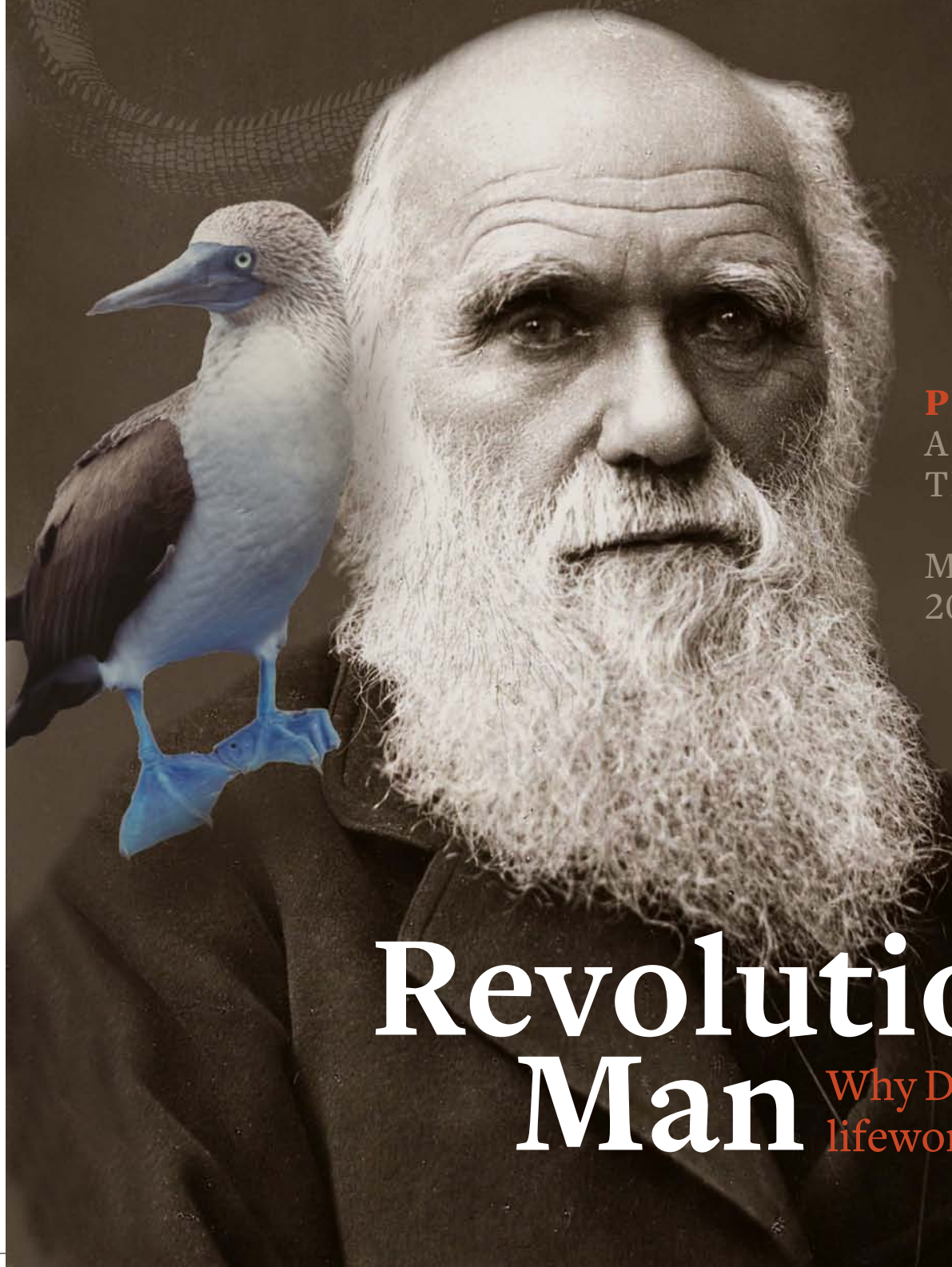


BROWN MEDICINE

Volume 15 | Number 2 | Spring 2009

A magazine for alumni and friends of The Warren Alpert Medical School of Brown University



PLUS:
A DOCTOR IN
THE HOUSE

MATCH DAY
2009

Revolution Man

Why Darwin's
lifework matters.

LETTER FROM THE DEAN



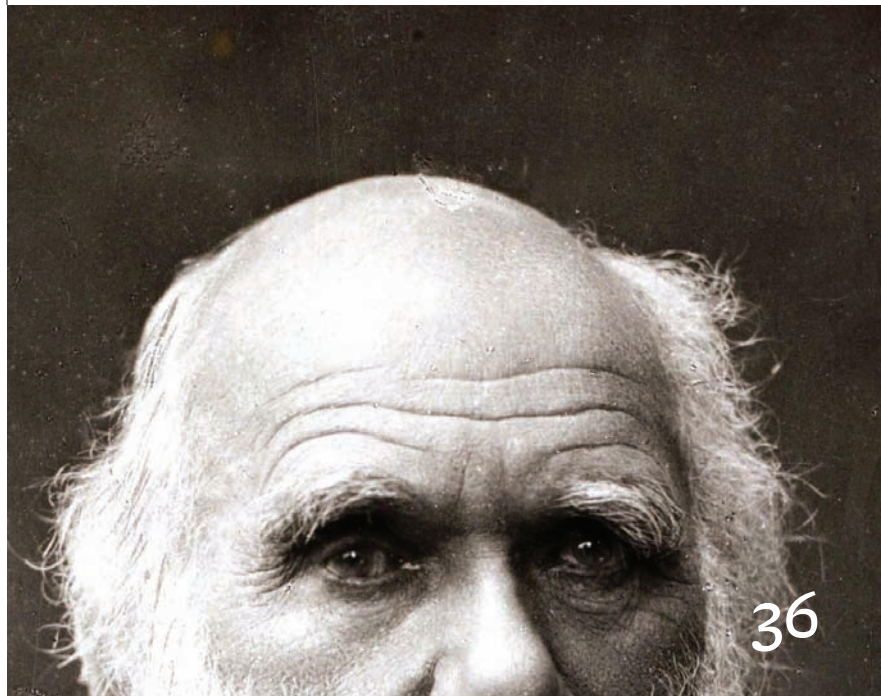
An Abundance of Talent

We are very pleased to highlight in this issue of *Brown Medicine* one of our most exciting initiatives and one of our most talented faculty.

