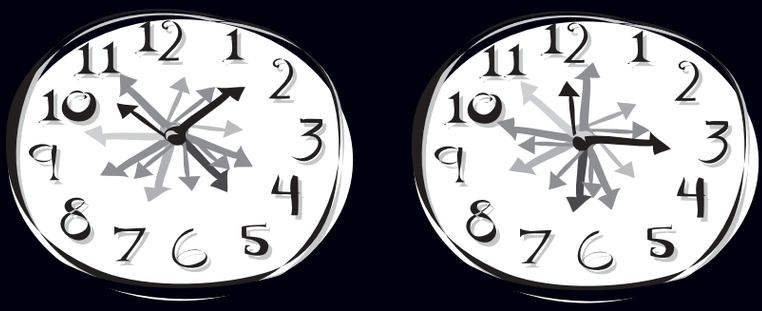
UNIVERSITY OF PITTSBURGH SCHOOL OF MEDICINE | OCTOBER 2002

PITTMED



ON THE CLOCK

LEARN TO DOCTOR IN 80 HOURS A WEEK OR LESS!

LUTENERO



LOST BOYS AND OTHER STORIES

I thoroughly enjoyed reading the Dean's Message in the July issue of *Pitt Med*. It is a vice of nearly all professions to compartmentalize learning in such a way as to inhibit rather than expand our overall understanding. In so doing, we impose arbitrary limits on our capacity to know.

Of course there is a place for art, literature, and even theology in the study of medicine. We cannot begin to penetrate the seemingly unfathomable secrets of our physical universe until we see a glimmer of our own place and purpose here. The following is from Brunner's *The Culture of Education*—a related but similar point:

[Education] is a complex pursuit of fitting a culture to the needs of its members and their ways of knowing to the needs of the culture.

It has been the convention of most schools to treat the arts of narrative—song, drama, fiction, theatre, whatever—as more "decoration" than necessity, as something with which to grace leisure, sometimes even as something morally exemplary. Despite that, we frame the accounts of our cultural origins and our most cherished beliefs in story form, and it is not just the content of these stories that grip us, but their narrative artifice. Our immediate experience, what happened yesterday or the day before, is framed in the same storied way. Even more striking, we represent our lives in the form of narrative. It is not surprising that psychoanalysts now recognize that *personhood implicates narrative*, "neurosis" being a reflection of either an insufficient, incomplete, or inappropriate story about oneself. Recall that when Peter Pan asks Wendy to return to Never Never Land with him, he gives as his reason that she could teach the lost boys there how to tell stories. If they knew how to tell them, the lost boys might be able to grow up.

Thank you for expressing your thoughts about art and science so eloquently. I will save this piece for future reference.

Robert J. Cindrich
United States District Judge

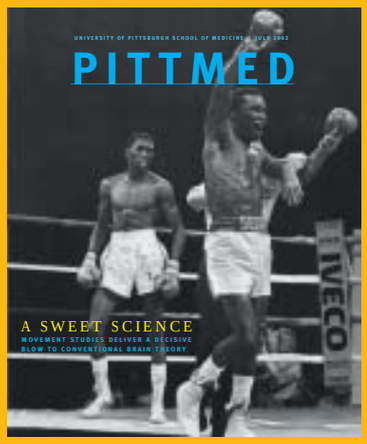
TRAFFICKING TUNNELS

RE: Definition of Carpal Tunnel [July 2002: "only tunnel in Pittsburgh that doesn't cause a traffic jam"]

What is carpal tunnel syndrome if not the biggest traffic jam to all median nerve impulses?

Seniors—hmmph.

Craig Miller, MD '59
San Mateo, CA



A KNOCK OUT

What a powerful issue! Very grabbing cover, too. You probably knew that Sugar Ray Leonard was a native DCer.

Barry Berkey, MD '61
Fairfax, VA

I am a former associate professor of orthopaedic surgery at Pitt and the proud Dad of a fourth-year med student, Kate. I just read the new *Pitt Med* and was intrigued by the work of Peter Strick. It was also great to see the photo of Lois and Tim Oliver, former colleagues, and it brought back delightful memories of my days on the admission committee with Lois.

Best wishes for continued success.

Carl L. Stanitski, MD (Res '74)
Medical University of South Carolina
Charleston, SC

NEEDLESS VIOLENCE

Most ethical physicians condemn professional boxing for its needless violence resulting in serious injury to satisfy the blood lust of its barbaric spectators. The AMA has repeatedly called for boxing to be outlawed. Therefore, I was appalled to find the cover of your July issue glorifying this violence. Like the spectators in the Colosseum of ancient Rome, you revel in Mr. Leonard's movements, and totally ignore the injuries inflicted on his opponent, "flustered and knocked off balance." There are many nonviolent forms of athletics in which motion could be studied—swimming/diving, figure skating, track, ballet, etc. I also teach medical students and would never subject them to videos of such violence.

I will get my professional information from more ethical sources.

George Bent III, MD (Res '75)
UPMC Shadyside

We gladly receive letters and photos (which we may edit for length, style, and clarity).

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2002 MAGAZINE HONORS

Gold Medal, Special Interest Magazines
2002 Council for Advancement and Support of Education (CASE)

Gold Medal, General Interest Magazines
2002 CASE District II Accolades

Gold Medal, Best Article of the Year
2002 CASE District II Accolades

Silver Medal, Periodical Staff Writing
2002 CASE District II Accolades

Honorable Mention, Magazine
Women in Communications
Pittsburgh Professional Chapter

Matrix Award, Best Article of the Year
Women in Communications
Pittsburgh Professional Chapter

PITTMED

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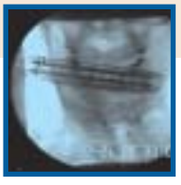
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CONTRIBUTORS

MARY ANN AUG—Before today's 24-hour news cycle, Mary Ann Aug was doing PR for the medical school, handling early media coverage of such Pitt legends as Bernie Fisher and Hank Bahnson. (She got to watch Bahnson perform open-heart surgery—he wore cowboy boots, she recalls.) The associate vice chancellor would become a legend herself in communication circles: In her 30 years at Pitt she helped launch news events like the US-Soviet citizens summit, which included uninvited KGB, and built pathbreaking media programs (*Pitt Magazine* and *Pitt Med* were birthed under her watch). As she retires, we'll miss her wit and wisdom, but are pleased she'll pursue another love—plans include volunteering with the Audubon Society. But sorry, she says she's not doing the newsletter. C. E. MITCHELL—["On the Clock"] After spending 12 hours shooting our story on trainees at Presby, C. E. Mitchell later returned to photograph another procedure. He has also captured the last five presidents on film, and his photos have appeared in *Time, Newsweek,* and *Der Spiegel.* In 1994, Mitchell was caught sneaking into Haiti on a moped a few days ahead of the US Marines. He says he'll go anywhere for a great photograph. CHUCK STARESINIC—["The House that Hank Built" and other stories] admirably filled in this summer while Dottie Horn, our associate editor, was out. The job, he says, enabled him "to practice" journalism—as if his work with the *Washington Post* were just pretending. He's moving on to tackle *Bug Hunters,* his book-in-progress about entomologists.

COVER

Sales of caffeinated products may dip slightly next year due to new restrictions on resident duty hours. (Illustration: © Michael Lotenero)

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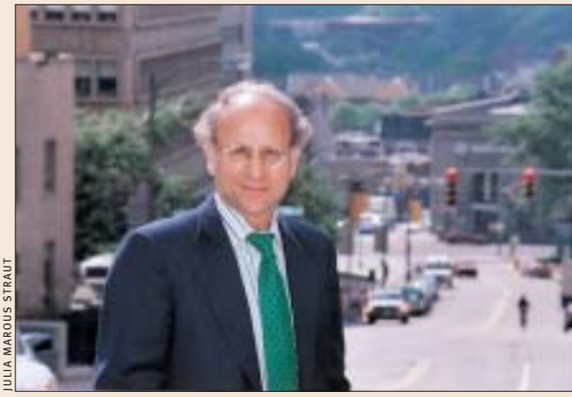
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JULIA MAROUS STRAUT

I have discovered that most of the beauties of travel are due to the strange hours we keep to see them: the domes of the Church of the Paulist Fathers in Weehawken against a smoky dawn—the heart stirred—are beautiful as Saint Peters approached after years of anticipation.

William Carlos Williams, the great poet and physician, reminds us how much what we value is influenced by perspective. The roofline of a New Jersey town can rival the splendor of Rome. It depends on what you're looking for.

The University of Pittsburgh School of Medicine consistently ranks in the top tier of institutions listed in *US News & World Report*'s Best Graduate Schools edition. This ranking pleases alumni, and may influence applicants, but I and many other deans believe that such rankings are ill-conceived and possibly pernicious. If reality is the dream of a mad philosopher, the inappropriate use of statistics is his nightmare: Ten percent of a school's ranking is based on faculty/student ratio, though the survey does not identify which faculty members actually teach and aren't virtually full-time clinicians. Thirty percent of a school's score is attributed to NIH funding, though some schools include funding for public health research while others don't. Forty percent is based on "reputation," derived from a survey of senior faculty and administrators. The magazine has had no more than a 50 percent response rate from that survey in recent years—not statistically robust. *US News* has reported no difference in reputation rankings throughout the last 25 years despite enormous changes in the schools themselves. I suspect that in many cases schools are deemed "great" even if the respondent is not familiar with the program in question, but only with its university's overall reputation. The magazine rescales its scores so that Harvard gets 100 percent and Northwestern 45 percent: Is the latter really only half as good as the former?

It's helpful for the magazine to show potential applicants, as they do now, what sort of grades and scores a given school expects of its candidates, but wouldn't it make sense for the overall ranking to reflect student creativity and the quality of the careers graduates establish? What caliber of residency programs are graduates entering? (Currently *US News* reports the percentage of graduates who were accepted into one of their first three picks, even if they aimed "low.") What percentage of a school's graduates serve the underprivileged? Embark on research careers? And what percentage of tuition goes to teaching? What resources are available—lab space, number of teaching beds, dual degrees offered, etc.?

Now the medical profession is fragile for economic reasons, yet the opportunity to better the human condition through health-care research is profound—do we want these rankings to be a disincentive to any applicant, and can there be any real use in comparing schools with very different priorities? Programs filling critical societal needs are bypassed by *US News*' current methodology. How does one compare an Ivy League venerable to Howard? Or to a school that specializes in rural medicine? Or to one committed to educating in-state students? Weehawken's Paulist Fathers may not lift their eyes every day to a ceiling painted by Michelangelo, but they've got one hell of a view of Manhattan.

Arthur S. Levine, MD
Senior Vice Chancellor for the Health Sciences
Dean, School of Medicine



Devoted to noteworthy happenings at the medical school . . . To stay abreast of school news day by day, see http://www.health.pitt.edu



A consult from 5,000 miles away

X RAY: COURTESY CHANG. OMOTADE: JEN URICH

Pitt Faculty Join Air Force

A doctor at an airbase near the Persian Gulf is reviewing an x ray, but she's not comfortable making a diagnosis. She can't tell if what she's seeing is a benign cyst or a malignant mass, and the nearest radiologist who can give her a consult is a continent away. A system that Paul Chang developed in Pittsburgh will shorten the distance between that x ray and the expert radiologist.

Chang, associate professor of radiology informatics at the University of Pittsburgh School of Medicine, developed Dynamic Transfer Syntax, which transfers large medical images over the Internet and is of great interest to the US Air Force, which doesn't have a radiologist at every base. Similarly, the air force doesn't have enough pathologists in its ranks. Pitt pathologists are about to abate that problem. Yukako Yagi, John Gilbertson, and Michael Becich designed a program (whole slide image technology) that enables the transfer of dense pathologic slides over the Web. With the help of an $8.5 million appropriation to the medical center from the US Air Force Medical Service, the radiologists and pathologists are refining their systems for the military. ***—MH***

FOOTNOTE

If only Mayor Murphy had thought of this.

LE LAVANDOU, France (Reuters), August 22—Gil Bernardi, mayor of this French Mediterranean town, faced with a cemetery "full to bursting," has banned residents from dying until he can find somewhere else to bury them.

"Initially, the decree has been remarkably well followed," the mayor said.

OMOTADE LEADS NATIONAL ORG

When Paula Davis, assistant dean for student affairs and director of minority programs for the School of Medicine, first met Aderonke Omotade, she knew there was something different about her: "I remember thinking she was one of those people I'd love to be when I grow up."

It's easy to admire Omotade (Class of '03), who rushes from place to place with barely five minutes between tasks. Maybe she's heading to a tae kwon do session; she's close to getting her black belt. Maybe she's organizing a program to mentor kids. Or in the library practicing Spanish or Yoruba, a West African language her parents speak. And now, Omotade is the second Pitt student in recent years to head the Student National Medical Association, an organization for minority medical students. Not surprisingly, she's eagerly diving into her new role. ***—MH***



Omotade



TOM ALTANY



Cancer Center Opens

One might say the new Hillman Cancer Center consists of two wings separated by a five-story atrium, but that would miss the point entirely. The atrium does not divide so much as it joins the complementary wings. One is dedicated to patient care, with state-of-the-art diagnostic facilities, such as CT and PET scanners. Bridges span the atrium to link those suites with ultramodern research areas, connecting the dual role—clinician and researcher—of many who work here.

The labs are bright, spacious, and loaded with data, telecommunications, and wet bench facilities. Fitted with a system of modular walls, the labs are configured to fit the needs of each research team. On every floor, a conference room, kitchen, and lounge surround a monumental open stairway, encouraging informal interactions among researchers, not to mention stair climbing. *—CS*

FOR MORE INFORMATION:
http://www.upmccancercenters.com

KANTER'S INFLUENCE LAUDED

Steve Kanter remembers when his dad moved his family to the border town of Laredo, Texas, in the late '60s. The elder Kanter, an education professor, was enlisted to help start a branch of what is now Texas A&M University to offer teacher education to the community, which, until then, relied almost solely on high school grads with "emergency certificates" to teach Laredo high school students. "That program really made a difference," Kanter says looking back. Today, the admiring son is Pitt med's senior associate dean. "I've always been interested in education and teaching, and in the kinds of innovative things that you can do to help people think better about what they're doing," he says. Pitt has certainly reaped the benefits of those meditations. Kanter has shepherded the school's curriculum reform efforts for the past decade and trained hundreds of faculty as facilitators. At the annual spring Curriculum Colloquium, he was recognized with the Distinguished Service in Medical Education Award, which the school has presented only one other time in its history (to Sheldon Adler and Carol Coffee in 1998).

The colloquium was also witness to two new award presentations: Ross Musgrave (MD '43), executive director of the Medical Alumni Association and role model for generations of Pitt students, was handed the first Donald Fraley Award for Medical Student Mentoring. Jack Schumann, associate professor of neurobiology, received the inaugural Sheldon Adler Innovation in Medical Education Award. *—EL*

A Lift for Faculty, Postdocs

By Chuck Staresinic

At the last annual meeting of the Association of American Medical Colleges, Associate Vice President Janet Bickel received a welcome surprise. She had convened a panel of leaders in medical education to discuss a frequently overlooked issue—many schools seemed to be putting less emphasis on faculty development, failing to invest in their greatest resource. When the discussion was opened to include the approximately 200 in the audience, Dean and Senior Vice Chancellor Arthur Levine stood up to announce that the schools of the health sciences at Pitt were creating a new Office of Academic Career Development to address this very issue.



PATTY NAGLE

Lakoski

"I think he was trying to inspire his colleagues," Bickel recalls. "I was delighted."

One year later, Joan M. Lakoski heads that new office as the founding assistant vice chancellor for academic career development. Lakoski believes that by helping postdocs and junior faculty members focus on what they need to accomplish at each career stage, through leadership and mentoring programs for instance, Pitt will become the premier place to develop a career in biomedical research.

"There are so many adjustments you have to make in a very short period of time." Lakoski says regarding junior faculty members. "It's probably the first time in your career that you have to manage people, you have to equip a laboratory, you have to develop a line of research expertise, you have to write grant proposals, and you have to teach." That's also when many would like to start families or already have young families at home.

Lakoski, a mother of two herself, is continuing her own National Institutes of Health-funded serotonin receptor research at Pitt as a professor of pharmacology. At Penn State, she was the interim chair of the Department of Pharmacology and professor of pharmacology and anesthesiology. As cochair of that school's Committee on Postdoctoral Fellows, she successfully pushed for a more formal system to support career development.

"Dean Levine has taken what I consider a visionary step of putting forward the resources to support his faculty and postdocs," Lakoski says. "Most places will give lip service to this . . . but when it comes down to it, many will say, 'Well, we can't afford that right now.'"

TO CONTACT DR. LAKOSKI: jlakoski@hs.pitt.edu



GETTY IMAGES

ONBOARD: KLAUSNER, SCOLNICK, AND OTHER LEADERS

Three national leaders joined the School of Medicine's Board of Visitors this year. The board advises the school on a broad range of issues, from education to clinical and research priorities.

Edward M. Scolnick is president of Merck Research Laboratories. Under his leadership, Merck developed the drug Mectizan, which prevents river blindness, a disease endemic to Africa. In 1987, Merck announced it would donate Mectizan wherever it was needed and for as long as necessary. Scolnick says that joining the Board of Visitors is an opportunity to stay on top of the cutting-edge work conducted at Pitt.

In 1995, President Clinton appointed Richard Klausner director of the National Cancer Institute, a post he held until stepping down last year. He's now executive director of the Global Health program at the Bill & Melinda Gates Foundation. Known for his contributions to genetics and cell and molecular biology, Klausner was awarded the University of Pittsburgh Dickson Prize in Medicine in 1998.

Arthur H. Rubenstein is a prominent diabetes researcher and the current dean of the University of Pennsylvania School of Medicine. He is remembered at Mount Sinai School of Medicine as the dean who shook things up, successfully challenging the faculty to integrate basic science courses with clinical training and bring electronic media into the classroom, among other innovations.

The school netted two other great catches for its board late last year: Catherine DeAngelis (MD '69) is editor of the *Journal of the American Medical Association.* In 2001, she received the Marion Spencer Fay Award, given annually to a pioneering woman by the National Board for Women in Medicine. In addition to joining the Board of Visitors, G. Nicholas Beckwith III, president and chief executive officer of Beckwith Machinery Company, was elected chair of UPMC Health System Board of Directors this year. —*CS*



CRAIG THOMPSON

A HEALING CAVE

You stand on a platform the size of a bathroom scale. The floor around the platform is actually a projection screen, as are the walls on either side and directly in front of you, though they may appear to be a supermarket aisle, a tunnel, or even a cliff edge. You might mistake this virtual contraption for an enormous video game, if it weren't in an academic medical center. Even its name is playful: Eye and Ear Institute's Medical Virtual Reality Center faculty call their creation "the cave." Their intentions are serious, however. Pitt doctors hope to use the cave to rehabilitate patients with balance disorders and to answer basic questions about why certain visual environments cause people to lose balance. ***–CS***

Appointments

As the school's new division chief of plastic surgery, **W. P. Andrew Lee** plans to collaborate with Pitt experts in transplantation and tissue engineering. Lee conducts research on transplantation of whole body parts, such as hands and limbs. His goal is to reach a transplantation watershed—to eliminate the need for immunosuppressive agents taken chronically or indefinitely, like cyclosporine. "If that can be achieved, it will really open up the horizon in reconstructive surgery," he says. Lee was previously associate professor of surgery at Harvard Medical School and director of the Hand Surgery Service and Plastic Surgery Research Laboratory at Massachusetts General Hospital.



Lee



Williams

Try telling **John P. Williams**, the new chair of anesthesiology, that something can't be done, and you're guaranteed to have that view challenged. Two years ago, his research helped Pitt professors of surgery and anesthesiology perform the country's first cardiac procedure on an awake patient, something long considered impossible. The switch from general anesthesia to a thoracic epidural reduces postoperative pain and eliminates some risks associated with general anesthesia.

