William A. Peck, M.D., an internationally recognized expert in the study and treatment of osteoporosis, has become the new vice chancellor for medical affairs at Washington University. This coming October he will also assume duties as dean of the School of Medicine.

Peck succeeds Samuel B. Guze, M.D., who retired after 18 years as vice chancellor, and M. Kenton King, M.D., who will be retiring after 25 years as dean of the School of Medicine. Peck will be the first person to serve both as vice chancellor for medical affairs and as dean.

Peck joined the Washington University faculty in 1976. He is the John E. and Adaline Simon Professor of Medicine, vice chairman of the department of medicine, and physician-in-chief of Jewish Hospital. His contributions to academic medicine involve clinical patient care, research, teaching and administration.

Peck's clinical and research expertise is in the area of endocrinology and metabolism. He has focused on osteoporosis, a progressive bone disease that is believed to affect more than 20 million Americans—often women—who suffer bone loss and who may have severe skeletal and health problems.

Peck's leadership in diagnosing and treating osteoporosis is widely recognized. He has been president of the National Osteoporosis Foundation since 1985, is a past president of the American Society for Bone and Mineral Research, and has been editor of the Bone and Mineral Research Annuals since 1981.

In 1987 the National Institute on Aging awarded Peck a $5 million grant to head a five-year study on the causes and prevention of hip fractures in the elderly. Eighty percent of all hip fractures are related to osteoporosis, because the disease causes bones to lose density and become more likely to break. The grant was the largest in Jewish Hospital history.

Peck is the author of more than 140 articles, abstracts and other publications, particularly regarding osteoporosis. In 1988 he and co-author Louis V. Avioli, the Sydney M. and Stella H. Shoenberg Professor of Medicine, wrote "The Silent Thief," a book on the nature, problems and treatment of osteoporosis. Peck has lectured throughout the nation and the world on osteoporosis, and was an invited speaker in 1987 at a congressional breakfast on how research can prevent this major national public health problem.

Peck earned his undergraduate degree cum laude in 1955 from Harvard University and received his M.D. with honors from the University of Rochester School of Medicine in 1960. After serving his internship and residency at Barnes Hospital, he was named a fellow in medicine at Washington University. Then he served with the National Institutes of Health until 1965, when he joined the University of Rochester as a chief resident and instructor.

By 1973 Peck was named a full professor of medicine and biochemistry, as well as head of the endocrine unit at Rochester. Three years later he returned to Washington University.

Peck is a diplomat of both the National Board of Medical Examiners and the American Board of Internal Medicine. He is listed in "Who's Who in America" and "Who's Who in the World." In 1984 he was named Clinical Teacher of the Year at the School of Medicine.

A member of numerous professional societies and associations, he is a fellow in the American College of Physicians, a past president of the St. Louis Society of Internal Medicine, and has been a member and chairman of several committees of the National Institutes of Health.
Exercise gives seniors a lift
Volunteers feel younger each day as they participate in a program designed to study the effects of exercise on aging.

Cholesterol carriers
Dr. Louis Lange III is hot on the trail for a drug that will block the absorption of cholesterol.

Pumping up by plugging in
Is “juicing up” the next alternative to steroids? Read how physical therapist Anthony Delitto's neuromuscular electrical stimulation experiment increased a local weightlifter's type II muscle fibers.

On the Cover:
Electrical stimulation helped weightlifter Derrick Crass add 85 pounds to his lift. See story on page 20.
PET study pinpoints brain region that mediates anticipatory anxiety

I f you could have looked into your brain on your way to the principal’s office, just before the dentist drilled into your tooth, or right before your first job interview, what would you have seen?

Researchers at Washington University and Mallinckrodt Institute of Radiology now know. They have, in fact, located what may very well be the seat of anxiety and fear, marking the first time ever that scientists have established involvement of specific parts of the human brain in a normal emotion.

As reported in the February 24, 1989 issue of Science, the production of anticipatory anxiety was associated with increased activity in the temporal poles—the tips of the temporal lobes, located in both hemispheres of the brain, inside the temples and behind the eyes.

The researchers—Eric Reiman, M.D., Marcus Raichle, M.D., Peter Fox, M.D., and Maureen Fusselman—used positron emission tomography (PET) to study normal volunteers with and without the production of anticipatory anxiety.

In order to investigate the neuroanatomy of anxiety, the research team had to design a situation that would make normal volunteers anxious and keep them anxious throughout a 40-second PET scan. They chose a time-tested method for inducing anxiety in a laboratory setting: the expectation of a painful electric shock.

“We were confident that this strategy would be effective in producing a well-defined and robust state of anxiety,” says Reiman, assistant professor of psychiatry and the study’s principal investigator.

The eight research subjects were asked to participate in a study designed to measure their “physiological response to the prospect of a painful stimulus.” They were told that a PET scan would be performed before, during and after the prospect of a painful electric shock. The subjects were told that no shock would be delivered during the first and third scans, which provided baseline measurements of regional blood flow. In contrast, the subjects were told that an electrical stimulus would be delivered to their hands sometime after the start of the second scan. Moreover, they were informed that the severity of the stimulus was likely to increase with the passage of time before its arrival. This instruction produced a sustained episode of anxiety during the second scan.

The shock was delivered immediately after the 40-second scan to preserve the investigators’ credibility for the remainder of the study. However, the severity of the stimulus was predetermined by the researchers to actually produce only a tingling sensation or mild discomfort. Afterwards, the subjects typically reported that the shock wasn’t nearly as bad as they had anticipated. Their anxiety quickly subsided.

After all of the subjects were studied, a sophisticated computer program was employed to identify the regions of the brain that had significant increases in blood flow during the production of anticipatory anxiety. The increases in blood flow were confined to the right and left temporal poles.

This study of normal anticipatory anxiety follows PET research on a pathological form of anxiety that affects about 1.2 million people—panic disorder, a syndrome characterized by recurrent anxiety attacks that occur suddenly and sometimes unexpectedly.

Says Reiman, “Our earliest research (with Eli Robins, M.D., and Joel Price, Ph.D.) suggests that panic disorder is distinguished from normal conditions by the presence of an abnormality in the vicinity of the parahippocampal gyrus, an abnormality that may be involved in the initiation of an anxiety attack. Our subsequent studies suggest that pathological and normal anxiety—at least those forms of anxiety that we have studied so far—share a common pathway involving the temporal poles.”

Reiman is excited about the prospects for future research.
**Competition can drive bright teens to the breaking point: How parents can help**

Seventeen-year-old Michael Stevenson is smart, good-looking, popular and athletic. He attends an exclusive college preparatory high school and is being courted by a number of private colleges and universities. A few weeks ago, he attempted suicide.

Michael had everything going for him, it seems, but himself. Despite his popularity, a solid A average and numerous sports awards, he can't shake the feeling that he just doesn't measure up.

Michael's one of a growing number of bright young people—high achievers—whose need to succeed is so great that they throw themselves into a sort of competitive overdrive, says pediatric psychologist Peter Ambrose Jr., Ph.D. It's a phenomenon that Ambrose has observed regularly in his practice at the Pediatric Psychology Center at the School of Medicine, and one that he suspects is occurring more and more across the country. These young people are so intent on meeting their goals that they refuse to acknowledge their limitations, oftentimes pushing themselves to succeed even when they may be out of their league.

These are teenagers, often from upper class families, who by most standards have it all—or at least the potential for having it all, Ambrose says. But the standards they set for themselves are impossibly high. "These teenagers—especially those in competitive upper-echelon schools—are very bright, but will compare themselves with peers who may be even more intelligent and then start to feel there is something wrong with them, that they can't make the grade."

The feelings of inadequacy can grow, he points out, culminating in a host of emotional problems, from anxiety disorders to full-blown depression and tragically, at times, to suicide attempts. Precisely because of the obvious advantages in their lives, these upper-echelon achievers "fall through the cracks," Ambrose says. "We assume their lives are rosy. Nobody expects these kids to have problems, so nobody is helping them."

While this is by no means an epidemic, Ambrose says, he can walk into almost any elite academic program and find a handful of teenagers who fit this description.

Some degree of competition is good, Ambrose comments. Otherwise, young people wouldn't be stimulated to excel. However, he adds, parents should be prepared to step in when competitiveness exceeds a healthy level.

"Basically, you're looking for symptoms of depression or anxiety. The most obvious one is social withdrawal—usually the bright kids who are unhappy have fewer peers. It's okay to be non-traditional or anti-establishment, but when you see an adolescent has no friends or little social contact, there could be a problem. Parents should look for teenagers withdrawing from their friends and withdrawing from their families," Ambrose states.

Unfortunately, overachieving teenagers often base their criteria for success on parental expectations. "It's a double-edged sword. How much do you push your kids? How much should you expect from them? In the long run, the question should be, what do your kids want for themselves?"

Well-meaning parents often put too much emphasis on their children being successful, rather than happy, Ambrose notes. The classic example, he offers, is the parents who insist on an Ivy League School because the best education will help them land the best job.

Inevitably, young people functioning merely to please their parents will end up feeling unhappy and unequal to the task.

Ultimately, he says, parents must teach their children to believe in themselves.

"Really, what parents should establish is an environment where their children are rewarded for effort and perseverance. If children are allowed to fail, they are also allowed to succeed."

*not patient's real name
Richard G. Stoker, Ph.D., is the new director of the medical center's Central Institute for the Deaf (CID).

Stoker had been an associate professor of audiology at McGill University in Montreal. He is the first person born deaf to head a major scientific and educational institution in this country. CID was founded in 1914 to teach deaf children to talk; to prepare teachers, clinicians and research scientists who deal with the deaf; and to pursue research beneficial to those with hearing disorders.

Stoker is the fourth director of CID. He replaces Donald R. Calvert, Ph.D., who has directed CID for 16 years. Calvert is returning to his home state of California to lecture and write.

Prior to his appointment at CID, Stoker was director of the oral rehabilitation and education division at McGill's School of Human Communication Disorders. His research interests include auditory-visual perception of speech by hearing-impaired individuals, speech and language development of hearing-impaired children, and implementation of technology for the benefit of the hearing impaired.

He joined the faculty at McGill in 1986, coming from Pennsylvania State University, where he had been an assistant professor of audiology for five years. Stoker also has taught at

Of mice and immune system cells

Researchers at the School of Medicine have made a milestone contribution to understanding the origin and fundamental biological basis of autoimmune disease and tissue rejection. Their discovery, documented in an article published in the British journal Nature, explains more fully than ever before how the body's immune system cells are bestowed with the ability to distinguish foreign tissue.

