *Virtue and Vanity*, is a sequel to *Desire and Duty*.

Bader is currently the local site director for two research studies on treatment for hepatitis C non-responders and cirrhotics. His recent medical publications include a chapter in *Essentials of Diagnostic Virology* and articles in *Hepatology*, the *American Journal of Gastroenterology* and *Obstetrics and Gynecology*. Some of his earlier publications report studies from his three-year scholarship payback in the United States Public Health Service. As Chief of Health Programs for the U.S. Penitentiary at Lompoc, California, he oversaw the care of 1,600 inmates and served on a national task force to determine how the prison medical system would handle AIDS cases. Following that assignment, he completed an internal medicine residency at St. Luke’s/Presbyterian Medical Center in Denver and a gastroenterology fellowship at the University of Utah before moving to his current position in Colorado.
Honored physician now serving as an honorable statesman

George Broman, MD '58, and his wife, Nancy Rogers Broman, NU '57, can't seem to get the hang of retiring. As soon as they quit one job, something or someone steers them into a new one.

The two married in 1957 and, after he completed his general surgery residency in Denver and two years with the U.S. Army Medical Corps at Ft. Lee, Virginia, they settled in Culpeper, Virginia. Broman was in private practice there and served at the Culpeper Memorial Hospital in a number of capacities. The hospital named him Physician of the Year in 1992 and 1997. Meanwhile, Nancy worked as Staff Development/Inservice Coordinator at the hospital, retired from that in 1984, but six weeks later was recruited to fill a “temporary” position as staff nurse in a busy family practice office. Years later she retired again, only to be caught up in community work, sometimes working as a substitute teacher, frequently mentoring youth activities at school and church. George retired in 1997, and visions of leisure time for travel and music and their four children, eleven granddaughters and one grandson “danced in their heads.” It was not to be.

George had been active in state and local professional groups throughout his career. He served as president of the Medical Society of Virginia in 1992-1993, and chaired the Statewide Health Coordinating Council under two governors. That gave him considerable contact with the Virginia General Assembly and when the 30th district representative retired in 1999, George was persuaded by colleagues, friends and former patients to run for the seat. Now a member of the House of Delegates, he serves on four committees (Agriculture; Counties, Cities and Towns; Health, Welfare and Institutions; and Labor and Commerce) and chairs a subcommittee. This responsibility dictates that the Bromans spend a significant amount of time in Richmond when the Assembly is in session.

George maintains that his political career will not be a long one; he says bluntly that he really doesn’t like politics and went to the House with no agenda other than to represent the folks in his district in a way that fits with the well-being of the commonwealth. His lack of political aspiration allows him to speak his mind and “simplifies everything.”

Before politics intervened, George was getting back to music. He always enjoyed singing and came close to becoming a professional trombonist. Playing in everything from trios to the St. Louis Philharmonic allowed him to make spending money and part of his college tuition. He still likes to play in brass ensembles, and he sings in the church choir.

Happily, he has no plans to retire as physician for the Culpeper High School and Middle School athletic teams. He covers all the home games for four football teams and the away games for the varsity, and says that he has gained much more from this than he ever contributed. The teams play on Broman Field, renamed in his honor in 1992. Earlier, the Culpeper County Education Association named him a “Friend of Education,” and he received the L.B. Henretty Outstanding Citizen Award.

Nancy serves on the Culpeper Town Planning Commission and is the first woman elected elder in the Culpeper Presbyterian Church. George credits her with having been his guide and chief supporter for the past 43 years and says, “Everyone should have a Nanc!” She muses, “Someday we will both retire again and tend our gardens and our families at a more leisurely pace.” It remains to be seen if they get the hang of it.
ASK PEOPLE WHO KNOW HER to describe Helene Roberson, and the words “caring,” “warm” and “unassuming” keep recurring. Someone who had just met her said, “When you’ve talked to her for a few minutes, you feel as if you’ve found a good friend.”

Helene Roberson is, indeed, a good friend whose generosity has benefited and will benefit many people who will never meet her personally. Her desire to “do something for the children” recently led her to establish a professorship in pediatrics as part of the St. Louis Children’s Hospital/Washington University School of Medicine Joint Program in Pediatric Chairs. Jonathan D. Gitlin, MD, professor of pediatrics and of pathology, head of the division of pediatric immunology and rheumatology and program director of the Child Health Research Center in the Department of Pediatrics, has been named the Helene B. Roberson Professor of Pediatrics.

