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The addition of bicycle-mounted safety officers has given new visibility and responsiveness to the Medical Center's protective services. A total of eight officers — some from each of the center's member institutions — patrol the grounds on mountain bicycles, enabling rapid response in an environmentally friendly form. The wheelmen were trained by Sergeant Paul D. Grady of the Seattle Police Department, founder of the country's first police mountain bike patrol.
A computer-generated reproduction of a Rhesus monkey's brain shows neural control to be less rigid than had been thought. The colored spheres represent neurons discharged during digital movement. The extent to which several areas are involved suggests a horizontal allotment of effort and a flexible system. For more on the work of Marc Schieber, M.D., Ph.D., see the story beginning on page 12.

Photograph by Tom Heine.

Basic Questions, Practical Answers 8
Sometimes, the connection between bench science and clinical application is immediate.

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Recent insight into neural organization suggests that a classic model may be too rigid.

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Eight physicians offer their observations about the Clintons' healthcare plan.

Not Even One 21
Having trouble quitting? It might be a genetically determined dependence that's fighting you.
Otology Award

John C. Sun, a third-year medical student, has received the 1993 Otologic Fellowship Award from the Deafness Research Foundation.

One of five recipients nationwide, Sun is using the award to investigate hair cell regeneration under the supervision of Barbara A. Bohne, Ph.D., professor of otolaryngology. He is studying sensorineural deafness, which affects over 80 percent of the deaf and hearing impaired population, and the role of aging on hair cell regeneration response.

The award recognizes individuals who have made a commitment to research in parasitology. With it, Sibley receives $60,000 over the next two years.

Sibley’s award will support innovative studies on the biology of Toxoplasma gondii, a protozoan parasite that infects virtually all types of nucleated vertebrate cells. Although it is not normally a major health problem in developed countries, Toxoplasma is emerging as a major opportunistic pathogen. In the United States and Europe, toxoplastic encephalitis occurs in 10 to 30 percent of AIDS patients, often causing death.

Sibley is taking a molecular genetic approach to understanding Toxoplasma virulence. Using a mouse model of toxoplasmosis, he plans to identify genes that regulate virulence using methods he has recently developed for DNA transformation in Toxoplasma. A long-term goal of the work is to identify the molecular basis of virulence in toxoplasmosis that may potentially lead to improved treatment.

Majerus To New Post

Phillip Majerus, M.D., has been named vice chair for financial affairs, a new post in the Department of Medicine.

A professor of medicine and biochemistry and molecular biophysics, Majerus will handle budgetary planning, resource utilization and oversee the business office of the Department of Medicine.

He came to the School of Medicine in 1966 as an assistant professor of medicine and biochemistry, becoming a professor of medicine in 1971 and professor of biochemistry in 1976. Since 1973, he has been co-director of the Department of Medicine’s division of hematology-oncology.

Meriting Recognition

David Sibley, Ph.D., assistant professor of molecular microbiology, has received the Burroughs Wellcome Fund New Investigator Award in Molecular Parasitology for 1993.

Into The Hall

Stanley L. London, M.D., assistant professor of surgery, has been honored for prowess on the basketball court and the baseball field during his collegiate years at Washington University.

Legal Matters

As the university’s newly appointed deputy general counsel, Sarah E. Terrace serves as the principal on-site attorney of the School of Medicine. Some of her responsibilities include
Robins Receives Eddy Award

LEE N. Robins, Ph.D., University Professor of Social Science and professor of social science in psychiatry, has received the 1993 Nathan B. Eddy Award from the College on Problems of Drug Dependence.

The Eddy Award is given annually to honor the career of a scientist who has made outstanding contributions to the field of drug abuse research. The award is named for Nathan B. Eddy, who is considered the father of drug abuse research.

"Dr. Robins' award is the first time a woman has not had to share the award with at least one male researcher, and I cannot think of anyone more deserving," says Martin W. Adler, executive officer of the College on Problems of Drug Dependence and professor of pharmacology at Temple University.

Robins directs the Program in Psychiatric Epidemiology at the School of Medicine and is on the university's Committee on Social Thought and Analysis. She has written more than 200 articles and books and currently serves on seven editorial boards.

On Behalf Of Students

LESLE E. Kahl, M.D., is the new associate dean for student affairs. She replaces Patricia L. Cole, M.D., assistant professor of medicine, who returned full time as director of the cardiac catheterization laboratory in the Department of Medicine's division of cardiology.

In her new role as associate dean, Kahl is responsible for dealing with students' academic affairs, assisting with financial aid, reviewing clerkship reports and supervising the operation of Olin Residence Hall. She will continue to be involved in patient care, teaching and research.

Kahl joined the Department of Medicine's division of rheumatology in 1987 and last year was named clinical section head of that division.

To Oversee Management Services

DENISE A. McCartney has been named assistant dean for management services.

In her new role, McCartney is responsible for human resources, including payroll/appointments, affirmative action, gifts/grants and contracts. She also serves as a liaison between the central administration and departments by advising the central administration on the operational impact of policies and procedures at the departmental level, and she will help coordinate activities and implementation of policies and procedures in the central administration.

McCartney joined the Washington University Medical Center in 1984 as a manager in the Barnes Hospital clinical laboratory. Most recently she was the administrative director of rehabilitative services at Barnes Hospital.

Herbert Lourie Professorship

ROBERT L. Grubb, Jr., M.D., professor of neurological surgery and radiology, has been named to the newly established Herbert Lourie Professorship in Neurological Surgery.

Grubb, with a reputation for clinical excellence, scholarly achievement and teaching, is an expert on cerebrovascular physiology and disease. He may be best known for his work assessing the pathophysiology of subarachnoid hemorrhage and cerebrovascular occlusive disease.

The professorship honors Herbert Lourie, M.D. (1929-1987) who did his neurological surgery training at Washington University and then joined the faculty at the Medical School of the State University of New York at Syracuse. The chair was endowed by Shi Hui Huang, M.D., Washington University trustee and former resident of the training program in neurological surgery here. Huang and Lourie were fellow residents and friends.
Weighty Check
University Chancellor William H. Danforth (second from right) accepts a check for $495,000 from the Ronald McDonald Children's Charities on behalf of the Department of Pediatrics at the medical school. The check represents the first of three installments of a $2.5 million grant the school will share with Children's Hospital of Philadelphia for research into neuroblastoma, a malignant form of cancer that occurs in infants and children. Pictured with the chancellor, from left, are researchers Eugene M. Johnson, M.D., Jeffrey Milbrandt, M.D., Garrett M. Brodeur, M.D., and Tom Tomlinson, regional chairman of Ronald McDonald Children's Charities.

Realizing The Dream
In the 75 years since women were first admitted to the School of Medicine, their opportunities have blossomed. Not only has the number of M.D.s granted to women quadrupled in the last 20 years to 40 percent of all graduates, but female medical students now can expect access to the same professional opportunities as their male classmates.

On October 8, 1993, the School of Medicine celebrated the 75th anniversary of women's admission with a symposium and a gala dinner to honor outstanding women physicians. A faculty panel discussed women's progress and the challenges they still face.

At the awards dinner, William A. Peck, M.D., executive vice chancellor for medical affairs and dean, presented the first Aphrodite Jannopoulos Hofsommer Awards to eight distinguished women physicians, five of whom are alumni. Aphrodite Jannopoulos Hofsommer was one of the first two women to register for medical school after the
admissions policy was changed to recognize women. She graduated in 1923. The alumnae recipients were: Katherine Bain, M.D. '25; Helen H. Glaser, M.D. '47; Jessie L. Ternberg, M.D. '53; Paula J. Clayton, M.D. '60, and Charlotte D. Jacobs, M.D. '72. In addition to Ternberg, who serves as professor of pediatric surgery, faculty members also honored were: Helen E. Nash, M.D., clinical professor of pediatrics; Jean H. Thurston, M.D., professor emerita of pediatrics, and Teresa J. Vietti, M.D., professor of pediatrics.

The award recipients' record of cumulative professional service to the School of Medicine totals more than 200 years; each has enhanced her specialty, improved patients' welfare and helped educate the next generation of physicians. An audience of medical students, friends, family and faculty gave each honoree a standing ovation.

Division Turns 20

The Division of Biology and Biomedical Sciences celebrated its 20th anniversary in November with a day-long symposium that featured distinguished alumni, a reception and an awards dinner.

Speakers at the symposium included Robert DeSalle, Dennis O'Leary and William Walden, all alumni of the division. DeSalle is with the Department of Entomology at the American Museum of Natural History; O'Leary is in the Department of Molecular Neurobiology at The Salk Institute, and Walden is in the Department of Microbiology and Immunology at the University of Illinois, Chicago. About 200 people attended the symposium.

Former division director Roy Vagelos, M.D., was the featured speaker at the dinner, attended by 80 people. Others who attended included: Milton J. Schlesinger, Ph.D., current head of the division; past division directors Carl Frieden, Ph.D., professor of biochemistry and molecular biophysics, and Philip D. Stahl, Ph.D., Edward Mallinckrodt, Jr., Professor and Head of the Department of Cell Biology and Physiology.

Scientists, Journalists Gather

The work of School of Medicine researchers was featured at the 31st annual New Horizons in Science Briefing hosted by the university in early November.

More than 120 science writers, scientists and science journalism educators from around the world attended the event designed to enhance the quality of medical and science reporting and improve the relationship between scientists and the press.

Speakers from the medical school were: Stanley J. Korshmeyer, M.D., professor of medicine and molecular biology; Eugene M. Johnson, Ph.D., professor of molecular biology and pharmacology; Dennis W. Choi, M.D., Ph.D., professor and head of the Department of Neurology, and John Atkinson, M.D., professor and chair of the Department of Medicine.

The event is an ongoing program of the Council for the Advancement of Science Writing Inc. (CASW), the purpose of which is to keep scientists and science communicators educated about science and medical topics that will be newsworthy in the near future.