In experiments using gene purification and cloning technology and "transgenic" mice, the researchers created a new mouse species with an immune system genetically programmed to attack its own tissue. The genetic alteration created a mouse with some immune system cells—specifically its T-cells—that should treat host tissue as though it were foreign tissue. The reasonable prediction was that such a mouse would have died early in its development as its genetically altered T-cells launched a massive autoimmune response.

Instead, the mouse's thymus gland—where T-cells mature and are programmed for their specific functions—employed what proved to be a two-stage process to snuff out the self-reactive T-cells before they had a chance to emerge and circulate throughout the mouse.

Elucidation of the dual process of "educating" T-cells in the thymus gland provides immunologists with a way to experimentally approach details of immune system development that have lain outside their grasp until now. The failure of one of these educational or screening processes in the thymus gland is a likely explanation for the existence of autoimmune diseases such as rheumatoid arthritis and some forms of diabetes.

"This (discovery) is fundamental to understanding transplantation, autoimmune disease, and to combating infectious organisms—relevant to many problems in medicine," explained principal investigator Dennis Loh, M.D., an associate professor of medicine and an associate investigator at the University's Howard Hughes Medical Institute.

The Washington University team has been involved in research in this area for five years. Like many other immunology groups, they have labored to develop an effective experimental approach to solving the field's greatest paradox: reconciling two long-held basic tenets of immunology, major histocompatibility (MHC) restriction and self-tolerance.

MHC restriction, first demonstrated 15 years ago, is the scientific term for the experimental observation that the body's T-cells will attack an infected cell only if that cell is
of the same host organism; T-cells are "restricted" to attack only cells whose MHC label is the same as their own. T-cells therefore have the ability to recognize and react with "self." Their function, in fact, is inseparably linked to that ability.

The paradox exists in the fact that at the same time T-cells exhibit MHC restriction, they also demonstrate self-tolerance; that is, they must tolerate the presence of cells of their same genetic identity, otherwise autoimmune responses would be the norm rather than the exception. Self-tolerance is the reason why people do not reject their own kidneys, or can have their bone marrow removed during chemotherapy and replaced later without rejection.

"This article in Nature, and another that we published just before it, clarify how MHC restriction and self-tolerance arises," said Loh. "The only cells that emerge from the thymus are those that recognize their own MHC label too strongly, and are therefore selected against for survival. Although each organism may begin with the whole universe of possible T-cell MHC labels, only the appropriate ones survive screening in the thymus."

"If this deletion mechanism is 99.99 percent perfect, we are probably normal," guesses Loh. "But what if, under some circumstances we don't understand, 1 percent of cells that are too self-reactive leak out of the thymus? This is one potential explanation for autoimmune diseases such as diabetes, lupus and rheumatoid arthritis." Loh feels that experimental manipulation of T-cell screening may someday lead to new ways to make the body better able to tolerate foreign tissue, thus facilitating tissue transplantation.

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National kidney group elects Klahr

Saulo Klahr, M.D., Joseph Friedman Professor of Renal Diseases in Medicine and director of the renal division at the School of Medicine, has been elected president of the National Kidney Foundation.

As president of the foundation, Klahr will be responsible for determining its role and policies in scientific and health matters including end-stage renal disease, dialysis and renal transplantation. He will also chair the committee that oversees the foundation's endowment research fund.

Klahr's research interests include urinary tract obstruction, renal metabolism and physiology, chronic renal disease, and parathyroid hormone metabolism. He joined the faculty at Washington University in 1963 as an instructor in medicine, and became professor of medicine and director of the renal division in 1972. He is also on staff at Barnes and Jewish hospitals.

Klahr received his medical degree in 1959 from the Universidad Nacional de Colombia School of Medicine in Bogota, Colombia. He interned at Hospital San Juan de Dios in Bogota, Colombia, and served a residency in medicine with the University Hospital of the Universidad del Valle School of Medicine in Cali, Colombia.

He has held appointments with the American Society of Nephrology and the American Society of Renal Biochemistry and Metabolism, served on a number of committees for the National Institutes of Health and edited several textbooks on nephrology and electrolyte disorders.

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Honor society elects new members

The Washington University School of Medicine's chapter of the national medical honor society, Alpha Omega Alpha, inducted 13 senior medical students, two alumni faculty members, one faculty member and three house staff officers this past winter.


Sherida Tollefsen, M.D. '75, assistant professor of pediatrics, and Jack Kayes, M.D. '57, associate professor of clinical ophthalmology, were inducted as alumni faculty.

Emil Unanue, M.D., Edward Mallinckrodt Professor and head of pathology, and house officers Joseph Parelman, M.D. (ophthalmology), Stanley Ashley, M.D. (internal medicine), and Michael Kidner, M.D. (surgery), also were made members.
Ackers, molecular biophysicist, becomes new head of biochemistry and first Witcoff Professor

Gary K. Ackers, Ph.D., has been appointed the first Raymond H. Witcoff Professor and head of the Department of Biochemistry and Molecular Biophysics at the School of Medicine.

A molecular biophysicist, Ackers is currently on the faculty at Johns Hopkins University in Baltimore. He replaces Carl Frieden, Ph.D., professor of biological chemistry, who has been acting as interim head of the department.

At Johns Hopkins, Ackers has been professor of biology and biophysics and acting director of the Institute for Biophysical Research on Macromolecular Assemblies. Macromolecular assemblies are complex, organized systems of large molecules such as RNA and DNA that are central to life processes. Because understanding how these systems interact is essential to fields such as biotechnology and genetic engineering, the study of macromolecular assemblies is considered one of the most exciting areas in basic biological research.

Ackers is particularly interested in the biophysics of protein-DNA interactions and in hemoglobin, a blood protein responsible for transporting oxygen and carbon dioxide, and one of thousands of proteins in macromolecular assemblies. Because the study achieved a postdoctoral fellowship at the Johns Hopkins School of Medicine. He worked at the University of Virginia for 10 years, three of which he spent as chairman of the biophysics program. In 1977 he joined the faculty at Johns Hopkins.

Ackers is a member of many professional societies, including the American Society of Biological Chemists and the American Association for the Advancement of Science. He is a recipient of the National Institute of Health's MERIT award, which provides long-term financial support to selected researchers in recognition of their superior achievement and consistent commitment to excellence. He has written numerous articles about his research, and serves on the editorial board of the Journal of Protein Chemistry.

The Witcoff professorship was established by St. Louis businessman Raymond H. Witcoff, president of the Transurban Corporation. Witcoff is chairman of the Washington University Medical Center board and a trustee of Washington University. He is also a member of the board of directors of Jewish Hospital, a sponsoring institution of the medical center.

Berg receives Public Service Award

Leonard Berg, M.D., professor of clinical neurology at the School of Medicine, received the 1988 Public Service Award of the St. Louis Chapter of the Alzheimer's Disease and Related Disorders Association early this year.

The Alzheimer's Association honored Berg for his leadership and guidance in establishing the local chapter, and for his continuing contributions to the growth of the organization. Berg is director of the Washington University Alzheimer's Disease Research Center and program director of the School of Medicine's Memory and Aging Project, a long-term study of intellectual function in older adults.

The Alzheimer's Association is a voluntary health agency dedicated to aiding victims of Alzheimer's Disease and their families through a program of research, patient and family services, education, and advocacy. The local chapter serves nearly 33,000 affected families in the greater St. Louis metropolitan area and eastern Missouri.

Berg is chairman of the Missouri State Advisory Board on Alzheimer's Disease and Related Disorders, which supervises the awarding of pilot research grants to scientists in Missouri for investigations into dementing disorders. He also serves on the advisory boards of both the local and national Alzheimer's Disease and Related Disorders associations, and is involved in efforts to create a national Alzheimer's Disease Education Center.

Berg joined the faculty of the School of Medicine in 1955 as an instructor in clinical neurology and was named professor of clinical neurology in 1972. He is on staff at Barnes, Children's, and Jewish hospitals.
Milling for nerve pathways

Like miners exposing veins of ore in the rocky recesses of the earth, two Washington University scientists are using a promising new technique to highlight tiny nerve pathways deep within the human brain. Their work may someday lead to a better understanding of certain degenerative diseases or developmental disorders, even the aging process itself.

"The belief now is that most nerve connections in the brain remain stable throughout life," says Andreas Burkhalter, Ph.D., assistant professor of neurobiology, who has worked with Kerry L. Bernardo, M.D., assistant professor of neurosurgery, on the project. "But is that true? This technique gives us, for the first time, a way to look at some of these fundamental questions."

Burkhalter and Bernardo's work has verified the existence of connections within the human visual pathway that had previously only been postulated to exist, based on studies in monkeys.

In their study, summarized in the early February issue of Proceedings of the National Academy of Science USA, the two researchers injected postmortem human brain tissue with diI, pronounced "dye eye," a fluorescent dye previously used only in animal studies. They targeted diI into primary and secondary visual cortex, the brain centers responsible for initial processing of visual information. The dye dissolves in fat and diffuses through fatty cell membranes along nerve pathways, labeling nerve cells and their processes in vivid detail.

To compare these pathways at different points in the human life cycle, Burkhalter and Bernardo studied connections in young adult, middle-aged and elderly brains. In each case, they looked at nerve connections within the visual cortex, a well-demarcated area of the brain critical for the perception of color, form, depth and movement.

"We are interested in looking at the stages that these connections go through during development in order to attain their intricate architecture," says Burkhalter, who presented the findings at the annual meeting of the Society of Neuroscience last November. "And also, whether connections are altered during the life span of an individual to change this network."

The results from the brain of one 85-year-old have puzzled, but intrigued, the researchers. In this case, the data showed that specific connections to outer layers of the cortex, found in younger individuals, were simply not present. Burkhalter and Bernardo are currently looking at other specimens from older brains to see whether this finding holds up.

"If true, this change is remarkable because it is such a selective change and not a degenerative effect involving the entire brain," says Burkhalter. "We would have to find out whether these changes were part of normal aging, or whether they involved some degenerative disease processes."

Heuckeroth named 1988 recipient of Gerty T. Cori Predoctoral Fellowship

Robert O. Heuckeroth, a student in the School of Medicine's M.D./Ph.D. program, has been named the 1988 recipient of the Gerty T. Cori Predoctoral Fellowship and Prize.