The patient-centered medical home is where we are likely to receive our medical care in the future. The medical home will bring appropriate medical care, single stop shopping, coordinated referrals to specialists, electronic medical records, and other services directly to patients. Costs can potentially be markedly reduced in such a model, and patient outcomes improved. The model can also make primary care a more rewarding career choice, and Rhode Island's Area Health Education Center, based here at the Medical School, is working with national leaders to promote this model and provide incentives for new doctors to enter primary care. I believe that health care reform likely will incorporate the ideas of a the patient-centered medical home and will be the future of medical care.

Professor of Medicine Sharon Rounds personifies excellence at Alpert Medical School. A true "triple threat," Sharon has excelled as a clinician and teacher. Rounding for many years at the VA in internal medicine, pulmonary medicine, and the ICU, she has cared for innumerable veterans and taught generations of students, residents, and fellows. She has always been regarded as a doctor's doctor, and research has brought her national and international recognition. And finally, serving as associate dean for clinical faculty affairs, president of the American Thoracic Society (the most prestigious pulmonary society), and now chief of medicine at the Providence VA Medical Center, Sharon has excelled as an administrator. We are more than fortunate to have Sharon on our faculty.

Edward J. Wing



“... [F]rom so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.”

– Charles Darwin

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The MD Class of 2009 was all smiles at another successful Match Day.

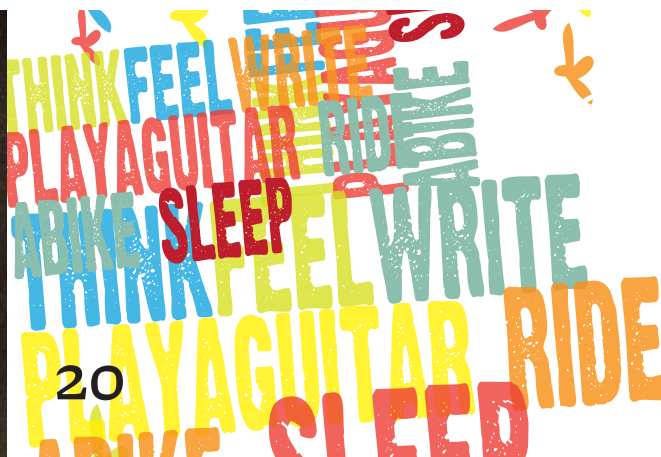
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BY KRIS CAMBRA

Rhode Island pilots the large-scale implementation of the patient-centered medical home concept. Will it work?

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Meet Sharon Rounds — a leader, mentor, and critical care physician who’s not afraid to wear a tiara.



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LETTER FROM THE EDITOR

Flora. Fauna. Fame.



In this year of Darwinophilia, there seems to be a bit of a “jump on the bandwagon” phenomenon. Right and left, institutions and publications are celebrating the 200th anniversary of the naturalist’s birth and the 150th anniversary of the publication of *On the Origin of Species*. But if you pause a moment to contemplate the profundity and reach of Darwin’s work, you’ll want a seat on that bandwagon, guaranteed.

What a guy. Beyond giving us the understanding that species are the modified descendants of earlier forms – a notion of such exquisite clarity and logic that it seems almost self-evident today – Darwin broke ground in botany, zoology, travel writing, and experimental psychology. Yet though his work caused an almost Copernican revolution in science and culture, Darwin comes across less as a radical than as a deep and unifying, acutely observant thinker whose theories were gradual – like evolution itself.

There is something charmingly understated about his personal journal entries. He is implacable when it comes to his own productivity. Over and over he laments days, weeks, months as “entirely wasted,” “lost” either to inactivity (“...nothing is so intolerable as idleness”) or to poor health (“lost several weeks by Boils & unwellness”), all the while researching, writing, and revising some 25 tomes that helped change the way we think about life on Earth.

It was only a matter of time, I suppose, before the aspiring fifth grade archaeologist that I was, who worshiped the Leakeys and made a stop-motion animation film starring *Australopithecus africanus*, gave Charles Darwin his due. As much as his contributions to science, it is his eclecticism and apparent unpretentiousness that I admire. John Collier’s achingly beautiful 1883 portrait conveys an irresistible impression of what I hope truly were his essential qualities: gentlemanliness, open-mindedness, insight, and wisdom.

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THE BEAT

WHAT'S NEW IN THE CLASSROOMS, ON THE WARDS, AND IN THE LABS

Crime Scene Science

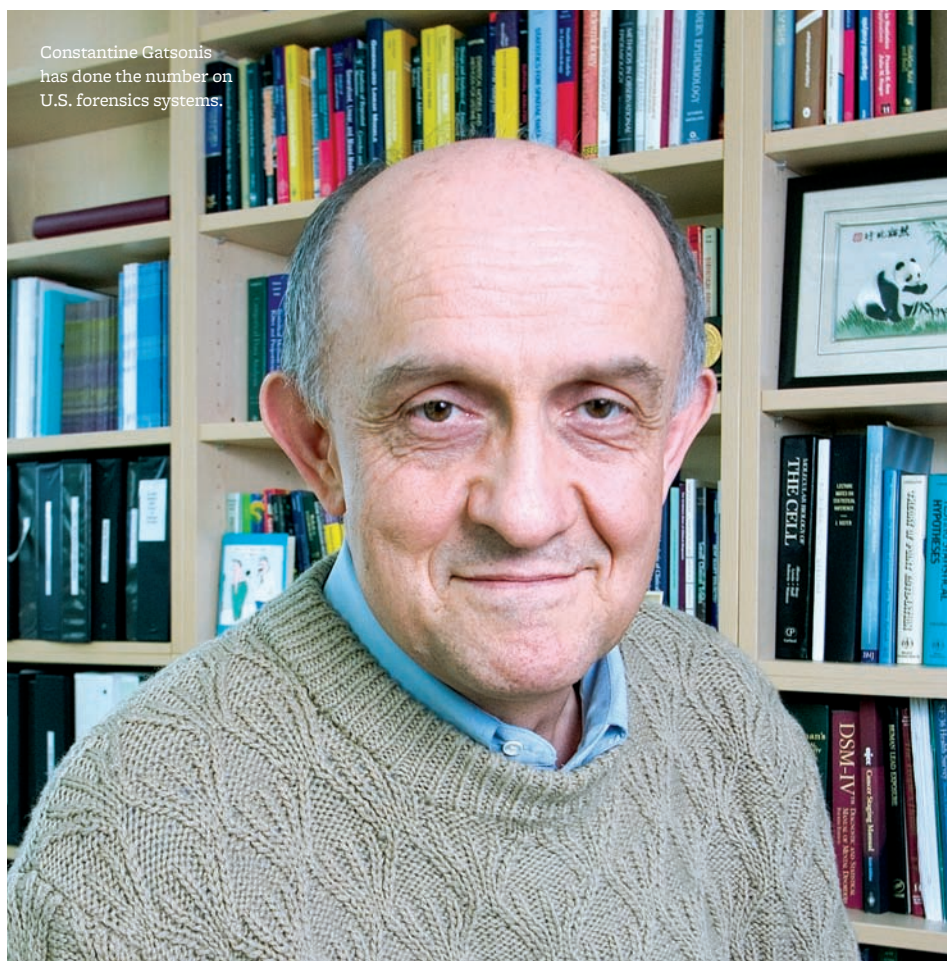
New report cracks the case on forensic evidence.