Williams expects researchers in his department to play leading roles in another milestone, discovering the basis of anesthetic mechanisms. "We're very close," he says. "I think we're going to find it at the subcellular level." Williams also plans to encourage the development of new ways to use artificial intelligence systems in the management of anesthesia; he envisions using machines that respond automatically to designated deleterious events during surgery. It's one more way to challenge the status quo. *–CS*

SURE STEPS



A year ago, Amanda Malina (Class of '03) became a certified step aerobics instructor—this, after recovering from a broken hip and being diagnosed with osteoporosis. The 25-year-old former figure skater, dancer, and runner also overcame an eating disorder as a teenager. Malina has been interested in women's health issues for years, and, needless to say, that interest has been more than academic. And now, after observing doctors during her rotations at Magee-Womens Hospital, she has decided ob/gyn is the career path for her.

Malina is a recipient of a 2002 Howard Hughes Fellowship for research training. The national fellowship supports her work with mentor James Roberts, director of the Magee-Womens Research Institute and a vice chair of obstetrics, gynecology, and reproductive sciences at Pitt. The two are investigating the relationship between leptin (a protein that regulates fat) and preeclampsia, a condition from which an estimated 5–10 percent of pregnant women suffer.

Malina and Roberts speculate that leptin is one of the signals increasing fatty acid and amino acid transporter levels between the fetus and placenta. Her work will help determine if high levels of leptin increase nutrient delivery during preeclampsia. ***—KM***

ALUMNI CHECKUP: ADAM GORDON

BY CHUCK STARESINIC



Street smart Adam Gordon (left) with colleague Paul Freyder at Harbor Light Center

JIM JUDKIS

If you're interested in crack cocaine and heroin, Adam Gordon is your man. He knows what's available in Pittsburgh, its potency, and its price. He even knows how to snap off a section of car antenna and fashion it into a 3-inch crack pipe. (Simply insert a scrap of pot scrubber as a filter and wrap the shaft in a rubber band so it won't burn your fingers. The pipe is straight as the barrel of a pen.)

These street smart tidbits aren't the sort of things discussed at, say, a Grand Rounds, but this sort of knowledge helps Adam Gordon (Fel '00, Res '98, MD '95) be the kind of doctor he has always wanted to be. As the volunteer medical director for two Salvation Army programs, Gordon works with drug addicts who have decided to change their lives for the better, but who otherwise might not get adequate health care. He interacts with patients in their communities, far from hospital settings that many people find intimidating.

It's the sort of work that often escapes notice, but last year Gordon, assistant professor of medicine at Pitt and staff physician for the VA Pittsburgh Healthcare System, won a national Community Service Award from the American Medical Association. The award recognizes his work at Harbor Light Center, a 90-day drug and alcohol rehabilitation program on Pittsburgh's North Side, and the Public Inebriate Program, an inpatient detoxification center on the South Side. (He points out that Pitt students as well as other faculty also volunteer in these settings.)

On a typical Friday evening, as the city's nine-to-fivers head home, Gordon enters the lobby of Harbor Light to friendly greetings of "Hey, doc!" and "Nice shirt, doc!" (The checkered magenta button-down Gordon wears resembles festive graph paper.) The lobby is more an intersection of hallways than a room. Swinging double doors lead to a cafeteria and communal living space beyond. Directly opposite, a set of glass doors opens to the front sidewalk on West North Avenue, where residents take in a mixture of fresh air and cigarette smoke.

While Gordon talks in the next room with a new patient, one of the regulars, Joe Carter (not his real name), waits his turn. He's a broad, talkative guy with a New York accent. The longest hair on his head runs from his lower lip to his chin, like a caterpillar escaping from his mouth. Through a window, Carter can see Gordon and the new guy in the sort of doctor-patient interaction that Carter has only experienced at Harbor Light. There's no chart and no white coat. The tall, youthful, and soft-spoken Gordon plops down next to his patient, then slouches. He rests his hand on the guy's shoulder as if they were two old friends shooting the breeze. They talk for half an hour.

Carter recalls his first exam with Gordon: "I said, 'This is a regular guy.' He's not standing or sitting at a desk looking over at me, talking in terminology junk. He's being a real person, with his arm around me saying, 'Hey, what's the problem here today? How long did you use dope?'" Carter liked the ease and knowledge with which Gordon talked about drugs and addiction. Carter said he'd used heroin for 14 of his 34 years, but he'd been clean for a couple months. "And y'know, I wasn't ashamed. He made me not feel ashamed."

Gordon is comfortable here at Harbor Light, and there is really no other place the doctor would rather be on a Friday evening: "You can talk to people for hours on end. . . . You're really impacting their lives, and they realize that you're there to help them, not just to go on to the next patient. That's really gratifying after a long day of work when you're seeing people on a schedule."

FLASHBACK

In 1971, when Watergate was just a hotel, radical mastectomy was SOP—until Bernard Fisher began his landmark trials of breast cancer treatment. Again, his studies confirm what has become common wisdom: More sparing procedures such as lumpectomies are just as successful. In publishing 25 years of study conclusions this August, *The New England Journal of Medicine* notes Fisher's "historic trial set the management of breast cancer on a new course."



Nancy Minshew reports that rapid and early brain growth and lack of neural connections bring about autism. LEFT: Katie and Joyce Douglas.

BEDEVILED NO MORE

AUTISM LINKED TO RAPID BRAIN GROWTH | BY DAVID R. ELTZ

All was right with beautiful blue-eyed baby Katie until the devil stole her soul one night. Her mom, Joyce Douglas, couldn't shake the bewildering, irrational feeling for years. How could she? Douglas had put Katie, then 16 months old, down for the night, and the next morning she plucked a different toddler from the crib. She was Katie in body, but *who* Katie had been, her spirit, seemed to have vanished.

Overnight Katie, who by then had mastered "mama" in her three-word vocabulary, refused her mother's attention. She no longer spoke. She was withdrawn. She seemed happy only sitting in a corner, turning the pages of a book, over and over and over; or lying in the tub, on her back, spinning in the enveloping water, tuning out everything and everyone.

After Katie finally was diagnosed with autism in mid-1996 at the age of 2-and-a-half, Douglas blamed herself. She did something wrong, she thought. And she had no idea how to help her daughter, who by then had lived in her own world as long as she'd shared her mother's. Douglas would lie awake at night, obsessing, *I must be the worst mother in the world. Please, God, make Katie well; kill me instead*. "There were so many fires. I couldn't put them out," she says.

"I couldn't fix this one."

At the time, Douglas didn't know that autism runs in families and is on the rise. (It's now diagnosed in one in 170 children worldwide. The rise is partly because high-functioning disorders like Asperger's syndrome are now classified under the broadening umbrella of autism.) And Douglas didn't know that as she was quitting her job and learning about life with an autistic child, Nancy Minshew was establishing one of the first centers of excellence in autism research, the University of Pittsburgh's Autism Research Program, funded by the National Institute of Child Health and Human Development. Nor did she know that because autism research had previously received little federal funding, Minshew, an associate professor of psychiatry and neurology, was just beginning to help change how doctors and other scientists approached the disease.

Minshew had a pretty good idea of what autism was about the first time she encountered it. Around 1985, then a young pediatric neurologist at the mental retardation center at Western Psychiatric Institute and Clinic, Minshew could hear the voices of children from the playground outside her office. Some just weren't right: flat, monotoned, seemingly emotionless. Their timbres were symptomatic of prosody disorders, such as the aphasia often experienced by stroke victims; but the voices were from children with autism. Minshew thought, *This has to be a neurological disorder of the cerebral cortex*.

Her way of thinking, however, was not in vogue. Back then, our understanding of autism, first described in 1943, had advanced little under decades of Freudian scrutiny. As recently as the 1970s, the disorder was characterized primarily as a problem of attention and sensory perception, possibly the result of amnesia. Some in the autism field adhered to the notion that bad parenting, particularly that of cold mothers, caused the disease.

Still, Minshew didn't go unnoticed. Thomas Detre, former senior vice chancellor for health sciences, recruited the stellar scientist in 1984 from the University of Texas Southwestern Medical Center–Dallas for thinking beyond traditional psychiatric theory. Soon, Minshew was forming a concrete profile of the lack of neural function in autism. Beginning in 1988 in a variety of articles, Minshew reported that impairments associated with autism—in social skills, language, memory, and reasoning—were problems involving higher order information processing, distributed throughout the brain.

Minshew had observed that children like Katie could not learn words and colors, how to play with toys, how to tie their shoes and dress themselves, unless they were taught through strict, repetitive therapy. (And there was no guarantee of achieving the same results if the therapist or parent changed the circumstance or place in which the child was taught.) For instance, once Douglas discovered the therapy network in Pittsburgh, met Minshew and other experts, and began to understand the disease, she started to teach Katie the words "yes" and "no." Each day she set in front of Katie foods the child liked and disliked, asking again and again if she wanted them. Sometimes Katie said "yes" to the food she liked most, ice cream. Half the time she did not. It was frustrating, for both mother and daughter, but finally, after engaging in the exercise for months, Katie consistently began to answer correctly.

By 1997, Minshew described the first detailed study of neuropsychologic functioning in autism. She specifically identified a feature common to all the deficits associated with the disease: Autism, she proposed, was a disorder of the brain failing to process complex information.

Then Minshew collaborated on work showing *why* such disorders were likely to occur. In one study (*Neurology*, December 1999), Minshew and colleagues conducted MRI tests of nonmentally retarded people with autism, focusing on the amygdala (the emotional center of the brain) and the hippocampus (an area central to memory). Comparing brain scans of people with autism and people without the disorder, the study showed that the volumes of these areas were smaller in people with autism compared with those of control subjects.

The smaller size of these brain regions indicated that the normal foundation of neural connections with the neocortex that develop in children to support memory for certain complex behaviors was not present in those with autism. Minshew and her collaborators have since made functional MRI images using saccadic paradigms that reveal, for the first time, that the neural wiring simply isn't present in the autistic people they've studied. "To be able to look at the wiring and say, 'It's not there,' I just think is phenomenal," Minshew says.

The missing neural wiring further explains a biological basis for the cognitive disabilities associated with autism. Because of the developing connections, when a 15-month-old learns the word "tree," he can point to any tree or even a hanging plant and comprehend what he means when he says it. But Minshew had seen all along that this development was

BOUND BY RULES

During a scene in *Rain Man*, Charlie Babbit (Tom Cruise) and his autistic brother, Raymond (Dustin Hoffman), drive down a highway. Charlie is driving. Raymond suddenly says, "I'm a good driver," and reaches over, taking the wheel. The car swerves. Charlie regains control of the vehicle, then screams at his brother. Raymond, agitated, starts rocking, and explains that he buys his underwear only at a certain Kmart on a certain street in Cincinnati.

He has no concept of the danger he just put them in. In his head, Raymond knows how to drive, so he tries to. When Charlie yells, Raymond rocks and talks about underwear because that's what he always does when he's upset. This is his "comfort rule." According to a recent study by Nancy Minshew, an associate professor of psychiatry and neurology at Pitt, such behavior is the result of a fundamental disconnect in Raymond's abstract reasoning abilities (*Neuropsychology*, July 2002).

People with autism can only identify concepts; they can't understand them, Minshew says. Because they can't form prototypes, they don't react well to novel situations, like being yelled at or shopping at a new store. Instead, they revert to a "rule"—such as rocking their bodies—which their brains use to comfort them. According to Minshew, Raymond doesn't have the neural wiring to solve problems; his brain selects a rule that identifies specific problems, or concepts. And if he doesn't find one for a given problem, his brain chooses his comfort rule—the Kmart rock. *—DRE*

DONALD KOCH

not happening in autistic people. And those with autism couldn't seem to understand concepts, be they tree, God, or woman.

"They just don't get it," Minshew says.

She once heard a boy say, "I don't like Christmas. I don't like presents. I don't like surprises. I'll make a deal with you; I'll come down and open one present on Christmas morning, provided I know what's inside beforehand." He had simplified the concept of Christmas as a ritual of surprise, missing the symbolic connection to the story of the three kings who brought gifts and goodwill to a child deemed the messiah.

Minshew's latest imaging study, published jointly with researchers at the University of Washington in Seattle, shows that from birth to about age 3, the neocortical areas and the gray and white matter in the brains of autistic children grow faster than in other developing children (*Neurology*, July 2002). The abnormal growth correlates to the time when symptoms like Katie's turning inward begin to occur, usually around the age of 15 months. So when a child's brain wiring is supposed to be forging refined circuitry that allows her over a period of months to start crawling, walking, pointing, talking, and reasoning, instead there's a premature acceleration of growth that fouls up the entire network of development. The effect of the early overdevelopment is abundantly clear: It halts the maturation of neural wiring.

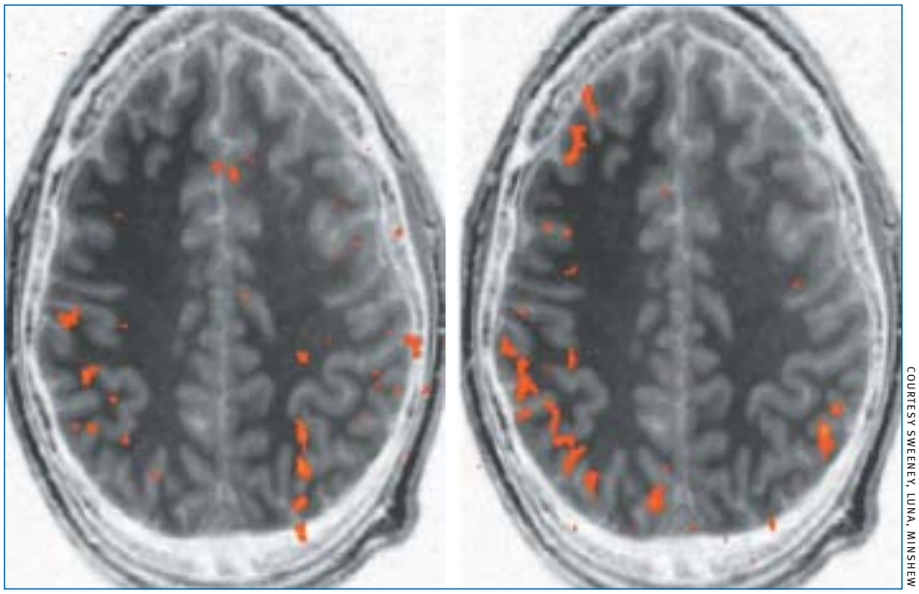
"It's like, instead of planes coming into O'Hare Airport in a very controlled, coordinated way, they all come in at once, too fast, heading for the same place . . . K*ablam!*" says Minshew. "You don't see that in any other disorder. And that's why you have autism."

Now Minshew wants to know how the brain forms prototypes. "If you don't think that's another major piece of the puzzle—" she says, trailing off.

Douglas, now an executive with the Advisory Board on Autism and Related Disorders, for which Minshew is an adviser, is working so that other mothers don't have to face devils in the night. She also plans to enroll Katie, now 8 and entering second grade, in some of Minshew's studies.

The change in their lives has settled on them, accepted if not embraced. Katie, even more beautiful now, with platinum blond hair and China-doll features, takes dance lessons without special adaptations. She's a nice kid; she doesn't complain. She'll get along okay in life, Douglas says. "I wouldn't change Katie for the world.

"I just worry a lot." ■



COURTESY SWEENEY, LUNA, MINSHEW

Pitt's Nancy Minshew recently collaborated with Beatriz Luna and the University of Illinois' John Sweeney on a functional magnetic resonance imaging (fMRI) study that offers the first visual evidence that the neural wiring of people with autism is incomplete. In the scan on the right, the areas illuminated in red in the brain of a person without the disorder indicate pronounced neural activity as the subject performs a high-level executive function. The neural activity differs in the image on the left in a scan of the brain of an autistic subject asked to perform the same task.

NO BIT PARTS

It was just another third-year rotation. Roger Jou (Class of '03) was working with Antoine Douaihy, assistant professor of psychiatry and medical director of the dual diagnosis unit at Western Psychiatric Institute and Clinic. It was just another rotation, but there was something about Douaihy. His patients had substance abuse problems and psychiatric disorders, but Douaihy never just gave them medication. He tried to change their thought processes. Maybe explain a different view to them. And he sort of did that for Jou, too. Douaihy didn't just introduce him to psychiatry, he invited him to *Don Giovanni*, Jou's first opera.

After this rotation, Jou wanted to pursue neuropsychiatry. A colleague told him that Antonio Hardan, assistant professor of psychiatry, was doing research on autism with Nancy Minshew (see p. 8), and the lab often worked with students. Jou thought it would be a good opportunity to get his feet wet.

Instead he was immersed. Jou got involved with three research projects. In two, he examined MRIs to determine how brains of autistic people appear to differ from others. He also examined the effect of an anticonvulsant on 15 adolescents and children with autism. Researchers reported that valproic acid, another anticonvulsant, reduces some autistic traits, like aggression, but it can damage the liver. Since the anticonvulsant Jou and Hardan are studying works similarly, they thought it might hold promise as a therapy. As the results of their limited trial come in, it looks as if the drug reduces hyperactivity and enhances attention. The researchers have also seen minor reductions in anxiety. Not only is Jou playing a part in potential new therapies, he'll be a coauthor on a paper the lab is submitting for publication and was chosen to present the group's work at the National Medical Students Conference on Psychiatry and Neuroscience at Columbia University.

After working with Douaihy and Hardan, Jou's thinking he'd like to pursue a clinical research career. He loves the investigative nature of the bench and still craves the human interaction of the clinic. Jou came into the lab summer nights and weekends, whenever necessary, but made it a point to patronize the arts as well. He enjoyed City Theatre's recent production of *Blackbird*, which is about a drug-addicted couple. He couldn't resist, however, diagnosing the characters' personality disorders while watching the play. *—MH*

LANGUAGE STUDIES

DOES DNA COME IN DIFFERENT LANGUAGES?

BY ROBIN KRIEGER MEJIA



DAVID POHL

At the most basic level, do humans share an organic alphabet with, yet speak a language different from, other life forms?

Proteins are workhorse molecules, helping us do everything from building muscle to keeping our hormone levels in check. And when our bodies create malformed proteins, the problems can be as serious as the benefits bestowed by the regular molecule. A modified hemoglobin protein causes sickle cell anemia. Transmissible spongiform encephalopathies, of which mad cow disease is an example, are also caused by misshapen proteins.

How a protein contorts itself into a given shape is critical to good health, and yet we don't really understand why a protein forms the exact three-dimensional shape it does.

If DNA is the book of life, as is sometimes said, the truth is we are still learning to read. Even when scientists know the genetic code and resulting amino acid sequence of a protein, it's still impossible to predict exactly what its final shape will be. Now, a small group of scientists is challenging one of biology's most basic assumptions. The University of Pittsburgh's Judith Klein-Seetharaman and collaborators suggest that DNA may not be a universal code for life, in the sense that the relationship between amino acid sequence and protein shape may not be uniform across species. They speculate that the DNA of different organisms could actually be written in different languages.

Klein-Seetharaman, who joined the Department of Pharmacology in March, notes identical strings of amino acids can create custom folds, depending on the organism; alternatively, proteins with different sequences can fold into similar shapes. In fact, many very different types of organisms contain similarly shaped proteins, and these proteins sometimes have noticeable variations in their amino acid sequence. So perhaps the DNA sequences that code for specific shapes or functions are species-specific. Much the way French and English use the same alphabet to create different sentences, a bacterium and a person may use the same nucleotides to code for different things. The idea makes sense: Each species' cells provide a unique environment for the folding process.