The award, established by Sigma Chemical Company in 1984 in honor of the late Gerty T. Cori, provides support for either an M.D./Ph.D. or a Ph.D. candidate in biochemistry who has displayed outstanding research abilities in carrying out his or her thesis project.

Heuckeroth's research focuses on protein targeting, the process by which proteins get to where they need to go in cells. In some cases, myristic acid attachment has been demonstrated to be crucial for viral assembly or intracellular protein targeting. Heuckeroth has developed a series of fatty acid analogs, compounds that differ slightly in their structure from myristic acid yet are still recognized by NMT and attached to myristoyl proteins.

Heuckeroth, who works in the lab of Jeffrey I. Gordon, M.D., professor of biochemistry, is now administering the analogs to cells in an attempt to "fool" NMT into transferring them, in place of myristic acid, onto myristoyl proteins. He hopes that the addition of these analogs will alter the properties of these proteins, and affect virus assembly or protein targeting.
Exercise Gives Seniors A Lift

By Brenda Murphy

At a time when many older adults are ready to trade work boots and time clocks for slippers and easy chairs, senior-aged research subjects at Washington University School of Medicine are donning Nikes and sweats to hit the track.

Kathleen Dirhold, 67, has noticed how much easier it is to pick up her grandchildren since she began the flexibility portion of the School of Medicine's exercise in the elderly program.
Researchers are testing theories that sedentary lifestyles of the elderly may not so much result from diseases of middle and old age but may actually cause or aggravate them. Additionally, exercise may be used to reverse the negative effects of these diseases.

While researchers study the effects of exercise on mild diabetes, cholesterol metabolism, heart function, the adrenal system, obesity and osteoporosis, research subjects are reaping immediate rewards from exercise—including amazement at their own physical achievements.

"I jog four miles a day," says research participant Jean Saputo, 64, a retired automotive parts sales and office worker from South St. Louis. "If they had told me a year ago, I'd jog four miles, I'd have told them they were crazy."

Saputo is among almost 50 participants, ages 60 to 70, who have completed one yearlong program of medical testing and individually-supervised exercise in the School of Medicine's climate-controlled facilities.

The program, titled "Physiological Adaptations to Exercise in the Elderly," is funded by the National Institutes of Health (NIH) and was begun in October 1985 under the direction of John O. Holloszy, M.D., professor of medicine and director of
In recognition of his continued commitment to excellence in scientific research, Holloszy has received NIH MERIT (Method to Extend Research In Time) status, which guarantees uninterrupted financial support from three to five years beyond a grant’s initial five-year period.

Holloszy believes that certain diseases, such as atherosclerosis, adult onset (type II) diabetes, high blood pressure and osteoporosis may be prevented or reversed with regular exercise.

“There was evidence from large-scale epidemiological studies that people who exercise on a regular basis had one-third the number of heart attacks and coronary artery disease as sedentary people,” says Holloszy. “There also were studies showing that populations with high-fat diets have a high incidence of coronary artery disease and type II diabetes.”

Modern technology that promotes a sedentary lifestyle, Holloszy suggests, may, in part, be responsible for the high incidences of these diseases in the elderly.

“This is the first time in history that large populations are able to go through life without regular physical activity,” he says. “It’s only been in the last 100 to 150 years that you could travel without moving your muscles. Modern technology has made sedentary lifestyles possible.”

When participants are accepted into the exercise program, they’re assigned to one of four study components.

Holloszy is studying the effects of exercise upon glucose tolerance and insulin resistance and its use in the treatment of mild diabetes.

“Exercise, in addition to having an insulin-like effect, increases the sensitivity of muscle to insulin,” says Holloszy. “We’re finding it can be quite effective in the treatment of mild diabetes.”

In a separate but related study, Myrlene Staten, M.D., assistant professor of medicine, is studying the effects of exercise on older people with abdominal obesity and a predisposition to impaired glucose tolerance.

Staten is testing whether weight loss achieved through exercise is more successful in treating mild diabetes than weight loss achieved through diet. Her study is titled “The Effects of Exercise on Fat Distribution and Insulin Action in Obese Older People” and is funded through an NIH grant channeled through the Diabetes Research and Training Center at Washington University and by a National Institute of Aging career development award.

Research subjects, ages 55 to 70, who are 40 to 55 pounds overweight, enroll in a weight-loss program lasting six to eight months.

“Abdominal fat is more closely associated with diabetes than fat in other areas of the body,” says Staten. “We’re trying to reduce abdominal fat to reduce diabetes. . . . We look at changes in fat, both subcutaneous and internal. We know fat cells from different parts of the body respond differently. Studies on rats suggest that exercise and dieting work differently.”

Preliminary results are positive.

“We’re getting great results with exercise,” says Staten. “With exercise, you repeatedly secrete adrenaline. We know adrenaline causes abdominal fat cells to lose more fat than hip fat cells. We hope subjects lose more abdominal fat. If the correlation between abdominal fat, exercise and diabetes is true, people with diabetes will improve.”

As part of Holloszy’s project, Richard Ostlund, M.D., associate professor of medicine, is studying the effects of exercise upon cholesterol metabolism in the older population.

The American Heart Association defines cholesterol levels above 240 milligrams per deciliter as elevated and levels between 200 and 240 milligrams per deciliter as borderline. Average cholesterol levels in Ostlund’s research subjects are 216 milligrams per deciliter.

“The majority of Americans in this age group have borderline elevated cholesterol levels,” says Ostlund. “So many people have it, that it used to be considered normal. A sedentary lifestyle and overweight both contribute to elevated cholesterol levels.”

Exercise often is recommended as part of treatment for lowering blood cholesterol levels, he says. Actually, blood cholesterol is made up of two major types of cholesterol, low density lipoprotein (LDL) and high density lipoprotein (HDL). LDL is a form of cholesterol that is eventually delivered to body tissues, whereas HDL is a form of cholesterol that is cleaned from the blood.

(Continued on page 14)
Younger by the mile

Researchers at the School of Medicine are finding that most older adults adapt to exercise without too much difficulty. "We're testing the hypothesis that much of the deterioration and loss of functional capacity that occur with aging are due to inactivity," says John O. Holloszy, M.D., professor of medicine and director of the applied physiology section in the Department of Medicine.

Upon admission to Holloszy's "Physiological Adaptations to Exercise in the Elderly" study, participants are put through a battery of tests, including exercise capacity, body composition, underwater weighing, glucose tolerance, blood lipid levels, strength and flexibility.

Participants then begin a three-month program of flexibility and strength work before gradually building up to a program of walking and slow jogging. Research subjects are asked to exercise one hour per day, five days each week, with a goal of reaching 16 to 20 miles per week of fast walking or slow running.

"Programs are individually prescribed," says Mary Malley, project administrator of the aging research study. "Intensity is similar with either fast walking or bicycling. We want to get them up to 45 minutes of continuous exercise without a break. We introduce running in a gradual fashion and work up to continuous running of one mile to three to four miles."

Marybeth Brown, Ph.D., assistant professor in physical therapy, coordinates flexibility and strength training.

"Many participants have major problems in these areas of flexibility and strength," says Brown. "We have to rectify sedentary problems."

Many older adults have lost a critical range of motion in both their necks and trunks due to increased sitting, she says.

"The exercises are not that strenuous, but they result in a rediscovery of muscles that have not been used," says Brown.

Kathleen Dirhold, 67, a retired payroll accountant from South St. Louis, noticed a difference in her ability to pick up her grandchildren shortly after entering the flexibility portion of the program.

"My flexibility just wasn't there," says Dirhold. "After a month or so, I was beginning to get more limber."

One of the reasons older adults shy away from exercise is that they fear injury. The number of injuries experienced by program participants, however, is low, according to Brown.

In data collected on 115 participants who have completed flexibility training, one experienced an injury. Of 71 participants in the jogging portion, nine injuries have been treated, while two-thirds of the participants have experienced a painful episode, such as knee or groin pain, according to Brown.

"Incidence of actual injuries are low," she says. "But painful episodes are higher than in the younger population. That may be due to pre-existing conditions such as arthritis."

A staff of six trainers is available to deal with injuries, according to Brown.

"One of the major reasons the program is so successful is that someone is there who can do something about injuries," she says. "It's just a matter of participants recognizing something's wrong and saying something about it."

Participant Harsh Brown, 65, a retired minister from North St. Louis County, appreciates the fact that the program is medically-supervised.

"One of the real values is the concern on the part of the whole staff," he says. "They want to do what's good for the program and what's good for us. We want to come out with some good data."

While altruism may play a role for many participants in completing the program, others may be intrigued by the unique challenge of exercise.

"Our ability to get the best out of older adults is quite good. . . . These men and, particularly, women are pioneers," says Marybeth Brown. "They haven't done this kind of thing. The notion of a woman sweating is off the wall."

Once participants have completed the yearlong program, they're encouraged to continue exercising. Most program graduates remain active, according to Brown.

"We hope to get across to people that exercise should be a part of their day," says Brown. "It's their duty to their bodies."

Jack McGartland, 65, a retired sales and marketing manager from South St. Louis County, was one of the first participants to complete the program.

"Three to four months after I was out of the program, I ran five miles in the St. Patrick's Day run," he says. "I never visualized I could do that, and neither could my contemporaries."

Ray Newsham, 63, a retired chemical company salesman from Florissant, reaped both lowered blood sugar and triglyceride levels from his participation in the exercise program. He also increased his oxygen uptake capacity by 48 percent.

Newsham plans to continue exercising on his own as much as the weather will allow. Exercise, for Newsham, is a matter of maintaining a healthy lifestyle.

"It's a life quality situation," he says. "You may not live longer but the quality of your life will be better."

Exercise and aging program participants are still needed. Research subjects must be ages 60 to 70, non-smokers and in relatively good health. They also must not be on major heart or blood pressure medications or currently involved in an exercise program.

For more information, contact Mary Malley at 362-2397.

Clinical lab technician Kim Roumayah lowers Clara Le Clerg, 73, into the underwater-weighing tank for a muscle-to-fat reading.
Participants in the exercise program get their blood pumping by walking and slow jogging at the Irene Walter Johnson Institute's indoor track.

"When people exercise, their blood levels of LDL go down and their levels of HDL go up," says Ostlund. "Cholesterol leaving the body in HDL is good; it's targeted for removal. We advise patients to exercise because it lowers cholesterol and raises HDL.

Because blood cholesterol is easy to measure, it is generally used to indicate a person's cholesterol level. Yet, researchers believe that it is really body cholesterol that contributes most to atherosclerosis. Preliminary evidence suggests that endurance exercise may also play a role in decreasing body cholesterol, by lowering the body's production of cholesterol and reducing body fat—especially central fat in the abdomen and chest. Such fat appears to be associated with high body cholesterol.