Roberson’s interest in health care and medical research goes back many years. During World War II, she worked as a nurse’s aide and also for the Red Cross. Growing up in St. Louis, she knew the outstanding national reputation of the School of Medicine and Barnes and Jewish hospitals, where she volunteered. Several Washington University physicians gave her excellent care when she experienced serious illnesses. Those experiences piqued her interest in how diseases are acquired and strengthened her desire to support further research. She believes that pediatric research also will help to resolve adult health problems, since many disorders begin in childhood.

An astute businesswoman, Roberson owned and operated Daytona Budweiser, Inc., an Anheuser-Busch wholesaler in Port Orange, Florida, and served as its chief executive officer and president for more than 35 years. Throughout the years, she maintained her interests in fine art (she attended Washington University’s School of Art) and music, and served on many civic boards. She is an honorary trustee of Ormond Memorial Hospital in Ormond Beach, Florida, and a life trustee of Atlantic Center for the Arts in New Smyrna Beach. Roberson has been a sponsor of the London Symphony’s biennial appearance in Daytona and a director of the Rehabilitation Center of Greater St. Louis. She supports the Boggy Creek Gang in Eustis, Florida, one of the camps for seriously ill children founded by Paul Newman and others. Recently she was appointed to the Washington University Regional Cabinet for the Gold Coast of Florida. Now retired from her business responsibilities, she enjoys traveling and indulging her enthusiasm as an auto racing fan.

William A. Peck, MD, executive vice chancellor for medical affairs and dean of the School of Medicine, says of the professorship, “This endowment is a lasting testimony to Mrs. Roberson’s great and generous support of the School of Medicine and its outstanding Department of Pediatrics. Dr. Jonathan Gitlin is a truly gifted academic physician who sets a highest standard for the chair as its initial occupant.”

For her part, Roberson simply takes pleasure in having found such a way to express her love for children.
Vellios Challenge announced
$200,000 to support scholarships

BY DAVID LINZEE

A Distinguished Senior Alumnus invites his juniors to join him in supporting the School of Medicine.

Frank Vellios, MD '46, is offering a $200,000 challenge grant to support the school's scholarship program. Vellios hopes to encourage recent graduates who gave last year to renew their gift, and to encourage first-time givers. The amount is not important. The school welcomes every gift as it seeks to improve its annual fund participation rate.

Vellios' challenge will match every dollar given to the School of Medicine Annual Fund up to $200,000. An incentive especially attractive for young alumni, Vellios will match all gifts up to $100 with $200.

Vellios has been giving steadily to the School of Medicine for 40 years. "I started with a check for $100 (the Century Club) and worked my way up," he says. After receiving his medical degree, he went on to do his internship and residency at Washington University Medical Center. He had a long and successful academic career, holding professorships at, among others, Indiana University, University of Texas Southwestern Medical School and Emory University. He will return to the Washington University campus this spring for his 55th reunion.

When Vellios thinks of the School of Medicine, he remembers people—the teachers and mentors who guided him through the first steps of his career.

Perhaps the foremost was Robert A. Moore, MD, then chair of the pathology department, who inspired Vellios to choose pathology as his own specialty. Moore's complete grasp of the subject made his lectures lucid and compelling, says Vellios, and he was as remarkable for thoughtfulness as for erudition. On Fridays, Moore would ask his residents what they were doing that night. "It was usually nothing, because we didn't make any money in those days," Vellios recalls. "So Dr. and Mrs. Moore would sometimes invite me to the symphony." Later, Moore recruited Vellios for the School of Medicine's exchange program with the medical schools in Bangkok, Thailand.

Another well-remembered professor was Evarts A. Graham, MD, then chair of surgery. On his first day on surgical rotation as a junior student, Vellios was called by Dr. Graham to assist on a gallbladder operation. "Graham was not only brilliant, he was kind," Vellios recalls.

Vellios fondly remembers how Margaret Smith, MD, professor of pathology, would sit at the laboratory bench next to students as they studied slides through the microscope. Vellios collaborated with Dr. Smith on an early paper about cytomegalic inclusion disease, and she gave him the privilege of presenting it at an important national meeting. "I was nervous, but it went very well," he says.

When Vellios gives to the School of Medicine, he is thinking not just of the past, but of the future. Confident that the school's faculty and graduates will continue to make dazzling advances in science and patient care, he enjoys being part of the excitement. To young alumni he says, "This is a great school. You should get in on the opportunity to help it along."
The Office of Medical Alumni and Development Programs recently bade farewell to one of its esteemed members, Ruth Bebermeyer, senior director of alumni and constituent relations. Bebermeyer retired last fall after 10 years of service.