With Raj Reddy at Carnegie Mellon University (CMU) and others at Pitt, CMU, the Massachusetts Institute of Technology, the Canadian Research Council, and Boston University, Klein-Seetharaman hopes to learn to read various species' protein languages. The collaborators are applying statistical models used in linguistics to problems of protein folding, and they're turning heads. The group recently received $9 million from the National Science Foundation to support the project.

The availability of large amounts of text enabled linguists to develop computer programs that analyze the structure of language, extract meaning, and make predictions. Klein-Seetharaman and collaborators hope they'll be able to use the huge amount of genetic code that has been sequenced in recent years in the same way. The goal, says Klein-Seetharaman, is to see, "Can we derive some set of rules of what constitutes the 'words' of protein sequences?"

Already the researchers have clues. Rare sequences of DNA code tend to be more important to the final shape of a protein than common ones. A similar rule applies in texts—rare words tend to define the meaning of a passage.

And what qualifies as a rare sequence varies between species, supporting the notion that we may need to learn to read a different language for each species we study.

Or perhaps scientists will just need to become accustomed to different dialects. Klein-Seetharaman wonders if interpreting genetic codes from species to species may more closely parallel making sense of, say, British versus American English, rather than translating between English and French.

Klein-Seetharaman, a native of Germany, is willing to learn whatever organic language is needed to pursue her lab work. The PhD biochemist worked with Nobel laureate H. Gobind Khorana at the Massachusetts Institute of Technology. She studies G-protein-coupled receptors, which are important to many biological pathways and may hold promise for new drug designs. Getting enough of these receptors, which come from human cells, for her studies can be difficult."That's often the limiting step in doing the experiment that gets you the exciting results," she says. But understanding the language of various species' proteins could allow her to enhance current recombinant technology. By manipulating human gene sequences according to the language rules of bacteria, she hopes to one day employ the bacteria to manufacture experimental receptors that "fold right" for her purposes.

If Klein-Seetharaman and her colleagues are on the right track, becoming fluent in DNA languages, or dialects, could have huge medical implications. ■

THE HOUSE THAT

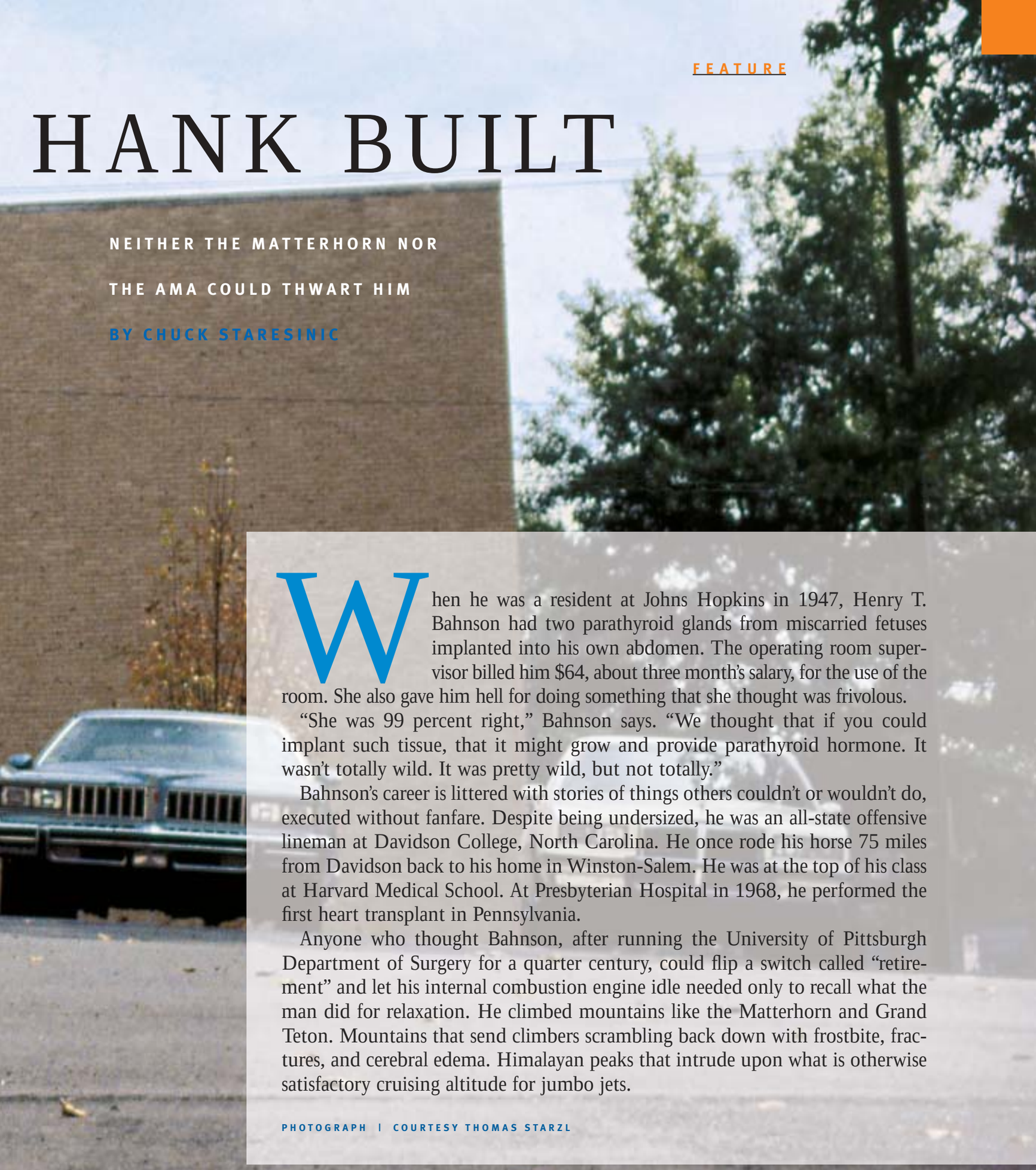


Ask Tom Starzl: There's no separating the Hank Bahnson who climbed mountains and took big risks from the Hank Bahnson who gave Pitt's Department of Surgery the standing it enjoys today. ABOVE: **Bahnson (left) and Starzl on a skateboarding break in the '80s.**

HANK BUILT

NEITHER THE MATTERHORN NOR THE AMA COULD THWART HIM

BY CHUCK STARESINIC



When he was a resident at Johns Hopkins in 1947, Henry T. Bahnson had two parathyroid glands from miscarried fetuses implanted into his own abdomen. The operating room supervisor billed him $64, about three month's salary, for the use of the room. She also gave him hell for doing something that she thought was frivolous.

"She was 99 percent right," Bahnson says. "We thought that if you could implant such tissue, that it might grow and provide parathyroid hormone. It wasn't totally wild. It was pretty wild, but not totally."

Bahnson's career is littered with stories of things others couldn't or wouldn't do, executed without fanfare. Despite being undersized, he was an all-state offensive lineman at Davidson College, North Carolina. He once rode his horse 75 miles from Davidson back to his home in Winston-Salem. He was at the top of his class at Harvard Medical School. At Presbyterian Hospital in 1968, he performed the first heart transplant in Pennsylvania.

Anyone who thought Bahnson, after running the University of Pittsburgh Department of Surgery for a quarter century, could flip a switch called "retirement" and let his internal combustion engine idle needed only to recall what the man did for relaxation. He climbed mountains like the Matterhorn and Grand Teton. Mountains that send climbers scrambling back down with frostbite, fractures, and cerebral edema. Himalayan peaks that intrude upon what is otherwise satisfactory cruising altitude for jumbo jets.

PHOTOGRAPH | COURTESY THOMAS STARZL

Retirement came anyway; in 1987, Bahnson stepped down as chair. When he became a student of the harmonica, it was easy to adopt the notion that his fierce intellect and drive to excel were easing into retirement. That was before he cowrote a peer-reviewed paper on the acoustics and physiology of harmonica playing. That was before he patented the Bahnson Overblow Harp—a harmonica that allows anyone to hit notes only highly skilled players can produce on a normal harp. In short, that was before it became abundantly clear that Henry T. Bahnson pursues hobbies with roughly the same intensity with which a lion pursues a zebra.

The house on Dorseyville Road is modest and unassuming. From the front, one would never guess that inside the man Thomas Starzl calls "the best technical surgeon I ever saw in all the world," looks out the back window at 11 acres of forest and fields and a barn stabling horses. There are no towering columns to flank the front door and make visitors feel small. Instead, two Colorado Blue Spruces stand sentinel at the far end of the driveway, and a few silver maples and locust trees gather round the split-level ranch Bahnson built nearly 40 years ago, where he spends most days. He has been retired as chair almost 15 years now. On November 15, he will be 82 years old.

When asked, Bahnson will talk about his long career with a slightly bemused smile, as if he's not entirely convinced the subject is worthy of protracted discussion, but he's willing to indulge. Despite living in Pittsburgh for almost 40 years, the piedmont of North Carolina is still present in his voice.

"I suppose I came along at the right time," he says with typical paucity of pride. "In the '50s especially, it seemed there was something new in cardiac surgery every few weeks, and I had the opportunity to develop some innovations myself."

A shock of white hair rises from his forehead, though perhaps not as thickly as in years past. A bit hesitant now, he gestures like a conductor with hands that seem made for someone of greater stature. Carpenter's hands, still broad and strong in the fingers and knuckles though they have not reined in a horse, grasped a ski pole, or held a scalpel for some time.

Bahnson arrived at Johns Hopkins in 1944, the onset of a milestone period in surgery. On November 29, Alfred Blalock operated on a frail little girl, blue with cyanosis. He joined her subclavian and pulmonary arteries in order to bypass an obstruction in the heart and increase blood flow to her lungs. Bahnson helped care for her over the next several days as she gradually lost her blue color, nearly died on more than one occasion, and finally began a complete recovery. It was the world's first constructive heart surgery, and the first of thousands of "blue baby" operations.

The Hopkins resident chosen to assist on what one observer called "Al Blalock's triumphal tour of Europe" was Bahnson. To universal acclaim they repeatedly demonstrated the success of the blue baby operation. In Paris, they were shown a young adult with another condition with which they were familiar; a persistent opening, or ductus, between the aorta and the pulmonary artery was growing larger as the patient grew, overwhelming the lungs with blood and causing near heart failure. A fatigued Blalock demonstrated his faith in Bahnson by asking him to perform the operation. While Blalock went to see the Tuileries Gardens, Bahnson performed the first patent ductus procedure in France amid a crowd of clamoring surgeons.

Back in Baltimore, Bahnson continued to build his own reputation. He was one of the first in the world to successfully excise thoracic and abdominal aneurysms and replace them with grafts. He experimented with different ways of removing and preserving grafts from cadavers. He developed fabric replacements for faulty valves and sewed them into the great vessels of the heart. Bahnson calls these "the baby steps" that led to modern cardiac surgery.

He left Johns Hopkins in 1963 to become head of the Department of Surgery at Pitt. His goal was to take a program with little national standing and turn it into one that instilled pride and loyalty in everyone associated with it. He inherited a department spread out among several hospitals and dominated by part-timers largely committed to private practice. There were four full-time faculty members. That began to change as older part-timers retired and Bahnson recruited for a program increasingly centered at Presbyterian, Children's, and Magee-Womens Hospitals.

"He captured the imagination of a number of good surgeons in the community, like J. R. Watson, his son Charles, Ralph Wilde, David Clare, Bob Atwell, and many others," says Ralph Siewers, one of the surgical residents recruited in Bahnson's early years.

Bartley Griffith, chief of cardiac surgery and director of the thoracic transplant program at the University of Maryland, trained under Bahnson in the '70s; he remembers an unspoken competition with a new faculty member, Ted Drapanas: "Dr. Bahnson would come in at six o'clock in the morning to do his work, and Dr. Drapanas was there one morning before Dr. Bahnson. Then the next morning, Dr. Bahnson was there five minutes earlier. Then Dr. Drapanas was there five minutes earlier. So they kept chasing each other right back into midnight. No one said a word, but each was quietly saying, 'I can get here sooner than you can.'"

"I didn't know anything about this school other than the fact that if Hank Bahnson were here, and if I were in his department, then that would be the place to be."

"He was very intimidating but at the same time exhilarating," says Griffith.

"There were residents who became very nervous and developed a major tremor when they were operating with him," says Siewers who adds that Bahnson was always a kind teacher, never denigrating. "If he thought you were having trouble, he would know that and show you how to do it correctly."

Griffith can still rattle off Bahnson's inviolate patient protocol: "White coats never touch the bed. Neckties. You conduct yourself as a gentleman, always.

"His patients loved him. I wouldn't say he was a cozy, chatty guy. He was more aloof. Of course, he was that way with everybody. He was such a presence that patients just liked him when he came by. And he always came by. He never didn't see his patients. I'd see him sneaking back to see a patient at midnight after a long day of meetings."

If Bahnson saw a patient with dirty sheets or a messy room while on rounds, he was likely to change the linens or wipe down the nightstand himself. "He often said to us," recalls Siewers, "'If the person who's supposed to empty the bedpan doesn't do it, it's your patient, and you have the ultimate responsibility.'"

The patient had no heart. Between Johns Hopkins and the University of Pittsburgh, Bahnson had performed more open-heart procedures than he could remember, but this was something new. It was 1968, and the sight of a living patient on the table with an empty space where his heart had been marked the entrance into new territory for Bahnson and for the University of Pittsburgh.

Minutes earlier, Bahnson had removed the diseased heart. It was inflamed, enlarged, and scarred. An inefficient pump beyond repair. When Bahnson sewed in the donor heart, it was the first heart transplantation in a medical center that would become the organ transplantation capital of the world.

"I came here for one reason only," says Starzl, "and that was because Hank was here. I didn't know anything about this school other than the fact that if Hank Bahnson were here, and if I were in his department, then that would be the place to be."

It's easy to forget that in 1980, neither organ transplantation nor Starzl was the fair-haired child of biomedicine. In the volatile court of public opinion there was an enormous backlash against transplant programs, especially the difficult and risky liver transplants performed by Starzl. Cyclosporine was a promising but still experimental drug; the FDA had approved trials in only three locations. With Bahnson's recruitment of Starzl, Pittsburgh became one of the three.

Starzl credits Bahnson with advocating for a national organ procurement program when it was just an unpopular piece of legislation. The American College of Surgeons and the American Medical Association favored a system with no government involvement in organ distribution.

"Hank found himself in a position that was not in line with that of these powerful embedded interests," Starzl says. "He did it anyway. As integrity often does, it came up roses. He supported the kind of reform that resulted in the national organ distribution system that's in place today. It was a heroic series of events.

"It's hard to conceive of the school's current status without Hank," Starzl says.

Still, he could never fathom one side of the man. He was stunned when Bahnson returned from a mountaineering trip to Pakistan in which an avalanche killed two members of the team. Bahnson looked malnourished and frail. Another time he came back from McKinley with his fingertips blackened by frostbite.

"I thought it was too much risk, frankly," says Starzl, who would eventually give up skiing for fear of compromising his abilities as a surgeon. Bahnson, however, was an extreme skier. He went to the Alps to do the challenging Haute Route—a 50-mile trek across glaciers and through treacherous downhill runs. Starzl recalls meeting the professional guide who took Bahnson on that trip:

"He said that Hank Bahnson was the strongest man he'd ever met."

Starzl knew exactly what the guide meant. There was physical strength and mental strength, and Hank Bahnson had both. Starzl also knew there was no separating the man who climbed mountains from the man who made Pitt's Department of Surgery what it is today.

I tried, almost religiously, to keep Sundays free," Hank Bahnson says of his efforts not to shortchange his family for the sake of his work. But Monday through Saturday were often 12-hour days, if not longer. He took long vacations out West to introduce his five children to the life he loved in the mountains. Behind the house, one can still see the remains of a ski tow he built for the family.

Louise Bahnson was one person who could not join her husband in his outdoor pursuits, but she never tried to dissuade him. She met her future husband in 1944 when Bahnson and a Harvard classmate noticed two pretty sisters playing tennis and asked if they wanted to play doubles. Both couples were married later that year. In 1953 Louise Bahnson was stricken with polio. Bahnson recalls there was a respirator outside her hospital room for a month, ready at a moment's notice. She recovered, well enough to play tennis with the same solid stroke as before, but she lost some of her mobility.

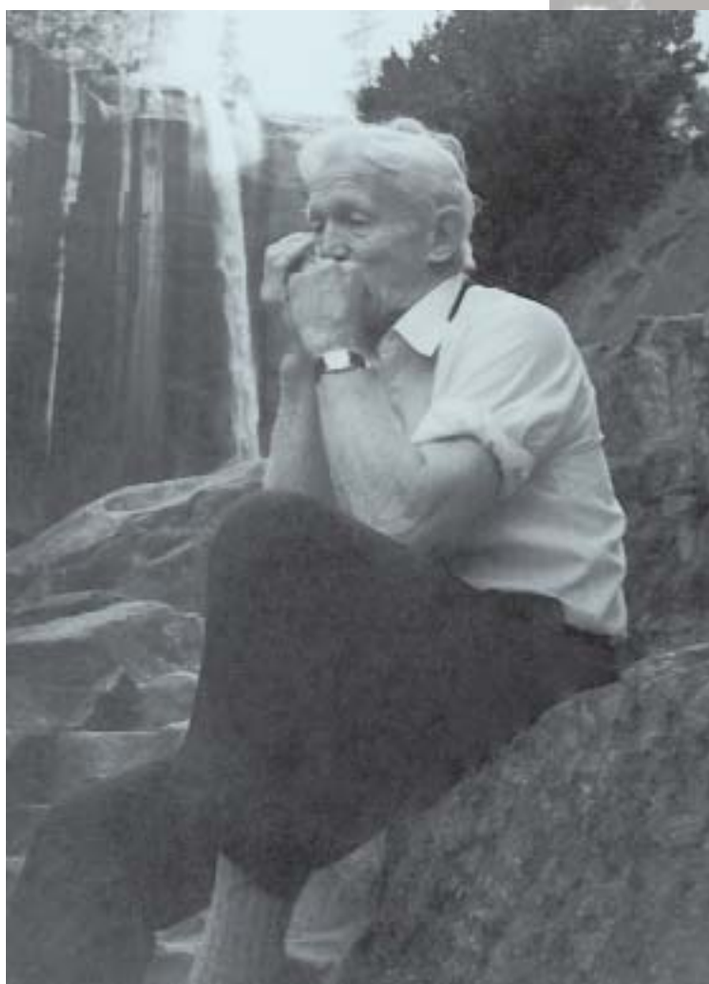
When Louise Bahnson began to suffer from Alzheimer's disease several years back, there were some who advised her husband to find an Alzheimer's unit for her. But he felt it was his job to take care of her, and it was something he very much wanted to do. The family came together to make it possible, with one daughter moving back from out of state into the family home. It would be untrue to say the ensuing years were easy, but Louise Bahnson never did move from that house until she died last year.

Siewers is one of several Bahnson trainees who stayed on to strengthen the tradition his mentor established. He remembers when two girls who had heart surgery suddenly arrested at the same time. Siewers and Bahnson worked for an hour at adjacent beds, using external cardiac resuscitation chest massage and medication but failed to save the children.

Descending in the elevator to deliver terrible news to two sets of parents, Siewers said to his mentor, "Do you ever get used to this?" In hindsight, Siewers knows it was more than a yes or no question. He was a young resident looking for guidance, not only in how to be a doctor, but in how to be a human being.

Bahnson replied simply, "It's not something I ever thought I should get used to." That's when Siewers sensed how profoundly this man cared, and how undeserved was his reputation for being aloof. Ever since, Siewers has maintained it is not only acceptable but necessary to feel such losses deeply.