"The preliminary results may indeed prove there is some effect on cholesterol metabolism with exercise," he says. "We clearly see effects on body fat."

A third research component of Holloszy's exercise and aging project is a study of the effects of exercise and aging on the function of the sympathetic and adrenal systems—the production of stress hormones and adrenaline.

William Clutter, M.D., assistant professor of medicine, and Philip Cryer, M.D., professor of medicine, have divided their study into two parts.

"First, we're looking into the possibility that as people age, the activity level of the sympathetic nervous system increases, which may possibly play a role in diseases such as hypertension," says Clutter. "We want to see what role exercise plays on such diseases in older people."

Second, Clutter and Cryer are studying the body's response to adrenaline and to noradrenaline, a very closely related chemical produced by the nervous system.

"There is some evidence that we release more as we get older," says Clutter. "If it contributes to raising blood pressure, it could be bad."

Although it is too early in the study to announce preliminary findings, the researchers hope to use their results as a basis for recommending exercise for older adults.

"Our hypothesis is that by increasing activity levels, we'll see a reversal of the changes associated with aging," says Clutter. "We don't know really why these changes occur with aging."
The fourth program component involves exercise and heart function in the older population. It is being conducted by Ali Ehsani, M.D., associate professor of medicine and director of the Cardiac Rehabilitation Program at the Irene Walter Johnson Institute of Rehabilitation.

Ehsani is testing the theory that high-intensity exercise can improve age-related deterioration in cardiovascular functioning. Preliminary data have been encouraging, according to Ehsani.

"We’ve found a number of improvements, including higher exercise capacity and an improvement in the pumping function of the heart, which increases during exercise," says Ehsani. "This is in individuals whose cardiovascular function is within normal limits. We’ve also seen some improvement in cardiovascular reserve, especially during exercise."

While research has shown that with advanced age, the heart doesn’t function as well, that deterioration may not be a natural part of aging, according to Ehsani.

"A sedentary lifestyle may contribute to it," he says. "The fact is that when you improve your work capacity, you can do more. You’re not putting as much strain on the system. You exhibit less symptoms, such as not being out of breath. There’s definitely an improvement in the quality of life and an improvement in your risk factors for coronary disease."

After recently completing a yearlong study on the use of exercise in improving bone density in women over the age of 50, Stanley J. Birge, M.D., clinical director of Washington University’s Program on Aging at Jewish Hospital, concludes that exercise may not only be used by younger women to prevent the development of osteoporosis in later years, but also by older women to reverse its effects.

Birge’s study included 22 female subjects, ages 50 to 72, including control subjects.

"Even those women with bone densities near the fracture threshold could increase their bone density with appropriate exercise," says Birge.

The significance of those results cannot be overemphasized considering that by the age of 70, 50 percent of white women will have developed osteoporosis signified by a reduction of bone mineral content, according to Birge.

"Many women experience a fracture of the spine," he says. "They begin to lose height. We know if a woman loses more than 1 1/2 inches in height, she stands more than a 75 percent chance of experiencing a compression fracture of the spine. She may be unaware that one or more vertebrae have collapsed, because most do not experience pain. The sooner one can intervene with treatment, the better off one’s going to be."

Younger women are encouraged to work toward prevention of osteoporosis with proper exercise, calcium intake and estrogen therapy after menopause, according to Birge. For older women who did not take these preventive steps and develop symptoms of osteoporosis, the only way to increase bone density is through exercise, he says.

"The only thing that will cause an increase in bone mass is exercise," says Birge. "It’s an effective form of treatment."

Birge is reluctant to recommend a preferred form of exercise for increasing bone density in older women but suggests from his research that the exercise program be individually-tailored and medically-supervised.

"This population is frail; they do have multiple diseases," says Birge. "We don’t want to cause more harm than good."

The exercise should be performed at an established intensity level a minimum of three days a week. And, as opposed to aerobic exercise, which has been shown in Ehsani’s study to improve heart function, weight-bearing exercise improves bone density, according to Birge.

"Aerobic exercise is not as important to the treatment of osteoporosis as isometric, or weight-lifting, exercise," he says. "The exercise should also be varied. Instead of pressing weights repetitively, the muscle should be varied to get maximum benefits."

Subjects in Birge’s study were followed after they completed the program to determine whether or not they continued an exercise regime and if their decision to discontinue exercise affected bone density.

"We found bone density went back to baseline levels if they stopped," says Birge. "If they continued, it was maintained. Our bones are what we make them. They’re there in response to the stresses and strains applied to them."

The same assessment could be made of the body functioning of older adults, if researchers’ theories of exercise and aging hold true. Rather than accept a large decline in functional capacity as simply a part of aging, older people can maintain a high level of function and protect themselves against a number of degenerative diseases by means of regular exercise.

"A lot of what we think is due to aging could just be due to a lack of exercise," says Holloszy. "Most people in our society are sedentary."

Before they hit the track, exercise program volunteers must complete three months of flexibility and strength training.
Researchers at the School of Medicine and Jewish Hospital have identified the receptor that brings cholesterol into the bloodstream. In doing so, they discovered a new physiological role for heparin.
This biochemical breakthrough, may lead to the development of an important new method for controlling cholesterol. The key, they say, is to prevent it from entering the bloodstream in the first place.

"You eat a food high in cholesterol, which is absorbed into the body from the intestines. Then it goes on to the liver and the arteries, where it causes all the trouble. If the cholesterol had never been absorbed, the rest wouldn't have happened," says Louis G. Lange III, M.D., Ph.D., associate professor of medicine and chief of cardiology at Jewish Hospital.

In a three-year study, Lange and a team of scientists discovered the metabolic mechanism for the absorption of cholesterol and fatty acids. They found a receptor on the intestinal cell membrane that promotes this absorption through the mediating action of heparin, a complex sugar abundant in the intestines, whose role there was never before clearly understood. These findings appeared in the October issue of The Proceedings of the National Academy of Science USA.

The next phase of their project should have important clinical implications. Since they understand the absorption mechanism, Lange's group can now work on a new drug to block the receptor's function and to prevent cholesterol and fatty acids from entering the bloodstream. And this drug should also have few harmful effects, since it also would not be absorbed.

The development of this drug and its Food and Drug Administration approval are still years away. "But now there's hope for a new type of therapy that will both be effective and associated with few toxic side effects," says Lange. "A huge number of people will benefit from an advance in this area."

**Roots of the Study**

In 1984 the government announced the results of the Coronary Primary Trial, a 10-year national study that proved indisputably that lowering cholesterol reduces the risk of heart disease. Other studies, debates among the experts and a government-sponsored education program have since combined to keep the public aware of cholesterol.

As most people now know, excessive cholesterol in the bloodstream can lead to atherosclerosis, a silent build up of fatty deposits inside the arteries. A heart attack can occur when a blood clot forms and closes off the narrowed portion of a coronary artery, thus blocking the flow of blood to part of the heart.

Two factors lie behind this overdose of cholesterol. There are often environmental causes, chiefly eating too many foods high in cholesterol and fatty acids. Smoking, high blood pressure and diseases such as diabetes can also accelerate atherosclerosis.

"Then there are very well-studied genetic factors," says Lange. "Some people have a genetic predisposition to developing hardening of the arteries. Two people can eat and smoke exactly alike, and one will get the disease while the other will not—just because of their parents."

This winter, a panel of experts from the National Cholesterol Education Program of the National Institutes of Health (NIH) established strategies for detecting, evaluating and treating high cholesterol levels in adults. The most critical step, they said, is to eat less of it. If that doesn't work, medical therapy should focus on interfering with its absorption.

Currently, the most commonly used agent for preventing absorption is a drug called cholestyramine, available as a powder that can be mixed with liquid or in a chewable "candy bar" form. Because it is not absorbed, it causes few side effects. But it reduces cholesterol levels by only 10 to 15 percent, tastes like sand and sometimes causes gastrointestinal complaints.

Still other agents are systemic drugs, such as the widely used lovastatin. These drugs travel through the bloodstream to the eyes, kidneys, liver and brain, where they can potentially cause side effects. "We realized there was a vast opportunity for improving on agents, if we knew what the mechanism for absorption was," Lange says.

"Scientific intuition" led Lange and his colleagues—Matthew S. Bosner, M.D.; Tod Gulick, M.D.; D. J. S. Riley, M.D.; and Curtis A. Spilburg, Ph.D. — to suspect the critical role that heparin plays in this process. Heparin, extracted from animal intestines, has long had widespread use in clinical medicine as a blood thinner, given intravenously to prevent blood clots. Its exact function in the human intestines, where it is found in large quantity, has never been discovered.

Lange's team reasoned that more than random movement must be involved in transporting cholesterol and fatty acids, which are in soluble compounds, out of the fluid-filled intestines and through the surrounding cell membranes into the bloodstream. Some agent must be working as an adaptor to facilitate this movement. Heparin, with an obscure function that didn't match its intestinal abundance, seemed a likely candidate.

**How Absorption Works**

The researchers unravelled a metabolic process that begins when a person eats a meal containing fat, made up mostly of cholesterol and triglycerides. The first stop for these fats, or "lipids," is the stomach; next they pass into the small intestine, where they mix with secretions from the liver and pancreas.

These liver secretions, which include bile salts and phospholipids, act like a dishwashing detergent to make the fats more soluble in water. And the pancreatic enzymes, secreted when a person eats, break up, or "hydrolyze," these fats into smaller and more easily absorbed com-
pounds. Triglycerides become fatty acids, while esterified cholesterol becomes free cholesterol.

This hydrolysis takes place at a particular site, or receptor, on the cell membrane of the small intestine. The receptor first binds to the pancreatic enzymes or proteins necessary for hydrolysis; in turn, those enzymes bind to the ingested fats and break them down. The key component of the receptor is heparin, which helps to mediate this metabolic process.

From the intestines, the cholesterol and fatty acids move through the bloodstream and lymphatic system into the liver, where they are further metabolized. Heparin is involved there too, Lange says, to bind the enzymes that work on lipids and promote the transport of these fats across the liver membrane.

“This is a very general phenomenon in the body,” says Lange. “How do you move these lipids from the blood to the heart? From the blood to the brain? From the blood to the liver? We’re hypothesizing that wherever you’re moving them across a membrane, heparin is involved.”