Coworkers describe Bebermeyer as a multitalented person with a knack for fostering strong bonds among people. She showed a genuine interest in the careers and lives of everyone connected with the medical school, including medical alumni and students, residents, former faculty and house staff, and nursing alumni.

"Ruth's focus on alumni relations was just one of her great talents," says Randy L. Farmer, EdD, associate vice chancellor and director of medical alumni and development programs. "She also is a very gifted writer, and has great organizational skills and an incredible work ethic."

Bebermeyer joined the office of medical alumni and development in 1990. According to Farmer, she continually put forth the question: "How can we best serve our students and alumni in ways that are meaningful to them?" She found a variety of ways to answer that question.

One of her biggest challenges was organizing the annual medical alumni reunion. Each year, she put together two and one-half days of events and reunion class dinners. "Docs Off Duty," a talent program that Bebermeyer developed to allow alumni the opportunity to showcase their "non-medical" skills, remains one of reunion's most popular events.

She also was the force behind the establishment of a nursing alumni reunion, instituted in the mid-1990s. The periodic event has been a phenomenal success.

Bebermeyer was especially sensitive to the needs of medical students. In addition to initiating regular yearly events, such as the freshman welcome and the second-year breakfast, she is expert at matching students with alumni who have similar interests. Her pairings run the gamut, from setting up shadowing, mentoring and summer learning experiences to coordinating an alumni's home as a place for a student to stay while undergoing the residency interviewing process.

Other important contributions include her close association with a succession of Washington University Medical Center Alumni Association presidents, as well as numerous high-level writing assignments. These include the case statement for the School of Medicine's current capital campaign, regular articles for Outlook, newsletters for medical and nursing alumni, and a variety of special projects.

Coworkers describe Bebermeyer as a multitalented person with a knack for fostering strong bonds among people.

From reunion entertainment, to alumni relations, to her creative versatility, Ruth Bebermeyer was a master juggler in more ways than one.

And it's not just at work that Bebermeyer is prolific. A Phi Beta Kappa graduate of the University of Missouri-Columbia, she is an accomplished pianist, and a singer-songwriter with four recorded albums of original songs to her credit. In addition, she is the author of a volume of poetry titled And Master of None.

In retirement, Bebermeyer continues to write for the Alumni and Development section of Outlook and remains available to assist the department with special projects as needed. She works closely with Chad Irtner, who succeeds her as director of alumni and constituent relations.

"Ruth left us with a great program where service is the governing principle," says Irtner. "We will build on that."
AZ writes that 13 members of her family have moved to Tulare, CA since he closed his private practice in Washington, NC, a small planned community too distant from emergency medical service to get help fast enough in cases of sudden cardiac arrest. Most of the residents, some 90 families, currently participate in the program. Whitmore and his wife moved to Washington to sail when he retired from his practice of radiation oncology in Kansas City 12 years ago.

George L. Rider, MD '45, has been working in a community health clinic in Tulare, CA since he closed his private practice in 1998. Jeanne Grigg Mill, NU '45, and her husband, Walter, have moved to Denver, CO after living in East Lansing, MI for 23 years.

H. Glenn Kellogg, MD '47, recently completed a two-year term as chairman of the Grossmont Hospital Foundation, which helped to raise the $40 million needed for a new emergency department and intensive care wing. He teaches "Doctor-Patient Relationships" at the School of Medicine at the University of California at San Diego.

Mary R. Devous, NU '48, of Glendale, AZ, writes that 13 members of her class enjoyed a reunion in conjunction with the all-class nursing alumni luncheon in St. Louis in September.

J. Stewart Whitmore, MD '49, has developed a program to train volunteers in CPR and AED operation in Washington, NC, a small planned community too distant from emergency medical service to get help fast enough in cases of sudden cardiac arrest. Most of the residents, some 90 families, currently participate in the program. Whitmore and his wife moved to Washington to sail when he retired from his practice of radiation oncology in Kansas City 12 years ago.

Marvin E. Levin, MD '51, and Lawrence W. O'Neal, MD '46, have had the sixth edition of their textbook, The Diabetic Foot, published this year by C.V. Mosby.

Eldo Jones, MD '52, has retired from his practice of cardiothoracic surgery in Texas, but continues to serve as physician for Australia's Davis Cup tennis team. His friendship with Australian tennis great John Newcombe, who until recently captained the team, was the subject of a feature story in the Wichita Falls Times Record News. Jones and his wife, Pat, have traveled the world with the team, and went to Barcelona for Australia's match with Spain in December.