As the recently retired director of pediatric cardiothoracic surgery at Children's Hospital of Pittsburgh, Siewers has himself become known for his devotion to patients and their families. He relates this as if he's taking credit for something that should rightly go to another, and he says, "It all goes back to the examples Bahnson gave." ■



Bahnson not only took up the harmonica, he patented one. He's shown here at Yosemite National Park.

COURTESY BLAY BAHNSON



THE CRAFT OF ART | BY LEAH KAUFFMAN

THE EGG MAN



Delving into cloning, questioning popular fertility treatments, experimenting with embryonic stem cells, there's little Gerald Schatten's group does that isn't newsworthy. And the fact that his researchers work with our close cousins, monkeys, makes their efforts particularly relevant to human health. ABOVE: ANDi (backwards acronym for inverted DNA) as a baby. ANDi is the world's first transgenic primate, and techniques used to birth him from a petri dish may offer ways to create genetic disease models in primates. LEFT: A rhesus monkey (not ANDi) at the four-cell stage. A gene that makes a jellyfish glow was inserted into the DNA, illuminating one of the very early monkey cells.

While eating out, 3-year-old Gerald Schatten excused himself from his family's company. Peering over the edge of a neighboring table, perhaps pulling himself up on his tiptoes, little Gerald examined his fellow diner's lobster, then—for the benefit of any kindred amateur naturalists within earshot who shared his passion—pronounced its sex. But lobsters were just a warm-up: Throughout his school years, Schatten brought home scores of wildlife specimens found along New York's East River to identify with the help of scientific texts. He credits his forays along that waterway, set among one of the world's highest population densities, for giving him a precursor course in biology.

It's no wonder then that when Schatten went to the University of California, Berkeley, he majored in zoology. A doctorate in cell biology followed. He started with the study of sea urchin development and

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Among those making things happen at the Pittsburgh Development Center: (from left) director Gerald Schatten, veterinarian Buddy Capuano, behaviorist Gerald Ruppenthal, and researchers Laura Hewitson and Christopher Navara.

progressed through the phyla: By the 1990s, Schatten was working with mice, cows, and pigs, investigating the molecular biology of the earliest stages of fertilization and development. In the mid 1990s, seeking an organism that provides an even more accurate reflection of human fertilization, Schatten began working with monkeys. Along the way his labs have been astonishingly productive in the field of reproduction, helping science answer befuddling cellular biology puzzles, like why mammals seem to inherit mitochondria only from their mothers.

Last year, he joined the faculty at the University of Pittsburgh School of Medicine. As director of the year-old Pittsburgh Development Center (PDC) at the Magee-Womens Research Institute and a professor and a vice chair in the Departments of Obstetrics, Gynecology, and Reproductive Sciences as well as Cell Biology and Physiology for the School of Medicine, Schatten continues the work he's long done on assisted reproduction technologies, the field known as ART. In recent years, Schatten's group has added cloning and transgenics to their repertoire, too. One of their findings may even end our national debate about the use of human embryonic stem cells for research and therapies. (Expect more on the embryonic front. As we went to press, we learned that the PDC had just received a shipment of human embryonic stem cells from the National Institutes of Health's tightly controlled registry.)

The treatment of infertility is considered elective by most American insurance companies. Since these treatments aren't covered by insurance, panels of doctors for insurance companies don't rule on which procedures are reasonable. The National Institutes of Health and other government agencies sponsor few clinical studies of ART and limited research involving human embryos. With a dearth of such investigations, patients may undergo infertility treatments without a clear picture of the risks to them, or to their child.

And there may indeed be risks. Evidence suggests that intracytoplasmic sperm injection (ICSI), a popular treatment for male infertility, may increase the likelihood of abnormal development, including chromosomal abnormalities, in the resulting children.

When a man produces too few sperm for normal conception, a couple might consider ICSI. The therapy involves using a miniaturized hydraulic apparatus to steady an egg while a sperm is drawn into a very fine needle, tail first. The needle then pierces the egg, depositing the sperm within. This often results in an embryo and then a baby, but Schatten's group is concerned that some of the molecular changes that take place during spontaneous conception are bypassed during ICSI, with uncertain results. For example, a sperm contains a protein collar that is shed as it enters the egg during spontaneous conception. Associate professor Laura Hewitson, who has collaborated with Schatten for the better part of a decade, helped show that during ICSI this collar is retained, cinching up the area where the sperm's X or Y chromosomes are contained, like a belt around a beach ball. This may prevent the sperm from integrating with the egg's genetic contribution. Another concern is that the mechanical manipulation of egg and sperm might cause damage. Hewitson discovered that in primate eggs, a structural landmark used by clinicians to guide the safe placement of the ICSI needle is not fixed as once thought. The technique of sperm injection, then, might cause chromatin damage. (Though it's a "big leap" to infer chromosomal damage from that stage, Hewitson cautions.)

Since ICSI has been practiced in humans for a decade, there are plenty of ICSI children to study. Yet it may not be possible to detect subtle chromosomal abnormalities in kids so young, before their reproductive years. And it's notoriously difficult to determine the causes of any developmental delays in an uncontrolled setting. Are they genetic? Related to something in the environment? A result of the same thing that caused the father's infertility?

Because we share so much of our genetic makeup with monkeys, what Schatten and his colleagues at PDC learn from studying fertility treatments in them can likely tell us what happens when we undergo the same procedures, giving us a more accurate calculation of the risks. Likewise if their research determines that the risks are small, Schatten's group will be able to reassure clinicians and patients.

The continuation of the ART research depends upon healthy monkeys and their offspring, so the animals are never sacrificed for research purposes. And the PDC opts for minimally invasive procedures in its studies. In fact, while most embryo transfers into monkeys are done with minor surgery, Schatten's group, led by veterinarian Buddy Capuano, is working to perfect the use of a laparoscope instead. (In humans, the procedure

. . . a popular treatment for male infertility may increase the likelihood of abnormal development. . . .





BOTTOM: REPRINTED WITH PERMISSION FROM HEWITSON ET AL., NATURE MEDICINE, VOL. 5, PP. 431-33. COPYRIGHT 1999 NATURE PUBLISHING GROUP. HTTP://WWW.NATURE.COM/MEDICALRESEARCH/. TOP: PORTRAITS BY CAMI MESA

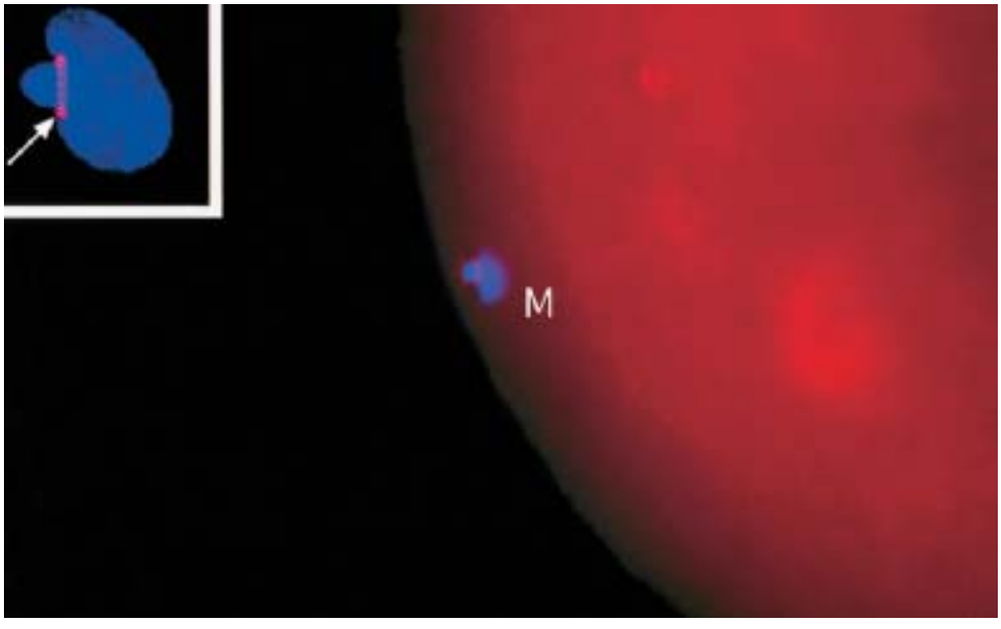
is typically done through the cervix, which is too difficult to navigate in rhesus monkeys.) The small incision required can be covered with a Band-Aid. Under the microscope, the PDC team studies what happens to egg and sperm just after conception. Then, using newer, more powerful imaging techniques, they track the development of a fetus in utero. Later, with the help of non-human primate behavior expert Gerald Ruppenthal, the monkey offspring are closely observed and assessed with a degree of scrutiny impossible in human subjects.

With more than 40 years' experience, Ruppenthal is known the world over for his work on monkey behavior, having edited an influential text on nursery-rearing monkeys (and he's a coauthor on another, to be published next year). By approximating mother rearing as closely as possible, by minimizing stress, and by providing crucial socialization and mental stimulation, Ruppenthal raises monkeys that know how to behave like monkeys.

The two Geralds met when Schatten was at the Oregon National Primate Research Center and Ruppenthal at the University of Washington. Ruppenthal's Seattle nursery, known for its extensive assessments of monkey infants, hosted some of Schatten's ART babies. The behaviorist calls the monkeys "kids." He enjoys watching them at play. Once they get to be about 6 months old, rhesus monkeys zing around like a cat with the evening crazies. They climb, leap, gallop, and wrestle. Harness their energy and you could power the lights of the Cathedral of Learning. In addition to play time with each other, they get intensive human handling in the form of daily physical and cognitive assessments, which not only provide data on development, but also give them intellectual stimulation in the form of puzzles to solve to find hidden treats and toys. More quickly than we can tell them apart, they recognize differences in us. Ruppenthal imitates their enthusiasm for a favorite caretaker by pounding his fist to his chest and leaning forward abruptly, a monkey ready to leap into the handler's arms. His widened eyes are the same cornflower blue as his broadcloth shirt.

Schatten is a considerable source of wattage himself. One day, setting up his laptop to display pictures of embryos and explain ART, he moves around his small, temporary office with hummingbird rapidity. (Next year, the PDC will get a new facility.) It's just as one Pitt administrator told Schatten it would be when recruiting him: The Pittsburgh research community is a scientific theme park, and Schatten is a kid with a ride-all-day, season-long pass. Already he has a roster of ongoing or hoped-for collaborations, with Chien Ho and Eric Ahrens over at CMU (MRI imaging), and Massimo Trucco, Steven DeKosky, Ronald Herberman, David Perlmutter, and Thomas Starzl at Pitt—to name a few. Tell him about a neat project going on up the hill, and he thinks of another potential collaboration. Inspiration is everywhere.

In 1998, inspiration came not from the East River but from the Atlantic waters off southern Massachusetts. Schatten had cofounded the six-week long program, Frontiers in Reproduction, at Woods Hole's Marine Biological Laboratory, meant to give physicians and researchers the most current, complete picture of the field. Staffed with instructors from all over the world, the program is an extremely intensive summer camp for young MDs and PhDs. Sometimes they don't leave the lab until the wee hours of the morning, they're so excited to be introduced to another technique or organism. Sometimes, they change career paths when they get home. Sometimes, even a faculty member is spurred to embark in a new direction. Exposed to an overview of molecular medicine that he would not have been otherwise, Schatten realized at Woods Hole that his group's work could help bridge the gap between experimental mouse studies and human cures. Monkeys have served as models for human infectious disease for a half century or more (the polio vaccine was tested in monkeys before it was used on humans), but they haven't yet been used as a



Laura Hewitson has found that a popular technique to help infertile men become fathers can cause unusual nuclear remodeling. The inset shows a protein forming a constricting ring around the male pronucleus, separating decondensed DNA from the condensed sperm head region. The red globe is the egg cell.

No one knows if stem cells from a primate with a wider gene pool will have the same incredible plasticity.

model for a genetic disease. Could he create transgenic, clonal, and stem-cell derived monkey models that might be studied responsibly to accelerate cures for select and devastating human diseases?

To those accustomed to the fast pace of creating mouse generations, primate research is plate tectonics. (Rhesus monkeys are fertile only in the winter months and are pregnant for five-and-a-half months. Mice come to term within four weeks; they can overrun a facility before the invoice for the Purina Rodent Chow arrives.) So it was a relatively short duration in primate space-time before Schatten was able to present, in early 2000, Tetra, the first monkey, and first primate, made by embryo splitting, also known as artificial twinning—or "poor man's cloning" in Schatten's words. Tetra is one of quadruplet embryos produced by dividing an eight-cell embryo in four and injecting the cells into four empty egg shells (see *Science*, January 14, 2000). Tetra was the only offspring to result, but the technology that created her can help answer some pressing questions: Can stem cells cure diabetes and heal diseased hearts? How does the environment of the womb affect future development? And a load of other riddles.

In lab mice stem cells are spectacularly regenerative, healing gaping bone wounds and restoring muscle function after spinal injury. But those cells come from a few inbred mouse strains. No one knows if stem cells from a primate with a wider gene pool will have the same incredible plasticity. To answer this question, Schatten imagines that one monkey will be carried to term, while its genetically identical embryo provides stem cells that can be studied in its sibling (treating an injury or disease) without the complication of rejection. To help answer a nature versus nurture question, Ruppenthal imagines two identical embryos carried to term sequentially by different mothers, testing various hypotheses about the lifelong implications of conditions in utero.

A year after Tetra's birth announcement came ANDi's. ANDi (a backward acronym for "inserted DNA") is the world's first transgenic primate. Among his own rhesus monkey DNA, he hosts a jellyfish gene called GFP, an acronym for green fluorescent protein. GFP is a benign gene commonly used in labs because the protein it generates can be easily seen under fluorescent light. Though GFP makes jellyfish luminescent, ANDi doesn't glow, probably because his GFP gene isn't switched on and making proteins. In order to cause disease, a gene must produce lots of protein, all of the time. Since little ANDi isn't his own night-light, critics say Schatten is far from making a disease model monkey. (Another monkey in this project, although stillborn, did have fluorescent hair and nails.)

But this is an early effort, and Schatten considers ANDi a success. The techniques that Schatten's team used to construct and conceive ANDi in a petri dish will soon allow them to insert, for example, a gene that contributes to Alzheimer's into just the right place on a monkey's DNA so that the gene's function can be tracked.

Though ANDi proves that a foreign gene can be incorporated into the DNA of a primate, Schatten is far from encouraging scientists to abandon their lab mice and fruit flies for monkey models.

"These are our closest cousins," says Schatten. Biomedical research on primates deserves a great deal of oversight and thought, he says. In fact, he adds, many of the PDC's animal studies don't involve primates, but use sea urchins and rodents.

Transgenic primate models would be employed sparingly as well, as Schatten sees it: "We're working through advisory boards to ask—Are there certain diseases that we've learned so much about in mouse models, and the mouse model doesn't give us enough information to go to people?" He suggests breast and ovarian cancers as possible candidates for modeling. "Only old world primates and humans have monthly cycles. So we know a lot from the mouse world, but it's not yet enough. Or maybe cystic fibrosis. There are great models for cystic fibrosis in mice, but the diseases they get are different and they don't really get a lung disease."

Schatten sees his group producing transgenic monkeys, perhaps even identical, artificially twinned transgenic monkeys, when a cure for a given human disease is in sight, but still untested. One group would receive the trial vaccine or drug treatment while the other group, their twins, act as the experimental controls. The efficacy of the treatment could therefore be judged quickly. "And then we could get out of the monkey business," says Schatten. He predicts it will take at least two years of consideration, preparation, and lab work for the PDC to create the first transgenic monkey models of human disease.

Will the PDC's work bring us closer to a world in which humans are successfully cloned?

The idea is certainly unpalatable to Schatten, who points out that these technologies are designed to be used only as research tools to examine human disease or injury: "We do have ethicists who guide us at each step of the process. We're mindful of the ethical issues and do understand the dangers of extrapolating the science."

On the other side of the coin, maverick commentators, like Greg Stock, director of UCLA's medical technology and society program, think that human cloning by someone, somewhere, is unstoppable. While the use of federal funds for human cloning is banned, any privately funded effort to clone a human is legal. Stock imagines Schatten's work could make any future attempts less likely to result in the sort of physical and genetic abnormalities that have marked attempts to clone other mammals, many of which age—and die—prematurely.

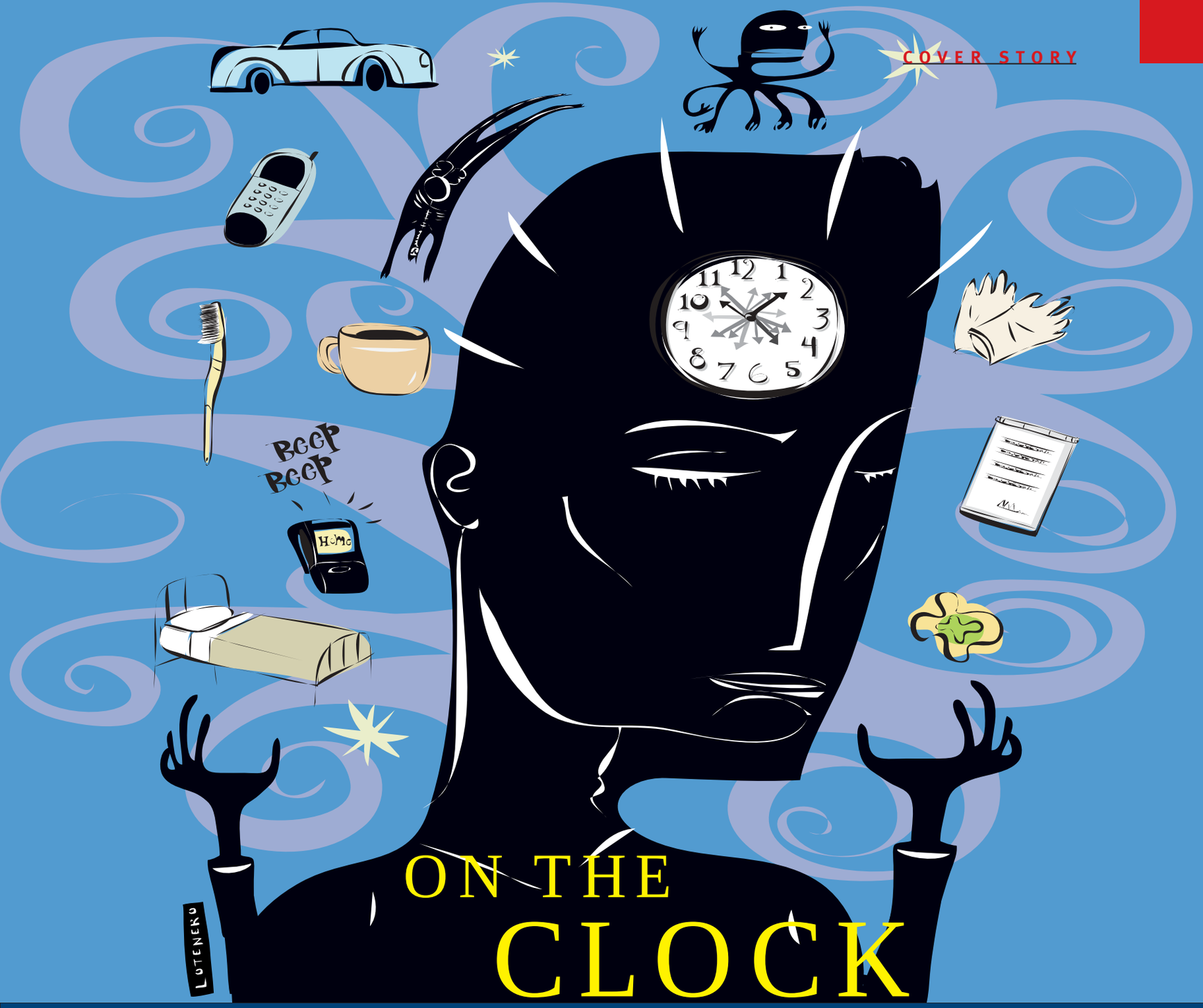
Schatten couldn't disagree more with Stock: "Our work will show that human cloning is very unlikely to succeed and implement."