First Lady Speaks

First Lady Hillary Rodham Clinton used the information superhighway to speak to students, staff and faculty at the School of Medicine about healthcare reform and other health issues during a live teleconference in October. About 150 people attended the event in Wohl Auditorium on the Medical Campus. The signal originated in Washington DC, and the event was sponsored by SELF Magazine. In addition to St. Louis, it was received in Atlanta, Boston, Chicago, San Francisco, New York, Dallas, Los Angeles and Columbus.
Protein Contributes To AIDS-Like Disease

A PROTEIN that is essential for normal immune system function is also necessary for development of an AIDS-like disease in mice, investigators here have found.

Without the immune system protein IL-4, mice become resistant to murine acquired immunodeficiency syndrome (MAIDS), a disease with symptoms similar to human AIDS. By helping to explain how MAIDS interacts with the immune system, the findings may lead scientists to a better understanding of AIDS in humans, says lead author Osami Kanagawa, M.D., Ph.D., research associate professor of pathology and medicine. Kanagawa conducted the work with colleagues here and at the Max Planck Institute for Immunobiology in Germany.

Although MAIDS is not considered a direct model for AIDS, the diseases may share deadly tactics that make comparisons worthwhile, Kanagawa says. Both are retroviruses, and both induce changes in immune system activity that gradually render the virus carrier unable to fight infection. The viruses differ in that MAIDS primarily infects the mouse immune system's B cells, whereas AIDS infects human T cells.

The investigators studied response to the MAIDS virus in 28 normal mice and in 28 mice that lacked the IL-4 gene. Six months after being infected with MAIDS, all normal mice had died of the disease. By contrast, only 3 of the IL-4 negative mice developed swollen lymph nodes — a symptom of MAIDS and AIDS — and all were still alive, Kanagawa says. MAIDS normally kills mice within three months. Because the Th2 response — immune system activity thought to survive longer than other immune defenses — may also survive longer in AIDS, it is possible that IL-4 may play a similar role in humans, Kanagawa says.

Hormone Replacement In Postmenopausal Women

THE School of Medicine is participating in a multicenter study evaluating various hormone replacement therapy regimens and doses in postmenopausal women.

Previous studies have demonstrated the benefits of hormone replacement therapy in postmenopausal women, such as prevention of osteoporosis and protection against heart disease. But this is the first large scale study to evaluate and compare different hormone replacement therapy regimens and doses. "I think the key is that all postmenopausal women should be on some form of hormone replacement therapy," says Dan Williams, M.D., assistant professor of obstetrics and gynecology and principal investigator at the School of Medicine. "In order to get more women to take the medication, there..."
must be alternative ways of giving it, because some patients will do well on one regimen and not on another.”

Drug therapy replaces blood levels of the hormones estrogen and progesterone, which are markedly reduced during menopause. Estrogen helps prevent osteoporosis and heart disease and also relieves hot flashes. But estrogen alone slightly increases the risk of uterine cancer. The risk can be offset with the addition of a progestin to hormone replacement therapy. Williams says the research may help physicians determine an optimal dosage of progestin.

 Detecting Damage

Surgeons here have developed a method to detect hidden injury in livers before they are donated for transplant. The test is the first to show that donor livers that appear to be healthy may actually be damaged before they are removed from the patient. The injury, which results from the disease or trauma that led to the donor’s death, is known as “preservation injury.” It occurs in the endothelium, or inner lining of the liver’s tiny blood vessels.

Researchers estimate that onethird of the 3,000 livers transplanted annually have preservation injury, which can lead to complications, frequent hospitalizations and, in some cases, rejection following transplant surgery.

“Until now, no one has suspected an injury such as this exists,” says Steven M. Strasberg, M.D., professor of surgery here and lead investigator of the study that was conducted at the University of Toronto. “When we assess potential liver donors, we test for diseases such as AIDS and viral hepatitis, and we find out if the liver has been damaged by drug or alcohol use. These are illnesses we know cause preservation injury. But this test shows that within the group of people we feel are qualified donors, a substantial number — one-third of patients — actually have significant injury to the liver.”

Strasberg says the organ can be damaged during any of three times: before the patient becomes a donor, after the organ has been removed from the donor and is being stored in the cold, and during rewarming, as the liver is being sewn into the recipient. These periods of injury are known as prerepreservation, preservational and rewarming injury, respectively.

Several years ago, Strasberg found that the main injury to the liver during preservation is to the endothelium. Endothelium, a tissue that lines all blood vessels in the body, also lines the liver’s tiny blood vessels, called sinusoids. Strasberg discovered that preserving the liver in near-freezing temperatures blocks blood flow through the sinusoids after the organ is transplanted.

His current work shows that the extent of injury can be determined on liver biopsy by the presence of platelets stuck to the endothelium. In order to see the platelets, Strasberg and his colleagues used a recently developed monoclonal antibody that makes them appear as black dots.

Strasberg says endothelial injury has been explored mostly in the liver because of the highly specialized endothelial cells in that organ. However, he says it is possible that endothelial cell injury is an important component of injury in other organs and that this work may be applied to improving preservation of kidneys and other organs.

 Routine Screening Not Recommended

Routine prenatal ultrasound screening does not improve newborn health in low-risk pregnancies and should not be a standard procedure, according to results of a study of 15,530 low-risk pregnant women.

Babies born to mothers who received ultrasound exams only for medically necessary reasons were just as healthy as babies whose mothers underwent routine ultrasound screenings, the multicenter study found.

“Physicians do not need to recommend routine ultrasound screening in low-risk pregnancies, because it does not improve newborn health,” says James P. Crane, M.D., professor of obstetrics and gynecology, and one of the study’s principal investigators. “Instead, physicians should selectively recommend the test based on the individual circumstances of patients, because ultrasound can be an important diagnostic tool in some medically complicated pregnancies.”

The study is the largest of its kind to assess the potential benefits of ultrasound in low-risk pregnancies. A typical prenatal ultrasound scan costs about $200. The researchers estimate U.S. healthcare providers and consumers could save $512 million annually by providing ultrasound exams only to pregnant women whose conditions require the procedure.
BASIC QUESTIONS, PRACTICAL ANSWERS

BY JULI LEISTNER
Tiny doses of aspirin help people reduce their risk of cardiovascular disease; new diagnostic tests spot patients with I-cell disease; simple injections provide the first effective therapy for Gaucher disease. These are just a few examples of practical answers to medical problems that have come from basic research at the School of Medicine.

Basic medical research is sometimes criticized as being irrelevant, far removed from practical application, too expensive — as science for the sake of science. But a look at the history of pure scientific endeavor at the medical school demonstrates the practical value of the most basic medical research. By exploring how the body works, bench scientists here and elsewhere help us learn how to make the body work better.

“'It's been shown over and over again that basic research in the most unlikely situation can lead to very important applications in clinical medicine. Even the most basic questions ultimately will contribute to the understanding of clinical problems,' says Stuart Kornfeld, M.D., professor of medicine and of biochemistry and molecular biophysics.

Three examples illustrate the point:

The health of every cell depends on its ability to break down and eliminate waste — a job tackled by powerful enzymes that work inside cell components called lysosomes. Before lysosomal enzymes can do their work, they must navigate through several parts of the cell's complex machinery, then finally be delivered to the lysosome. In the 1970s, Kornfeld began studying the molecular signals that direct traffic inside cells; his work has played a major role in explaining how this intricate routing process works. The knowledge has direct implications for understanding a family of roughly 50 diseases called lysosomal storage disorders.

Kornfeld was among the first to propose that complex sugar chains on the surface of proteins, such as lysosomal enzymes, might act as signals to direct these proteins to their proper destinations. To understand how the sugar chains worked, he and his lab staff began by asking basic questions: What do the sugar chains look like? How are they formed? What molecules interact with them? Over the next several years, he and his colleagues uncovered the structure of many of these sugar chains. They also pieced together much of the intricate chemical pathway through which they are
been able to show how the marker was formed. Since then, his laboratory and others have found many examples of how these sugars act as markers to direct cell traffic.

In the early 1980s, Kornfeld had the opportunity to apply his basic science expertise to a clinical problem — lysosomal storage disorders. These diseases result when one or more lysosomal enzymes do not function properly. Two National Institutes of Health researchers, Elizabeth Neufeld and Scott Hickman (who is now on the faculty at the medical school), had found the cause of a storage disorder called pseudo-Hurler polydystrophy, a milder form of L-cell disease, had a partial deficiency of the same enzyme. Kornfeld has since developed diagnostic tests for these two diseases that measure the amount of the missing enzyme using skin or blood samples.

"This is a nice example of how the contributions of many different investigators have led to a practical benefit," Kornfeld says. As cells go about their daily tasks, they constantly must send vital materials from their environment to the inside of the cell. Specialized proteins, called receptors, stand guard on the cell surface to determine which materials get in and which do not. To enter cells, substances such as hormones, nutrients and invading organisms must bind to a receptor, which then carries them inside. The process is called endocytosis.

Philip Stahl, Ph.D., professor and head of the Department of Cell Biology and Physiology, began his career at Washington University studying how endocytosis works. In the process, Stahl and his colleagues discovered a receptor called the mannose receptor, so named because it recognized and bound to mannose sugars. Since the discovery in 1975, he has used the mannose receptor as a model to better understand endocytosis. But the discovery has had an unexpected practical application: development of the first effective therapy for Gaucher disease.

Gaucher disease is another type of lysosomal storage disorder that affects about 1 in 40,000 people. People with the disease carry an abnormal form of a lysosomal enzyme called glucocerebrosidase. This enzyme works inside the lysosomes of macrophages, cells of the immune system that specialize in digesting infectious organisms and worn-out cells. Without the enzyme, the macrophages of Gaucher patients become dysfunctional and damage organs such as the spleen and liver. Symptoms of the disease — chronic pain, impaired liver and spleen function, blood clotting disorders, anemia and a host of other problems — can range from mild to life threatening.