Implications

Receptor-blocking drugs, of the kind proposed by Lange’s team, are already accepted therapy for other medical problems. Beta-blockers exist for the treatment of ischemic heart disease; H-2 blockers are used for duodenal ulcers. Others are now under study.

When it is developed, Lange says, this latest receptor-blocker should represent a significant advance for the large number of people with high cholesterol levels. The NIH panel recommended that anyone with a reading above 200 needs evaluation and possible treatment. That means some 40 million people in the U.S. alone may have cholesterol problems.

The cost of their treatment could become a major social issue. “There are physicians, as well as economists and politicians, who think that will bankrupt our system,” Lange adds. “We are proposing a mechanism for cholesterol absorption that would allow us to design new agents that could be effective, well tolerated and cheap.”

Though aimed at people who take in excess cholesterol, this drug should also help people with hypercholesterolemia, a condition in which the body overproduces cholesterol for reasons not yet fully understood. Like most Americans, these people often eat more cholesterol than they should and could benefit from an agent to block its absorption.

What’s more, some people whose bodies synthesize too much cholesterol may also be absorbing more than average from their intestines. Even if they are eating a low-fat diet, Lange says, they may be “hyperabsorbing” whatever cholesterol they take in.

“Understanding the intestinal absorption of cholesterol gives us a significant new framework for study,” Lange says. “It suggests a whole host of new experiments and ways in which to diminish this absorption. From a scientific and public health point of view, it should have profound implications.”

Tripping up the heparin-dependent cholesterol receptor may provide a way to block cholesterol from entering the bloodstream.
At 8:30 A.M., drinking coffee from a Styrofoam cup, Derrick Crass seems out of place in this large physical therapy room at the Washington University Medical Center. A fleet of wheelchairs is parked over here, a fleet of walkers over there. Dozens of crutches hang on the wall. Some patients are using the wheelchairs and walkers to make slow, painful circuits in the room.

The compact, muscular Crass, however, epitomizes physical fitness. He's wearing running shoes, red gym shorts and a blue sweatshirt spotted with white paint. The sweatshirt reads, "U.S. Weightlifting Federation."

Crass is an Olympic weightlifter, a veteran of the 1984 and 1988 summer games. He's here among the hobbled and weak to undergo a therapy to increase his muscle strength. Physical therapist Anthony Delitto will stimulate the muscles in Crass' thighs and buttocks with high-frequency electrical current, producing powerful contractions. Unlike anabolic steroids, this training technique is legal and, under proper supervision, safe.

For years, neuromuscular electrical stimulation, or NMES, has helped thousands of physical therapy patients regain use of their limbs. Crass credits NMES with helping him make the 1988 Olympic team. "He won't need the coffee once he gets juiced up," says Delitto, an instructor at the School of Medicine. Crass grins.

Crass, a police officer in nearby Belleville, Ill., sits down in an elevated chair as if he's about to get a haircut.
Delitto straps padded electrodes to Crass' right thigh and buttocks. The electrodes are connected to an electronic box called VersaStim 380. Delitto and Crass refer to it as "the Blaster."

Delitto straps Crass to the chair. Crass' well-developed thighs look like two giant hams. His right leg is braced against an isokinetic dynamometer, a machine that measures muscular force.

"Are you ready?" Delitto asks. Crass answers, "Let's go." Then Delitto turns some knobs on the VersaStim. For 11 seconds, Crass grips the sides of his chair and winces as 40 milliamps of current flow into the quadriceps muscle in his thigh. The muscle, vital in lifts such as the front squat and the snatch, dramatically bulges up as his leg exerts 240 pounds of force against the isokinetic dynamometer. Then the muscle relaxes.

"Are you all right?" asks Delitto. Crass says, "Yeah."

Then Delitto turns on the current for the gluteus maximus muscles in the buttocks. Crass is lifted up like a schoolboy at his desk trying to see over the kid in front of him.

Crass takes a three-minute rest before the next round of shocks. What he felt, he says, was not pain but a strong, deep-seated pressure.

"If it were pain," he says, "I'd be screaming and hollering."

Physical therapists continue to escort their patients around the room in their wheelchairs and walkers. Crass and Delitto make small talk.

Crass says his fellow police officers kid him about his shock therapy. "Electro Man," they call him. His weightlifting friends are intensely curious.
"How much does that cost to get that done?" says Crass. "That's the first thing everyone asks."

The three minutes are up. Delitto administers another dose of current to the quadriceps. Crass grips the chair.

If Canadian sprinter Ben Johnson had shunned anabolic steroids and instead plugged himself into the "Blaster," he might have come away from the 1988 Olympics with a gold medal in the 100-meter dash after all.

Of course, that hypothetical gold medal assumes that NMES, in conjunction with normal training, actually improves athletic performance. Delitto and some of his fellow researchers believe it does. Other researchers believe it doesn't.

The efficacy of NMES is one issue. The ethics of NMES is another. Barring the fact that using anabolic steroids for athletic purposes is illegal as well as dangerous, is there any difference between popping a pill and juicing up? Aren't both shortcuts to a gold medal? Delitto's experiment with weightlifter Crass opens the proverbial Pandora's box, releasing a multitude of questions about the very nature of athletic competition.

The sports applications of anabolic steroids and NMES have their roots in medicine. Anabolic steroids create protein and other substances necessary for tissue growth. One anabolic steroid is testosterone, the primary male sex hormone. Chemists synthesized other anabolic steroids as a means to help recovering surgery patients rebuild wasted muscle tissue. Physicians also have prescribed anabolic steroids for skin and blood disorders.

Banned by the International Olympic Committee (IOC) and other sports organizations, anabolic steroids are suspected of causing cancer, heart disease, hypertension and sterility. But hundreds of thousands of athletes take anabolic steroids just the same. A few, like Ben Johnson, get caught and lose their medals.

Physical therapists have used NMES to help post-surgical patients strengthen their muscles after long periods of immobilization. NMES also can increase local blood supply, relax muscles and reduce pain. In addition, NMES practitioners theorize the technique can re-educate muscles to perform in proper sequence, massage muscles for improved lymph and venous flow, and reduce fluid retention.

Scientists from the Soviet Union were the first to exploit NMES for enhancing the performance of healthy athletes. In the 1976 Olympics, a worldwide audience watched Soviet track and field athletes resting between events with electrodes stuck to their muscles.

One of the pioneers of Soviet work in NMES, Jakov Kots, revealed some of his secrets at a 1977 Canadian-Soviet symposium on sports medicine. His version of electrical stimulation, he said, consisted of 50 bursts, or pulses, of current per second on a carrier frequency of 2,500 Hertz. The high frequency numbed the skin and prevented pain. Kots did not specify voltage or amperage.

Anthony Delitto (standing) jokes with weightlifter Derrick Crass before "juicing him up."

Soviet athletes took their voltage four to six days a week in addition to their normal exercise regimens. The force of the contractions—more than 100 percent of maximum voluntary effort—far exceeded anything produced by NMES in physical therapy.

The pay-off described by Kots was astounding—a 30 percent to 40 percent increase in muscle strength.

Attempts by researchers in Western countries to achieve Kots' numbers fell short of the mark. No one could electrically elicit force levels equal to or above 100 percent of maximum voluntary effort in their experiments. Many figures in sports medicine came to regard Kots as a liar and NMES as useless for healthy athletes.

"If you can do heavy resistance exercise, electrical stimulation won't increase your muscle strength any more," said Dean Currier, Ph.D., director of the physical therapy division at the University of Kentucky in Lexington and an NMES researcher.

Delitto, however, concluded that much of the nay-saying U.S. research was flawed. Kots, he said, had worked with world-class athletes motivated enough and strong enough to withstand relatively high doses of current. In contrast, early U.S. research into sports applications of NMES relied on healthy, non-athletic college students and weak, post-surgical patients. They received lower doses of current than did the Soviet athletes.

U.S. researchers, Delitto said, also improperly compared subjects who normally exercised and those who received NMES. Muscle contractions of equal force should have been required of each group, but as it turned out, the contractions for electrically stimulated subjects were weaker. Even so, said Delitto, NMES matched the strength gains of normal exercise.

To faithfully follow Kots' scientific trail, Delitto first needed the proper equipment. Electro-Med Health Industries in Miami built a customized contraption for Delitto called VersaStim 380. It produced the same high-frequency current that Kots prescribed, although Delitto altered the waveform and increased the number of pulses to 75 per second. While normal NMES equipment in physical therapy delivered 10 to 12 milliamperes of power, VersaStim packed up to 200 milliamperes.

Delitto deployed VersaStim in a test involving 20 patients attempting to strengthen their legs after knee surgery. Ten patients exercised; the rest let VersaStim do the work. The results, published last May in the Journal of the American Physical Therapy Association, showed that the VersaStim patients had developed stronger leg muscles than their counterparts.

The only way to confirm Kots' findings, however, was to test VersaStim on an elite athlete. Enter Derrick Crass.

Crass, 28, won the championship title from the U.S. Weightlifting Federation in the 82-kilogram weight class in 1987. He sought out Delitto later that year to treat a hip problem that stemmed from favoring his right leg after knee surgery. Crass was determined to recover in time for the 1988 Summer Olympic games. He had a comeback to make.

Delitto keeps a photograph of Crass from the 1984 summer games in his desk drawer at work. "Derrick doesn't like to talk about
"this," said Delitto. The photograph shows Crass crumpled like a stick figure beneath a gigantic barbell.

It was his first—and only—lift after placing first in the weightlifting trials. A ligament in his right knee ruptured, and a ligament in his left knee partially ruptured. He also dislocated his right elbow.

"I think they wrote him off after that," said Delitto.

Crass healed up and persevered, however. And when he encountered the opportunity to undergo NMES under Delitto's supervision, he took it.

Delitto chronicles the experiment in an article to be published this spring in the International Journal of Sports Medicine. In the first month, Crass worked out as usual. In the second month, still working out, he received NMES to his quadriceps three times a week. A tough customer, Crass soon was able to take all 200 milliamps the "Blaster" could deliver.

The force of his electrically induced contractions exceeded 100 percent of what Crass could produce voluntarily. One contraction was so powerful that it once broke a leather strap holding down his leg.

In the third month, Crass didn't undergo NMES. Then he sat back in his literal electric chair for another two weeks. All through the experiment, he continued his normal training routine.

Crass' performance improved immediately with stimulation. In the front squat, for instance, he went from 330 to 375 pounds after just two weeks of NMES. He stayed at that level during NMES withdrawal and finished the study lifting 415 pounds.