Wolfgang Kirsch, MD '55, received an honorary fellowship and was awarded a gold medal for his surgical research at the 32nd World Congress of the International College of Surgeons in October 2000 in Singapore. He is professor of neurosurgery and biochemistry and director of the Neurosurgery Center for Research, Training and Education at the School of Medicine in Loma Linda, CA, California.

Sidney Richman, MD '58, left his position as chief of cardiology at West Palm Beach VA Hospital and is back in full-time private cardiology practice in Palm Beach.

Joshua B. Grossman, MD '65, appeared as Padre Perez in the historic Jonesborough Tennessee Repertory Theater production of "Man of La Mancha" in spring 2000. He notes that he dedicated his Gregorian chant of the "Last Rites" to the beloved memory of his classmate, Dennis P. Cantwell, MD '65. Cantwell was Joseph P. Campbell Professor of Child and Adolescent Psychiatry at UCLA prior to his death. Grossman and his wife, "Mickey" Schandler Grossman, OT '64, have been married for 36 years. She serves as president of B'nai Sholom Congregation. They have three children, Wendy Anne, a feature writer; Joel, a medical oncologist; and David, a computer scientist. The Grossmans enjoy round, square and ballroom dancing and theater.

John S. Douglas Jr., MD '67, professor of medicine at the Emory University School of Medicine, has been named director of the Andreas Gruentzig Cardiovascular Center of Emory University Hospital. He also directs the cardiac catheterization laboratory. One of the pioneers in interventional cardiology, Douglas served on the American College of Cardiology committee that established recommendations for the development and maintenance of competency in coronary interventional procedures. His research focuses on improving the results of percutaneous coronary revascularization by using stents, new antithrombotic agents and intracoronary radiation, and by developing methods to protect the myocardium from particulate microembolization. The first placement of a coronary stent in a human being in the United States occurred at the Gruentzig Center, as did the first studies of the use of beta radiation to prevent restenosing after angioplasty.

John W. Barr, MD '69, is one of 64 participants selected nationally for the prestigious Coro Fellows Program in Public Affairs. He will complete the intensive, nine-month graduate-level fellowship in San Francisco, with the goal of developing knowledge that will increase his ability to participate actively in the design of California's health care system. Barr is a diagnostic radiologist in Oakland and has served as a board member of Pacific Imaging.
Consultants, Inc., a 35-member organization of diagnostic radiologists that covers hospitals and imaging centers throughout the Bay Area. He also served as a Population Committee member for the San Francisco Bay Sierra Club Chapter.

70s

Charles R. Noble, MD, HS '74, retired from his dermatology practice in Orlando FL on August 31, 2000.

Edward Peskin, MD '74, is one of 20 scholars selected by the Association of Professors of Gynecology and Obstetrics (APGO) to participate in the APGO/Solvay Pharmaceuticals Educational Scholars Development Program. The 15-month program is designed to help obstetricians and gynecologists become better teachers and leaders in the field of women's health. Peskin is an assistant professor at the University of Massachusetts Medical School and director of the third-year clerkship there. He was selected from a competitive group of applicants across the United States based on their credentials and demonstrated commitment to women's health education.

Barry Auster, MD, HS '75, is in private practice in Michigan. He also serves as clinical instructor of dermatology at Wayne State University and heads the division of dermatology as well as dermatologic laser surgery at Sinai-Grace Hospital in Detroit.

Charles R. Merrill, MD '78, will serve as chief of staff at Marian Medical Center in Santa Maria CA during 2001-2002. He has been an oral board examiner for the American Board of Emergency Medicine since 1990. Before relocating to Santa Maria in 1992 he was a clinical instructor in emergency medicine at Harbor-UCLA Medical Center in Torrance, CA. He and his wife Cheryl have two children, Julie (17) and Robert (15). Merrill is team physician for St. Joseph High School football team and also varsity tennis coach.

80s

Herbert E. Bevan III, MD '80, was recently promoted to the position of associate professor of clinical pediatrics in the Department of Pediatrics at Eastern Virginia Medical School and Children's Hospital of The King's Daughters in Norfolk VA. In addition to being a childhood cancer specialist, Bevan directs the hospital's Comprehensive Brain Tumor Clinic.

Gary R. Collin, MD '85, recently began a new position as director of Surgical Critical Care at St. Francis Hospital and Medical Center in Hartford CT. St. Francis is a Level I trauma center and a major teaching hospital of the University of Connecticut.