Initial efforts to treat the disease focused on supplementing patients with injections of the normal enzyme. That approach was unsuccessful; most of the dose never reached the macrophages. Stahl's mannose receptor opened up a new option; because the receptor existed in high numbers on the surface of macrophages, it provided a possible gateway into these cells.

"If you could selectively deliver enzymes to these macrophages by using the mannose receptor, it would be a way of accomplishing enzyme replacement therapy," Stahl says. Researchers at the National Institute of Neurological Disorders and Stroke developed a modified form of the enzyme that carried exposed mannose sugars.

"Once this enzyme is infused into a patient, the enzyme is taken up quickly into macrophages through the mannose receptor. It reverses the disease symptoms, and the patients can lead a normal life," Stahl says. A similar approach could be used to fight diseases such as tuberculosis and leishmaniasis, Stahl adds. "In these diseases, the infectious organism lives within the macrophage — the very cell that is supposed to kill it. These organisms have developed
strategies for preventing the killing process from working," he says. Researchers may be able to target drugs to these infected cells via cell-surface receptors, he says.

Aspirin is a wonder drug, relieving pain from a variety of sources and causes. But the drug also carries a well-known drawback: a tendency to cause bleeding. In the 1970s, Philip Majerus, M.D., began research aimed at explaining how aspirin exerted this anti-clotting power. The answers he found gave clinicians the key for turning aspirin's drawback into an advantage for potential heart attack and stroke patients.

"My first idea was that aspirin might react with a clotting factor in the blood, interfere with its function and prevent normal blood clotting," says Majerus, professor of medicine and of biochemistry and molecular biophysics. He and his colleagues performed laboratory studies to see whether aspirin would, in fact, bind to any clotting factors. "We found nothing. It didn't work."

So they considered another possibility: that aspirin acted on platelets, blood components that clump together to form the initial framework of blood clots. Another round of investigation in Majerus' lab revealed that aspirin inhibited the enzyme that produces thromboxane, a potent platelet aggregating agent. The findings, reported in 1975, were the first to explain precisely how aspirin prevents clotting.

But the study was important for another reason. At the time, a few researchers had considered the possibility that aspirin's anti-clotting properties might protect against heart attack and stroke. "But they all looked at very high doses of aspirin. The toxicity was so great that it tended to wipe out any detectable benefit," Majerus explains. His findings suggested that very low doses of aspirin might provide protection without the unwanted effects. The reason: Platelets possess no DNA or RNA and, therefore, cannot make proteins to counteract the effects of aspirin. "So we speculated that when platelets get hit by aspirin, the effect would be permanent, and that the dose of aspirin it would take to affect platelets would be much lower than for other uses of this drug."

Majerus and colleagues turned to dialysis patients to test their theory. These patients wear plastic shunts in their arms for easy connection to dialysis machines; blood clots tend to form in the shunts and offer an easy window to monitor clotting. In the 1979 study of 44 patients, Majerus found that low doses of aspirin, one half an adult tablet per day, significantly reduced clotting without any side effects.

"That was the first real proof that low-dose aspirin could be an anti-thrombotic drug," Majerus says. The finding spurred hundreds of clinical trials that have since established low-dose aspirin as a safe protective agent against heart attack and stroke.

Of course, influential findings such as these do not happen in isolation, says Kornfield, but as new pieces added to a huge and growing knowledge base. "Each investigation will add a little bit of new information about how our world works. Every once in a while, with a good observation and an astute observer who thinks about the results, you end up with something that has a major impact on the treatment of disease."

Philip Stahl, Ph.D.

Philip Majerus, M.D.
Handle something — a pen, a button, a shoelace — and your brain automatically tells your fingers how to move the object. Simple tasks are the result of lightning fast communication between muscles and millions of nerve cells in the brain and spinal cord.

So how does the brain tell the fingers to move? Traditionally, scientists have pictured each finger with its own command center, a precise set of neurons in a specific section of the brain's motor cortex.

But there's something wrong with that classical picture, says Marc H. Schieber, M.D., Ph.D., assistant professor of neurology and neurosurgery. Schieber's research, recently published in the journal Science, casts doubt on such a tidy and tight organization for motor control. "The motor cortex is a melting pot, not a group of discrete neighborhoods of neurons devoted to particular fingers," says Schieber.
A new way of picturing the motor cortex could direct scientists to uncharted regions of neurology and rehabilitation, where the need for conceptual breakthroughs is substantial. For instance, Schieber's work provides compelling evidence that people who have a brain injury that affects part of the hand area may be able to train remaining portions of the motor cortex to take over tasks formerly handled by the damaged tissue. Scientists have long known that the commands for finger movement originate in the motor cortex, a strip of tissue extending roughly from ear to ear along the top of the brain. How does this thin sheet of nervous tissue generate the instructions necessary for piano playing or knot tying?

Part of the explanation came in the 1950s when a group of prominent neuroscientists proposed what would become a belief widely accepted by researchers — namely, that the motor and sensory regions of the brain are divided into compartments, each with responsibility for a hand or foot or shoulder. The group, led by Wilder Penfield, believed that the larger hand region was further subdivided into small parcels of tissue responsible for motivating each finger or thumb.

When Schieber began his neurology training, he never thought he would one day chip away at the fidelity of this creed long held by his fellow neuroscientists. Those behind the theory reside on a sort of neuroscientist's Olympus — Drs. Hughlings Jackson, C.S. Sherrington, Clinton Woolsey and Penfield — and Schieber had no intention of challenging the men he calls the "giants of the past."

Penfield's famous homunculus — a little man whose features embody the modern theory of cortical organization — arose from this early work. The homunculus' features are distorted in proportion to the amount of neural area dedicated to those features, creating a memorable cartoon of a man with a giant head, lips and hands and relatively small ears, arms and legs. Despite the distorted appearance of the homunculus, the work was anything but a joke.

Penfield's incisive doctrine has had lasting effect and has convinced many scientists that the motor cortex and possibly other areas of the brain are neatly partitioned.

Schieber's initial skepticism about the homunculus came while he was doing his residency in neurology. He saw many patients who for one reason or another lost their ability to control hand movements. Their problems were usually the by-product of a stroke or other traumatic insult to brain tissue. Seeing these patients, Schieber began with the idea that Penfield and company might have been mistaken.
His musings were prodded by the observation that people who suffer strokes never get "thumb strokes" or strokes affecting a single finger. The damage is generally more widespread, he says.

If the Penfield hypothesis were correct, Schieber reasoned, somewhere there should be a patient with very localized damage, affecting just a thumb or one finger. But his observations and talks with colleagues never yielded a patient with such localized damage. In order to find out how this could be possible, Schieber carefully developed a model to test his closely guarded suspicions.

The model, he knew, had to mimic natural finger movements. Human studies were out of the question, so Schieber turned to Rhesus monkeys because of their dexterity and temperament. The monkey's natural dexterity made things easier, but it still required about 18 months to train a Rhesus monkey to make the kinds of finger movements Schieber needed for his studies. The training proved arduous, and the monkeys became Schieber's partners.

Hazel and Chip, two of Schieber's monkeys, now well-trained, begin the experiments by inserting a hand in a special Nintendo-like glove that Schieber designed for the project. Inside the glove, switches open and close when a finger is moved. Each switch tells Schieber which finger Hazel or Chip moves. Colors flash on a light display in front of the monkeys, prompting the animals to move their fingers. During their 18-month training period the monkeys have learned that each colored light corresponds to a type of finger movement Schieber wants them to make. If Hazel or Chip makes the correct finger movement, a drop of water is the reward that reinforces the correct behavior.

This conditioning is essential to the study, Schieber explains, because it teaches the monkeys to move one finger at a time, on cue, while keeping the other fingers as still as possible. More importantly, this exercise provides a realistic snapshot of the monkey brain as it generates finger movements.

With the monkeys wiggling their fingers in the glove, Schieber carefully records the activity of single nerve cells within the motor cortex. He is able to do this by precisely placing a small electrode in the motor cortex. The data collected from the electrode are fed into a computer which then sorts the results. This setup allows Schieber to sample the whole motor cortex hand area to see how single neurons behave when a thumb or finger moves.

The work has demonstrated several facts to Schieber. He has shown that single neurons can be active when a monkey is moving not just one, but many different fingers. "During any particular finger movement, there are neurons active over the whole hand area," Schieber says.

Instead of delegating control of one particular finger to a specific strip of neurons, Schieber now believes the brain orchestrates finger movement by allowing neurons from across the motor cortex hand area to help move each finger.

When he saw the results for the first time, Schieber was shocked. He painstakingly repeated the experiments several times to be sure of his results. Still not quite convinced, Schieber decided to review the data that led Sherrington, Penfield and Woolsey to propose that the motor cortex contains a map of the human body. To his surprise, Schieber found that his own data were not unlike the data collected by the giants of the past. "When you get right down to the nitty gritty, it says the same thing," Schieber says. "We were thinking about the data in the wrong way because it was so attractive and easy to think about it in that way."

It frustrates Schieber not to know the reason these eminent neuroscientists interpreted their results as they did. Speaking on their behalf, Schieber suggests that their view of the motor cortex appeared correct in light of their experiments and what was known about the brain at the time.

Part of the answer may lie in the techniques chosen by Penfield. He probed the brain's surface with...
electrical stimulation mapping. Applying small amounts of electric current to specific areas of the brain, Penfield noted which parts of the body moved. He reasoned that the area he had stimulated must control the muscles that subsequently twitched. With this systematic approach, Penfield described the size and location of the nooks and crannies of the brain that control various muscle groups. The technique is not as precise as Schieber's because it stimulates "a good-sized chunk of brain," Schieber says. Perhaps Penfield thought that when more precise stimulation techniques became available, the map would look more precise. It didn't.

Elements of the original Penfield hypothesis remain accurate in the detailed maps found in the somatosensory cortex and in the visual cortex. But even these maps may not be rigid. Anecdotal evidence, some of it published in prominent research journals, implies that after injury or amputation the brain may reorganize itself on a massive scale.