Crass' ability to hoist heavier loads of metal over his head meant that NMES produced the all-important "carry-over effect" from essentially isometric exercise with NMES to dynamic exercise, said Delitto. Isometric exercise is static, while dynamic exercise involves movement.

"If your muscle registers more force on an isokinetic dynamometer after stimulation, but you can't lift more weight, hit a baseball harder or run faster, it means nothing," he said.

Muscle biopsies performed after the experiment by Marybeth Brown, Ph.D., assistant professor in physical therapy, revealed that Crass had fewer endurance-producing (Type I) muscle fibers and more strength-producing (Type II) fibers—valuable in sports requiring explosive bursts of energy. Allowing for the possibility of a sampling error, Delitto said Type I fibers may have converted into Type II fibers, or existing Type II fibers may have split. In
either case, Delitito’s experiment was one of the first in muscle physiology to apparently increase the number of Type II fibers in a human subject—a finding that has sent a current of controversy through the scientific world.

At the 1988 summer games, Crass finished 11th in a field of 31. For an athlete who wasn’t even expected to make the team, Crass’ performance indeed represented a comeback.

The comeback isn’t over. Still training with NMES, Crass is aiming for the national championships this April in Houston, the world championships this fall in Athens, Greece and, ultimately, the 1992 Olympic games in Barcelona, Spain.

Meanwhile, Delitto has connected other athletes, including a high school basketball team, to the VersaStim machine. He knows he has a long way to go to prove conclusively that NMES does give a healthy athlete a competitive edge. He has many skeptics to win over, including Michael H. Stone, Ph.D., chairman of the medical committee of the U.S. Weightlifting Federation.

“One person is not a definite study,” said Stone, an associate professor at Appalachian State University in Boone, N.C. “Nor is one study definitive.”

Delitto’s research comes at a time when other sports medicine experts report that the Soviets are not quite the believers in NMES they once were.

One of those experts is Michael Yessis, Ph.D., professor of physical education at California State University at Fullerton and editor of a journal called Soviet Sports Review. Yessis said the Soviets still use NMES for rehabilitating injured athletes, helping muscles recover more quickly from workouts, and exercising small muscles hard to reach through normal exercise. But the Soviets, he said, are no longer so convinced that NMES is an effective way to build large muscle strength.

Clouding the scientific debate is the commercialization of NMES. Some health spas claim their NMES equipment will help you lose weight, tone your muscles, remove wrinkles and enlarge your breasts. An advertisement in a fitness magazine touts a line of NMES machines for home use called “The Body Maker Series.”

“When you’re ready to stop playing with the toys and want to achieve that rock hard body, get the Body Maker,” the ad reads. Price: $249 to $975, depending on the model. The manufacturer is HealthTech Inc. in Washington, D.C.

The federal Food and Drug Administration looks askance at such marketing. David Duarte, an agency spokesman, said the FDA approves the marketing of NMES for only five medical uses—relaxing muscle spasms, preventing blood clots in bedridden patients, increasing blood circulation, retarding muscle atrophy due to disuse and increasing or monitoring the range of motion in limbs. Bodybuilding, wrinkle removal and breast enlargement aren’t on the list, he said, because no one has yet submitted clinical evidence to show NMES works in those areas.

“We have seized devices which are being used in an illegal fashion,” Duarte said. “These things come in waves. They’re hot for a year or two. They subside. And then they come back again.”

Nancy Avitabile, vice-president of HealthTech Inc., said fraud did indeed exist in her industry. The problem, Avitabile said, is that low-powered NMES devices meant for therapeutic purposes, such as eliminating cramps, are being falsely marketed for bodybuilding. The Body Maker equipment, on the other hand, actually strengthens muscles, she said. Even while you watch television.

“You will see incredible results in a short period of time without drugs,” said Avitabile. “It is drug free.”
The whole subject of NMES miracles performed on the living room sofa or in a spa turns off researchers like Delitto. "That's ridiculous," he said. "The most exercise these folks get is getting on and off the table."

The appeal of an easy workout and the question asked by Crass' friends, "How much does it cost?" point to the subtle subject of ethics. Athletes always want to get better, whether it's knocking a millisecond off their time in the 100-meter dash or adding a millimeter to their long jump. Is NMES a legitimate means to their end?

Neither the U.S. Weightlifting Federation or the IOC have any policies banning or governing the use of NMES. Prince Alexandre deMerode, chairman of the IOC medical committee in Lausanne, Switzerland, said his committee has just started to examine the technique.

The IOC might ban a training aid, deMerode said, if it:

- Harms an athlete. Steroids are an obvious example.
- Compromises medical ethics. The prescription of anabolic steroids for a non-medical use illustrates this taboo. "Athletes are not ill people," said deMerode.
- Creates unequal training conditions.

This last criteria, he said, is hard to apply in a world where athletes in one country have private trainers, biofeedback equipment and special diets, while their counterparts in another country do without. "Equal conditions is not real life," he said. "On the other hand, I believe we should try to maintain it."

Commitment to a "level playing field," explains why the National Collegiate Athletic Association divides competing schools into divisions, said Jan Boxill, Ph.D., a sports ethicist at the University of North Carolina at Chapel Hill. The divisions are not based on school size, but school resources. Wake Forest University in Winston-Salem, N.C., for instance, has only about 5,200 students, but it is heavily endowed. It competes in Division I against giants like Ohio State University in Columbus with 53,000 students.

Sports ethicists sometimes consider the distinction between "artificial" and "natural." A good summary of this distinction comes from Boxill.

"Is it something you are doing to try to develop yourself, or is it using a performance-enhancing method which doesn't come from you, but something else?" she asked. "In sports, we try to see how good we can be, not how good our machines can make us."

Boxill didn't concoct her opinion in an ivory tower. Besides earning a doctorate in philosophy at the University of Southern California, she was a starting guard on its women's basketball team during her undergraduate days there. She also coached women's basketball at the University of Tampa. But despite the most seasoned of perspectives, the distinction between artificial and natural gets blurred.

"Is it normal for someone to train eight hours a day for a sport versus someone who can only train two hours, who holds a job?" asked Stephen Fleck, a sports physiologist with the United States Olympic Committee in Colorado Springs, Colo.

Weightlifter Crass also wonders where to draw the line. "Are we supposed to run on dirt barefoot?" he asked. "I spend a lot of time in the gym. That's not natural. Nautiluses aren't natural!"

Carl Wellman, a philosophy professor at Washington University, said anabolic steroids and NMES arguably might be classified as artificial aids. But then again, special diets, vitamins and even aspirin might fall into that category, too. Taking a philosophical turn in the road, Wellman applied the same argument to bodybuilders.

"Look at their physiques," said Wellman. "Is this developing their natural build, or is it an unnatural and grotesque distortion of the human torso?"

On an official level, NMES may never emerge as an ethical issue in athletic training. Fleck said he doubts the IOC would ever ban NMES. It's just too impractical.

"How would you test for it?" asked Fleck, a skeptic regarding the claims made for NMES. "How would you say how this person did this? To have a rule against something you can't test isn't a rule. It's a moot question."

For Delitto, NMES initially seemed to solve an ethical problem, not create one. NMES, after all, promised to make dangerous anabolic steroids obsolete. Then he encountered issues like equal training conditions and artificiality.

"At first, I joked about it," he said about the ethics angle. "This is something that journalists dream up when they don't have anything to do. But then my colleagues brought it up."

Delitto laughed about Fleck's observation that a training aid can't be ruled unethical if it can't be detected. "That's the backdoor way to get out of it," he said.

After weighing all the arguments, Delitto still defends NMES as ethical, primarily because of its safety. If organizations such as the IOC ever deem it improper, "I will abide by it," he said.

Delitto added he didn't begin experimenting with NMES to help U.S. weightlifters win more gold medals. He was only seeking advances in his chosen field—physical therapy. The sports application of NMES "was a real serendipitous kind of thing."

As is so often the case, the serendipity of scientific research brings with it weighty, sometimes unwelcome questions. If only a jolt of electricity could help human minds come up with gold medal answers.
Hunger project brings food to St. Louis poor

In a land where some people devour $4 pints of premium ice cream in one sitting, pay more than a dollar for a single piece of designer chocolate and think nothing of dropping $25 for a nouvelle cuisine dinner that's more plate than food, it's hard to imagine anyone going hungry.

Yet 20 million Americans do go hungry at least some days of the month, according to the Physician's Task Force on Hunger, and 12 million of these hungry people are children.

Many of them are in the School of Medicine's own backyard, according to students involved with the Washington University Medical Center Hunger Project, who have compiled some alarming facts.

St. Louis has a higher percentage of its population living below the poverty level than any other major city in the U.S., they say, and 65 percent of those living in poverty are children. There are currently 10,000 homeless people in St. Louis, and emergency food programs have experienced nearly a 400-percent increase in need over the past two years.

Three years ago, third-year medical student David Jaye and four of his classmates decided to do something about this problem by forming an ongoing food drive known as the Washington University Medical Center Hunger Project. The idea was to get students, faculty and staff to donate canned goods and other foods on a regular basis. "This occurred to us because it seemed like something that everyone could participate in—

at least through the act of giving a can of food," Jaye says. "It's something that students can afford, and it seemed at the time to be an easy thing to do."

The food, which is collected at various sites around the medical school campus, goes to the St. Louis Food Pantry Association and is then distributed to emergency food shelters around the St. Louis area.

One of the goals of the hunger project, which is run by more than two dozen medical and allied health students and coordinated by second-year student David Shepherd, is to get people into the habit of buying an extra can of food every time they go to the grocery store, says founder Jaye. It's an easy habit to establish, he points out, as "a can a week is about the equivalent of giving up going to the soda machine one day a week."

Shepherd says that before he became involved in the program, he was skeptical that the small amounts of food collected at the medical center would make any difference. He believed that donations from major corporations were what kept the food pantries going. "The more I got involved in the program, the less I saw that was true," he says. "The donations have really picked up with our efforts this year."

The hunger project was one of several student programs commended by President George Bush this past February during his campus address on student volunteerism.

Members of the program hope their efforts spur others to become involved in the community as well. "How I view it," says Shepherd, "is, if you can get someone to think about hunger, get them to go to a grocery store and just get through the simple act of thinking about it at the grocery store, bringing it home and putting it in the container—just getting them thinking about it is the first step to civic-mindedness. If you can get them to think civicly, it will be a more civil place."