PROOF Although the CBS program “CSI” and its two spinoffs would suggest otherwise, Professor of Community Health (Biostatistics) Constantine Gatsonis and his colleagues say the country’s forensics methods and systems—from fingerprint identification to bite-mark analysis—need an overhaul.

Gatsonis, the director of Brown’s Center for Statistical Sciences, co-chaired a two-year study on forensic science for the National Academy of Sciences (NAS). The study found uneven standards for collecting evidence, outdated scientific practices, and a lack of effort to develop and use new science. “The simple reality is that the interpretation of forensic evidence is not always based on scientific studies to determine its validity,” says the report. “This is a serious problem.”

NAS formed its committee to assess the state of forensic science back in 2006, at the request of Congress. The committee looked at many different kinds of evidence—from hair to bloodstain patterns to fingerprints. This type of forensic evidence is increasingly offered in criminal prosecutions and civil litigation to “match” a piece of evidence to a particular person, weapon, or other source. However, according to Gatsonis, with the exception of nuclear DNA analysis no forensic method has been rigorously shown to demonstrate consistently, and with a high degree of certainty, a connection

Constantine Gatsonis has done the number on U.S. forensics systems.



between evidence and a specific individual or source. Gatsonis found that forensic analysts commonly fail to acknowledge this uncertainty when describing their findings.

Today, there is a dearth of peer-reviewed, published studies establishing the scientific bases and reliability of many forensic methods. And most forensic science labs are underfunded and understaffed, and have no effective oversight. Gatsonis says that rigorous and mandatory certification programs for forensic scientists are lacking, as are strong standards and protocols for analyzing and reporting on evidence.

In this forensics climate, Gatsonis’s long-awaited report could be highly influential. “There is interest in Congress, both

STATS

Cash Flow

\$10.4 billion

Extra funds for the National Institutes of Health (NIH) in the 2009 federal economic stimulus package

300,000

Number of jobs now supported by NIH grants to external organizations

6

Number of years the NIH budget has failed to keep pace with inflation

13%

Loss in purchasing power by the NIH budget over that period

14,000

Estimated number of scientifically meritorious research proposals that the NIH had approved but had been unable to fund

2:1

Return on every research dollar from the NIH in business activity (increased output of goods or services) at the state or local level

\$143,435,000

Grants from the NIH to Rhode Island institutions in 2007

2,026

Estimated new jobs generated in the state in 2007 by those funds

Sources: AAMC, Dartmouth Medicine, Alpert Medical School

in the Senate and House. The White House is interested in this. My belief is something will happen down the line," he says. "The system is federal, state, and local so there is a potential overhaul of the entire system."

The report offers no judgment about past convictions or pending cases, and it offers no view as to whether the courts should reassess cases that already have been tried. Rather, it describes and analyzes the current situation in the forensic science community and makes recommendations for the future. "Much research is needed not only to evaluate the reliability and accuracy of current forensic methods but also to innovate and develop them further," says Gatsonis. "An organized and well-supported research enterprise is a key requirement for carrying this out."

The research council report recommends that a new, independent National Institute of Forensic Science set a research agenda, enforce standards, and push for improvements. This new institute, according to Gatsonis, "must have a culture that is strongly rooted in science" and not be part of a law enforcement agency. —Rachel Blatt '09

Get a Cancer Clue

Researchers work out the structure of a possible cancer flag.

FINDINGS Two Brown researchers, Hua Li and Gerwald Jogl, have determined the three-dimensional structure of TIGAR, an enzyme whose presence in the body could indicate that cancer may follow. The *Journal of Biological Chemistry* published the results of their study in its January 16 issue. The findings could help doctors detect cancer earlier or develop more targeted treatments.

Jogl, an assistant professor of biology, says understanding TIGAR is important because the enzyme is "one of the good guys" in the battle against cancer. Since its presence comes in tandem with cellular damage, knowing more about the enzyme could lead to earlier cancer detection or even to preventive treatments. Jogl says "studying the good guys will lead us to the bad guys and where the places are to interfere."

After more than a year of research together, Jogl and Li, a fifth-year PhD student based in Jogl's lab, discovered that the enzyme TIGAR has a more substantive active site than they expected. They mapped its structure using a method called x-ray crystallography. Jogl says the discovery will also "help us to understand where else we should be looking for good [anti-cancer] targets." —Mark Hollmer





Goddard says coverage is capital.

Ms. Goddard Goes to Washington

Student advocates for affordable health care for herself *and* her patients.

ACTIVIST Lauren Goddard MD'12 found herself rubbing elbows with the family and friends of Washington's most powerful political players in February, as she watched President Barack Obama's first address to Congress from the Visitor's Gallery of the House of Representatives.

A self-described "political geek," Goddard attended the speech as a personal guest of Sen. Sheldon Whitehouse, D-R.I.

Goddard met Whitehouse early this year at a community dinner in Warwick that focused on health care reform. The

dinner was attended by about 200 people who spoke about their struggles in receiving health care.

Obama's focus on affordable health care had personal resonance for Goddard. After graduating from Barnard College in 2004, she was diagnosed with Crohn's disease, a gastrointestinal disease for which there is no known cure. "I took health insurance for granted for my whole life, but then I became too old to be covered by my mother's insurance policy. I found myself without health insurance and the owner of a pre-existing condition. As a medical student,

I see patients with insurance problems all the time, but it's scary finding yourself in those shoes," Goddard says.