The PDC has discovered recently that cloning primates by nuclear transfer (the technique used to create the famous ewe, Dolly) poses even more difficulties than scientists imagined. They plan to publish their results in detail this fall.

And there is a windfall finding, reported, though overlooked, in the same *Science* article that introduced Tetra, which may resolve our national debate over the use of human embryonic stem cells.

The PDC team has shown that a few cells can be nipped off an eight-cell monkey embryo—the same technique used clinically for genetic diagnosis of cystic fibrosis and Huntington's disease—and used to culture stem cells. As with genetic diagnosis, the future development of the embryo is unaffected, meaning an embryo needn't be sacrificed for science or for life-saving therapies. Couples who undergo treatment for infertility might have the option of banking not only unused embryos, but—should they be needed one day to treat a family member's illness—precious embryonic stem cells as well. Every constituency in the debate over human embryo research can get its way: Patients can gain new therapies. Researchers can pursue promising experiments. Prolife activists can preserve viable embryos.

"Rather than debating who's going to win," Schatten advises, "be smarter and say, 'How can we all win?'" ■



ON THE CLOCK

AS HOURS ARE SLASHED, BOTH TRAINEES AND THEIR PROGRAMS STILL HAVE MUCH TO LEARN

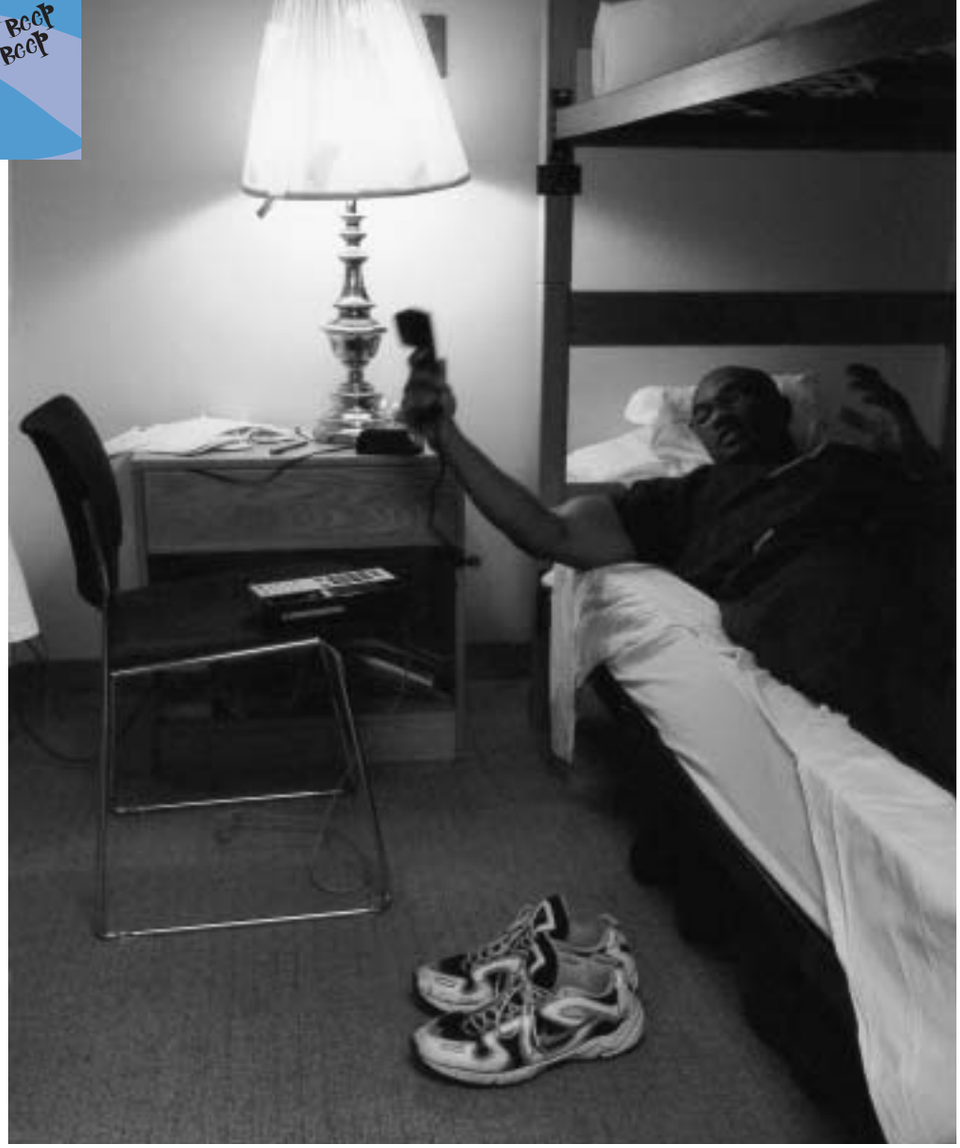
BY DAVID R. ELTZ

Another steamy gust blasts up Lothrop Street, rising fast and hard like a missile in the oppressive dusk. Pittsburgh's weather has been torrid all weekend, a July weekend for some of family picnics, for others of air-conditioned refuge.

Brian Pettiford, Res '01, MD '96, knows another side of summer. He left his wife and son Saturday

ILLUSTRATION | MICHAEL LOTENERO
PHOTOGRAPHY | C. E. MITCHELL





In the dead of the night a shrill pager blares: *beep beep beep beep beep.* A groggy Brian Pettiford rolls over in the cramped bunk bed and reaches for the telephone, his second most familiar instrument next to a pair of forceps. Soon he is everywhere, like a blanketing mist. The ICU. A patient's bedside. Back in the OR. In the cafeteria, he grabs a quick bite with Raja Mahidhara (MD '96), a senior resident in general surgery. Having known each other now for 10 years of training at Pitt, they part warmly. There are other patients to visit and moments of learning ahead.

for 6 a.m. rounds at UPMC Presbyterian Hospital. After a slow day and a brisk workout, the tall and chiseled cardiac surgery fellow was looking forward to a quiet family evening at home. But then he got paged: *We have a heart.* Soon, Pettiford, 32, was spending his family time flying to Grand Rapids, Michigan, harvesting the organ and rushing it back in a frigid plastic cooler for transplantation.

Tonight, Sunday, Pettiford isn't crammed into an airplane seat, where he finds sleeping difficult. Yet, now, in the middle of a 24-hour duty shift, he won't sleep much at the hospital, either: Another doctor is flying in another heart from Washington, DC. It's 7:40 p.m. A man lies on the operating table, his chest spread open, an invitation to the new heart that cardiac surgeon Larry Shears and Pettiford soon will provide. For the weekend, Pettiford has worked almost as many hours as most people accumulate in a week. And his night has just begun. This is life on the medical trainee clock, the reality of medicine. For now.



Come July 1, 2003, universal standards on resident work hours adopted by the Accreditation Council for Graduate Medical Education (ACGME) officially take effect at the 7,800 residency and fellowship programs the organization validates across the country. The standards prohibit graduate medical trainees from working more than 80 hours a week averaged over a month, or on shifts longer than 24 hours. (Residents and fellows can work an additional eight hours a week under "special circumstances" like heart transplants.)

The ACGME standards—a reaction, some say, to the very real threat of federal oversight—went into practice at Pitt *this* July, so that administrators could monitor compliance among its 85 accredited programs. The policy is a clarification for some programs already conforming to the standards. For others, like the surgery residencies, it's a dramatic change. The challenge for those programs is giving trainees time outside the hospital without harming their education.

The graduate medical trainee lives a curious life. On one hand, a resident works for a hospital system. For his services he receives benefits, including malpractice insurance—for which the premiums in Pennsylvania run into the tens of thousands of dollars a year. He earns a salary, ranging at Pitt from $37,000 for first-year interns to almost $50,000 for senior fellows. That comes from the federal government, which reimburses teaching hospitals on average about $95,000 annually from Medicare for the education of one resident.

At the same time, of course, a resident is an apprentice, whose training load differs from residency to residency. A pathology resident might see an angiosarcoma for the first time and spend hours afterward reading the recent literature about it, but not until







reviewing the day's caseload. A general surgery resident, by contrast, might treat 12 patients during a 24-hour duty shift. Then she will make rounds at 6 a.m., spend the rest of the morning and that afternoon completing paperwork, seeing patients, and watching surgeries, finally sitting down at 5 p.m. with the rest of the department for an hour's instruction on ulcer disease.

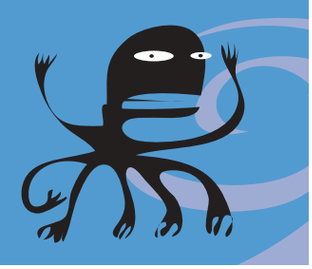
The resident's schedule is infamously unrelenting. Surgery occurs more often at night than during the day: A heart gives out at its own pace. Some cases, an upper gastrointestinal surgery for example, come along only so often. For the medical trainee system to work correctly, so the theory goes, these residents must learn a great deal in a short time, so many are scheduled to work painfully long night shifts for hands-on training they won't find in books. It's not unheard of for residents to stay at a hospital after their shifts end, so they don't miss that day's surgery or continuity clinic, for fear of being ill-prepared to treat similar cases on their own one day.

What's more, today's residents treat sicker patients. In 1900, people who came into the hospital either got better or died. For decades, residents lived at the hospital not only to treat those cases but also because they were required to do so. Now, people live longer with serious diseases that require constant care. And residents still provide much of the treatment, except now they have lives outside of medicine, or at least try to.

Time was the resident experience was a brutal existence, often comprising duty shifts every other night. But in some ways it wasn't nearly as stressful as today's, with many residents now claiming to buckle under the pressure, according to a study in the *Annals of Internal Medicine* (March 2002). Today's residents leave medical school with an average debt burden of $128,000. They are quickly required to master rapidly expanding scientific and clinical knowledge. They may feel conflicting pressures of starting a family, especially residents who are young women of childbearing age. They feel overworked, sleep-deprived, depressed, and cynical about the future. Moreover, the public fears if residents work 136 hours in a week, they will become so fatigued they'll make mistakes that run counter to the doctor's creed, "First, do no harm."

Pettiford and Shears lean over their patient, heads barely touching, staring into the man's trapezoidal chest cavity. It's just before 9 p.m. The operation moves forward with delicacy.

Pettiford slips blue surgical thread through the aorta, transferring a curved needle back and forth between forceps. Shears, the attending, puts a handful of melting ice on the new heart. If it warms too quickly, the heart might fibrillate later, increasing the chance of ischemia, irregular heartbeat, kidney failure. The man's old heart was a general mess. When the doctors opened him up, the heart fibrillated, wriggling like a trapped snake.



Shears and Pettiford had to shock the fist-sized muscle into submission in order to clamp off the arteries. Putting ice on the new heart should prevent it from also fibrillating.

"Sometimes you can be up most of the night taking care of the patient because of this," Pettiford says through his surgical mask.

The procedure is simple, Shears (Res '99), not long ago Pettiford's chief resident, says in jest. You attach the vena cavae, the pulmonary artery, the aorta. "Then I'll go home," Shears says, nodding in Pettiford's direction. "He has to stay and take care of the patient."

Even if he's tired. To him, this is nothing new. Growing up in Tifton, Georgia, Pettiford wanted to be a heart surgeon. His grandmother died of a heart attack; her mother died the same way. And so, when Shears was finishing his residency two years ago and Pettiford asked him, "What's it like?" he didn't blink as Shears said, "Man, it's hard."

It's so hard that at times Pettiford admits he's sometimes humbled. "You think, 'Damn, will I ever learn?'" The fatigue he lives with, trained by experience to handle it, not unlike a member of an elite military unit, he says. Plus, working crazy hours is part of the job. "Do I really like being in the hospital three or four days straight? No. I don't think anybody in their right mind would want to be here," he says, one afternoon after surgery. "You have to put things in perspective. If I were a patient, I would want someone who had worked 100, 110, 120 hours a week [as a trainee], who had seen everything under the sun, operating on me, versus someone who had worked only 40, 50 hours a week, who maybe hadn't seen anything."

The call for change in the training regimen began soon after Libby Zion checked into New York Hospital–Cornell Medical Center one night in 1984 with a high fever and tremors. A junior resident obtained her medical history: She'd taken several medications, including phenelzine, a monoamine oxidase (MAO) inhibitor prescribed for depression and stress relief. The resident, in his 22nd hour of work, diagnosed Zion as suffering from "viral syndrome with hysterical symptoms" and ordered Demerol, a drug contraindicated for patients on MAO inhibitors.

Eight hours later Zion was dead. Within five years, duty-hour limitations became part of the New York State Health Code. The regulations allow residents to work no more than 80 hours in a week and limit duty shifts to 24 hours. A surprise inspection in 1998 at 12 New York hospitals found that 60 percent of surgical residents still worked 95 hours a week.

"The people on the service, particularly the senior residents, are not going to want to leave a patient."

By 1998, the Institute of Medicine concluded that as many as 98,000 people die in the United States each year because of medical errors. A year later 12,000 graduate medical trainees formed a union, the Committee of Interns and Residents. Along the way, the 30,000-member American Medical Student Association (AMSA) lobbied vigorously for federal intervention in the treatment of residents, citing the Zion case prominently.

"Some believe residency is a rite of passage that tests residents' worthiness or that gives a rigorous and systemic exposure to the realities of the physician's life. This rite of passage resembles hazing more than training and is inappropriate for a profession committed to healing and compassion," the AMSA states in its most recent position paper on the subject.

Last fall, the Association of American Medical Colleges issued a policy statement that in essence asked the medical community to clean its own house. It may have been too late. In November, John Conyers Jr., a Michigan Democrat, introduced legislation in Congress that would allow the federal government to enforce duty-hour laws based on the New York rules. By the time the ACGME released its universal policy in June, the issue had taken on a political urgency resembling campaign finance reform: Conyers, with 60 members of the House of Representatives in his corner, had vowed to remain steadfast. New Jersey Democrat Jon Corzine, meanwhile, had introduced a companion bill to the Senate. To date, neither bill has been brought to a vote.

But even if the government swoops in, the ACGME has put the nation's teaching hospitals on notice. In May, the council threatened to strip the accreditation for one major medical center's general surgery residency program unless the hospital made major changes to working conditions. The report was confidential, but the *Boston Globe* reported that surgeons-in-training there worked on average more than 100 hours a week.











As schools across the country try to implement the new standards, they are likely to run across few if any simple remedies for maintaining quality graduate medical education. Pitt has taken a few steps that might make its transition to the new rules smoother. Long ago administrators brought all of the University's residency programs under one central authority, now the UPMC Office of Graduate Medical Education (GME). Pitt's system makes the School of Medicine's department chairs as well as program directors responsible for the education of each resident. Dennis Zerega, vice president of the office, and Kenneth S. McCarty Jr., assistant dean of GME, routinely sit down with program directors and chairs to work out problems as they arise. Pitt also has an assistance program in which medical trainees can anonymously receive counseling for such professional hazards as fatigue and financial problems. "We're probably the most well-organized place in the country," Zerega says.

The pressure, says McCarty, falls on program directors to ensure residents learn within the pending ACGME standards *today*. Program directors have been told to be on the watch for residents who are tired because they stayed at the hospital beyond their duty shift or were moonlighting, picking up extra work as a physician to earn some more money (perhaps as a trainer for a high school football team or at another hospital).

"We're going to audit to see that no resident is scheduled to be in the hospital for 80 hours, then is scheduled to be on call on Saturday, and has scheduled himself for a moonlight on Sunday, and is supposed to be in clinic Monday morning at 8 a.m. This makes him inefficient and unable to perform his best," says McCarty, who remembers working late into the night in the 1970s during his internal medicine residency at Duke University, not long after Duke first allowed its medical trainees to live outside the hospital. (Duke still required them to be on call 24 hours a day for five days a week. On their two days off, they could leave only when the work was completed.)



No one wants fatigued residents getting injured in car accidents or not giving the best care because they're tired, so having the ACGME standards down in writing is good, says William Crombleholme, Pitt's program director of obstetrics and gynecology.

But the rules make his job harder, and the ACGME has offered no guidance on how to make the adjustment. On average, most of the 34 residents in his program work about 80 hours a week. But the four residents on the oncology service sometimes work more hours, because their patients are so sick. "The people on the service, particularly the senior residents, are not going to want to leave a patient," Crombleholme says.



He'll need to find money in his budget to pay two or three physician assistants or nurse practitioners to offset scheduling changes in the oncology service alone. Maybe the residents won't have as much clinical work. One thing Crombleholme firmly believes: Residents now will have fewer cases. Fewer cases means less variety in the





"After a certain point your efficiency of learning drops off."

kinds of cases they'll learn about. In the end, he says, their education might suffer.

"It's not the kind of thing where you can add another resident, because the caseload isn't going up. You're adding a resident to cover care and not education, and that gets beyond the mission of residency," he says.

If you limit a resident's experience, says John Kane (Res '98), program director for general surgery, you end up with doctors who are less prepared to care for patients. Kane, remembering his own 100-hour workweeks, has no doubt that his investment in training had a price, keeping him from his wife and children. But little has changed since: "I'm still always on-call for my patients if there's a problem. If I end up in a 14-hour operation, I don't hand it off seven hours into the surgery to somebody else and say, 'You know what? I've got a busy clinic day tomorrow; I don't want to be up past 10 o'clock.' For each individual patient, it's all or nothing."



But Kane also knows that some change is necessary. He knows that applications to general surgery programs nationwide have dropped by 30 percent during the last nine years. Med school grads want more from life than just medicine—families, outside interests like music—and so increasingly they look for specialty training that doesn't keep them in the hospital 100 hours a week for 10 years. He also knows the ACGME could pull his program's accreditation. So Kane recently changed the 24-hour on-call schedule from every fourth night to once every six days for first-year interns and once a week for junior residents. He established a new buddy system where an intern and a second-year resident team up for several services to handle the caseload increase caused by giving other residents the day off. He also told his trainees to track their hours.

For Rohit Sahai, a second-year resident under Kane, the change has been significant. Last year, as an intern, Sahai likely worked 100 hours a week often, though he never counted. Since July, it's as if he has entered a new program.

"After a certain point your efficiency of learning drops off," says Sahai, sitting at a table in the Watson Surgical Education Center; at times he has worried that fatigue will cause him to make mistakes. "If you're more alert, you're more able to grasp things well and to pay more attention to detail."

By 12:15 a.m., Pettiford's patient stabilizes. The doctors have spent hours reversing the effects of blood thinners, coaxing the new heart to beat steadily, suturing and cauterizing bleeders, sopping up blood. Shears talked with the man's family and left for home. Pettiford stepped away from the patient, conferred with Sahai, just starting a six-week rotation in thoracic surgery under Pettiford, and now stands for a moment outside the OR, waiting to wheel the patient off to intensive care.

Pettiford feels lucky. There's nothing else he could think of doing with his life. So many people made sacrifices for him to spend these 10 years training: his parents, who as teenagers worked in the grueling Georgia cotton fields; his baby sister, whose graduation from college Pettiford missed because he couldn't break away from training; and his dad's grandmother, who watched over him when he was a boy. When she died a few years ago, he tried to rearrange his residency schedule to make her funeral. He wound up arriving just as her casket was carried away.

Whenever Pettiford thinks he's working too hard, he remembers them. He can't let them down—even if it means not coming home until 10 p.m. to wake his 6-month-old son, and hold him, just for a minute, before the boy screams for his mother. Never mind that most 6-month-olds haven't bonded with their fathers, even those fathers home for dinner every night. You can't tell that to someone and expect it to matter if he rarely sees his family.