Jay Diamond, PT '85, writes that he is approaching the time when he will have lived in Missouri longer than he did in New York, but says, "Do not despair, I still remain loyal to the Yankees, Giants and Knicks!"

Laura Kemp Roach, PT '85, is busy as co-owner of an outpatient private practice and as the mother of two daughters.

Steve Hausberg, HA '87, and his wife, Joy, welcomed daughter Abby Caroline on December 4, 2000. The Hausbergs live in Chester NY.

Darrell Fader, MD '91, moved from Ann Arbor MI to Seattle WA in January to take over a dermatologic surgical practice.

David Alligood, HA '93, and his wife, Susan, announce the birth of Katelyn Brooke on August 7, 2000. She joins a sister, Lauren. The Alligoods live in Cullman AL.

Lee Fox, MD '93, and his wife, Shari, had a son, Samuel Alex, on November 13, 2000. They live in Florida where Fox is a private practice interventional radiologist in West Palm Beach.

Lisa Vandermeer, PT '93, and her husband, Curt, had a second baby girl, Katrina Danielle, born August 4, 2000.

Elizabeth Davis, PT '94, and her husband, Brian (JD '96), welcomed their second son, Andrew Robert, on December 6, 2000. He joins brother Matthew Carl. The Davises live in Charlotte NC.

Susan Stout Hollinrake, HA '94, and her husband, David, welcomed a son, Andrew Thomas, on December 10, 1999. They live in Lakeville MN.

Amy Owens Blanford, PT '95, reports the birth of a daughter, Camille Elise, on April 21, 2000. The Blanfords live in Decatur IL.

Jennifer Sambrook, DT '97, is working at Children's Hospital in Philadelphia in their Early Intervention Program. She is engaged to Lou Pitonyak, DT '98, and they plan to be married in October 2001. Lou is employed at Crozier-Chester Medical Center, working in acute care.

Mary Lou Burkeybile Meier, OT '98, married Jason Douglas Meier of Cedar Rapids IA in October 1999. Their son, Zachary Paul, was born on November 25, 2000. Mary Lou is enjoying a maternity and child-rearing leave for the remainder of the 2000-2001 school year from her position as a school-based therapist in Cedar Rapids. The Meiers welcome e-mail at mlh@home.com.

Kaye Nembhard, MD '98, is now a third-year resident at the University of Pittsburgh, specializing in general surgery. She also enjoys being a Big Sister to a "charming 12-year old girl" in the Big Brother/Big Sister Program of Pittsburgh. She writes: "I am very interested in knowing how my amazing classmates are doing. Please drop me a line. Yes, I'm still unmarried and without children."

Brook Sullivan, PT '99, and husband, Steve, have a daughter, Aislin Rose, born August 22, 2000. They reside in Lafayette IN where she is employed by Sports Plus Rehabilitation.
IN MEMORY

Ralph Berg, MD ’26, died of infirmities on January 3, 2001, at age 96. He was an internist, general surgeon and obstetrician/gynecologist who practiced in St. Louis for nearly 60 years. He was a past president of the medical staff at the former Incarnate Word Hospital and Lutheran Hospital, and taught at Saint Louis University for several years. After retiring, Berg was active with the Literacy Council of Greater St. Louis. He taught philosophy at Older Adult Service and Information System and taught English to international students who attended Washington University. In addition to his wife, Ruth Benjamin Berg, he is survived by a daughter, Barbara Berg Cohn; a son, Edward F. Berg, MD ’64, and five grandchildren, including Daniel Berg, MD ’00, Michael Berg, Scott Cohn, Julie Greene and Emily Cohn. Memorials may be made to Washington University School of Medicine, Campus Box 8509, St. Louis, MO 63108, to the Brodsky Library at 12 Millstone Campus Drive, St. Louis, MO 63146, or to another charity of the donor’s choice.

Lena Wood Short, NU ’30, of Springfield MO died October 15, 2000, at age 92. She had suffered from Alzheimer’s for several years.