After seeing the President's speech Goddard is hopeful, but feels there is still "so much that needs to change in our health care system right now. For example, we need to improve our electronic health care records.... There needs to be a standardized, unified electronic system shared by primary care doctors and specialists." She says there also needs to be more incentive for graduating medical students to go into primary care.—Brian Mastroianni '11



Live from London

Students present at international conference.

SPOTLIGHT Three medical students were invited to present at the 2008 British Medical Association-American Medical Association-Canadian Medical Association International Conference on Doctors' Health in London, England. The students, Joanna MacLean '06 MD'10, Tanya Rinderknecht '05 MD'10, and Sarah Wakeman '05 MD'09, gave a presentation called "Breaking the Silence: A workshop on the standards, ethics and importance of reporting unprofessional behavior and impairing illness in medical school."

The students went on behalf of the Alpert Medical School Student Health Council, which was established in the 1980s to deal with ethical dilemmas in the clinical setting. They were the only American medical students invited to present at the conference. —R.B.

Dance Lessons

Med student uses dance to embody the message.

WHO KNEW? For Almaz Dessie, a second-year medical student who plans to enter primary care, medicine has become a kind of dance. When she first came to Brown in 2003, as an undergraduate in the Program in Liberal Medical Education, she took the normal load of human biology and organic chemistry, but she also began studying music and West African dance. As a senior, Dessie joined New Works, a dance company in Providence that uses music, movement, traditional storytelling, and poetry to tackle such issues as disease and hunger. "I thought I'd be done after my senior year," Dessie says, "but I couldn't leave. I just kept dancing straight into med school."

In addition to the 10 hours she devotes to New Works each week, Dessie works as a teaching assistant for the Mande dance class at Brown and continues to study performance on her own. "I see it as another way to explore people's relationships to their bodies," she says. Dessie's fellow medical students don't know where she gets the time. "They think I'm crazy to spend so much time doing this when I could be studying, but it keeps me connected to myself and makes me a better student," she says.

Last summer, while doing HIV research in Ghana, Dessie joined New Works in Mali for the dance company's annual three-week trip there. "While we were there we danced, but we also did malaria research to see how mosquito nets were being used in small villages." The team then choreographed a performance to raise awareness about malaria prevention and treatment in those villages. "We called it 'edu-tainment,'" Dessie says. "[It's] science education through dance and performance."

While Dessie is sure she wants to enter academic medicine when she graduates, she says her performances will continue to inform the way she thinks of health and the human body. "I plan to dance until my body can't do it anymore." —R.B.



From med school to Mali, Dessie keeps on her toes.

ISTOCK, BRANDON CHINN '09

The after-effects of cancer treatment in children.

Lead author Christine Trask, PhD, ABPP, a clinical assistant professor of psychiatry and human behavior at the neuropsychology program at Rhode Island Hospital says, "This study showed us that parents had a moderately positive satisfaction level with regard to the information they received about NCLE, but it is also clear that there is a strong desire across all groups to know more." Trask also notes, "One particularly interesting finding is that parents had significant variability about when they wanted to receive information about NCLE. Parents who reported higher levels of emotional distress, lower levels of education, or who had a child with leukemia reported wanting to receive more information on NCLE as early as possible."

The study appeared in the February edition of the journal *Pediatric Blood Cancer*.— *Kris Cambra*

OVER
HEARD

KRISTIN DIVONA



Amal Trivedi wants to get the right care to the right people.

And Coverage for All

A physician studies the hidden cost of co-pays.

ELEVATOR PITCH

When Amal Trivedi was a first-year medical student at UCLA, he witnessed two events that would define his career. The first was the attempt at universal health care coverage during the early years of the Clinton administration, which, as Trivedi says, “collapsed pretty spectacularly.” The second was the LA County Health Care Crisis of 1995. “The entire safety net system for Los Angeles County was going to be defunded,” he explains. “And I quickly learned that this ‘crisis’ happens every few years.”

Trivedi became interested in the issues at play in attempts to enact universal health care coverage. “I thought that was just as important as what I was learning in anatomy and biochemistry ... that physicians had a role to play in setting the agenda for health policy, in making sure that vulnerable populations have access to high quality care.”

A hospitalist at the Providence VA Medical Center and an assistant professor of community health, Trivedi came to Brown in 2006 because the position allowed him to integrate clinical care with research on health care policy and quality. *Brown Medicine* recently talked to Trivedi about his research.

What did your recent study on mammography, published in the *New England Journal of Medicine*, find?

We’re all in agreement that women between 65 and 69 should receive regular mammography because mammograms reduce breast cancer deaths. We studied the effect of requiring women to pay more than \$10 for a mammogram and found that the rate of mammography use [by seniors on Medicare] decreased by 8 to 11 percent. There was a larger effect among poor and less educated women, so vulnerable

populations were impacted the most.

It probably makes good clinical sense and good economic sense to eliminate co-payments for some services that we know are very valuable.

You've also studied co-pays for mental health care. What did you learn there?

Coverage for mental health services has historically been more restricted than coverage for all other types of health care ... you sometimes have to pay a lot more out of pocket to see a mental health provider. We know that when patients are admitted for a psychiatric illness, if they are able to see an outpatient mental health care provider [subsequently] they are less likely to come back to the hospital. We found that in Medicare health plans where the mental health co-payment was much more than the co-pay to see a primary care or specialty care provider, the rates of follow-up were dramatically lower. Health plans with equivalent co-pays have much higher rates of appropriate follow-up after psychiatric hospitalizations.

We should note that Congress implemented mental health parity [in 2008] ... as part of the financial bailout package. The headlines were about the \$700 billion for troubled financial assets, but for people who had been following the parity debate, this was a landmark step. But what the legislation didn't specify was whether parity means equal co-payments for mental health and specialty care or primary care.

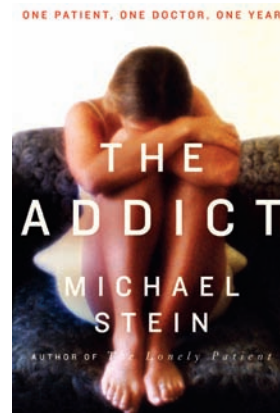
What is the optimal amount to charge patients to receive care?