Susie Stark, a second-year graduate student in occupational therapy, adds that "by the nature of our profession, we are ethically and morally bound to think about these things, and this is a good way to bring up these issues now—before people get busy with work and forget about it. Projects like this will be more and more important in future as we run out of money for health care and need to focus on prevention."

Health care practitioners should be concerned about hunger because it is the number one enemy of health, according to first-year student Jim Stevermer. "If you're in a developing country somewhere, the first attack on any health care problem is going to be at the level of nutrition," he says. "It's the first thing you have to worry about, and it's the same thing here."

In addition to the cans they collect, students in the hunger program publish a quarterly newsletter and are beginning to organize a speakers series.

A lot of people have a negative view of charity, according to Shepherd. They may believe that people are in the situations they are because they are lazy. "Fifty percent of our clients are children," he says. "So regardless of the circumstances of their hunger, these are children who are hungry and have no control over their situation."

"Philosophically, at least, I feel that people have a right to be fed and that it's our duty, as those who have, to make sure everyone in our society has enough to eat. Even if you don't look at it that way, and you want to look at it more selfishly—ask, 'how is this going to help me?' If people are able to eat, they go to school and they can learn and become productive citizens. If they don't have enough to eat, they don't learn in school. They turn to crime. This is very simplified. But in a sense, you'd be helping yourself by helping others too."
AIDS presents us with both a threat and a challenge, according to Jonathan Mann, M.D. '74, director of the World Health Organization's Global Programme on AIDS. Mann delivered the annual Carl G. Harford Lecture to a packed house this past February at the School of Medicine.

"We are still in the early phases of a global epidemic," he told his audience at Carl V. Moore Auditorium. AIDS has "joined the central threats of our time, which include nuclear war, environmental degradation and hunger."

Mann estimates that a total of 5 million to 10 million people are infected with the AIDS virus worldwide. How far will it spread and how fast? "What we do know is that this is not an epidemic that just sweeps through a population. It's an epidemic composed of many smaller epidemics," Mann said.

He cited as an example the population of intravenous drug users in Bangkok, Thailand. Two years ago, none of the drug users was infected with HIV. Recent data suggests that between 40 percent to 50 percent of IV drug users in Bangkok are now infected with the virus. "We know where the vulnerabilities lie," Mann said. "The question is what to do about it."

In mobilizing against the spread of AIDS, it is critical to back up informational and educational programs with health and social services, according to Mann. "Those people who just haven't paid much attention to their own lives, let alone the psychology of others," he said. "For instance, how can you expect people to use condoms if condoms are not available, are of poor quality or are too expensive? How can you expect people who are HIV-infected to deal responsibly with their life and their behavior without lifelong access to counseling and support?" he asked. "Maybe it sounds obvious, but it's been a long road to demonstrate to people that it isn't enough to talk; it isn't enough to make brochures and posters. You also have to provide services to people who need them."

It is also important to know who you're trying to get through to and engage them in dialogue. "Information and education shouldn't be a speech," Mann said. "Information and education have to be dialogue." A non-discriminatory approach is essential, he added, citing examples where the incidence of infection has been reduced to zero among prostitutes in Kenya and Greece. These women benefited from programs in which they were not only given information, but also condoms. And they did not suffer stigma as a result.

Even with such prevention programs, the WHO antici-
pates a worldwide cumulative total of more than one million AIDS cases by the end of 1991, according to Mann.

These people will need psychosocial support and, even more importantly, the application of recent and continuing medical advances, he said. "How you do that (care for them) is going to test this community and this school," he said.

Given that good drugs are developed, Mann asked, "Will the fruits of biomedical science be available to the rest of the world?"

Mann gave the example of the hepatitis B vaccine, which cost approximately $100 per person when it was developed. In Central Africa the total expenditure per person on health per year is less than $10. Consequently, the hepatitis B vaccine is still not available except to the rich.

Beyond medicine, Mann said that we need "to use all of what we can do, which will include resources that go beyond the traditional health system, to help people who are infected and those who live with them."

"...I would say that if any of you, in fact, remains untouched by AIDS—untouched personally, untouched professionally, untouched intellectually—then for some reason you are missing one of the most important opportunities of our lifetime."

"AIDS is forcing institutions, professions and individuals to rethink issues that "are key to dealing with AIDS and key, perhaps, to the future of our societies," Mann explained. "AIDS is giving us an opportunity to rethink intravenous drug use. It is forcing us into an opportunity to rethink issues that lead to prostitution. It is forcing us to consider how well we educate our children. It's forcing us, if we are physicians, to ask ourselves, 'What is my relationship to the patients? How good am I at counseling? What sort of support does this person need that I can or cannot provide?'"

AIDS has also brought forth, he said "in some way that we don't understand, a personal and human dimension to health that has always been true. But in some way, AIDS has crystallized for us, brought forward for us, the particular forms of human need and suffering, as care givers, are sensitive to."

The next phase in the global AIDS effort, Mann said, is going to be a period of transformation—"to take the initial dynamism and energy which has characterized this unprecedented global mobilization and convert it into a sustained commitment to consolidating what we have done, to strengthening where we must do more, to innovating where we are simply not doing enough.

"We believe at the WHO," he said, "that it is too early to mainstream our thinking about AIDS. If we do, we will lose an opportunity that we may never see again in our lifetime, a period of creativity during which we and you—all of us—are privileged to be working and to be making our contributions."

"...And so, as we face our time and its challenges, its urgent call for new tools, for new concepts in medicine and health, we realize that we see what we can see because we stand on the shoulders of the giants like Carl Harford, who came before us. And finally, for myself, I am very grateful to have attended Washington University School of Medicine as my father did before me. To me this is a temple in which we gain tools, concepts, confidence and a measure of understanding from which we all go forth alone, yet together, to face the great issues of our times and of our lives."

Jonathan Mann’s post with the World Health Organization is the latest in a distinguished public health career. After receiving his M.D. degree in 1974 from Washington University, he served two years as an officer with the Epidemic Intelligence Service of the Centers for Disease Control. In 1977 he went to New Mexico as the state’s head epidemiologist and chief medical officer and as deputy director of the health department. He returned to the CDC in 1974 as an assistant director of its AIDS program. Responsible for international programs, Mann established and directed the Zaire AIDS Research Project (Project SIDA), a collaboration among Zairian, Belgian and American investigators involving epidemiological, immunological and clinical research. In 1986 he joined the World Health Organization in Geneva, Switzerland, as director of its Global Programme on AIDS.

Mann received a master’s degree in public health from the Harvard University School of Public Health in 1980. He is a member and fellow of the American College of Epidemiology.

The Harford Lecture is sponsored each year by the School of Medicine’s infectious diseases division to honor Carl G. Harford, M.D., professor emeritus of medicine and former head of the infectious diseases division.
A Tribute to Charlie

by Diana Heil

One father figure for more than 400 boys might sound impossible. But in the life of Charlie Ruggieri, such a feat was undeniably accomplished. As cook and manager of the Phi Beta Pi medical fraternity house for 38 years, Ruggieri created a haven of stability, love and laughter for his students.

In return, Ruggieri's boys have remained loyal and affectionate—friendships 90-year-old Charlie, a widower with no children of his own, drew strength from last June when he had a colon cancer operation at Barnes Hospital.

"I didn't suffer at any time," says Ruggieri. "And I didn't have pain before the operation. I don't know what happened to me; I was just sick."

"But I came out of it real good," he assures. "Gene Bricker, he's the first one I recognized when I came out of surgery. He was right there."

These days you'll find Charlie, rosy-cheeked and bright-eyed, in a private room at Bethesda-Dilworth Memorial Home. He's telling jokes, laughing a lot, and going out with his two girlfriends or his nieces. A picture of the Phi Beta Pi house and a certificate verifying his honorary membership to the fraternity hang on his wall.

"One guy called from Boston and wanted to know what kind of a joint I was living in," says Ruggieri. When Ruggieri told him that Mildred Trotter, the medical school's famous anthropologist, lived five floors up from him, his doctor friend was convinced Charlie was in a good place. A trust from the sale of the Phi Beta Pi house, which will eventually revert to a student loan fund, helps Ruggieri pay his bills.

"I'm better off than almost anybody here. I have no pains," insists Ruggieri, whose 5-foot-6 frame, aided by a cane, keeps pace with even the youngest visitors. "Most everyone here is handicapped; mine's in the head. Sometimes I think so, when I try to think of something and I can't remember it." Nevertheless, Ruggieri can still rattle off many of the names and whereabouts of his boys.

Robert Gibb, M.D. '48, understands the source of Charlie's confident attitude toward aging. "That's typical of the Charlie Ruggieri approach to life," says Gibb, a retired pathologist who lived at the Phi Beta Pi house for one year. "He's one of the most positive people I've met. Considering the hardship and environment out of which he came as an orphan, it is neat to see the values and ethics this guy has."

No, Charlie Ruggieri wasn't born with a silver spoon in his mouth. In fact, he's not certain when or where in Italy he was born. "I woke up really in an orphan home in Memphis, Tennessee," says Ruggieri, who received a fourth-grade education there. He never knew his mother. And the sparse communication he had with his father required the presence of an interpreter because Charlie never learned Italian.

Until his service in the ambulance corps in Belgium during World War II, Ruggieri never even celebrated a birthday. To join the army, he had to give a birth date and picked May 22, 1899.

After his return to the United States, Charlie moved to St. Louis to be near his brother, Andrew. By that time, Charlie had held several jobs since he left the orphanage at age 14 and had learned the secrets for survival: a conscientious attitude toward hard work and a good sense of humor. These essentials he built on as a counter waiter, meat carver and manager for several successful downtown St. Louis restaurants.

In 1931, Charlie became the wheel that would keep the Phi Beta Pi house at 4933 Forest Park Blvd., operating for the 30 medical students who lived there each semester. "I heard people say several times, 'When you leave the fraternity, it's going to fold,'" says Ruggieri. "And it did." The fraternity's property was sold to Washington University in
1970, and the house was eventually torn down.

Eugene Bricker, M.D. ’34, who was living at the Phi Beta Pi house before Charlie came on board, brags that he helped hire Charlie. “Charlie was the cook, the mainstay, the factotum of the house and kept everything working, including the lighting and the plumbing. He was indispensable.” Although he was never a Phi Beta Pi officer, Charlie was so important that he attended all the meetings concerning problems and policies, and even recommended who should be president or house manager.