Frank G. Zingale, MD ’33, died February 5, 2001, of infirmities, at Grandview Care Center in Sun City West AZ, where a memorial service was held. He was 93 and had lived in St. Louis for more than 50 years before retiring from his practice as a urological surgeon. In 1931, Zingale graduated with a bachelor of science degree from Alfred University in Alfred NY. Two years later, he earned his medical degree from Washington University School of Medicine. Zingale opened his private practice in St. Louis several years later and joined the staff at Lutheran Hospital, now SouthPointe Hospital, where he was named president of the medical staff in 1960. In 1953, he joined the staff at the old St. Anthony’s Hospital in St. Louis, now St. Anthony’s Medical Center, and served in the urology department until 1981. Zingale also served on the staffs at other St. Louis area hospitals. He was a past president of the St. Louis Urological Society. He retired from private practice in the early 1980s and shortly after moved to Phoenix. Among the survivors are a son, F. Lee Zingale of St. Louis County, a granddaughter, and two great grandchildren. Memorial contributions may be made to Washington University School of Medicine, Medical Alumni and Development, 4444 Forest Park Ave., Suite 6500, Campus Box 8509, St. Louis, MO 63108.

Nancy S. Brown, DT ’33, died in Rochester MN on October 5, 2000, at the age of 95.

Addie S. Schreiman Dobson, NU ’34, died December 20, 2000 in St. Louis. She had been in hospice care for several months.

Harriet E. Stick, NU ’35, died in January 2000, in Napa, CA.

Lawrence E. Mendonsa, MD ’37, died of infirmities January 6, 2001, at his home in Chesterfield MO at the age of 87. He practiced obstetrics and gynecology for 48 years, retiring in 1985. He was on the staff of five hospitals in the St. Louis area and had received the Distinguished Physician Award from St. John’s Mercy Medical Center. During World War II he served in the Army Medical Corps in the Panama Canal Zone, attaining the rank of major. He is survived by his wife of 60 years, Dorothy Mendonsa, NU ’36, a son, Lawrence Jr., and a daughter, Maribeth. Memorial contributions may be made to Hamilton Christian Church in Creve Coeur MO, where Dr. Mendonsa was a lifelong member.

Bart M. Passanante, MD ’39, died February 22, 2001, of Alzheimer’s disease at his home in Olivette. He was 87. A native of St. Louis, Passanante received his bachelor’s degree in 1935 and his medical degree from Washington University School of Medicine in 1939. He also served with the 91st Evacuation Hospital in World War II until 1945. He was awarded four Bronze Stars and attained the rank of lieutenant colonel. Passanante was in private practice for 27 years with several St. Louis area hospitals, including St. John’s Mercy, Deaconess and Barnes-Jewish. In 1955, he became coordinator of resident training at the old Missouri Pacific Hospital and director of the tumor clinic. He retired from private practice in 1976. After retirement, he established a school to train nurses as surgical assistants at the former Luther Hospital in 1978. He fully retired in 1985. Passanante was a member of several medical organizations, including the Southern Medical Association and the American Surgical Association, and was a diplomate of the American Board of Surgery. He was also an amateur artist, winning a blue ribbon at the American Medical Art Exhibit. Among the survivors are his wife of 60 years, Alberta Passanante of Olivette; three daughters, Joy Passanante of Moscow IN, Judy Passanante of Palo Alto CA, and Jean Passanante of Maplewood NJ; and three grandchildren. Memorial contributions may be made to a charity of the donor’s choice.

Frederick Stewart Whitfield, MD ’39, died November 16, 1998. He had lived in Demopolis AL.
Robert E. Shank, MD '39, died in St. Louis of complications from a stroke on December 25, 2000, at the age of 86. He joined the faculty at Washington University School of Medicine in 1948 and became the first Danforth Professor of Preventive Medicine and chairman of the department of preventive medicine and public health. He retired in 1983. Shank was internationally recognized for his research in nutrition and had done extensive work for the World Health Organization and UNICEF on four continents. During World War II he served in the Navy Medical Corps as a lieutenant commander at New York City's Rockefeller Institute for Medical Research. He is survived by his wife, Eleanor Caswell Shank, a daughter and two sons. Memorials may be made to Washington University School of Medicine, Office of Gifts, Grants and Contracts, 660 S. Euclid Ave., St. Louis, MO 63110 or to the First Presbyterian Church in Alton, P.O. Box 116, Alton, IL 62002.

Sydney Thurman Wright, MD '40, died January 2, 2001, in Los Gatos CA at the age of 88 from complications of a cerebrovascular accident and a hip fracture. After residency at Barnes Hospital he served in World War II with the 21st Hospital Unit. He practiced family medicine in Selma CA from 1946 to 1981 and was a Life Fellow of the American Academy of Family Physicians. Following his retirement, he remained active with the Selma Community Hospital Foundation until he moved to Los Gatos in 1998. Survivors include his wife, Winifred Wright, and two sons, Sydney Wright Jr., MD '72, and John Wright.

Jimmie Murray Combs, NU '46, died August 28, 2000, in Colorado Springs CO. She is survived by her husband of 53 years.