This idea suggests that once sensory input is lost or disconnected, that part of the brain somehow rewires itself to receive sensory information from another part of the body. For example, after an arm amputation, the part of the sensory cortex that formerly processed sensations from the arm now registers signals from the face and chest. Such plasticity is most often associated with the somatosensory cortex — the area of the brain responsible for touch — but Schieber is keeping an open mind about the potential for the motor cortex to reorganize. Previous studies on rats by researchers at Brown University suggest that the motor cortex also can rearrange itself minutes after limb amputation. "There's even evidence in humans that the motor cortex can reorganize itself much more quickly than previously thought," Schieber says.

Cortical reorganization is now on the minds of many neurologists, neurosurgeons and occupational and physical therapists. Indeed, neurorehabilitation, a field that has sprouted within the discipline of neurology, is attracting scientists like Schieber with ideas and insight from basic research that could revolutionize how patients recover from stroke or automobile accidents or paralysis. The specialty differs from traditional neurology, which has mainly concentrated on understanding disease states.

"We may understand very well how an injury occurred, but we don't have good ways of making it better once it's happened," Schieber explains. "Part of the underlying reason we can't make it better is that we don't understand how it works in the first place."

For patients with motor damage, there is reason to be encouraged by the current emphasis on structure and function. Much of rehabilitation relies on defining precisely the patient's deficits, then working to overcome those weaknesses using "compensatory strategies." For example, scientists are interested in how people learn to make hand or finger movements by watching someone else, as in guitar playing.

Schieber and others believe that there are specialized areas of motor cortex responsible for turning novel visual information into motor activity. Finding those areas of motor cortex and understanding how they work could help people who have difficulty responding to visual cues. Someone who, because of a loss of neurological function, can't get his foot off the gas and onto the brake when a stoplight turns red could benefit from a compensatory strategy. "If we knew why the problem was occurring and which routes the information was traveling in the brain, we might be able to teach the person certain tricks to get around the problem," Schieber says.

For now, the compensatory strategy most neuroscientists are using to understand the brain is more basic research. Given the brain's surprising ability to shrug off conventional notions about its operations, it's no wonder many theories don't stand the test of time. And as for Schieber's proposal, only time will tell. "I don't expect them to be teaching this next year to medical students," he says, "but I hope the paper will find its way into a few advanced, graduate-level courses."
THE IMPLICATIONS OF REFORM

by Kleila Carlson

President Bill Clinton laid the groundwork for an overhaul of the nation's healthcare system when he outlined a sweeping plan for reform in September.

Since Clinton's address to the nation just over 90 days ago, many plans for healthcare revision have been suggested by various special interest and political groups. No one knows what plan (or, indeed, if any plan) actually will be approved by Congress and the President. And even after a plan is approved, all indications are that it may take years to fully implement.

What follows are thoughts and concerns from faculty, administrators and clinicians on the implications of healthcare reform, such as that proposed by President Clinton, could have for medical practice, research and academic institutions.
I think that physicians should play an important, though not exclusive, role in the design of a healthcare system which provides the services needed for the long-term health of the American people. Although certain physician groups have been involved in developing the President's proposal, I have serious doubts as to how representative these groups are of the medical profession. Furthermore, it is not at all clear as to what role physicians as a group will play in defining how they are to be involved in establishing the standards of care to be provided in a new healthcare system.

I am more concerned about the ability of the profession to do what the profession should do than I am with the economic concerns of how doctors will be paid. I believe that the best way to secure physician income is to make certain that the American public perceives the medical profession as being more committed to the public's welfare and quality of medical services than they are to their own pocketbook. I question whether the currently proposed organizational structure for a new healthcare system will, in fact, preserve patient-doctor relationships and offer real choice. I am perturbed that economists, bureaucrats, technocrats and bookkeepers will define how and what medical services shall be provided.

One of the difficulties we face is that physicians are not a homogeneous group; they represent a whole host of heterogeneous talents and skills. Furthermore, one of the serious distortions in the current system is the extraordinary disparity of fiscal reimbursement for services. There is no doubt in my mind that certain technical procedures are reimbursed at inappropriately high rates, whereas those specialties characterized by both long-term and intimate interactions with patients and their families are not adequately reimbursed.

There is a natural tendency for each currently favored professional group to preserve the status quo and resist change. Consequently there is no single effective, unified voice speaking for physicians. There is no doubt in my mind that the absence of unified and coherent leadership in medicine is being taken advantage of by politicians, economists and the business community. It certainly is being taken advantage of by the for-profit healthcare industry.

Desperately needed is a more organized, effective interaction by major medical groups, including the American Medical Association, which until recently have not focused on the professional role and responsibilities of physicians, but rather on issues involving their financial security.

The President's plan can be criticized, in that the people who are actually doing the work — physicians and hospitals — were not consulted in the formation of the plan. Also, I share with others a skepticism that an efficient and cost-efficient plan can be managed by the government.

There were no working physicians, those who actually get their hands dirty in the business of providing medical care, involved in the planning, and no hospitals were consulted. There is a great deal of apprehension about making these changes with a government agency in charge, since most people feel the experience with mandated projects in the past has not been very good. They are suspicious and skeptical about government and would prefer that it were done by non-government agencies.

In academic medicine, we are concerned about maintaining quality. There is no mechanism at present to ensure that the quality of medical care will be good. In addition, there appears to be an across-the-board cut in research funds, which is very worrisome. Nor is there much attention to medical education at any level: student, resident or continuing education for practicing physicians. These are some concerns with the plan as it affects academic medicine.

The plan's goal is to ultimately ensure that 50 percent of physicians will be doing general medicine and 50 percent will be specialists. At one of the meetings I attended, I heard that the figure for generalists may be increased to 67 percent. In medical centers, we are concerned that the quality of people doing specialty work will deteriorate. We fear that people who are not qualified to do specialized procedures may be entrusted with the responsibility of doing them.

While many of us find fault with certain aspects of the plan as we understand it, nevertheless there is a plan, and all of us feel confident that the bad features will be eliminated in the Congress or in the various states, depending upon the individual needs. What emerges will be something that probably satisfies most people. At least it has been recognized that there is a problem and that finally something is being done about it.
influence effectively. Other organizations attempting to influence the outcome include the American Society of Internal Medicine, the American College of Physicians, the Academy of Pediatrics and the Academy of Family Practice. Each displays differences in approach and what is acceptable. If there are substantive differences not only among these professional organizations, but also with subspecialty organizations and the medical school-based organizations such as the American Association of Medical Colleges, the final decision will be made without their input, because the confused decision-makers faced with divergent opinions from similar groups will accept the plan, the focus or the consensus developed by the organization that most closely coincides with their personal view.

It is imperative that organized medicine unify into a single voice. We must work out the controversies among the organizations behind closed doors and present a unified front. If we in the profession don't develop consensus, we will not have a voice that is heard.

The area that concerns me most is the concept among some healthcare planners that medical schools are viewed as a homogeneous lot — that is, they all have about the same mission: They all do research, take care of patients and teach. Thus, they conclude that what is good for one is good for the other and what is bad for one is bad for the other. This concept has been accepted by some professional organizations, particularly those that accredit medical schools and postdoctoral programs. Therefore, we have to be cautious about rules or defacto plans that say all medical schools have to turn out 50 percent of their graduates in primary care; that all medical schools must have a particular curriculum for their students, and that all training programs must follow a long list of specific essentials.

I personally believe that Washington University has a mission different from some state schools, for example. In my view, it would detract from our mission to be required to direct 50 percent of our students into a primary care career.

The way professional healthcare organizations will interface with the system in order to bring about the final plan is very important. Right now, the American Medical Association has said it wants universal access and an employer-based system, but there is a series of nuances which it finds totally unacceptable. The AMA has lobbying and public relations resources to result in an inflexible system that will be upsetting to the population, have serious operational and financial difficulties and require another healthcare reform five to 10 years from now. I'm concerned that organizations such as the American Medical Association, the American Association of Medical Colleges, insurance companies, equipment manufacturers and other kinds of providers will be so opposed to the system that the political process over the next couple of years in the U.S. will end up with a very compromised healthcare system that will not satisfy our need for access and cost control.

The solution is for organized medicine and other providers to get together and come up with a common ground as to what's acceptable and what isn't and work with the system to allow managed competition with important cost reductions to occur.

My other concern is for Washington University. The current approaches completely ignore the needs for future healthcare to include education and research, two challenges that make us special. The current approach suggests that the cost of education and research must be borne by the institutions that decide to do education and research, as well as take care of patients. The additional cost will force such institutions out of the market because they will be too expensive. I'm concerned for Washington University with our stated goals of being the best in all three areas — clinical care, research and education — that if we continue to focus on all three, which I want to do, we'll be hurt in the marketplace.

We're going to have to be very creative in new approaches to clinical care, just as we're creative in research and education. Our goal should also be very creative administratively. We should force ourselves to look at ways to do research more economically. We should force ourselves to take advantage of the medical students and the residents we have and to make them even more a part of the educational and clinical process. We're going to have to teach and do research with fewer resources. It will be a major, major challenge.
William A. Peck, M.D.  
Executive Vice Chancellor for Medical Affairs and Dean

Our present healthcare “system” is dysfunctional: A large segment of the population is uninsured or underinsured; many socially indigent people have no or limited access to primary care; our costs are the highest in the world, and we rank lower than many developed countries in general indicators of health.

In reality, we have no healthcare system, but rather multiple approaches to financing and access, including HMOs, PPOs, Medicare, Medicaid and fee-for-service. Yet, we provide the highest quality healthcare to our insured population, lead the world in biomedical research and technology development and have the finest physicians. First Lady Hillary Rodham Clinton and her staff are to be congratulated for crafting a comprehensive proposal, and the President for bringing a plan to the public for the first time in decades.

The Clinton proposal, which is being modified as we speak, is noteworthy for providing universal coverage, insurance reform, attention to quality, simplicity, comprehensiveness of benefits, emphasis on primary care and the inclusion of components of managed competition and fee-for-service. Concerns are its costs, which may be higher than initial estimates, a high degree of control by the federal government via a national health board and by state governments of health alliances, possible limitations in the choice of physicians and inadequate tort reform.