This is one of the most controversial health policy topics. Should health care be free, and if not, how much should people pay? The elderly may be particularly sensitive to higher prices because they generally have lower incomes, and if they forego important medical care they can have serious consequences because they tend to be sicker. Plus, elderly on Medicare face high cost sharing—what they pay out of pocket for doctor visits, hospitalizations, and prescription drugs.

How do you define high-quality care?

I think high-quality care is getting the right care to the right person in a timely fashion, in the most efficient way. That's

BOOK SHELF



THE ADDICT: ONE PATIENT, ONE DOCTOR, ONE YEAR

By **Michael Stein**, MD, professor of medicine and author of *The Lonely Patient: How We Experience Illness*. HarperCollins, 2009 | \$19.99

Read an excerpt! Go to <http://med.brown.edu/brownmedicine> and check out Web Extras —Read.

really what my research agenda is—trying to find ways to measure and improve the quality and equity of care. [O]ne of the questions is whether quality improvement measures can also make care more equal. The jury's still out on that.

Imagine you are advising President Obama. What do we need to do first to reform health care?

The most important thing is expanding coverage to every American. That's where you start. The second part is trying to find ways to control costs. I don't think it's possible to control costs unless everyone is in the system.

What's next for your research?

I just received a Career Development Award through the VA. The goal of my project is to compare the quality of care in the VA system to the care delivered by private health plans in Medicare. The VA and the Medicare health plans are structured very differently and I want to do a head-to-head comparison between them. — K.C.

ASK THE EXPERT

Excess in IVF

Don't put all your eggs in one basket.

Professor of Obstetrics and Gynecology John E. Buster, of the Center for Reproduction and Infertility at Women & Infants Hospital, was director of one of the two academic medical teams that in 1984 were responsible for the first successful delivery of a healthy baby from donated oocytes and embryos. Below he addresses concerns raised by California's "octomom" and her octuplets.

What are the risks involved in assisted reproductive technology, and how can they be avoided?

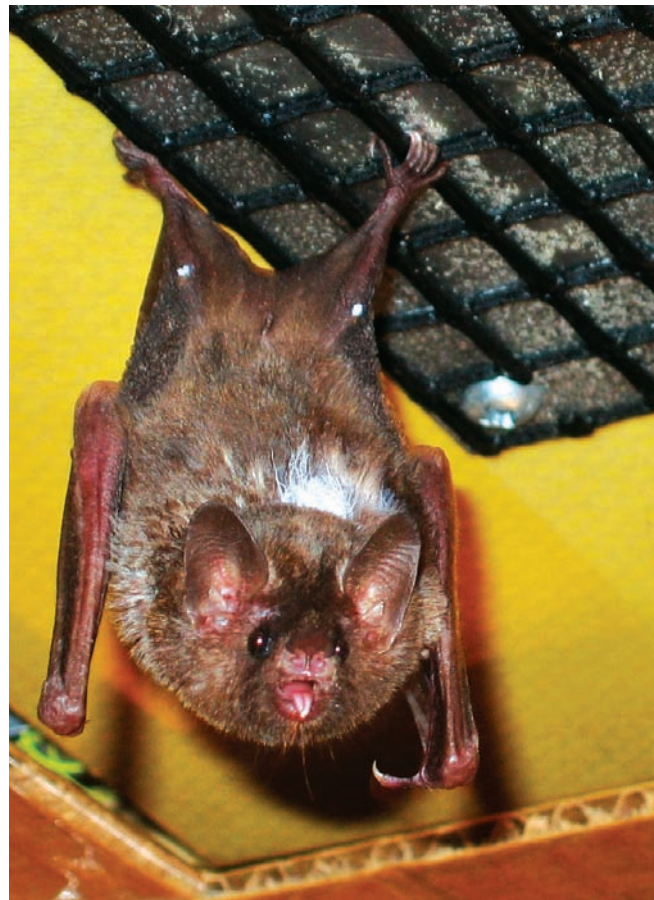
A possible outcome of assisted reproductive technology (ART) is high-order multiple births. But this problem can and should be avoided.

To overcome fertility problems with IVF, the ovary is stimulated to make multiple eggs, which are then fertilized in the laboratory. To make sure that a pregnancy occurs, there is a temptation to put in as many eggs as possible, but this is a delicate balance. We want to make sure couples have the best chance at pregnancy but also decrease the risk for multiples, which come with significant increased risks to the health of the mother and the outcome of the pregnancy.

Advances in laboratory methods and clinical protocols enable us to freeze better quality embryos and place fewer embryos. National standards about the number of embryos transferred—based on a patient's age and her medical condition—have been set by the American Society for Reproductive Medicine and the Society of Assisted Reproductive Technology. Standards have also been set for careful monitoring of ovarian stimulation with drugs to prevent both complications and multiple pregnancy.

A new technique called in vitro maturation (IVM) enables specialists to recover and mature eggs without fertility drugs. This makes it possible to treat infertile women whose ovaries over-respond to fertility drugs and who have serious problems achieving pregnancy with standard IVF.

Do you have a question related to contemporary medicine? Send it to Brown_Medicine@brown.edu and be sure to put "Ask the Expert" in the subject line. Read Dr. Buster's retrospective of 25 years of infertility treatment. Go to Web Extras at med.brown.edu/brownmedicine/spring2009.



Happy Landings

Small flying mammals have real bat mobility.

ACROBATS Scientists have discovered that bats do much more than simply take flight and land. Daniel Riskin, a postdoctoral research associate in the Department of Ecology and Evolutionary Biology, has found that leaf-nosed bats consistently land on their feet upside down, with a twist and tuck of their wings and hind legs. Riskin's research took advantage of bats' natural tendency to choose a favorite roosting spot and keep returning to it. High-speed cameras captured the bats' landings, and a scale attached to the lab's ceiling measured the force of their impacts.

The findings, published in the *Journal of Experimental Biology* in March, show that landing styles vary among species: two of the species studied cart-wheel into soft landings, while a third back-flips into a harder impact and lands on all fours. Some bats can also run. Riskin put vampire bats on a treadmill and found that they shifted to a new gait at higher speeds, reaching out both wings at a time to bound forward. Riskin's team attributes the locomotive differences to evolutionary differences.

Who Wants to Live Forever?

Scientists halt aging – in fruit flies.

FINDINGS Professor of Biology Stephen Helfand and Assistant Professor of Biology Nicola Neretti have added another piece to the puzzle that Helfand first discovered in 2000. Nine years ago, he identified a mutation in the Indy (short for “I’m Not Dead Yet”) gene that can extend the lifespan of fruit flies. Subsequent studies have led to a new finding that a mechanism in those genetically altered fruit flies could someday help humans fight the aging process.