Richard E. Johnson, MD, HS '47-'48, died of prostate cancer June 16, 1995, in Columbia MO. During his career he served as pathologist at the Ellis Fischel Cancer Hospital and at the Boone County Hospital and was a charter member of the Boyce and Bynum Laboratories. He was a U.S. Navy physician during World War II. After he retired in 1985, he continued to serve as a volunteer at the Boone County Hospital until a few days before his death. He is survived by his wife, Lorna L. Johnson.

John Gentry, MD '48, of Gloucester MA died unexpectedly August 11, 2000, at the age of 78. He was a commissioned officer in the U.S. Public Health Service and was board certified in preventive medicine and public health. During his career he held positions as the first public health officer in Anchorage AK, medical director of the U.S. Agency for International Development in India, professor of public health and medical care organization at the University of North Carolina in Chapel Hill, medical director of the New York City Medicaid Program, and health commissioner of the Erie County Health Department in Buffalo NY. In addition to his wife, Jane, he is survived by five children.

Kathryn Kagy Carlson White, NU '48, died August 15, 2000, following a brief illness. She lived in Salem IL.

Lorraine Lake, PT '48, PhD, died in St. Louis on December 17, 2000, at the age of 82 from complications of a stroke. She was an early proponent and former director of the physical therapy program at Washington University and a professor of anatomy. She is survived by a nephew and a great niece. Memorials may be sent to the Lorraine F. Lake Scholarship Fund, care of Washington University School of Medicine, Program in Physical Therapy, Campus Box 8502, 4444 Forest Park Ave., Room 1101, St. Louis, MO 63108-2212.

Laurens Park White, MD '49, a San Francisco oncologist and former president of the California Medical Association, died of an apparent heart attack August 25, 2000, at the age of 74. Following graduation with honors from Washington University School of Medicine, he worked at Massachusetts General Hospital in Boston and at the National Cancer Institute in Bethesda MD. He opened his private practice in San Francisco in 1963 and joined the faculty of the University of California where he was a professor in the departments of medicine and community medicine, and a lecturer on thanatology in the department of...
psychiatry. White was the son of Park White, MD, longtime faculty member at the School of Medicine and pediatrician at St. Louis Children's Hospital, which established the Park White professorship in pediatrics in his honor. Like his father, who was credited with having opened training opportunities and hospital appointments to many black physicians in the 1940s, White was widely known for his activism and reform efforts on issues as varied as AIDS, cancer therapy and care for the dying. The Bay Area AIDS Foundation gave him its Achievement Award in 1989. For several years, he chaired the medical staff at St. Luke's Hospital, where he was a member of the Board of Trustees and where he was known for devoting much of his time to caring for uninsured and indigent cancer patients. He was also a regent for the Cathedral of St. Mary of the Assumption. He is survived by his wife, Annette Campbell White, and Maria Southworth, five grandchild and two sisters, Phyllis White Cherbonnier and Katherine White Drescher. Memorial contributions may be made to Washington University School of Medicine.

Roger L. Fuller, MD '50, died December 29, 2000, in Mt. Carmel IL at the age of 80. He served as a fighter pilot in the U.S. Marine Corps during World War II and married Evelyn VanLeeuwen the day the war ended. He joined the medical staff of Wabash General Hospital in 1952 and practiced family medicine in Mt. Carmel until his retirement in 1985, after which he volunteered at the Free Clinic in Wabash County. He was active in the Illinois Cancer Society and had served on the local board of education. In addition to his wife, he is survived by three sons, David Fuller, MD '73, Terry Fuller, MD '74, and Kim Fuller, MD; and one daughter, Ann Fuller Hnedak.

Mary Hales, NU '52, died in St. Louis on July 1, 2000 after a long illness.

Ronald L. Scott, MD '52, died December 22, 2000 in Vallejo CA at the age of 81. A native of Canada, he served as a Navy medic in Samoa during World War II, and then attended Reed College in Oregon before earning his medical degree at Washington University. He was a family practitioner and anesthesiologist associated with Kaiser Permanente Health Care in California for many years. Survivors include his wife, Elizabeth (Berry) Bruce Scott; three children, Nancy Gavin, Peter Scott and Mary Elizabeth Holbrook; and four grandchildren. Memorials may be made to The Alzheimer's Association.

Anna Presnell, NU '54, of Ellisville MO died in October 2000 at the age of 84.