Substantial cuts in Medicare will be used to pay for the program, and those cuts could have a negative impact on the quality of healthcare for the elderly and on graduate medical education which is supported, in part, by Medicare funds. The bill recognizes the importance of academic health centers, but, for reasons I don’t understand, the definition of academic health centers excludes medical schools. If there is any common denominator to an academic health center, it is a medical school affiliation. In my view, academic health centers will lose vitally needed funds if the proposed legislation is enacted unchanged. I’m also concerned that appropriations for healthcare research will reduce appropriations for biomedical research.

I believe that some components of the bill will be incorporated into law over a period of time, but it may be as long as eight years. The managed competition part of the program may become more flexible, and the power of the proposed national health board may be reduced. Caps on insurance premiums may not be sustained, and tort reform may be more rigorous. But the country is ready for change.

Helen E. Nash, M.D.  
Clinical Professor of Pediatrics, Private Practitioner in St. Louis

I feel that universal healthcare is a must if we intend to take care of all segments of the population. I do not think the majority of people know or understand how the lower economic segments of the population live; I don’t think they know the obstacles they must overcome. For example: A woman who has just given birth and already has five children at home is discharged 24 hours after the delivery and told to return to the hospital two days later as an outpatient for an injection of Depo-Provera (a contraceptive which she could have received before being sent home). The hospital refuses to administer the injection while she is there on the grounds it is an outpatient procedure. No one understands that in order to return she must find a baby-sitter and transportation and deal with the fatigue from giving birth. Often, these women become pregnant before all the arrangements can be made for them to return for this injection.

I find it disturbing that insurers and politicians do not understand human behavior. I don’t know how we got into a system where lawyers and businessmen are running the medical profession. They have no medical knowledge or insight into a community, and yet they implement these rules that make it nearly impossible to work in the system.

I believe universal healthcare can be accomplished, but much more needs to be done. The government should revise the Medicaid system to be more responsive to the actual needs of the patient instead of providing them with the cheapest brand of healthcare available. St. Louis would benefit from a centralized public health system, which we no longer have. Our own city health department provides fewer and fewer public health services each year while all the emergency rooms in St. Louis are being used as outpatient clinics. We need public health clinics and outpatient clinics so that children will not have to go to hospital emergency rooms for non-emergency procedures.

What I have come to believe after this many years is that I am not going to cure the problem. Healthcare needs revising and everyone must have access to it, but I don’t know that lawyers can do it. They would not let me reform the judicial system.
President Clinton has taken a bold step in trying to come to grips with the serious issues affecting the healthcare of all Americans. The panel that he empowered has done an enormous amount of work in a short period of time, and it has touched on points of concern to the public.

With respect to teaching and training, I think that the healthcare plan must incorporate ways to make primary care medicine attractive. You want the smart, able people on the front lines. I hope that the plan will provide for assisting the very best of our students to pursue careers in primary care.

Primary care is more complicated than it used to be, and I think medical schools should contemplate extending the medical school experience. Humans are no more evolved than they were a century ago mentally, but the knowledge required to direct patients through a complex medical system has evolved enormously. One way to compensate is to significantly broaden training.

Students need more experience in clinical medicine. I'm somewhat old-fashioned and think they need this before they make their choices for postgraduate training. Students need to reflect on their clinical experience and how basic medical science applies to it. Someone going into primary care should have direct knowledge about what each of the medical specialties can do for the patients he will be sending to specialists.

Medicine has gotten wonderfully effective, but that means there is much more to learn. Postgraduate training is directed to the issues that concern a field. If the fiscal burden were less, students could take an extra year of medical school to do research, advanced clinical rotations or work in clinics in various parts of the world and make more thoughtful choices. I think 48 months of required clinical work is barely enough. I think the truncation of the preclinical sciences without later review is really doing our students a grave disservice.

One of the things I've seen recently in the healthcare plan is a modification that would allow that option. That would be helpful, but once you do that, you automatically re-establish a two-tiered health plan.

I don't think a two-tiered plan is wrong. The problem is that some people have decided that healthcare is a right, and, if it's a right, then all people are entitled to equal healthcare. But that only works if you're going to supply all people with equal, best healthcare. We've come to find out that's not economically feasible, especially from the public purse. My suggestion: Get the government out of the healthcare business. It would not be simple. It would have to be done in stages; it would be wrenching to make the transition, but in the long run it would be far, far better.

But I think it's unrealistic to think that government will get out of the practice of medical care. That's not been the history of medical care in other countries. Assuming that's not going to happen, we will see major restructuring of healthcare. I tend to be a bit optimistic. Doctors are smarter than politicians, much smarter. They will learn to function within whatever system is imposed on them. They will give their patients the best care possible under whatever system is functioning. I have confidence in doctors.

We are acknowledged as having one of the best healthcare systems in the world. At the same time, politicians tell us we have a crisis. The word "crisis" is used by politicians whenever they want to take away peoples' freedom and money and give themselves more power. So, here we are in another crisis where the politicians are looking to run things more.

The main problem with healthcare, as far as I'm concerned, is the involvement of the federal government in the first place. More government, as I see this plan, will mean rationing of healthcare, enormous cutbacks on numbers of positions in medical training, rationing of how many physicians can go into specialized medicine and rationing of specialized care for patients using gatekeeper systems to decide who needs it and who doesn't in order to cut back on costs.

A patient can't come to me and say, "Doctor, I know that Medicare will only allow this much and I'm not allowed to be in the hospital for my surgery, but I want to go outside the Medicare system. I will pay you as a private physician. I would like to go into the hospital for a week and occupy a bed." In all of Europe that is possible and OK to do. My European colleagues can't understand that in the land of the free, namely the United States, this option doesn't exist.

Thomas A. Woolsey, M.D.
Professor of Anatomy and Neurobiology, Cell Biology and Physiology, and Neurology and Neurosurgical Surgery

Robert C. Drews, M.D.
Clinical Professor of Ophthalmology and Visual Sciences, Member School of Medicine National Council
Many of us know or even live with people who would like to stop smoking but have been unable to. Despite irrefutable warnings, they accept shortness of breath and potentially extreme health effects in return for nicotine's stimulation. In the judgment of the nonsmoker, they shorten their lives with each smoky inhalation.

“It is a small minority who can remain social smokers, smoking just a few cigarettes per week. The vast majority are daily users, smoking 10, 20 or 30 cigarettes per day,” says Andrew C. Heath, D. Phil., who studies smoking initiation and persistence. “They damage their health. Most are dependent.”

by Steve Kohler
Why does one regular smoker's dependence persist while another's can be overcome? Heath's research into that question suggests that genetic differences may predispose some long-term smokers to depend more heavily on their habit than others. In fact, genetically determined physiological differences may increase the strength of some people's addiction to nicotine, although that remains less certain.

**GENETIC INFLUENCES**

If it is hard to believe that the tendency to continue smoking has a genetic component, Heath suggests considering the case of the influences at work in alcohol abuse, which he calls analogous. As recently as 20 years ago, few believed that genetics was a determining factor in a person's tendency to abuse alcohol. But a number of highly respected studies, many done here at the School of Medicine, showed clearly that as much as 60 percent of the variance in the risk of alcoholism is due to genetic effects.

For cigarette smokers, the genetic component is even stronger, the numbers even higher. Heath says as much as 74 percent of the variance between people who continue to smoke and those who do not is due to genetics rather than environment. Yet, Heath says, very few researchers study the role of genetics in cigarette smoking: "The health consequences of smoking make it a serious epidemic, but few people know how important the genetic influences are."

Though it is unlikely that there is a single "smoking gene" to be found, "a handful of genes" may influence persistent smoking; according to Pamela Madden, Ph.D., a postdoctoral fellow working with Heath. Their work shows that genetically controlled personality traits have an effect on smoking initiation.

**THE STUDIES**

Heath and his colleagues — Madden, Kathleen K. Bucholz, Ph.D., Stephen H. Dinwiddie, M.D., and long-time collaborator in Australia Nicholas G. Martin, Ph.D. — explore the interrelationships of smoking and alcohol abuse, genetics and environment in the behavior of more than 5,900 adult twins in an Australian study begun four years ago. The survey assesses personality, lifestyle and psychiatric disorders of participating twins and includes reports on the behavior of their relatives.

Using sophisticated statistical methods, team members resolve the effects of genetics and environment on behaviors reported by study participants. By contrasting monozygotic (genetically identical) twins with dizygotic twins (who are no more genetically alike than any other siblings), team members use the large numbers in their database to identify genetic influences.

Heath, associate professor of psychology and genetics in psychiatry, offers a simple illustration of how the twin studies work: If a persistent smoker's monozygotic co-twin is more likely to be a persistent smoker than the co-twin of a dizygotic persistent smoker, then a genetic influence is at work. By controlling for environmental risk factors — such as twins with dissimilar friends who might influence smoking behavior differentially — the data can yield surprisingly deep information.

The group's studies have looked at persistent smoking and at the separate issue of initiation of smoking. Because heavy drinkers are often smokers, the association between smoking and the genetic effects on alcoholism risk also has come under scrutiny.

**PERSONALITY EFFECTS**

Interestingly, it turns out that a personality trait that correlates strongly with smoking initiation also is represented in many people who have problems with the use of alcohol. That personality trait — Madden calls it "novelty seeking" or "risk taking" — is over-represented among both abusers of alcohol and those who start smoking. "It's not just that heavy drinkers are likely to be heavy smokers," Madden says. "Novelty seeking is the most strongly correlated personality trait in our studies of alcohol problems and initiation of smoking."

Exploring the relationship of the genetics of alcoholism and smoking further, Madden has found that being a smoker is a much more powerful
predictor of getting into trouble with alcohol in women than in men. (One of the reasons the twin study is conducted in Australia is that most Australian women use alcohol.) That result poses questions for the investigators: "Is there a pharmacologic effect of smoking and drinking combined? Does smoking diminish the effect of alcohol so that a woman who smokes will drink more than she otherwise would?"