"If I have any regrets about going into medicine, that's the one: time lost that I know I will never ever get back," he says, his voice trembling ever so slightly. "That's the stuff that hurts." ■





A RESIDENT'S BEST FRIEND

HOW MARLENE COOPER WATCHES OVER 1,200 RESIDENTS AND FELLOWS

BY CHUCK STARESINIC



Marlene Cooper

JEN URICH

After the euphoria of Match Day has subsided, reality will eventually set in for the new resident assigned to a University of Pittsburgh–affiliated teaching hospital. First, a small dose of reality arrives as a 1-inch thick packet of forms, contracts, memos, and guidelines. There are regulations, recommendations, salutations, and exhortations. Health insurance, life insurance, malpractice insurance, and disability insurance forms. The noncitizen will need a J-1 visa, unless of course the particular situation warrants an H or an O visa.

If any of this paperwork causes confusion (and why wouldn't it?), the Loeffler Building at the corner of Forbes and Meyran is the place to sort it out. It may be a monochromatic location, but the double glass doors at street level mute the roar of traffic, and when you climb the stairs and enter the Office of Graduate Medical Education (GME) you are greeted by an unexpectedly musical sound. This is more than a few discordant tinkles from a door chime. It's as if someone left a xylophone out in a hailstorm. It's the sort of sound that accompanies magic.

The person most likely to greet you is the executive director of UPMC Health System's GME, Marlene Cooper, whose office door is usually open. She only has to look up from her desk to bestow a welcoming smile. The wind chimes are an improvised security system, hung on the door long before they were made to lock automatically at five o'clock, but Cooper and her staff have grown to like the chimes, and so they have kept them.

Cooper calls this the human resources office for more than 1,200 residents and fellows—physicians training to be specialists in surgery, obstetrics/gynecology, pediatrics, and other Pittsburgh programs. "We do everything for them," she says. "Licensure application, visas, payroll, benefits, program accreditation—"

Ignazio Marino made the first of many visits to this office in 1990, when he left Italy for a transplant fellowship at Pitt. Over the course of several weeks, Cooper successfully walked him through the process of getting his credentials in Pennsylvania. "She understood how stressful the entire application process and its timing was for a young foreign surgeon who had just decided to bet everything on a challenging adventure far away from his home country," he says.

Marino returned to Italy as the director of the UPMC–affiliated transplant center, Istituto Mediterraneo per i Trapianti e Terapie ad Alta Specializzazione, in Palermo, before recently moving on. He has never forgotten how Cooper personally checked with her Harrisburg contacts on a November afternoon when she knew a decision had just been levied on his status: "She immediately paged me because she knew how anxious I was."

Cooper became the director when the residency programs were consolidated in 1986, and she quickly proved her worth. She noticed that residents often worked at hospitals outside the system, yet their salaries always came from UPMC. Cooper began tracking every resident's hours; then she picked up the telephone, called each facility, and in her always cheerful voice said, "Hi. We're sending you an invoice for the services of these residents." And she did, every month. She tells the story with a little embarrassment now, laughing and clapping both hands over her mouth to hide a childlike smile.

Now she tracks hours for different reasons. Starting next year, no resident may exceed the maximum number of scheduled hours set by the Accreditation Council for GME. Cooper is identifying residencies struggling to cut hours so that those who design the curriculum can help bring the programs into compliance.

Since they moved here in 1977, the Coopers have found Pittsburgh a wonderful place to raise children. But if it were up to Cooper's husband, the couple would be living elsewhere now that both children are grown. He might have accepted that job offer in California. They have stayed in Pittsburgh for her. "I won't go. I'm content here in Pittsburgh," she says in a voice both happy and stubborn. "It's a wonderful city, and I like what I do."

Everyone involved with the residency program can breathe a big sigh of relief. ■



President Clinton named Karl Kandler one of this country's elite young researchers. He started out his scientific career obsessed with animal behavior. Eight-year-old Zia Kandler inherited her dad's zeal.

OF DUCKS AND DYSLEXIA

BY EDWIN KIESTER JR.

THE BRAKES OF THE BRAIN

Karl Kandler's journey to the White House started in a small town in Bavaria amid a noisy, lively, and ever-changing menagerie of animals. "Birds, chickens, ducks, fish, turtles, water insects, I brought them all home," he recalls with a smile. "I drove my mother to distraction."

Flash forward several decades to another continent. The little boy in lederhosen has grown into a slim, trim University of Pittsburgh assistant professor of neurobiology who still speaks with the precise consonants of his native land. It's October 2000, and at the invitation of President Bill Clinton's administration, Kandler stands in the executive mansion with 11 other researchers to receive the Presidential Early Career Award for Scientists and Engineers (PECASE). The PECASE is the highest honor the government gives to young scientists, and honorees' work must be deemed exceptionally promising and contributory. The executive citation

PHOTOGRAPHY | CAMI MESA

praises Kandler for "outstanding contributions" in explaining the cellular basis for disorders and dysfunctions like "speech perception, language development and dyslexia."

"Hot" and "exciting" are words used by Lynn Luethke, program director for hearing in the National Institute on Deafness and Other Communication Disorders to describe Kandler's research in relation to dyslexia. "It's very basic but with important implications for clinical problems," Luethke says. "Understanding the causes can lead to the development of treatments, and, more important, to the means for preventing such disorders."

Kandler is elucidating confounding disorders like dyslexia by pursuing a more fundamental, and seemingly obscure, field of research. He is figuring out how the brain organizes its complex network of neurons during the early stages of development—and how that neuronal organization both turns on and turns off actions and feelings.

His interest traces back to a boyhood in the small town of Schrobenhausen, amid the rolling Bavarian country northwest of Munich.

"There is nothing to report about this town except that they grow lots of white asparagus," a German delicacy, Kandler says.

But the area turned out to be an ideal environment for a budding neurobiologist. Karl the schoolboy detoured on his daily walk home to visit creeks and ponds, where he tried to capture fish with his bare hands, watching how their instincts enabled them to elude him. When he did catch them—"never by being faster, only by tricking them," he says—he brought them home as "guests" to the aquarium in his bedroom. The fish shared the room with a colony of brown and black mice Kandler was breeding to see how the color is passed on: "My mom made me quit when I had over 60 of them." She allowed a tortoise, a chameleon, and snakes in the room as well, but banished the ducks and chickens outside.

The boy fished, too, but reeling in a catch was never the main goal. He was really interested in taking in what was going on around him. A "successful fishing day" for Kandler might mean seeing a snake and some birds and then getting an eyeful of bluegills building their underwater nests.

The antics of the nine-spine stickleback, a common small fish of Bavarian waterways, particularly intrigued him. A male stickleback builds an elongated nest on the creek bottom, then attempts to lure females while vigorously defending it against other males. He follows a strict sequence of courtship and defense behavior that scarcely varies from stickleback to stickleback. Clearly, the young Kandler could see, stickleback brains had to be similarly programmed to explain this complex but stereotyped behavior.

"It was a big deal for me at the time," he says.

Between Bavaria and the Beltway, Kandler's early days in academe had him examining such abstruse subjects as the predatory nature of tree snakes on Guam and the come-hither messages of moths. (He learned why the wily sticklebacks so often eluded him when an exchange student in Colorado: "Fish have a special fast escape-behavior circuit, basically a three-synapse circuit with just one single neuron, called the Mauthner cell . . . specialized for speed at many different levels.")

As an undergraduate at Bavaria's University of Regensburg, Kandler recalls a professor who gave a lecture about pheromones—the chemicals released by insects to, among other things, attract mates. "A single molecule of the pheromone on the antenna of a male moth is enough to arouse him sexually," he says.

The fish shared the room with a colony of brown and black mice Kandler was breeding to see how the color is passed on: "My mom made me quit when I had over 60 of them."

"Until then, I had been observing animal behavior, *why* animals did what they did. Now I wanted to know *how* they did it, what was happening in the nervous system that enabled them to act as they acted."

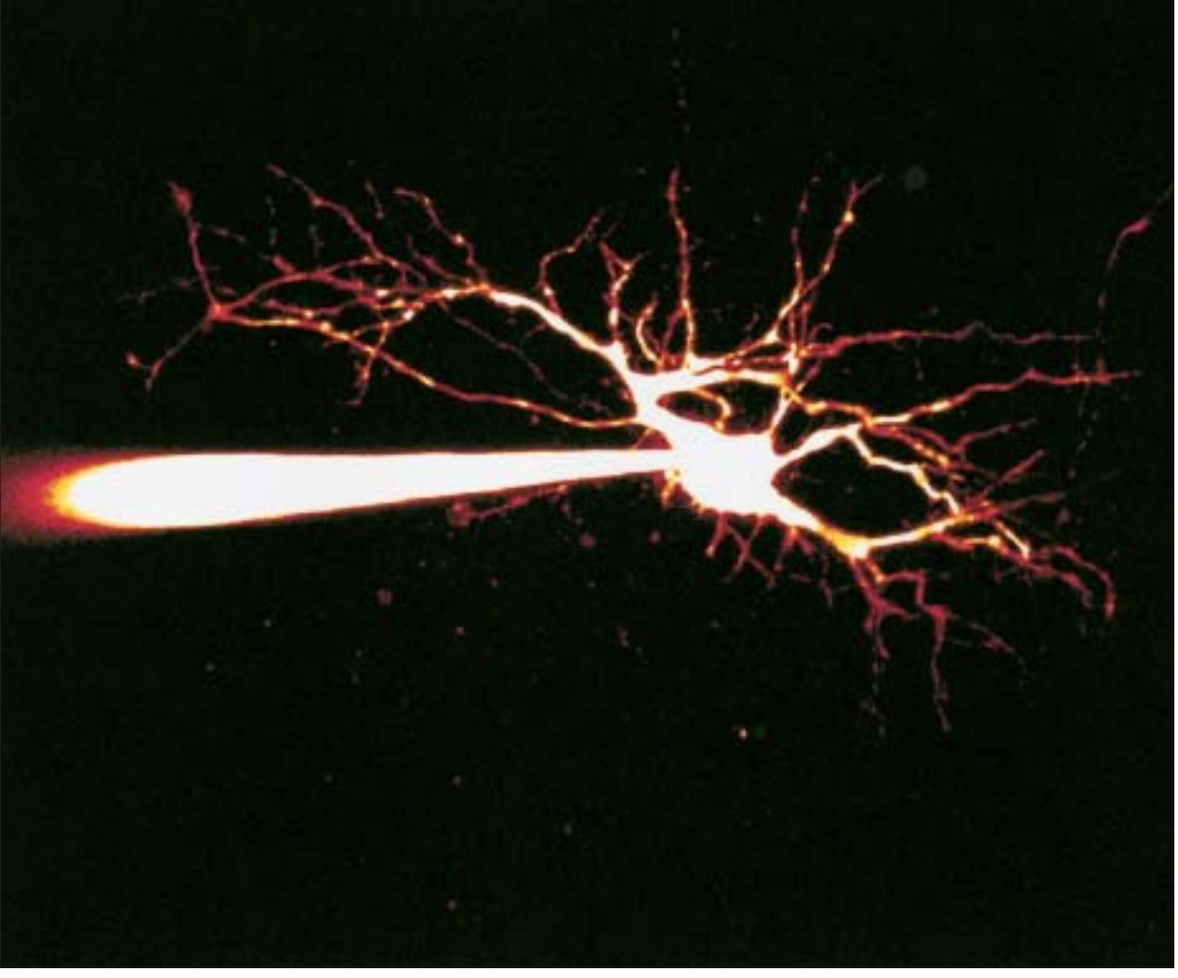
Questions about the wiring of the brain fascinated him more and more. His search for answers led him into neurobiology. After Regensburg, Kandler went on to the University of Tübingen, where he obtained his doctorate, then to Duke University as a postdoctoral student. He joined the faculty of the University of Pittsburgh School of Medicine four years ago as an assistant professor of neurobiology.

In Pittsburgh, he has focused on the development of the poorly understood "inhibitory network" of nerve cells. To oversimplify, inhibitory neurons serve to keep the nervous system in a precise, delicate balance; they counteract neuronal impulses turned on in response to sensory input. When, for example, we touch a hot surface, neurons of the "excitatory network" fire to convey the message to the brain. Remove the hand, and inhibitory neurons tell the others to stop firing. The alarm is over. "It's like the brakes of the brain," Kandler explains.

This is where dyslexia and learning disorders enter into the picture. To read or understand speech, one must develop "phonemic awareness," recognition of the tiny individual fragments of spoken sound, or phonemes, that blend one into another to make comprehensible speech. The brain does this assembly and interpretation for us, whether the phonemes are uttered aloud or printed on the page. It is important, though, for each "puh" or "fuh," as Kandler illustrates with puffs of the lips, to switch off quickly to make way for the next phoneme. Switching off is the task of inhibitory neurons. Some suggest that people who are dyslexic process auditory signals slowly, and Kandler theorizes that an underdeveloped or abnormally organized inhibitory network may be at fault. For instance, to a dyslexic person, Kandler's own quick, sharp consonant sounds might not be interpreted swiftly enough for the following phoneme to be understood.

And abnormalities of the excitatory-inhibitory balance might partly explain other disorders. Epilepsy, for instance. Perhaps seizures, especially in the first year or two of life, are caused by the failure of inhibitory neurons to "inhibit" motor neurons controlling movement, so that the neurons keep firing and firing and produce the classic excitatory overload characteristic of a seizure. "That could be the worst-case effect," Kandler says, pointing out that up to 15 percent of infants may have seizures in the first months of life, while the neuronal networks are still developing.

Other researchers have speculated that autism and schizophrenia may result from an abnormal network balance. And some





Kandler's team records electrical and chemical responses from a living neuron in the brain of a newborn mouse. The researchers are investigating how immature synapses (nerve connections) are eliminated or stabilized within the mysterious inhibitory neuronal network. LEFT: What looks like a ray of light on the left is a pipette filled with fluorescent calcium-sensitive dye penetrating a living neuron. ABOVE: A strand of optical fiber, narrower than a human hair, looks much bigger as this "miniature flashlight" shines.

LEFT: COURTESY KANDLER. RIGHT: CAMI MESA

believe depressed inhibitory neurons may explain puzzles like the "phantom pain" amputees sometimes feel in an absent limb.

Much mystery remains about the inhibitory neuronal network, though its existence is taken as a given; after all, some system has to prevent excitation from running on unchecked. What blocked more detailed knowledge was that the presumed inhibitory neurons seemed inextricably intertwined with their excitatory counterparts, so that they were difficult to study individually. And there seemed to be no easily studied animal model.

Kandler, however, has identified a part of the auditory system that can be used as a model. The lateral superior olive (LSO), a question-mark shaped area in the brain stem of mammals, is much simpler in structure, easier to access, and more independent in its function than other areas of the brain. The LSO helps us to localize sound. When a sound is "heard," neurons in the ear nearest the noise become more excited than those in the opposite ear. LSO neurons receive excitatory input from one ear and inhibitory input from the other. Together, they let us know that that clanging is over there to the left, not to the right.

To visit Kandler's lab on the 14th floor of the Biomedical Science Tower is to step into a Lilliputian world of miniatures and "clever and innovative" approaches, as Robert Malenka and Roger Nicoll of the University of California at San Francisco wrote in reviewing Kandler's research in *Nature Neuroscience*. (Kandler's 600-square-foot laboratory is sort of miniature, too. "You have three or four people in here, stumbling into each other, and the most common words are 'Excuse me,'" he notes.)

Kandler's white-coated postdoc, Deda Gillespie, demonstrates a study method usually performed by lab colleague Gunsoo Kim. She bends over a microscope, peering into a small chamber. The chamber holds a bath medium with finely prepared living slices from the LSO of a newborn mouse, each a mere 20th of a millimeter thick. Gillespie manipulates a pipette, not much bigger than a broomstraw, and an optical fiber, thinner than a human hair. Intermittently, there is a quick, bright flash from the tip of the fiber.

The LSO is laced with a "caged compound," which may sound like a confinement area for miscreants, but is actually an almost infinitesimal amount of glutamate covered with a special coating. Glutamate, a neurotransmitter that triggers neuronal activity, is rendered inert by the "cage," or coating, this very effective one developed by Brigitte Schmidt of Carnegie Mellon University. An ultraviolet, or UV, flash from the optical fiber breaks the cage and frees the glutamate, allowing the neurons in the tiny illuminated area to fire and activate the neurons to which they are attached. Neuron by neuron, Gillespie traces those connections. At the same time, she is able to record the strength of each connection: Her pipette is filled with salt solution that conducts electrical impulses from receiving neurons, reading their signals with sensitive amplifiers.

Kandler likens this approach to mapping computer wires: "We determine not only where the wires run but also what voltage they are using, how effective the wires are."

"You shine it up here, see?" Kandler explains, pointing to a dendrite in a diagram he has drawn on a chalkboard. "Like a miniature flashlight. And then up here. . . and up here. . . and up here. . . and you can bring this cell to fire." He points to axons, the sites of the neuron's outputs, as well as dendrites, the sites of its inputs.

"You can ask the neuron, with whom are you connected? Which other neurons?"

"Use it or lose it" is Kandler's favorite mantra for how neuronal activity organizes the brain during the early stages of excitatory development. The neuro community has shown many times over that excitatory connections go through a pruning process: Those that are most utilized are reinforced and strengthened. Those with less purpose fall away. But little was known about inhibitory network development until Kandler was able to show, with the help of fiberoptic UV flashes, those connections are trimmed as well—in the LSO of rodents at least.

By the age of two weeks, when a rat is capable of hearing, three out of four of its LSO connections have been eliminated. Using a series of age-graded samples from the LSO of animal models within the first two weeks of development, Kandler recorded sources of inhibitory inputs.

"Let's say I'm a neuron," he says. "I receive inhibitory inputs from the Cathedral, from Scaife Hall, from McDonald's—almost every building in Oakland. A week later, we see the connection from Scaife is gone, from McDonald's is gone. Only the Starbucks connection remains."

Once a rat starts hearing, Kandler discovered, its inhibitory LSO connections have been functionally pruned, meaning the connecting "wires" may still exist but aren't used. Whether the "use it or lose it" dictum applies in inhibitory cases is not at all clear.

"At this point we don't know whether the ones used most often are maintained," says Kandler. "Though this is believed to be the case for excitatory connections, we have no idea whether this concept also applies to inhibitory connections.

"The next step is to find out why certain connections are preferred over others—what tells the cells to keep some connections and not the others."

"Here's the best part" of his LSO studies, Kandler reports, barely containing his enthusiasm: As part of his PhD work, he found that inhibitory neurons start out behaving excitatory. In a rat's first week, LSO neurons defined as inhibitory by their chemical structure (emitting neurotransmitters that are inhibitory in adults, GABA and glycine) act in ways indistinguishable from excitatory connections. A few scientists had reported this developmental paradox in other brain areas, but Kandler was skeptical. He needed to see for himself: "I was surprised. I didn't expect to see this."

This phenomenon may explain why children and animals are more prone to epilepsy as newborns. "It's a very dangerous time, I think—like a wolf in sheepskin," says Kandler. "The brakes of the brain act like the accelerator."

He notes that if there's an insult to the brain, a stroke perhaps, as the brain rewires itself, inhibitory connections act excitatory again. This excitatory mimickery may make cells more plastic, Kandler conjectures. But again, he has no confirmed explanations. Not yet anyway.

Using the same caged compound and miniature flashlight method, Kandler has settled another question that has divided the research community for years: When synaptic connections in the hippocampus are strengthened or weakened by activity, what's happening? On what end does the change take place, the pre- or postsynaptic side? This highly technical mouthful sounds like an "inside baseball" controversy, of interest to only a handful of researchers, but the hippocampus is the seat of learning and memory. Knowing more about how it puts itself together could not only benefit learning and education but perhaps lead to better understanding of the memory losses of, say, Alzheimer's disease.