William S. Costen, MD '54, died of a heart attack at his home in St. Louis on January 13, 2001, at the age of 72. He had been an orthopaedic surgeon at St. Luke's Hospital for nearly 40 years. During the 1950s he served two years in the Air Force. In addition to his medical practice, he was known as an accomplished guitarist, singer and storyteller. Among his survivors are his wife, Karla Bronner Costen, a daughter, a son and two stepdaughters. One son, Lt. William “Tom” Costen, was a Navy pilot whose plane was shot down over Iraq during the Persian Gulf War. Costen helped to establish the Tom Costen Scholarship Fund at John Burroughs School in Ladue in his memory. Memorials to Costen may be made to that fund.

Enrique Higa, MD, HS '69, died February 19, 2001, of colon cancer at his home in Chesterfield MO. He was 61. A native of Argentina, he practiced there after completing his residency in pathology at Washington University, and then returned to St. Louis in 1976 as an assistant professor. In 1979, he joined the medical staff at St. Luke's Hospital and remained there until his death. He is survived by his wife, Josefa Criado Higa, his mother, two daughters and a son.

FACULTY

William H. Masters, MD, professor emeritus of clinical obstetrics and gynecology at the School of Medicine, died Feb. 26, 2001, at the Tucson Medical Center Hospice in Tucson AZ of complications from Parkinson's disease. He was 85. Masters, with his research collaborator and former wife Virginia Johnson Masters, revolutionized sexual therapy and research. He received a medical degree from the University of Rochester School of Medicine in New York, where he became interested in studying human sexuality. After Masters' mentor alerted him that taking on the subject of human sexuality would be controversial, he spent years accruing credentials in obstetrics and gynecology at the School of Medicine to pursue his goals of making the field a legitimate science. Masters completed internships and residencies at the School of Medicine and what is now Barnes-Jewish Hospital. He joined the medical school faculty and in 1955 began publishing his human sexuality research. He also served as director of the medical school's Division of Reproductive Biology. Masters' self-funded research revolutionized sexual therapy with his book *Human Sexual Inadequacy* published in 1970. The Masters and Johnson Institute he co-founded operated in St. Louis until Masters retired in 1994. A separate organization, the Masters and Johnson Clinic, continues to serve patients in St. Louis. Masters is survived by his wife, Geraldine B. Masters of Tucson AZ; a daughter, Sarah Masters Paul of Weston CT; a son, Howie Masters of New York City; a brother, Francis Masters of Kansas City MO; and two grandsons. Memorial contributions may be made to a charity of the donor's choice.

Outlook Spring 2001

Alumni & Development 35
Concerned about Retirement Income?
Washington University offers . . . .

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- Capital gains tax savings
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With a Deferred-Payment Charitable Gift Annuity.

Here's how it works...

If both you and your spouse are .......... age 55
And create a Deferred-Payment Gift Annuity with .......... $10,000
Which will begin paying income to both of you at .......... age 65
The two of you will receive annual lifetime income of .......... $1,090
Which is a return of .......... 10.9% of the amount you transferred.
Your immediate charitable deduction is .......... $4,183*

Ultimately, the amount remaining from your gift will be used for a purpose you choose at Washington University.

*Amount of the charitable deduction may vary slightly.

Sample Rates of Return

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Individuals over age 65 may find an immediate Charitable Gift Annuity or a Charitable Remainder Unitrust more attractive.

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Advice from your tax or legal advisor should be sought when considering these types of gifts.
□ Washington University is already included in my estate plans—I would like to become a Robert S. Brookings "Partner."

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□ Immediately  □ When I reach age ______

□ I would like a calculation based on a theoretical gift of:

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□ Cash  □ Securities

$__________ (Cost Basis) ________ (Acquisition Date)

First Beneficiary

Birthdate________ Relationship________

Second Beneficiary

Birthdate________ Relationship________

□ Please send me your booklet on Deferred-Payment 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 have Paul Schoon or Lynnette Sodha from the Washington University Planned Giving Office call me.

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A Celebration of Life  Artist Trudy Marshall poses with her multi-tiered bronze relief sculpture, "A Celebration of Life," unveiled during the grand opening of Central Institute for the Deaf's Harold W. Siebens Hearing Research Center at 4560 Clayton Ave. The sculpture is installed in the main lobby that serves both the new research and administration building and CID's oral school.
Augendienst, a state-of-the-art manual of eye diseases and treatments — in 1583 — allows the reader to lift page upon page, looking ever deeper into a human head. It is just one of the many treasures housed in the Archives and Rare Books section of the School of Medicine's Bernard Becker Medical Library.