That question also came up in a study of a small subset of subjects who took part in an alcohol challenge study, drinking a controlled amount of alcohol adjusted for body weight. Men who regularly drank more reported feeling less intoxicated with the challenge dose than those who drank less. But in women, drinking history was a less powerful predictor of how intoxicated the subjects felt. Instead, it was the smokers who felt less intoxicated. Again, the question is unavoidable: "Is there an interaction between nicotine and alcohol, especially in women?"

Heath and his colleagues are beginning a study of female adolescent twins in Missouri to explore some of these interrelationships further. Until now, the studies' subjects have all been adults. "But it is adolescents who begin smoking and drinking," Heath says. Teenagers also can be seen to be bigger risk takers than adults, and Heath has wondered why some adolescents mature out of their novelty seeking behavior and others apparently do not.

PERSISTENCE

If the personality trait of novelty seeking is strongly related to smoking initiation, it is not a predominant characteristic among persistent smokers; its presence is a poor predictor of long-term, persistent smoking, Heath says. Australian, North American, British and Swedish studies all have shown a strong genetic component to smoking persistence. "So how do we explain the strong genetic influence on persistence?" he asks.

The influence may still be personality based, but if so it is related to a trait that has not yet been identified. Another possibility is that a genetically based difference in response to nicotine is at work. Heath suggests that risk takers who initiate smoking might be of two types: those who are lucky and have no trouble quitting and those who are unlucky and have inherited a genetically increased risk of dependence on nicotine. People with the bad luck to inherit this second genotype will find it much more difficult to quit once they start.

THE IMPACT

Together, smoking and alcohol abuse have an enormous negative economic effect on the nation. All costs related to alcohol abuse alone were estimated at $85.8 billion in 1988. Heath believes that smoking's costs may be even greater. So the impact of studies such as these can be substantial.

They make clear the message that many people who start smoking have trouble quitting. "That's important information for teenagers who see someone quit smoking and assume that's how it will be for them," says Heath. "But our message is that because of biological differences, many who start to smoke will have extraordinary difficulty in quitting."

Knowing more about the genetics of why people continue to smoke might also improve pharmacological efforts to help smokers who want to quit. The next generation of nicotine patches, so to speak, might benefit from information concerning the genetic differences that make it more difficult for some to quit than others.

And, Heath says, those who have trouble quitting may come to understand that it is not a defect of character that is at the root of their smoking persistence. "If smoking persistence is known to be a genetic vulnerability -- we all have them -- the client may be more motivated to overcome it. He may recognize the size of the effort required or get the help he needs," says Heath.

And finally, if it turns out that smoking can be a trigger for alcohol problems, as some of the work with female subjects suggests, then women with a family history of alcoholism should know; they may choose to govern their behavior accordingly. For them especially, and for everyone else with the choice as well, Heath's advice remains clear: "The best thing to do is never to try even one cigarette."
Birth Defects: *Impact and Prevention*

by Alison R. Wakoff

*In 1990, the U.S. Public Health Service published Healthy People 2000: National Health Promotion and Disease Prevention Objectives, a document outlining "a national strategy to improve the health of the nation in the coming decade." Improving maternal and infant health is a key goal identified by Healthy People 2000. Among the targets of the plan is to reduce the infant mortality rate from the 1987 baseline of 10.1 deaths per 1,000 live births to no more than 7 deaths per 1,000 live births.

The single leading cause of infant mortality is birth defects, and the percentage of infant deaths caused by birth defects has been rising. Of the approximately 4 million infants born in this country each year, about 250,000 have birth defects. Every year, almost 40,000 infants die before their first birthday; of these, 8,000 die from birth defects. If we are to make an impact on infant mortality, we must focus our future efforts on understanding and preventing birth defects.

The term "birth defects" covers a wide range of problems, from structural anomalies to mental retardation. We know very little about how birth defects are caused or how genes and environment interact to produce them. Each specific defect is rare, and we must chip away at this multifaceted problem by attacking one defect at a time.

Neural tube defects, or NTDs, affect approximately 2,500 infants each year. They result from failure of the neural tube to close during the first month of fetal development. Spina bifida, in which the spinal cord and meninges have herniated along the midline of the back, and anencephaly, in which the cerebral cortex and the bones of the skull fail to develop, compose 90 percent of all NTDs. Spina bifida is a major cause of paralysis, and anencephaly is fatal within the first few days of life.

Several studies since 1981 have shown a relationship between folic acid intake during pregnancy and NTDs. Folic acid, a B vitamin critical in nucleotide synthesis, reduced the incidence of NTDs by 60 to 100 percent when it was taken daily beginning one month prior to conception and throughout the first trimester of pregnancy (the periconceptional period). The most recent and compelling evidence comes from a 1992 Hungarian study. Preliminary results showed that 0.8 mg of folic acid taken in the periconceptional period reduced the risk of NTDs by 100 percent. Because the protective effects of folic acid were so great, the study was stopped on ethical grounds: The researchers could not justify withholding the vitamin supplements from the control group.

Based on these remarkable findings, the U.S. Public Health Service made the following recommendation in September 1992: "All women of childbearing age in the United States who are capable of becoming pregnant should consume 0.4 mg of folic acid per day for the purpose of reducing their risk of having a pregnancy affected with spina bifida or other NTDs."*
Because the neural tube develops and closes by the 28th day of pregnancy, women often are unaware that they are pregnant until after the critical period has passed. Furthermore, over half of all pregnancies in the United States are unplanned. Clearly, most women could not alter their folic acid intake during the periconceptional period alone. To circumvent these problems, the Public Health Service recommendation addresses all women of reproductive age.

The most efficient and certain way to give all women the recommended amount of folic acid is via the fortification of cereal-grain products. These foods are enriched with other B vitamins and iron, and women of all socioeconomic groups consume them. The March of Dimes Birth Defects Foundation, among other groups, has recommended that the FDA act to authorize health claims for foods rich in folic acid and to fortify cereal-grain products with folic acid to ensure that all women and infants receive its protective effects. The final rules are pending.

Even the most conservative estimates indicate that adequate folic acid intake could prevent at least 50 percent of all NTDs; each year, we could save the lives of 1,250 babies as well as the millions of dollars spent on their care.

Unlike NTDs, the causes of which remain a mystery, some birth defects have known and entirely preventable causes. For instance, one of the leading causes of mental retardation is fetal alcohol syndrome, or FAS, which results from maternal alcohol use during pregnancy.

Each year, approximately 8,000 infants are born with FAS, and many thousands more have Fetal Alcohol Effects (FAE), a milder form of FAS. Because FAS is completely preventable, every case represents a missed opportunity for education and prevention. No minimum level of alcohol has been determined safe; therefore, all pregnant women should drink as little as possible or, preferably, not at all. Alcohol and other drug treatment centers, regular visits to clinics that include family planning, substance abuse and counseling services, and widespread education campaigns are our best hopes for preventing FAS.

Another important tool in preventing birth defects is a nationwide birth defects surveillance system. Unlike nearly every nation in South America, Europe and East Asia, the U.S. has no nationwide birth defects monitoring program. Several state-run programs exist, but most collect their data passively, relying on voluntary reporting from hospitals and clinics. Passive systems may miss up to 30 percent of birth defects, depending on the reliability of the medical community. Twenty-seven states and the District of Columbia have no surveillance system at all.

The implications of our lack of a surveillance system were recently illustrated in Brownsville TX. In 1991, a clinician there noticed that three anencephalic infants were born in one hospital in a 36-hour period—an extremely unusual event. Because no monitoring system was in place, researchers had to go through records by hand to determine if indeed a cluster of NTDs was occurring in Brownsville—a tedious, time-consuming process prone to error. Nonetheless, a cluster of NTDs in Brownsville was confirmed.

Had a surveillance system existed, the discovery of this cluster of NTDs would not have been left to the chance observation of an astute clinician, and the data would have been available to study possible environmental, nutritional, and genetic effects.

The March of Dimes Birth Defects Foundation is currently working with members of Congress—more than 50 in the House and five in the Senate—to pass legislation known as the Birth Defects Prevention Act (BDPA). The bill authorizes a three-pronged approach toward the prevention of birth defects. First, it provides for a national surveillance system and establishes regional centers of excellence to conduct research on prevention strategies. Second, the bill sets aside funds for demonstration prevention programs. Finally, the act creates public information campaigns to enhance awareness of the causes of birth defects and establishes professional education programs for clinicians. The BDPA will probably come to a vote in Congress early in 1994.

We cannot afford to know so little about the cause of one in five infant deaths in the U.S. The BDPA provides an opportunity to reduce the infant mortality rate and to improve the quality of life for families of all ethnic, racial and socioeconomic backgrounds.

Editor's Note: Alison Wikoff is a second-year student at the School of Medicine. This article is excerpted from a longer, more detailed examination she prepared while participating in the American Medical Student Association Foundation's Washington Health Policy Fellowship Program. She worked at the March of Dimes during her fellowship.
FOR Arthur M. Brewer, M.D. ’81, the brave new world of healthcare reform already has arrived. It’s a world in which everyone is legally entitled to care — and receives it — but services are managed carefully, given the limited resources. It’s a small world, too — 13,000 patients. Lucky people? They’d rather be somewhere else.

The patients are inmates in the Connecticut Department of Correction. Brewer, the department’s director of professional and clinical services, has made a career of caring for people behind bars. His practice of correctional medicine, a subspecialty all its own, gives him a useful perspective on the workings — and breakdowns — of today’s healthcare system.

Brewer didn’t enter correctional medicine with a career in mind. After finishing his residency in internal medicine at George Washington University Hospital, Brewer needed to “pay off” his National Health Service scholarship with three years of service. He interviewed for a job with Chicago’s Cook County Jail, largely for the sake of working in his hometown. But he went to the interview with misgivings. “The only thing I knew about correctional medicine was from movies, and it wasn’t positive,” says Brewer, 36. “The prison doctors you saw were impaired or incompetent.”