Although they didn’t live at the fraternity house, both Charlie and his wife, Hilda, were devoted to their adopted boys. For Charlie, the work was difficult and the hours long, a 12- to 15-hour-a-day job that started at dawn. Only someone like Charlie could tackle such a challenge with a smile.

“I had a saying that if they found out that they could get along without me, I’d lose my job,” says Ruggieri, who would feed as many as 100 students per day.

“No one wanted that job I had,” he truthfully admits. “When I tried to quit because I was getting older, they hired somebody. But nobody could do as good a job as I had done.”

In 1966, Charlie retired and went West for six weeks with Hilda to visit more than 50 doctor friends. But while they were in California, Charlie was notified that his replacement, a former army cook, didn’t want the job. “‘You’re crazy!’ the man had said. ‘Nobody can hold that job.’” So Charlie came to the rescue and worked four more years.

“The old Phi Beta Pi medical fraternity house on Forest Park Blvd.

“Of course, anybody could do cooking, but I’d done the managing, too. I bought the food. I checked the bills to be paid, and put them on the treasurer’s desk, and then hounded the treasurer until he paid them.”

Charlie’s thrifty managing skills kept the fraternity alive during the Great Depression and World War II, periods the other University medical fraternities didn’t survive.

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Charlie notes that during the food rationing days of World War II, his boys never had a meatless meal. On special occasions, they even had steak and whipped cream eclairs.

“We all got to know Charlie Ruggieri,” recalls John Herweg, M.D. ’45, who didn’t live in the fraternity house but ate dinner there, “because he had the magic touch of coming up on Sundays with very nice T-bone steaks or whatever. We all gave to Charlie our food rationing coupons; he waved the magical wand and served a very good table.”

Ruggieri never trusted anyone to help him with the cooking, not even his wife. “I did finally have one girl who put frosting on the cakes, but I never trusted anyone with something they could goof up. Stupid! I did everything. One time I’d be baking cakes and another time I’d be unstopping a toilet.”

The Phi Beta Pi house and Charlie’s role there ceased nearly two decades ago, but
his devotion to medical students hasn’t ended yet. Several second-generation School of Medicine students know him as a grandfather figure and have tasted Charlie’s cooking. “He’s one of the most genuine people you’ll run into, and that sounds hokey, but it’s true,” says Gail Knopps, Robert Gibb’s daughter, who is finishing her studies at the School of Medicine. “I think that’s something people go back to him for because it’s so special.”

Special, too, is the genuine gratitude and respect Charlie’s boys—many now retired from their medical practices—still feel toward him. For each Phi Beta Pi fraternity member, there is an individual set of Charlie Ruggieri memories.

“He’s one of the great men in my life,” says John Eisenhauer, M.D. ’43, who remembers shooting craps in the basement with Charlie. “He’s easily as great as any of the professors just because he managed the refuge that we came home to.”

“And Charlie taught all of us more about love than any of our professors did, because that’s where we got our replenishment. We were stretched tight and taut, but Charlie provided circumstances with a lot of goofy medical jokes. They were set things that happened to you when you were a freshman or things you saw happen to others when you got older. You could explode, and laugh, and get a real gut level of release.”

To Robert Gibb, Charlie Ruggieri was a role model. “Charlie led an unpretentious life that was dedicated to his students. They were his kids, since he had no children of his own. He brought affection and leadership to us during those tumultuous war years.

“And Charlie had a delightful sense of humor that kept our lives in perspective when we saw tragedy every day. He was a bright spot in everyone’s day,” adds Gibb. “Although he had no formal education, he was a good judge of character and wise in his own right. Most everyone developed a strong attachment to him.”

No question, Charlie still has the heart of a father. “The people I met were tops,” Charlie summarizes. “Some of them were heels when they were in school, but I liked them anyhow.

“Some of them have said, ‘I wouldn’t have gotten through medical school if it weren’t for you,’ but I don’t believe it. I had nothing to do with it. I did try to tell the fellows at one time, you’ve got to have determination to get through. Attitude—this school goes by your attitude. If your attitude is poor, they’ll look for ways to kick you out. But if they know that you’re trying, they’ll bend over backwards to help you. That was true then, and I’m sure it’s true yet.”

To those who know him, Charlie Ruggieri leaves quite a heritage.

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Leibner fund established

Family members, colleagues and friends have established an I. Wallace Leibner, M.D. Award Fund in memory of Leibner, who graduated from the School of Medicine in March of 1943. Income from the fund will be given annually in the form of an award to the member of the graduating class of the School of Medicine who has demonstrated outstanding ability in the clinical practice of medicine.

As a pediatrician, Leibner believed strongly in the role of the primary care physician. This role entailed not only excellence in diagnostics and therapeutics but also in understanding human nature and needs in an active nurturing of both patient and family. The School of Medicine is proud to have this award established and hence foster those ideals in its best graduates.

Individuals desiring to make contributions to this fund may send them to the alumni office: 660 South Euclid, Box 8049, St. Louis, MO 63110

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CLASS NOTES

’30s and ’40s

Lawrence M. Aronberg, M.D. ’36, recently celebrated his 80th birthday with dinner and dancing for 250 people.

Lawrence M. Kotner, ’38, was elected president of the medical staff at Jewish Hospital.

Irving L. Berger, M.D. ’39, is retired but still does consulting. He spends his winters at Delray Beach and devotes more of his time to artwork, especially painting in watercolor.

Robert M. Hardaway III, M.D. ’39, professor of surgery at Texas Tech University School of Medicine in El Paso, Texas, just published his eighth book in the field of trauma, titled “Shock—the Reversible Stage of Dying.” This year will be his 50th class anniversary and his father’s 79th.

George W. Prothro, M.D. ’45, former medical director of the Tulsa City-County Health Department, recently received the 1988 A.H. Robins Award for Community Service from the Oklahoma State Medical Association. Prothro recently retired from his position as associate professor of family medicine and director of community medicine at the University of Oklahoma Tulsa Medical College.

Robert A. Huckstep, M.D. ’48, has served for the past two years as president of the board at Minerals Area Community College in Flat River, Mo.

Dale W. Hayhurst, M.D. ’49, was forced to retire five years ago due to illness. He recently lost his wife of 42 years to cancer. They have three children and two grandchildren.

Russell D. Shelden, M.D. ’49, was recently presented with a distinguished service award from the medical staff at the Research Medical Center in
Kansas City, Mo. It was signed by George P. Holec Jr., M.D. '60, who is president of the medical staff there.

'50s and '60s

John I. Sandson, M.D. '53, became dean emeritus at Boston University School of Medicine last spring. A chair in health manpower was established at that university in his name.

Robert C. Drews, M.D. '55, was elected to the board of trustees at Washington University.

Selma Kaplan, M.D. '55, recently received a faculty career achievement award from the University of California at San Francisco.

Donald H. Tibson Jr., M.D. '55, writes that now that his sons are grown and out of the house, he and his wife have moved into a restored set of army quarters at Vancouver Barracks, where they once again look out onto a parade ground.

Floyd E. Bloom, M.D. '60, was elected president of the American College of Neuropsychopharmacology and this summer will become chairman of the neuropharmacology department at the Research Institute at Scripps Clinic.

R. Michael Sly, M.D. '60, has been appointed associate editor of the Annals of Allergy and will become editor next year. Sly is chairman of allergy and immunology at Children's Hospital National Medical Center and professor of child health and development at the George Washington University School of Medicine and Health Sciences.

L. Philip Carter, M.D. '64, accepted positions as associate director of the division of neurosurgery and professor of surgery at the University of Arizona.

Ronald G. Evens, M.D. '64, was appointed to the Board of Chancellors of the American College of Radiology. He was also named chairman of that group's Commission on Technology Assessment and Efficacy Studies.

Roger L. Mell, M.D. '65, an orthopedic surgeon from Chesterfield, Mo., was elected president of the Southern Medical Association.

Gary S. Rachelefsky, M.D. '67, is clinical professor of pediatrics at the University of California at Los Angeles, where he directs the allergy clinic. He is also chairman of a joint board of allergy and immunology. He has three children.

Michael R. Treister, M.D. '67, was recently elected treasurer of the Jewish Vocational Service of Chicago, a social service agency that provides educational and vocational counseling, job placement, rehabilitation and skill training services.

Steven R. Raffin, M.D. '68, contributed two chapters to the fourth edition of "Gastrointestinal Disease: Pathophysiology, Diagnosis, Management," edited by Sleisenger and Fordtran.


'70s and '80s

W. Norman Sitz, M.D. '74, is part of a group practice in internal medicine. He's also a father of two daughters and an avid fisherman, hunter and basketball player.

Joseph N. Marcus, M.D. '75, married Margaret A. Olsen, Ph.D., a virologist at Creighton University, where he is an assistant professor of pathology.

Michele R. Flicker, M.D. '76, has been promoted director of medical affairs at Marion Laboratories, Inc., a company that manufactures cardiovascular, gastrointestinal and wound-care products.

Gary R. Lammert, M.D. '77, has a new son, Henry Matthew.

Robert D. Rosenberg, M.D. '79, was married to Jane Wishner last spring in Chicago.

Dennis Devito, M.D. '80, is an assistant professor of orthopedic surgery at Vanderbilt University, specializing in pediatrics. He, his wife and three children live in Nashville.

Faith Holcombe, M.D. '80, gave birth to her second child, Alan, this past summer. She writes that she and her husband are just starting to sleep through the night again and would enjoy hearing from friends. Their number is (314) 991-2588.

Raymond Phillips, M.D. '81, is completing a gastroenterology fellowship at Walter Reed Army Medical Center.

Todd Swanson, M.D. '85, is in his fourth year of orthopedic surgery training in Sacramento, Calif. He and his wife, Julie, have two boys: Taylor, 22 months, and Adam, 9 months.

FORMER HOUSE STAFF NOTES

Roger J. Elbie Jr., M.D., Ph.D., FHS in neurology, has been named director of the Regional Alzheimer's Disease Assistance Center at Southern Illinois University School of Medicine in Springfield, where he is an associate professor of neurology.

Russell H. Tomar, M.D., FHS in pathology, is a professor of pathology and laboratory medicine and director of clinical labs at the University of Wisconsin Center for Health Sciences in Madison, Wis.

IN MEMORIAM


Robert Bruce Stevens, M.D. '27, died January 14, 1989.
Second-year students open the first act of their class show with an anti-smoking scene, “Every Puff You Take.”
Scientists at the School of Medicine and Mallinckrodt Institute of Radiology have discovered the seat of anticipatory anxiety, depicted as the hotter colors on this brain PET scan. See page 2.