“Understanding how... the Indy mutation alters the metabolic state of the fruit fly would allow someone to come up with pharmacological interventions that could mimic it and give you the benefit of genetic manipulation without having to do genetics,” Helfand says.



Helfand found that the lifespan of a genetically altered Indy fly increased from an average of 35 days to 70 days. The genetically modified flies expressed lower levels of the gene that generates the power for normal cell life. This lowered their production of free radicals, the cellular byproduct that contributes to aging, but surprisingly, did not decrease the overall amount of energy in their cells.

The findings provide evidence for possible interventions that could alter metabolism to extend lifespan, without the negative consequences normally associated with metabolism changes. The article detailing the findings appeared in the January 21 issue of the *Proceedings of the National Academy of Sciences*. Neretti, an assistant professor in Brown’s Institute for Brain and Neural Systems, was the lead author.

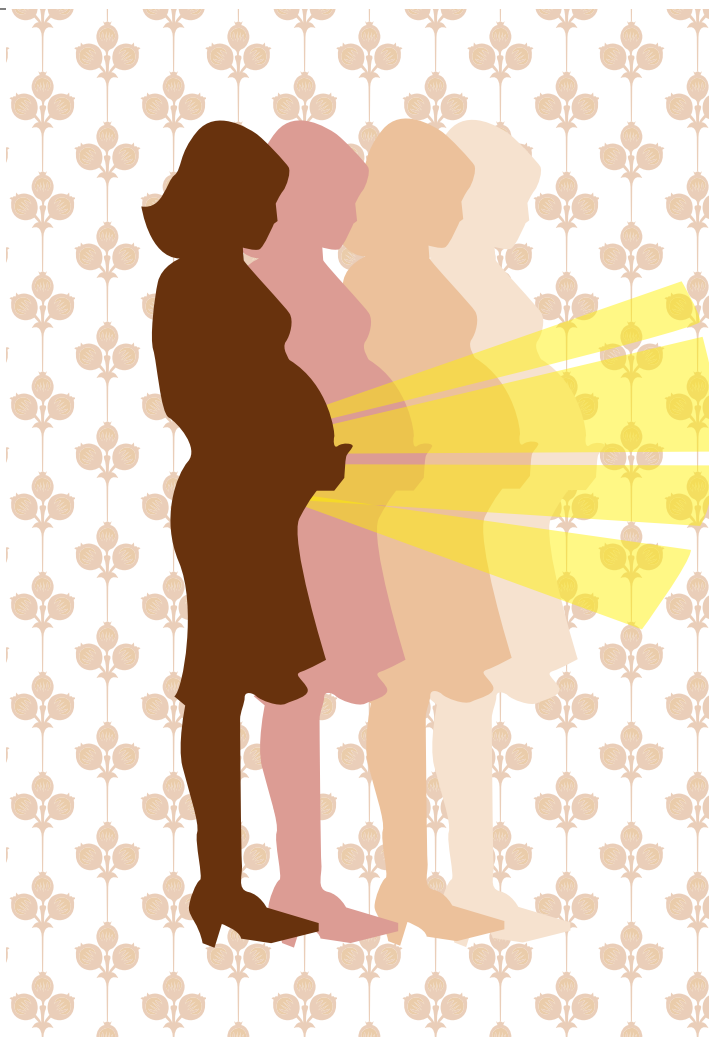


Let the Sunshine In

Bradley’s new building will make kids more comfortable.

HOSPITAL On April 1, patients moved into the Emma Pendleton Bradley Hospital’s newly constructed, 44,000-square-foot inpatient facility, just a year after ground was broken. Clinical Assistant Professors of Psychiatry and Human Behavior G. Oana Costea, MD, director of the child inpatient program, and Harsh Trivedi, MD, director of the adolescent inpatient program, say the new facility was designed with detailed input from physicians, parents, and patients to insure patient safety and comfort. Private rooms and spacious common areas provide flexibility and a more comfortable therapeutic interface. “We wanted to give it a warm and welcoming feeling ... to restore dignity and respect to the process [of psychiatric hospitalization],” Trivedi says.

The inpatient service of the Center for Autism and Developmental Disabilities is also located in the new facility. The building is phase one in a multi-phase revitalization project for the hospital campus that will be completed in fall 2009. Renovations will expand space for outpatient services and research and the hospital’s residential treatment program. — K.C.



You're Glowing!

More pregnant women are getting CT scans.

FINDINGS The screening of pregnant women with CT (computed tomography) scans is increasing, according to research by Dr. Elizabeth Lazarus, assistant professor of diagnostic imaging. The scans are usually done to diagnose life-threatening conditions in pregnant women, but the radiation produced by some of these imaging machines could be of slight risk to a fetus.

For the study, Lazarus's team looked at the trend in pregnant women undergoing CT, fluoroscopy, and plain-film x-ray imaging at Rhode Island Hospital and Women & Infants' Hospital from 1997 through 2006. The researchers hoped to raise awareness about the increase of imaging in pregnant patients and possibly encourage the development of protocols that minimize radiation exposure, Lazarus says. MRIs and ultrasound, for example, do not expose the patient or fetus to ionizing radiation.

The report was published in the March 17 online edition of *Radiology*.

Bullseye Protein

Discovery could lead to new autism treatments.

FINDINGS A team led by Justin Fallon, a professor of neuroscience, has found something in the brain that could serve as a target for future treatments of autism and mental retardation—the Fragile X granule.

While many research groups have been studying Fragile X protein's role in the post-synaptic, or the receiving side, of our brain's synaptic connections, Fallon's team is one of the first to show that Fragile X also exists at the pre-synaptic, or send-



ing side, of the synapse. "For over 25 years the field has focused almost exclusively on the post-synaptic, receiving side," Fallon says. "Almost no one has looked at the pre-synaptic side, as it was not thought to be involved in Fragile X." Fallon's findings are significant because they identify a new defective element for researchers to target.

Autism affects as many as 1.5 million Americans, and the number is on the rise, according to the Autism Society of America. The brain disorder can be caused by a variety of genetic factors. Further research is still needed, but Fallon's lab suspects that Fragile X granules could contain multiple RNAs, or sets of genetic information to help modify the synapse during learning and memory. If this theory proves correct, the granules might serve as pinpoint targets for eventual drug treatments of autism.