However, the physicians whom Brewer met struck him as “knowledgeable, educated and committed people.” Several had started out at Cook County Jail under a National Health Service scholarship, but they had fallen in love with the field and stayed on.

The same thing happened to Brewer. He owed the government three years but worked at Cook County Jail for four. Then, in 1988, he was named medical director of the maximum security Stateville Correctional Center in Joliet IL, which houses more than 2,000 male inmates. In 1993, Connecticut hired him to oversee the medical care of its prisoners. He supervises 500 healthcare workers, including 50 full-time and part-time physicians, and manages a $44 million budget.

Brewer leaves his office in downtown Hartford and visits the state’s correctional facilities on a regular basis. His actual patient care is limited to a clinic that he directs for HIV-positive inmates. Some are asymptomatic; others struggle through the final stage of AIDS.

Brewer represents a new breed of physicians who work in corrections. He belongs to the American Correctional Health Services Association, reads publications in his field and attends correctional-medicine conventions. And the increasing sophistication of correctional medicine reflects a sea change in the approach toward the healthcare needs of inmates during the past 25 years. The University of Wisconsin in Madison offers a two-year fellowship program for physicians who want to become administrators in correctional institutions. The Joint Commission on Accreditation of Health Care Organizations evaluates prison healthcare units and accredits those that meet high standards.

In a landmark 1976 ruling, the U.S. Supreme Court declared that
inmates have a constitutional right to medical care. To deprive them of it, the court said, is to inflict cruel and unusual punishment. Armond H. Star, M.D., who directs the National Center for Correctional Health Care Studies at the University of Wisconsin, estimates that annual state and federal outlays for correctional healthcare exceed $2 billion.

Brewer says the 1.5 million inmates of county, state and federal correctional centers have better healthcare than the average uninsured American. "But what we have is a managed-care system," he says. "Prisoners can't get just what they want. If someone's nose was broken 10 years ago, he's not entitled to a nose job."

In many respects, the healthcare concerns of inmates mirror those of society at large, according to Brewer. At the Stateville prison in Illinois, the most common chronic illness was asthma, also common among young adults in general. However, other medical problems have a higher incidence in prisons and jails — mental illness, tuberculosis, substance abuse and HIV. These situations, explains Brewer, are related to one another. To support their habits, drug abusers turn to crime — burglaries, for example — and end up behind bars. Drug abusers who prefer intravenous injections often encounter HIV infection. Their weakened immune systems make them susceptible to tuberculosis, which spreads more easily in closed environments like prisons or homeless shelters. "And it's not easy finding the space for isolating TB patients," he says.

Brewer says local, state and federal governments are hard pressed to find money to address correctional healthcare crises such as HIV, mental illness, substance abuse and tuberculosis. Yet he faults short-sighted public health policies with exacerbating these situations as well as helping to swell the ranks of the inmate population.

"The TB epidemic stems in part from the fact that we've failed to provide routine TB tests for all people. We decided to de-institutionalize the mentally ill and treat them in community mental health centers, but we haven't funded those centers as we should. So the mentally ill are on the street and some

meaning to being a primary-care physician."

The truth of that observation came home to Brewer one day when he lost his temper with an inmate who had peppered him with letters asking for favors about special deodorant and underwear. "Why are you writing these letters, wasting my time?" Brewer recalls asking him. "He sat there calmly and said, 'Dr. Brewer, that is your job.'"

"He was absolutely right," says Brewer. "We may not perceive the prisoner's request as a medical one, but it may be. And the prisoner usually views the doctor as a last resort.

At the very least, we need to listen."

Brewer the administrator has told that story more than once to his staff to help them remain focused on their mission of service. While most inmates pose no difficulty, a minority is demanding, abusive and uncooperative. That behavior can wear down a nurse or doctor until they lash out. "The job may be hard, but we still need to be respectful," says Brewer.

As for Brewer, he heeds the advice of an old hand at prison medicine who once suggested that he address each inmate as Mr., Mrs. or Ms.

"Saying that establishes a relationship and a sense of respect and dignity. It also sends a message to other people who work with you that they should take the same approach."

However healthcare evolves, or whatever reforms are enacted, Brewer's bedside manner serves as a reminder that a physician's essential calling never changes.
Awards Honor Dedication

CELEBRATING the second hundred years of excellence in research, teaching and patient care at the School of Medicine, the Second Century Award is conferred in recognition of individuals whose long-term commitment, dedication and generous participation have made it possible for the School of Medicine to enter its second century with strength and confidence. “With this award, we show our appreciation to those who have provided the means, the inspiration, the intellect and the spirit to drive our important work forward,” says William A. Peck, M.D., executive vice chancellor for medical affairs and dean of the School of Medicine.

The Second Century Awards for 1993 were presented on September 10 at a gala dinner held at the Ritz Carlton Hotel. The honorees were William Maxwell Cowan, M.D., Ph.D.; William H. Daughaday, M.D., and Shi Hui Huang, M.D.

Cowan, vice president and chief scientific officer at the Howard Hughes Medical Institute in Chevy Chase MD is also adjunct professor of neuroscience at The Johns Hopkins University School of Medicine. His ability to comprehend and distill an array of information from a broad range of disciplines makes him well-suited for his current responsibility for determining the scientific content of biomedical research to be undertaken.

Cowan is internationally known for pioneering research in the development of the central nervous system, and he has been a tremendous influence on the lives of young colleagues, many of whom now hold positions of prominence in neuroscience.

He spent 14 years at Washington University, much of that time as professor and head of the Department of Anatomy and Neurobiology, as professor of biomedical engineering and as director of the Division of Biology and Biomedical Sciences.

Daughaday is recognized worldwide for his discovery of insulin-like growth hormones, or somatomedins, from which he studied at the National Taiwan University Medical School before coming to Washington University, where he trained in neurosurgery with Henry Schwartz, M.D.

Subsequently, Huang established a neurosurgery center at Yodogawa Christian Hospital in Osaka. Upon the death of his father in 1979, Huang went to Taiwan to direct the family business. He now is chairman of the board of the Ching Fong Group, an international conglomerate with headquarters in Taipei.

Huang continues his involvement with medicine as professor of neurosurgery at Taipei Medical College in Taiwan. His generosity is responsible for three endowments for...
Eliot Society Begins Drive

One benchmark of any successful institution is the support it receives from those who know and understand it best. The School of Medicine is fortunate to have so many alumni, former residents, faculty and friends who express their confidence and loyalty through their leadership as Eliot Society Committee members. The membership committee, composed of 32 volunteers, provides public support by encouraging new members to join the Eliot Society.

Established in 1959, the William Greenleaf Eliot Society pays tribute to the unique contributions of Washington University's founder, William Greenleaf Eliot. Members demonstrate leadership support for the continuation of excellence and set an example for others. Through annual gifts of $1,000 or more, members may elect to support one of several areas of the School of Medicine.

On September 27th, the co-chairmen of the Eliot Society, Drs. Phillip E. Korenblat and Nicholas T. Kouchoukos, hosted the 17th annual Eliot Society Kickoff event for the School of Medicine. Volunteers came together to renew acquaintances and to discuss plans for strengthening membership in fiscal year 1994. William A. Peck, M.D., executive vice chancellor and dean, was on hand to describe the new facilities development on campus and to extend his appreciation to the dedicated individuals who help sustain the Eliot Society.

Through the efforts of our dedicated membership committee, the Eliot Society hopes to recruit 100 new members and seek the continued participation of all 432 members this year.

Nicholas T. Kouchoukos, M.D., (left) and Phillip E. Korenblat, M.D., co-chairmen of the Medical Eliot Society, hosted the 17th annual kickoff event for the School of Medicine.

School of Medicine Eliot Society
Membership Committee, 1993-94:
Phillip E. Korenblat, M.D., and Nicholas T. Kouchoukos, M.D., co-chairs

New Members: John Atkinson, M.D.; Eugene Bricker, M.D.; Henry J. Kaplan, M.D.; Edgar H. Keys, M.D.; Charles Kilo, M.D., and Barry Siegel, M.D.

Chairpersons Named

Class chairpersons are hard at work on preparations for Reunion '94, which will take place on May 12 - 14. Most classes have divided the duties between a social chairperson and a class gift-drive chairperson or persons; others have a single person or co-chairs assuming responsibility for both aspects. The chairpersons are:

Class of 1934: Dr. Paul Hagemann and Dr. Eugene Bricker
Class of 1939: Dr. Benjamin Milder, Social chairman; Dr. Edgar Keys, Class Gift chairman
Class of 1944: Dr. Virgil Loeb, Jr.
Class of 1949: Dr. Robert H. Lund, Social chairman; Dr. Sidney Jack, Dr. Joseph Levitt, and Dr. Kenneth Bruns, Class Gift co-chairmen
Class of 1954: Dr. Gerald L. Behrens, Social chairman; Dr. Andrew McCanse, Class Gift chairman
Class of 1959: Dr. Charles C. Norland, Social chairman; Dr. Paul DeBruine and Dr. Charles Kilo, Class Gift co-chairmen
Class of 1964: Dr. Ronald G. Evens
Class of 1969: Dr. John J. Sheridan,
Social chairman; Dr. Barry A. Siegel, Dr. Garrison Fathman, and Dr. Robert C. Kolodny, Class Gift co-chairmen of a steering committee of 17 members
Class of 1974: Dr. Ronald K. DeGuerre, Social chairman; Dr. Alan Tiefenbrunn, Class Gift chairman
Class of 1979: Dr. Jeffrey M. Wright, Social chairman; Dr. James F. Zakem, Class Gift chairman
Class of 1984: Dr. Jennifer Wray Cole, Social chairman; Dr. John K. Appelbaum, Class Gift chairman

Special Fundraising Efforts Underway

In addition to ongoing reunion class gift drives and other annual giving activities that contribute to the School of Medicine’s Annual Fund, three special efforts are underway.