"It's a very dangerous time, I think—like a wolf in sheepskin," says Kandler. "The brakes of the brain act like the accelerator."

"The question is whether the changes in the cell are caused by the strength of the input, or by the cell itself becoming more sensitive to the input," says Lawrence Katz of Duke University, who was Kandler's mentor and collaborated with him on the research.

"It's like you and I are talking on the phone," continues Katz, "and at first I can't hear you, but then I can hear you better. Is that because you are talking louder, or because my ear is picking up the sounds better? We said it was the 'ear,' the change was greater sensitivity in the neuron itself. And we were right."

Kandler managed to set the record straight by stimulating the postsynapse artificially, with a fiber optic UV flash. Since the optical fiber was a constant, any change in the strength of this semiartificial connection must have been on the postsynaptic end, how the cell received it, Kandler deduced.

"The novel approach of Kandler and colleagues has shed a bright light on a persistently vexing problem," Malenka and Nicoll remarked in their review, "the eventual solution to which will go a long way in clarifying some of the most fundamental properties of synaptic communication."

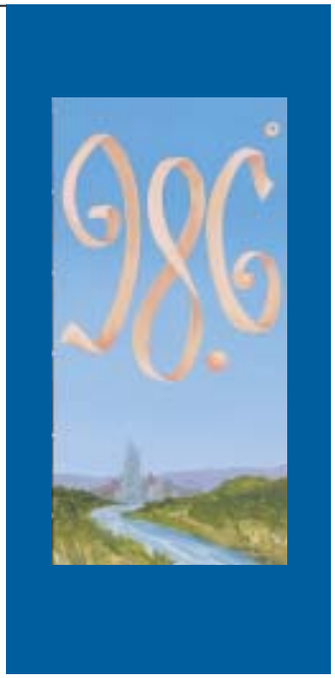
"Karl is very skilled and very passionate about his research," Katz says of his one-time postdoc. "He was fearless about making new things. He had great technical skills and fantastic hands. We shared many things. Neuroscience, of course, but also a love for fishing and for Alfa Romeos."

When Katz bought a new Alfa, he offered to sell Kandler the older one parked in his garage. "It was covered with dust and had no license plates," Katz recalls, "but Karl wanted to test-drive it. So I said, 'Sure, let's take it around the block.' He was horrified. He said, 'Without license plates? We could never do that in Germany.' So we started out, and we hadn't gone 200 feet before a cop whistled us over. He not only gave us tickets but said, 'You *cannot* drive that car on the streets. So we had to *push* it back to the garage." Kandler bought the car but now has a different Alfa, a 1974 model, which he treats lovingly:

"I never wanted to fix cars, but once I started to work on the Alfa, I liked it because it is basically the same question I ask in the lab: 'How does it do it?' And the Alfa does it in a very elegant way."

Kandler has hiked over the Alps from Munich to Italy, crossed the Pyrenees, and trekked in Kashmir and Nepal. He spends less time in the outdoors and a lot of time in the lab these days. Now, he says, his major pastime is his family: Xaver's soccer games and Zia's menagerie. Following in her father's footsteps, Zia Kandler, 8, has collected three birds, a chinchilla, a rat who recently died, a dog, fish, caterpillars, praying mantises, an Eastern king snake, and most recently, a species of chicken that lays blue eggs. Her mother, Dinnie Goldring, sounds resigned. "How, in this family, could I object?" she asks. ■

People and programs that keep the school healthy and vibrant

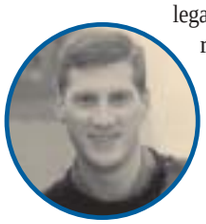


STANDOUTS

THE CLASSES OF 2001 AND 2002 SET EXAMPLES

BY MARK DRAGOTTA

When the envelope came, it seemed to validate Matthew Agnew's existence. After earning a bachelor's in history from Princeton University, Agnew spent three years in Manhattan, one as a paralegal in the district attorney's office, two raising money for a fund that sent South African blacks to college. For much of that time, however, he thought about following his father and sister into medicine. So Agnew quit his job and New York life and moved to Boston to take premed classes at night at the Harvard Extension School. Over the next two years he opened 35 rejection letters until Pitt offered him a chance with the Class of 2001.



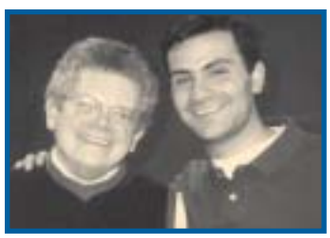
Agnew

Brett Perricelli received a rejection letter, another noting that he'd made the wait list, and finally an acceptance letter, all in the same year from the School of Medicine. Soon after his last correspondence from Pitt, he was packing up and leaving his apartment in Hershey, Pennsylvania, where he had already enrolled in the medicine program at Penn State University (his dad's alma mater).

Agnew, MD '01, and Perricelli, MD '02, each would become president of his class. The struggle to get there only increased their attachment to the school. "I felt like I had something to prove," says Agnew, now a general surgery resident at the University of Washington. He didn't disappoint: Agnew co-coordinated the Surgical Interest Group, served on curriculum committees, was elected to the Alpha Omega Alpha Honor Society, and started the Class of 2001 Fund. During his fourth year of med school, Agnew sent e-mails to his classmates, called them on the phone, even stopped them in the hallways, to ask for a pledge to their school, whatever they could afford, once a year for four years after they graduated.

Perricelli, now a general surgery resident at UPMC Presbyterian Hospital, showed the admissions committee they hadn't made a mistake in choosing him for one of those coveted 150 spots. Like Agnew, he helped to lead the Surgical Interest Group; he also was awarded the Merck Book Award for student leadership and started a class fund. Perricelli set up a network of some 20 graduates, each responsible for calling 10 classmates to remind them of their pledges.

The enterprising ways of Agnew and Perricelli make their classes stand out. On average, less than a quarter of the members of a class donate to the School of Medicine after graduation. Yet, so far 60 percent of the Class of 2001 has made donations. Similarly 59 percent of the Class of 2002 pledged donations—at a time when grads have an average debt burden of $128,000.



FROM LEFT: professor Jamie Johnston and Perricelli

Officers for both classes plan to meet at Pitt during their five-year reunions to decide how to use the funds. Some possibilities include endowing scholarships and professorships, funding projects and student groups—anything that adds texture and value to the learning environment at Pitt. "Maybe," Agnew says, "in 50 years we can pay for everyone's education."

Beyond the money raised, Agnew and Perricelli agree, a class fund is a chance for classmates to keep in touch with one another and the University and start a tradition. "A lot of people go through their education without ever feeling a real attachment to a place," says Agnew. "If you're part of something larger it makes your time there and afterward a richer experience."

FOR MORE INFORMATION: **877-MED-ALUM**

BOOSTER SHOTS

After Richard N. Harris, MD '74, died in May 2001, fellow med school alum **John Kokales, MD '73,** wanted to honor a friend with whom he'd shared an internal medicine practice in Pittsburgh. So came to be the **Harris Memorial Golf Outing**. The event is about more than fixing your slice. With the help of local physicians, businesses, UPMC Health System, and pharmaceutical companies, the first tourney netted $30,000 for a fund in Harris' name set aside for scholarships to medical students from Pennsylvania. As we went to press, Kokales and a few other alumni were getting ready for a second tournament.

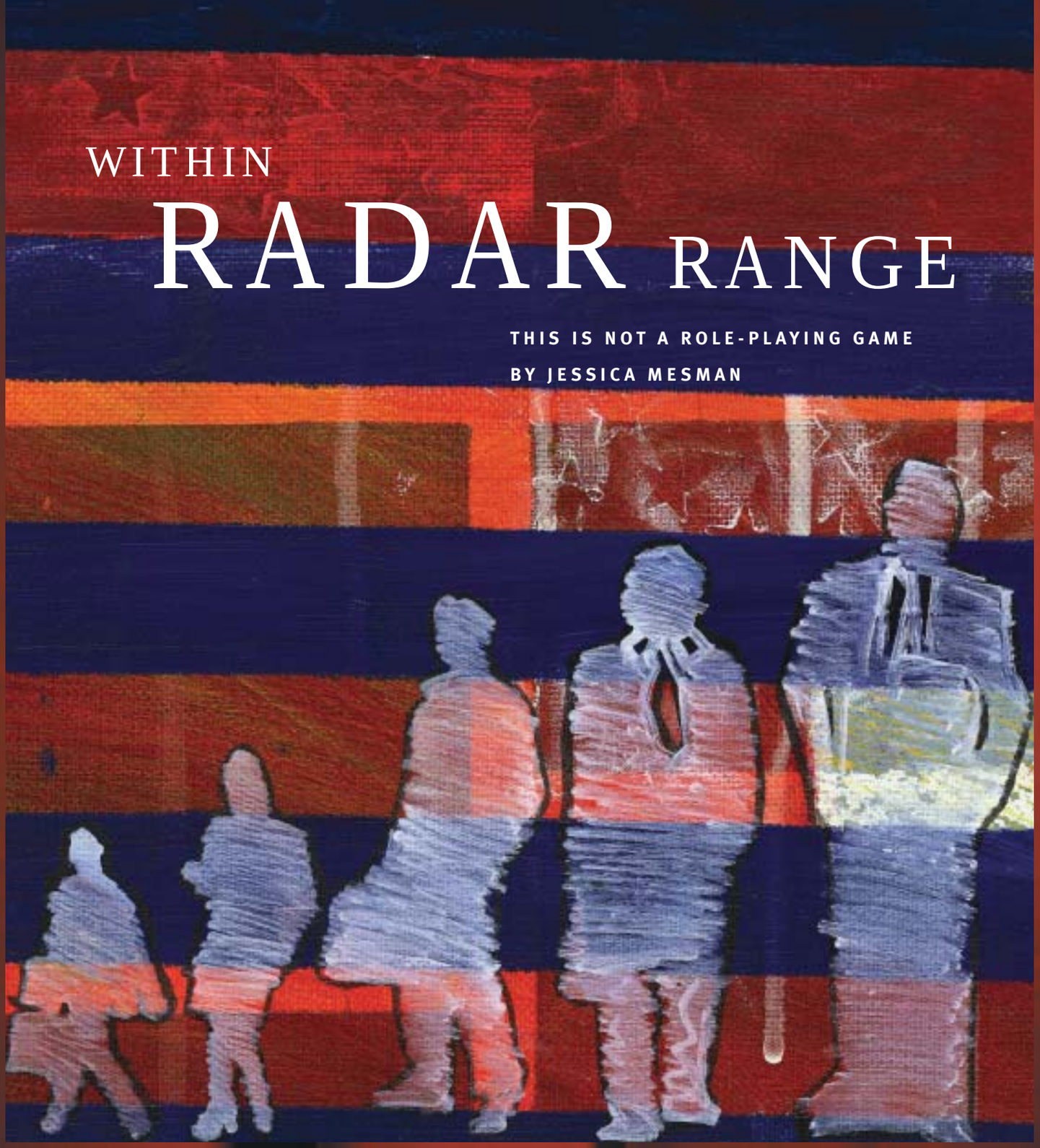
Charles William Vates Jr., MD '45, maintained his ties with the School of Medicine long after graduation. After all, his parents, Charles William Vates Sr. and Rose Stanley Vates, were members of the Class of 1912. So, in the years before he died in 1993, Vates Jr. donated more than $450,000 to a low-interest medical student loan fund established in memory of his parents. Since then, his sister, **Elizabeth Vates**, has upheld the Pittsburgh family's connection to Pitt, now donating in her brother's name. She most recently made a gift of $200,000 to the loan fund. —*DRE* ■

FOR MORE INFORMATION: **877-MED-ALUM**

WITHIN RADAR RANGE

THIS IS NOT A ROLE-PLAYING GAME

BY JESSICA MESMAN



A summer fellowship program convinces students they won't try to go it alone if their goal is the very best patient care.

ARTVILLE

Eighteen health sciences graduate students sit in a meeting room in the Western Pennsylvania Hospital, plastic nametags hanging from strings around their necks. A woman in a red jacket calls out their schedule for the day like an auctioneer.

"Three to three fifteen prepare for interview three fifteen to three forty-five interview Jim Osborn of MERITS three forty-five to four fifteen tour facilities in the Institute for Computer Assisted Orthopaedic Surgery four fifteen to five watch

surgery . . .” She barely pauses as she ticks off the times and assignments and distributes copies of a biographical sketch of Jim Osborn, executive director of Medical Robotics and Information Technology for Medicine and Surgery, or MERITS, of Pittsburgh. He's the man the students are meeting in 15 minutes. Before then, they must devise questions and choose a facilitator, a timekeeper, a greeter, a closer, and a questioner.

It feels like a game show, as though the students were about to engage in a lightning round of some role-playing contest for the future business leaders of America. They're actually at the weekly afternoon session of the JHF/Coro Pittsburgh Health Sciences Fellowship. A collaborative project of the Jewish Healthcare Foundation and the Coro Center for Civic Leadership, the program introduces students in the health sciences to inspiring local leaders in the field. Most sessions include visits to notable organizations of which students might not be aware, such as the Institute for Computer Assisted Orthopaedic Surgery, where surgeon and alum Anthony DiGioia (Res ’91) performs hi-tech total hip and knee replacements with robotic technology created by Osborn and his MERITS team.

Throughout the program, the fellows—who include medical and law students from Pitt, occupational therapy students from Chatham College, pharmacy students from Duquesne University, and others from various health-care programs—are expected to work together to choose common goals and design plans of action to reach them. At West Penn, they are allotted the first 15 minutes of the session to decide what information they want from Osborn.

Sara Silvestri, embarking on her second year at the School of Medicine, does most of the talking. She's small and soft-spoken, but as the facilitator, she's today's leader. When the program directors leave the room, she turns in her chair to face the other students, notebook and pen in hand. In the next 15 minutes, she must delegate responsibility among the group—decide how many and what questions will be asked of the expert, and by whom. She's also expected to keep the session on schedule. Some students volunteer to ask questions they have in mind. Others Silvestri assigns duties from the list in her hand. All the while, the timekeeper shouts, “Five minutes! Two minutes! Thirty seconds!”

Next, the students pack into a tiny conference room, where a bearded, bright-eyed Osborn (eschewing formality, he tells them to call him “Oz”) quickly launches a whirlwind PowerPoint presentation on robotics technology.

He's barely halfway through when Silvestri's small voice interrupts from the back of the darkened room. Adhering to protocol, she introduces herself before gently asking Osborn if he wouldn't mind stopping his talk so they can ask some questions.

MERITS' advancements in robot-assisted health care are exciting but mostly experimental. The students wonder about practical application: Which patients will have access to the technology? It'll be expensive, Osborn responds with regret. How will doctors and hospitals implement the programs? He barely has a chance to answer two of the students' carefully planned questions before they're hustled to the labs for demonstrations.

“Interrupting Oz was one of the most difficult things I've had to do during this internship,” says Silvestri later. “I am a relatively quiet person and interrupting the executive director of MERITS of Pittsburgh was not something I wanted to do.” But she knew it was up to the students to keep the program on schedule.

The JHF/Coro Fellowship has two tracks: “Frontiers,” Silvestri's track, introduces students to regional efforts to recast health care with promising technology and increased access. The second track, “Innovations,” explores the challenges of improving the health-care delivery system at the point of patient care. This is the stuff that really resonates with Gabriel Silverman, a second-year MD/PhD student.

“I've definitely seen things I never knew existed in Pittsburgh,” says Silverman.

He learned about organizations like Global Links, which recycles medical supplies for donation to understocked hospitals in developing countries. At UPMC Shadyside, his group toured the Center for Complementary Medicine, where they saw an acupuncture session and learned about a business model—originally developed by Toyota—that the hospital is implementing to reduce waste and increase productivity.

Many of these innovations are normally beyond the radar of the medical student, he says.

The most valuable aspect of the fellowship for Silverman is the opportunity to work with people with different skills and backgrounds. (For the most part, the fellows are indistinguishable in their expertise. If you pay attention however, you can pick out the nursing and med students. They're the ones able to eat chips and pretzels while watching a video of DiGioia pounding a metal knee replacement into a leg that's unfurled like a Slim Jim wrapper.)

Odd as it seems, many new medical students are disappointed to find that they spend most of their school training time with doctors. They rarely have a chance to interact with the public or health-care professionals who aren't MDs.

According to Silverman and Silvestri, two of five Pitt med student fellows in the summer program, working with and learning from those in other disciplines will change health care. They would like to see a shift from a rigid hierarchy of MDs and administrators to a state of equity among all health-care professionals and the patients they serve.

“I've definitely seen things I never knew existed in Pittsburgh.”

“Exceptional patient care is not achieved by a single individual,” says Silvestri. “It's a collaboration between many people in many disciplines. This fellowship is teaching us early on in our training how to work in such a group.”

She admits, a week before her JHF/Coro graduation day, that she was surprised by how well an interdisciplinary group can work together to achieve common goals.

By the end of the program, the students know firsthand the groundbreaking health-care initiatives under way in Pittsburgh, and they can speak fluent businessese with the best corporate recruiters.

More important, they say the fellowship reinforced why they wanted to work in health care in the first place.

“It's not just about curing a person of what's wrong with him,” says Silverman.

“It's about deeply personal interactions.” ■



CLASS NOTES

'40s

At 85 years old, **Roy Charles Monsour**, MD '43, continues to practice family medicine full-time, still making house calls from Monsour Medical Center—the Jeannette, Pennsylvania, hospital he cofounded in 1952 with his brothers, Howard, William, and Robert Monsour (MD '43). Known as "Dr. Roy" to his patients, Monsour and his wife, Cicely Monsour, recently received the "Heart of Westmoreland," a humanitarian award from the American Heart Association for their efforts to improve health throughout their home county.

'50s

P. Kahler Hench, MD '58, is a senior consultant emeritus at the Scripps Clinic and Research Foundation, in La Jolla, California. Last year he led a delegation of rheumatologists to Cuba through the People to People Ambassador Program. For eight days, he and his colleagues held conferences with Cuban rheumatologists. The Cuban doctors had little access to COX-2 anti-inflammatories, tumor necrosis factor antibodies, and other biologic response modifiers. Even so, Hench was impressed by the resourcefulness of the Cuban rheumatologists, noting they did a lot with what they had.

Basil RuDusky, MD '59, lives in Wilkes-Barre, Pennsylvania, where he is a private practitioner of internal medicine, cardiology, forensic medicine, and other arts. He has recently written two books, including *Your Car Can Be Hazardous To Your Health,* which examines health problems associated with cars, including back pain and respiratory illness. He is a former independent automotive consultant.

'60s

James Theodore, MD '62, is now emeritus professor and acting chief of pulmonary medicine at Stanford University. Theodore completed his undergraduate math degree at Pitt on a football scholarship, then continued on to the School of Medicine. He later enlisted for two years in the 6570th US Air Force Toxic Hazards Division, where he researched environmental safety of capsules for the Aerospace Medical Research Lab in Ohio. In 1970, he started his career at Stanford. Since then, Theodore has published more than 200 journal articles and editorials on pulmonary disease and heart-lung transplantation.

Gary M. Williams, MD '67, is a professor of pathology at New York Medical College in Valhalla. He received the Enhancement of Animal Welfare Award at the annual Society of Toxicology meeting for his work over the years in culturing animal liver cells so that fewer animals would be used in research.

'60s RESIDENTS AND FELLOWS

Michael Hess (Internal Medicine Resident '69–'70, Internal Medicine Intern '68–'69, MD '68), is director of Cardiopulmonary Laboratories and Research at Virginia Commonwealth University in Richmond. Since 1999, he has directed the heart failure and transplantation program. His research indicates that pacemakers stimulate the muscles around the heart, making the heart pump better. Pacemakers, then, may be a viable treatment for heart failure, rather than serving only to stabilize irregular heartbeats.