Fallon is the senior author of the study, which was published in February in the *Journal of Neuroscience*. Two postdoctoral students at Brown were lead authors: Sean Christie and Michael Akins. — M.H.

The Wild

Imported wildlife poses frightening risks to U.S. ecology and to humans.

THREAT **Wildlife imports into** the United States are fragmented and insufficiently coordinated, failing to accurately list more than four in five species entering the country, a team of scientists has found. The effect, the scientists write in a *Science* paper, is that a range of diseases is introduced into the U.S., potentially decimating species, devastating ecosystems, and threatening food supply chains and human health.

The research by Brown University, Wildlife Trust, Pacific Lutheran University, the Centers for Disease Control and Prevention, and the Global Invasive Species Programme comes as Congress begins deliberating the Nonnative Wildlife Invasion Prevention Act (HR 669), which would tighten regulations on wildlife imports. At a recent hearing before the House Natural Resources Committee, Subcommittee on Insular Affairs, Oceans and Wildlife, wildlife experts discussed how non-native species and plants can disrupt ecosystems. One case mentioned at the hearing involves the Burmese python, originally imported as a pet that now infests the Florida Everglades.

The global wildlife trade generates billions of dollars annually. The team analyzed Law Enforcement Management Information System (LEMIS) data gathered by the U.S. Fish and Wildlife Service from 2000 through 2006 and found the U.S. imported 1.5 billion live wildlife animals. The majority of the imports were from wild populations in more than 190 countries around the world and were intended for commercial sale in the United States — primarily in the pet trade.

“That’s equivalent to every single person in the U.S. owning at least five pets,” says Katherine Smith, assistant



The Nile monitor is now rampant in Florida.

research professor in the Department of Ecology and Evolutionary Biology and a co-author on the paper.

“That’s over 200 million animals a year — unexpectedly high,” says Peter Daszak, president of Wildlife Trust and also a co-author on the paper.


The team also found that more than 86 percent of the shipments were not classified to the level of species, despite federal guidelines that mandate species-level labeling. The lack of accurate reporting makes it impossible to fully assess the diversity of animals imported or calculate the risk of nonnative species or the diseases they may carry, the team wrote.

“Shipments are coming in labeled ‘live vertebrate’ or ‘fish,’” Daszak says. “If we don’t know what animals are coming in, how do we know which are going to become invasive species or carry diseases that could affect livestock, wildlife, or ourselves?”

“The threat to public health is real. The majority of emerging diseases come from wildlife,” says Smith, who is also a senior consultant at Wildlife Trust. “Most of these imported animals originate in Southeast Asia — a region shown to be a hotspot for these emerging diseases.”

The team called for direct and immediate measures to decrease what it has termed “pathogen pollution” — the risks associated with poorly regulated wildlife trade. Specifically, requiring stricter record keeping and better risk analysis of animal imports; establishing third-party surveillance and testing for both known and unknown pathogens at points of export in foreign countries; and educating individuals, importers, veterinarians, and pet industry advocates about the dangers of diseases transmitted from wildlife to humans and domesticated animals.

—Richard Lewis



Vicki Tsai and Sandy Chira

Game, Set, Match!

Four years of all-night study sessions, grueling clinical rotations, and a nerve-wracking interview process paid off on March 19 when the 92 members of the MD Class of 2009 celebrated Match Day. The 84 students who matched (six did not enter the Match this year and two will enter military training programs) are headed to top residency programs across the country, with California, Rhode Island, and New York the most popular states. Thirteen students matched with Alpert Medical School-affiliated programs.

“The overall satisfaction seemed high given the level of kissing and hugging and crying,” said Associate Dean for Medical Education Philip Gruppuso, whose jazz band once again provided musical accompaniment for the envelope opening. “From my standpoint, student satisfaction is the most important thing. A secondary, albeit important consideration is that many of our students are going to programs that are widely considered to be outstanding.”

To see the complete list of residency appointments, go to <http://med.brown.edu/about/match>.

For more scenes from Match Day, go to <http://biomed.brown.edu/photos/zp/>.