Gertrude K. and Raymond F. Holden, Jr., M.D.

The Holden Challenge is sponsored by Raymond F. Holden, Jr., B.S., M.D. ’33, and his wife, Gertrude K. Holden, NU ’30. Dr. and Mrs. Holden are focusing on encouraging participation in the Annual Fund by those medical alumni and former house staff who have not given in the past, on increasing membership in the Century Club (donors of $100-$249 annually) and on recouping lapsed Eliot Society members or adding up to 35 new Eliot Society members (donors of $1,000 annually). The Holdens will match the gifts of those who fulfill these criteria $2-for-$1 up to a total of $100,000.

The DeBruine Class of 1959 Challenge celebrates the 35th reunion of the Class of 1959. Paul DeBruine, M.D. ’59, and his wife, Ruth DeBruine, will match the gifts of his classmates to the School of Medicine Annual Fund at one of several ratios, depending upon whether they are sustained at the same amount as last year ($1-for-$1 match), an increase from last year or a new gift ($2-for-$1 match), or a gift eligible for new Eliot Society membership ($3-for-$1 match), up to a total of $25,000.

The Class of 1969 Scholarship Gift is led by a steering committee of 17 members of the 25th year reunion class and is directed only at members of that class. With a goal of $200,000 raised from the class, this gift will be used for medical student scholarships. Each class member is being asked to give $2,500 over five years, or $100 for every year since his or her graduation from medical school. Pledges stand at $84,000 after five months’ effort.

For further information, those interested may call Sue A. Ghidina, Director of Annual Giving, at (314) 362-9671 or Elizabeth R. Kodner, Assistant Director of Annual Giving, at (314) 362-9660.

Founders Day 1993 commemorated the 140th anniversary of the founding of the university and honored distinguished alumni, faculty and supporters. Shown with William A. Peck, M.D., executive vice chancellor and dean (second from right) are, left to right: Raymond H. and Roma B. Wittcoff, both recipients of Robert S. Brookings Awards. Raymond Wittcoff is a member of the Board of Trustees and serves on the medical school’s National Council. Roma Wittcoff is serving her third term as a trustee and also helps steer the medical school as a member of its National Council. Both are active supporters of the university.

John P. Atkinson, M.D., chairman of the Department of Medicine, received the Distinguished Faculty Award. He is a renowned teacher, a superb clinician and an internationally known investigator. Mitchell Yanow, M.D. ’41, received the Distinguished Alumni Award. He is cofounder and chairman of Medicine Shoppe International, Inc., a national franchiser of more than 950 pharmacies. He is an avid supporter of the university and the school.
'40s

Washington University School of Nursing alumnae who matriculated in November '43, the first U.S. Cadet Nurse Corps Class, celebrated the Corp's 50th anniversary with a reunion luncheon at the Frontenac Hilton in St. Louis on November 6. Class members came from around the country to participate in the special camaraderie they have maintained throughout the years. Reunion organizers Sue Tyler Keck and Ethel Metheny Morrison say the class will return for the 50th anniversary of their graduation in 1996.

The School of Nursing Class of September '48 celebrated its 45th reunion in St. Louis on Saturday evening, with 24 classmates attending at least one function. They came from California, Massachusetts, Texas and points in between. A large group enjoyed dinner at the Frontenac Hilton and a luncheon on Saturday. Nine husbands toured Grant's Farm. A banquet for 36 was held on Saturday evening.

'60s

David C. Bisno, M.D. '66, writes that he has sold his ophthalmology practice in "hectic" Atlanta and is "now enjoying rural New England while writing a history of the Dartmouth Eye Institute and leading history of science study groups for Dartmouth's continuing education programs." In Norwich VT he canoe, hikes, swims, skis and enjoys his two children, for a life he describes as "just right."

Major General Michael Adams, M.D. '67, retired August 31 from his position as Air National Guard Assistant to the Surgeon General, United States Air Force/Deputy Surgeon General for Air National Guard Affairs. Adams served an illustrious career in both the Air Force and the Air National Guard. He was both pilot and physician and has more than 4,000 flying hours, primarily in jet fighters. In 1969, he was selected as United States Air Force Europe, Flight Surgeon of the Year. General Adams has been in the private practice of internal medicine in Fresno CA since 1975. He is currently assistant professor of medicine at the UCSF School of Medicine.

Wallace B. Mendelson, M.D. '69, writes to notify colleagues and friends that he has been appointed director of the Sleep Disorders Center at the Cleveland Clinic Foundation, Cleveland OH.

'70s and '80s

David J. Goode, H.A. '71, has been named senior vice president for the Catholic Health Corporation's northern region. He will serve as a liaison between the CHC corporate office and system healthcare facilities in North and South Dakota.

John M. Eisenberg, M.D. '72, was named "Distinguished Internist of 1993" by the American Society of Internal Medicine at its 37th annual meeting in October. The award is made each year to an internist who has contributed outstandingly to the social and economic environment of the practice of medicine. Eisenberg chairs the Physician Payment Review Commission (PPRC), a federal panel that advises Congress on Medicare payment policies. He is a leader in efforts to integrate health policy and cost-effective delivery of care into medical education and training. From his post, Eisenberg has advocated changes to ensure a more equitable physician payment system, including more appropriate valuation of primary care services. He was elected to the Institute of Medicine in 1988.

Charles A. Feldman, M.D. '72, has been elected vice president and president-elect of the 1,500-member Stanford Hospital medical staff. He took office in October. Feldman is clinical professor of medicine (nephrology) and will ascend to the presidency of the group in September 1995.

J. Larry Read, H.A. '74, has been appointed administrator of Mayo Medical Center, Jacksonville FL, which includes Mayo Clinic Jacksonville and St. Luke's Hospital. Read will coordinate the administrative functions of the clinic and the hospital. Read joined the hospital in 1986 as its chief operating officer.

Warner C. Greene, M.D., Ph.D. '77, spoke recently at a meeting of the California Academy of Medicine. The academy, now in its 125th year, holds three black-tie dinners annually. Greene heads the new Gladstone Institute at the University of California at San Francisco, where he is professor of medicine and of microbiology and immunology. The institute is devoted to AIDS research.

Lieutenant Colonel (Ret.) Edward P. Syron, H.A. '77, retired recently from the Air Force, leaving his position as chief operating officer of Malcolm Grow USAF Medical Center in Maryland. He accepted a position as director of quality improvement at the 635-bed St. Francis Medical Center in Peoria IL.

Arthur Krieg, M.D. '83, writes of his pride in announcing the birth of his third child, Peter Arthur, on March 4, 1993. He says that his home in Iowa City IA, "most struck the flooding here, but we couldn't drive to it for five weeks because all of the roads were under water."

John M. Dawes, H.A. '84, is serving as senior associate director of Saint Luke's Hospital of Kansas City. He is responsible for working with managers in renal dialysis/ transplanr, digestive diseases, nutrition services, pastoral care and radiology.
American Academy of Pediatrics. He is survived by a son and a brother.

Philip Shahan, M.D. '42, died September 30 at Barnes Hospital after suffering from pneumonia. He was 76. A lifelong resident of St. Louis, Shahan was in the private practice of ophthalmology for 44 years. Among the survivors are his wife of 53 years, Jean Keith Shahan; two sons and two grandchildren.

Harry A. Wittler, M.D. '43, died August 15, 1993, at his country home in Vienna MO after suffering a heart attack. He was 76. Wittler was in the private practice of surgery for 50 years in the St. Louis area. Among his survivors are his wife, Rhona F. Wittler; a son, a sister and two grandchildren.

Harold A. Franklin, M.D. '45, a retired internist, died October 6 at Barnes Hospital from complications of a stroke. He was 72. Franklin engaged in private practice in the St. Louis area for 32 years before his retirement in 1983. Among his survivors are his wife, Francis; three daughters, a son, a sister and seven grandchildren.

Stanley B. Lyss, M.D. '62, community leader and pediatrician, died September 17, 1993, after a heart attack. He was 57. Lyss was on the staff at St. Louis Children's Hospital and, from 1981 to 1983, served as president of its medical staff. Active in his community's affairs, Lyss was active on the Clayton (MO) school board and task forces on drug abuse. In 1975 and 1980 he was named as one of the Best Doctors In America. Among his survivors are his wife of 32 years, Esther Bryan Lyss; three daughters and two brothers.

Lauren V. Ackerman, M.D., the first surgical pathologist-in-chief at the medical school, died July 27, 1993, aged 88.

After graduating from the University of Rochester School of Medicine in 1932, his interest changed from internal medicine to surgical pathology. In 1942, he became an assistant professor of pathology here.

Longtime friend and colleague Michael Karl, M.D., recalls: "Surgical pathology just didn't exist here before he arrived." During

Lauren V. Ackerman, M.D., with a group of his students.

Ackerman's 25-year tenure, he guided surgical pathology to divisional status within the Department of Pathology and created a seedbed of excellence.

His contributions to the field were widely recognized, and Ackerman lectured all over the world. But his greatest satisfaction came from the students he trained, many of whom he inspired to become academicians. Among them is Louis P. Dehner, M.D., now head of surgical pathology.

His ties to Washington University remained strong after his 1973 retirement, and he returned in 1990 for the dedication of the Lauren V. Ackerman Laboratory of Surgical Pathology. His first wife, Elizabeth, died in 1982. Survivors include his second wife, Carol; daughters Gretchen, Jennifer and Allison; a son, John; 14 grandchildren and a great-grandchild.
Diane Sawyer of the ABC newsmagazine show, "PrimeTIME Live," interviewed Marcus E. Raichle, M.D., at the School of Medicine for a segment concerning research into the workings of the brain. The interview, conducted in three hours on October 18, will air sometime during the new television season.
On September 16, the nation's Surgeon General, Joycelyn Elders, M.D., spoke to students, faculty and staff about healthcare reform and the nation's deep need for a greater emphasis on public health programs. She also voiced her concerns about indigent children and unplanned pregnancies. Her visit was sponsored by the Academic Women's Network.