'70s

Howard Rabinowitz, MD '71, is a professor of family medicine at Jefferson Medical College in Philadelphia, where he also directs the Physician Shortage Area Program (PSAP). This program has been successful in increasing the supply and retention of rural physicians. Rabinowitz credits Pitt's late Ken Rogers with introducing him to issues of rural medicine. As a med student, Rabinowitz visited a Native American reservation for a nine-week rotation. With support from the Robert Wood Johnson Foundation, he's taking a sabbatical to write a book about the PSAP.

Joseph Verbalis, MD '75, recently became director of the General Clinical Research Center at Georgetown University Medical Center, in Washington, DC. Verbalis investigates kidney function and water retention, both of which can cause edema of the brain. He has discovered that the brain sometimes adapts to what would otherwise be lethal swelling.

Randy Miller, MD '76, professor and chair of the Division of Biomedical Informatics at Vanderbilt University's School of Medicine, is now associate editor of the *Journal of the American Medical Informatics Association*. Many thought that Miller, a member of the School of Medicine faculty at Pitt until 1994, would never leave Pittsburgh. He tells us he moved to Vanderbilt

RICHARD BRUNO

DIPLOMATIC AND OTHER IMMUNITIES

A woman becomes anemic at the US embassy in Paramaribo, Suriname. She's a Jehovah's Witness and refuses a blood transfusion. Richard Bruno, MD '76, directing her care from his office in Fort Lauderdale, Florida, must treat her unconventionally. He has her injected with the hormone Procrit, stimulating bone marrow to increase red blood cells. She is flown at a low altitude to a hospital in the States where she recovers.

Regional medical officer for the US Department of State Foreign Service, Bruno travels to South



The State Department keeps Richard Bruno moving.



The Owl, 1976

because he had an opportunity to start a clinical informatics program, an area in which he had considerable know-how after helping Jack Myers and Harry Pople start Pitt's Decision Systems Laboratory. He recalls getting his start in computers early on, as a high school student working at Westinghouse laboratories in Pittsburgh's east suburbs.

'70s RESIDENTS AND FELLOWS

Bruce C. Herman (Internal Medicine Intern '77–'78) maintains a private practice in internal medicine and geriatrics in Thiensville, Wisconsin, a suburb of Milwaukee. He also lends his talents to the St. Mary's Hospital–Ozaukee Community Health Clinic, which treats the uninsured working poor. Says Herman: "We have individuals who are totally destitute, and health insurance is very expensive in Milwaukee. It doesn't hurt to volunteer my time."

'80s

Stacey L. Berg, MD '85, has been a member for eight years of the Developmental Therapeutics Committee of the Pediatric Oncology Group and Children's Oncology Group funded by the National Cancer Institute. The committee meets several times a year to determine what drugs will begin Phase I testing for cancer treatments. A pediatric hematologist and oncologist at Baylor College of Medicine in Houston, Berg is codirector of the Texas Children's Cancer Center Clinical Pharmacology Group. To unwind from patients and the classroom, she enjoys kung fu and her garden.

'80s RESIDENTS AND FELLOWS

Jonathan Jahr (Pediatric Anesthesiology Resident '89, Anesthesiology Resident '86–'89) is a professor of clinical anesthesiology and director of clinical research at the University of California–Los Angeles. For the past six years, he has been investigating blood substitutes for use in cardiopulmonary surgeries. During an operation, one approach to conserving patient's blood is called acute normovolemic hemodilution (ANH), where some of the patient's blood is removed at the beginning of the operation, replaced by fluids, and then returned to the patient at the end of the procedure. One drawback is the lack of oxygen-carrying replacement fluids. Blood substitutes may be an ideal bridge during this time and allow for far greater amounts of blood to be conserved.

'90s

RESIDENTS AND FELLOWS

Kaveh Ilkhanipour (Emergency Medicine Resident '90, General Surgery Intern '85–'86, MD '85) is a clinical associate professor of emergency medicine for Pitt and physician quality manager at Mercy Hospital in Pittsburgh. He recently won the Caduceus Leadership Award, presented to a young physician at Mercy every four or five years. He has completed a study evaluating protocols in the emergency department involving acute coronary syndrome management. Ilkhanipour discovered that when emergency medicine physicians use a set criterion to identify patients at high risk for acute coronary syndrome they are more accurate at diagnosis. If the doctors then prescribe appropriate treatments, such as taking aspirin or new blood thinning drugs, complications, including heart attacks and sudden death, are less common.

Daniel Nuss (Cranial Base Surgery Fellow '89–'91) is chair of the Department of Otolaryngology–Head and Neck Surgery at the Louisiana State University School of Medicine in New Orleans. He's strengthening the department's focus on basic and cancer research. Soon Nuss and colleagues will be conducting Phase I clinical trials on intraoperative cytotoxic therapy, a technique they've developed for use during surgeries to remove head and neck cancers. Often in such surgeries, the tumor is disrupted, causing cancerous cells to spill into the body. In time, these cells can cause the cancer to recur (sometimes in a form that is more aggressive). Nuss believes that flushing the wounds with a chemotherapy agent prevents the spread, and his theory has thus far proved correct in tests on animals.

Judith Anne Lucas (Pediatric Resident '91–'94) is an assistant professor in the pediatrics department at Children's Hospital at the Albany Medical Center in New York. She has been in practice for seven years and recently started part-time so she can rear her 18-month-old twins. Since 1997, Lucas has collaborated on a double-blind clinical trial evaluating the nutritional status of children with HIV, for which the results are being calculated. She recalls her time in Pittsburgh fondly, noting that she nearly cried as she watched Three Rivers Stadium imploded on television. *—MH, KM*

America or the Caribbean twice a month for such cases among embassy workers, diplomats, and their family members. He previously has been stationed in Nigeria, Germany, South Africa, and Washington, DC.

If, years ago, someone told Bruno he would receive a new assignment every three years, his belongings misplaced in each move, his wife constantly starting another job, he would have asked, "Why would anyone want to do that?" Tell him the same today, and he'll let you know that he wouldn't change a moment of the last 19 years: He has visited remote places, treated interesting cases, in all, led a wonderful life. And he's right where he wants to be, wherever that may be. *—KM*



THE WAY WE ARE: CLASS OF '52

BY KRIS MURAWSKI AND DAVID ELTZ

Robert Holmes (MD '52) hit a grand slam, or at least that's what fly-fishermen say. For 20 years Holmes, now a retired ob/gyn in Titusville, Pennsylvania, and his wife, Martha Holmes, have traveled to the South Pacific, Australia, New Zealand, Africa, the Caribbean, and elsewhere to hunt and fish. Along the way, Holmes has collected trophies ranging from an elephant and a buffalo to a brown bear and a leopard. The Holmeses recently booked a fishing expedition on the Yucatan Peninsula in Mexico, where Robert Holmes tackled fly-fishing's greatest challenge, a grand slam: In one day he caught a permit, bonefish, and a tarpon.



Holmes (left) with his best man, Bill Schwerin (MD '52)

His classmate Thomas J. Tredici (Res '57, MD '52) is a civilian ophthalmologist and flight surgeon instructor at the USAF School of Aerospace Medicine, Brooks Air Force Base, near San Antonio, Texas. He once headed the school's ophthalmology department and has taught more than 12,000 flight surgeons while keeping pilots who developed eye problems in the sky. After retiring as a colonel in the US Air Force, Tredici remained on the base as a civilian instructor to stay connected with the department he spent much of his professional life building. Scalpels aside, Tredici likes to cut a rug. He and his wife foxtrot, rumba, and waltz.



Tredici (left) with son Tomas, also an ophthalmologist

Like Tredici, Samuel B. Challinor (MD '52) served his country. He was an enlisted man in the army during one of the bloodiest battles of World War II. For some 100 days in 1944, Challinor dug into the beach near the Italian town of Anzio, water bubbling up in the trench, soaking into everything around him. German troops, perched above the Allied invaders, shelled them repeatedly, killing 6,000 beached troops. "I'm lucky to be alive," he says. Eventually he made it home safely and returned to his studies. After earning his MD from Pitt and finishing a

residency at Shadyside, Challinor set up a general practice, soon switching to internal medicine. He retired in 1992 to become medical director of an insurance company known today as United Healthcare. Since retiring again in 1996, he spends much of his time golfing, traveling, and backwater fishing in the shallow shoals of the Indian River in Florida.

Herbert Tauberg (MD '52), organizer of the Class of '52 reunion, is a semiretired orthopaedic surgeon and now works in occupational medicine for the US Post Office in Pennsylvania and West Virginia. He planned several events around Pittsburgh on October 25 and 26, including a tour of the UPMC Sports Performance Complex. No word of any fishing contests on the Mon, though.



FROM LEFT: Linda Thompson (MD '78), Dorothy Christie Scott (MD '56), Jeanette South-Paul (MD '79), Lydia Saris-Mechenbier (MD '81), and Betty Bradley (MD '41)

WISDOM GLEANED

About 30 years ago, Margaret Ragni took out a sheet of paper. She drew a line down the center. Concerned about her future, she listed the pros and cons of becoming a PhD or an MD. She worried if she went into general practice she would miss a special piece of herself—the researcher who is creative, inquisitive, fun. Then, a mentor investigator took her along on rounds. Ragni, MD '75, now the director of the Hemophilia Center of Western Pennsylvania and a professor of medicine at Pitt, was thrilled to learn that doctors could do research and also care for patients.

Ragni shared her story, as did other alumnae, as part of an anthology of voices speaking out about life choices and challenges at the second annual Women in Medicine Luncheon in the spring. About 20 first- and second-year students gathered in Scaife Hall to garner wisdom from Ragni, Betty Bradley (MD '41), Lydia Saris-Mechenbier (MD '81), Jeannette South-Paul (MD '79), Linda Thompson (MD '78), and the now late Dorothy Christie Scott (MD '56). *—KM*

DOROTHY CHRISTIE SCOTT
OCTOBER 2, 1925–JUNE 11, 2002



Scott

Legend has it that Dorothy Christie Scott (MD '56) once brought a cross-eyed boy home to her engineer father's house in Johnstown, Pennsylvania, because she wanted to fix what was wrong. Years later, after she'd made the transition from scrub nurse to medical student (one of only two women in her graduating class) to ophthalmologist, she encouraged young women to become doctors. She, herself, was one of the first surgeons in Pittsburgh to implant intraocular lenses after cataract removal and the first female president of both the University of Pittsburgh Medical Alumni Association and St. Francis Medical Center's staff. In 1997, she established a humanitarian award at the School of Medicine for fourth-year med students to follow her lead.

What a lead it was. For years, she brought teams of ophthalmologists to the Caribbean island of Montserrat to provide its people with free eye care, a service especially appreciated after a volcano destroyed much of the island. One day, four children pulled up to the clinic in Montserrat in the back of a pickup; they were all cross-eyed upon their arrival and all well when they left, recalls her husband, Glenwood Scott.

"I don't think she ever thought of herself as being more than a mother and a wife, but obviously she was much more," he notes. *—DRE*

IN MEMORIAM

'40s

LAWRENCE XAVIER SULLIVAN SR. (MD '41)
JUNE 18, 2002

WILLIAM D. CLELAND JR. (MD '43)
NOVEMBER 4, 2001

ARMAND L. FONTANA (MD '43)
JUNE 11, 2002

MATTHEW B. MOORE (MD '43)
AUGUST 8, 2002

W. CREIGHTON MCCLINTOCH (MD '47)
AUGUST 24, 2002

'50s

WILLIAM M. GEORGE (MD '52)
JUNE 1, 2002

STEPHEN A. ZUBRITZKY (MD '52)
JUNE 13, 2002

DOROTHY CHRISTIE SCOTT (MD '56)
JUNE 11, 2002

'70s

JEFFREY S. PERCHICK (RES '75)
MARCH 1, 2002

'80s

J. JEFFREY GRIBB (MD '88)
MAY 25, 2002

NOTE: THE AMERICAN MEDICAL ASSOCIATION, A PRIMARY SOURCE FOR DEATH NOTICES OF OUR ALUMNI, NO LONGER PRINTS AN OBITUARY LIST. WE ENCOURAGE YOU, MORE THAN EVER NOW, TO LET US KNOW ABOUT ALUMNI WHO DIED RECENTLY. (ON THE INSIDE FRONT COVER YOU'LL FIND CONTACT INFORMATION FOR THE MAGAZINE.)

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PAUL PARIS: A FATHER'S DOCTOR

BY MEGHAN HOLOHAN



MARTHA RIAL

Paris wants his emergency medicine residents exposed to a variety of experiences, which might include treating someone in a bingo hall.

Snow and ice made Highland Park hills hostile that day. When Paul Paris was in 10th grade, his father, Robert Paris, fell. He lost his footing, and his body surrendered to gravity, crashing to the ground. Immediately, there were just some bruises, sore muscles, tender flesh. Nothing a few aspirin couldn't fix. But Robert Paris, known to many as "Dear" for his pleasant disposition, was taking Coumadin to treat coronary heart disease. No one mentioned that the combination of aspirin and Coumadin would make his blood too thin. No one mentioned that it could cause him to bleed internally.

A few days later, Robert Paris woke up looking horribly pale. His wife, Ruth Paris, called the police. Before anyone arrived, he died. "Dear" was 52.

It was clear to teenage Paul Paris that his father's death was a result of someone's error. He would be a doctor, he decided. He could do a better job. But he hadn't been a great student, so he worked harder, pushing himself to make the grades. He went to college at the University of Pittsburgh, was accepted to the School of Medicine, and graduated in 1976. Twenty-one years later, Paris was appointed chair of Pitt's Department of Emergency Medicine. In June, he became president of the Medical Alumni Association.

After he graduated, Paris left the Pittsburgh area for an internal medicine residency and an emergency medicine fellowship. He returned in 1981, joining Ron Stewart, founder of the Center for Emergency Medicine of Western Pennsylvania, to head the University of Pittsburgh–affiliated residency in emergency medicine, one of the first in the country.

In crafting the program, Paris wanted his residents exposed to a variety of experiences. No room for mistakes. So he rotated them through several hospitals. He taught them to always have a back-up plan (in case intubation doesn't work, for example, better be prepared to do a cricothyrotomy). He sought their feedback. At the same time, he was busy implementing Stewart's ideas, like creating a helicopter system and coordinating efforts among hospitals and ambulance services.

Pitt would become one of the few programs in the country that sent residents on calls with paramedics. Then, like now, Pitt ED residents rode in the STAT MedEvac helicopters. They learned to treat someone trapped in a car or under farm machinery. They learned how long they should treat someone at the scene before rushing the patient to the hospital.

"You see how different it is to treat cardiac arrest in a bingo hall," says Ron Roth, medical director of Pittsburgh Emergency Medical Services, chief of emergency medical services at Pitt, and former resident under Paris.

"And bingo doesn't stop for anything."

Not every novel idea played out well. Roth recalls an argument the residents had with Paris and Stewart over their uniforms. Polyester pants, clip-on ties, and vests—residents would wear these outfits, their bosses insisted, to portray a professional image. Yet few rookie residents had flown in helicopters before, so many would get queasy, rushing to the bathroom upon arrival at the hospital, ruining that first impression anyway.

Uniforms aside, Vincent Verdile, who completed his residency in 1987 and recently became dean of the Albany Medical College, says it was Paris' energy and leadership that made the program such a success: "He allowed for our creativity, but he was watchful and would give us guidance."

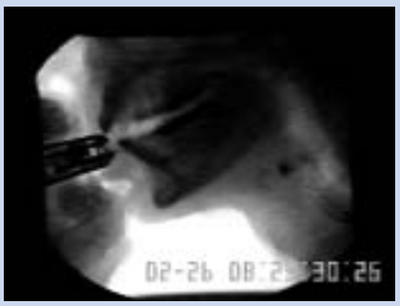
"Instead of just treating the results of poor health, it seems that emergency medicine can keep people healthy."

When Paris is in the ED, it's not unusual to see him encouraging a patient to quit smoking. He's looking out for the many who end up at the hospital because they don't have a personal doctor. "In general, health-care systems are designed to treat the ill and injured, but they've sort of failed to keep people healthy," says Paris. "Instead of just treating the results of poor health, it seems that emergency medicine can help in a variety of ways to keep people healthy."

Another Paris initiative is a van sent to Pittsburgh neighborhoods to conduct health screenings. He has enlisted paramedics in his preventative medicine cause as well, instructing them to ask every patient they treat, *Have you had a flu shot?*

In Paris' world, every patient is dear. ■





Thanks to Hank Bahnson, former chair of surgery at Pitt and designer of the Overblow Harp, the average Joe can now hit notes on a harmonica only legends like Howard Levy could in the past. In a way, this fluoroscopic x ray, captured by Bahnson collaborator James Antaki—a.k.a. "TurboDog" when a harp is nearby—shows you how. To view this video, and others that include Levy himself demonstrating licks, visit http://www.turboharp.com/Company/CompanyVideo.html.

IMAGES | COURTESY J. ANTAKI, H. T. BAHNSON, R. CURTIN

CALENDAR

OF SPECIAL INTEREST TO ALUMNI AND FRIENDS

SCHOOL OF MEDICINE HOMECOMING BREAKFAST
OCTOBER 26
University Club, 9 a.m.
Pittsburgh
For information
Jennifer Rellis
877-MED-ALUM
jrellis@medschool.pitt.edu

HOMECOMING GAME
OCTOBER 26
Pitt vs. Boston College
Heinz Field, Time TBA
For information
Ross H. Musgrave, MD '43
412-648-9090
medalum@medschool.pitt.edu

HOMECOMING REUNIONS
OCTOBER 25 AND 26

CLASS OF '47
For information
Alex Minno, MD '47
412-681-2828

CLASS OF '52
For information
Herbert Tauberg, MD '52
412-621-3939

CLASS OF '67
For information
Jon Brillman, MD '67
412-243-9662

CLASS OF '77
For information
Freddie H. Fu, MD '77
412-605-3265

CLASS OF '82
For information
James Kunkel, MD '82
724-443-2617

CLASS OF '87
For information
Jon Levy, MD '87
412-441-7775

CLASS OF '92
For information
Evan Baker, MD '92
412-464-1619

SCHOOL OF MEDICINE RECEPTION
113th Annual Meeting of the Association of American Medical Colleges
NOVEMBER 10
Hilton San Francisco & Towers, 6 p.m.
San Francisco, California
For information
Kristin Bagdon
412-648-9000
kbagdon@medschool.pitt.edu

ROSS H. MUSGRAVE LECTURESHIP
NOVEMBER 15
Magee-Womens Hospital Auditorium, 5:30 p.m.
Peter Randall, MD, Speaker
"Robert H. Ivy"

NOVEMBER 16
Scaife Hall
Lecture Room 5, 10 a.m.
Peter Randall, MD, Speaker
Surgery Grand Rounds
"Dr. Penrose: His Drain and His Family"
For information
Ross H. Musgrave, MD '43
412-648-9090
medalum@medschool.pitt.edu

23RD ANNUAL PETER AND EVA SAFAR LECTURESHIP
NOVEMBER 21
Scaife Hall
Lecture Rooms 5 & 6, 4 p.m.
Lyn Yaffe, MD, Speaker
"Future Medicine—Biomedical Technology Systems for Victims of Combat and Terrorism"
For information
Linda Ryan Amick
412-383-1901
AmickLR@anes.upmc.edu

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OUR WISH

After three years of publishing *Pitt Med,* we're breaking from the tradition of keeping birthday wishes secret: The best present you could give us is news about yourself. Let us know about your career, your hobbies, your fondest or most enduring Pitt memories. Tell us what you like about the magazine, what you'd like to see more or less of. Use the business-reply postcard in the Alumni News section, send an e-mail to medmag@pitt.edu, or call 412-624-4152.

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