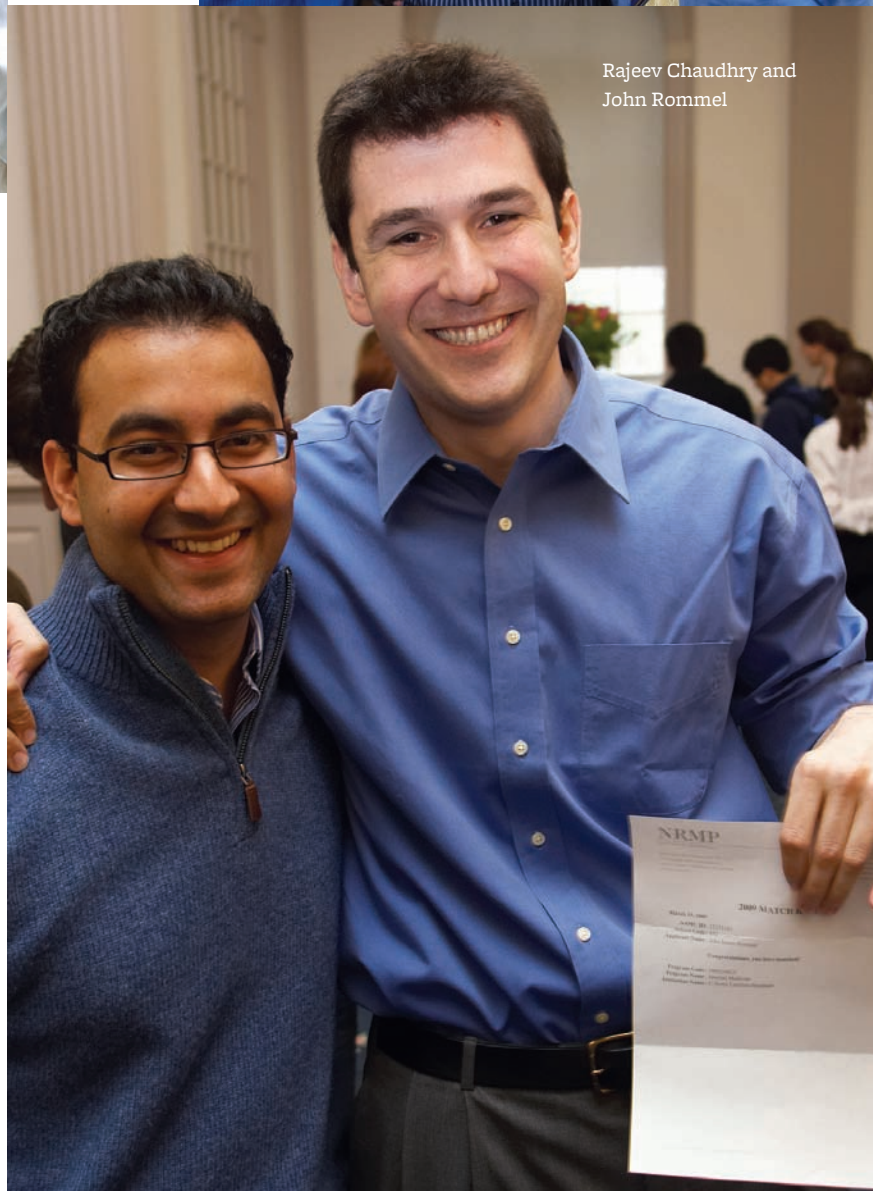
Joanne Chiu with
her mom



Jessica Chan and
Carmelle Romain



Mark D'Agostino,
Anthony DelSignore, and
Cliff Voigt



Rajeev Chaudhry and
John Rommel



Christina Rincon

A Sick Wind

An unexpected lesson in the cultural context of illness.



tem that releases a cascade of neurotransmitters at the slightest provocation. Experience has taught me to appreciate what happens when this chemical rush starts to inflame the blood vessels surrounding the brain. First and foremost, there are the headaches: the throbbing, pulsating headaches that can last for days if left untreated. Then comes a bewildering array of symptoms as the rush of neurotransmitters moves down to the brainstem: pallor, alternating episodes of sweats and

I sat on the bed drifting in and out of consciousness, trying hard to ignore the throbbing pain in my head. It was 5 a.m., day three of my med school summer project in Cambodia, and I was caught in the throes of a bad migraine. I had spent the night cooped up in the only bathroom in the house, plagued by the cyclic vomiting that usually accompanies my headaches. Exhausted, I finally stumbled back to bed—only to be shaken awake by the mother of my host family. On her face was an expression of concern. “You are very sick because you aren’t used to eating our food,” she said in Cambodian, speaking slowly so I could understand her. “I think we need to do something to help your stomach.”

She got up from my bed and strode purposefully into the kitchen. I, on the other hand, took the opportunity to fall back into bed and curl up in a fetal position.

My migraine had started a full 24 hours ago—the result, as I would learn in medical school, of a hyperactive nervous sys-

tem that releases a cascade of neurotransmitters at the slightest provocation. Experience has taught me to appreciate what happens when this chemical rush starts to inflame the blood vessels surrounding the brain. First and foremost, there are the headaches: the throbbing, pulsating headaches that can last for days if left untreated. Then comes a bewildering array of symptoms as the rush of neurotransmitters moves down to the brainstem: pallor, alternating episodes of sweats and

chills, a crippling sensitivity to all sensory stimuli, and of course, the endless bouts of nausea and vomiting. It’s these symptoms that always seem to be misinterpreted by those who have never had a migraine. In college, my roommates assumed I was antisocial due to my tendency to spend weekends curled up in bed with the shades drawn. Even my own mother, who suffers only mild attacks, tends to read my symptoms as an act of cultural disobedience. “You wouldn’t be so sick if you listened to the Chinese doctor and stopped drinking ice water,” she would say as I crawled under the bed covers. “Cold things aren’t good for Asian bodies.”

When I woke with a throbbing headache just one day after arriving in Cambodia, I had a sinking feeling that my symptoms would somehow get lost in translation. After all, I was thousands of miles away from home—separated by several time zones and surrounded by a culture and language that were very foreign to me.

It started from the moment my host family saw me emerge from my room. My face was a silent but visible announcement to the world of the perfect storm building up in my head. So frightening was my pallor that when the children saw me, they quickly looked away and started jabbering away to their mother in rapid Cambodian. I later learned that they were saying that I looked like I had been possessed by a ghost.

“*Niet meun srool kluhn dtay?*” asked the mother, furrowing her brow. “Are you not feeling well?”

I shook my head, smiled, and took my seat at the breakfast table, trying my best to pretend nothing was wrong. But despite my best efforts, the smell of a traditional Cambodian breakfast—rice porridge, savory meats, and egg—was more than enough to turn my stomach. Before I knew it, I was making the first of many sick visits to the bathroom.

“*Dtay, dtay! Niet sokhapiet ot laor chruan!*” the mother shrieked as I came out of the bathroom. Between my throbbing head and my limited experience with the Cambodian language, it took me a minute before I finally realized that she was making some comment about my bad health.

“Uhh...*Ch-Chheu K’baal*,” I stammered, with a good deal of effort. “My head hurts.”

It was just my luck that in the Cambodian language, “pain” and “sickness” share the exact same word. One would, for instance, use the same word to tell someone they had a stomach *ache* as they would to say that they had been ill with a stomach *virus*. Context, not vocabulary, dictates meaning.

It Feels So Good When It Stops

Twenty-four hours later, curled up on my bed, I saw the mother come back with a cure for what she was sure was a stomach problem: a small tub of Tiger Balm—a menthol-based ointment—and a well-worn coin. I felt shivers go down my spine. This was something that needed no translation, and the expression on my face must have looked like that of a kid on the verge of receiving her first shot. Having worked with Cambodian patients as a med student, I knew I was going to be subjected to coining, the age-old technique of releasing illness from the body by scraping the skin with the edge of a coin. “You have a stomach problem. We need to coin you to get the bad wind out.”

Cringing, I bit back a scream as the cold metal touched my bare chest, only to turn searing hot from friction as the coin was dragged back and forth. The pain was intense. I fought back tears as my head throbbed harder. For what seemed like an eternity, her hand moved the coin methodically down my chest and abdomen in a straight, horizontal pattern that left a series of red, angry lines on my body.

“*Laor nah!*” the mother finally exclaimed, beaming proudly at her handiwork. I was too tired and shocked to speak. Smiling, she handed me back my shirt and left without saying another

word. At last, alone at dawn, I was left to contemplate my throbbing head and queasy stomach. They were both still there, like old friends, accompanied only by the slow burning pain radiating from the lesions running up and down my front side. But I was amazed to find that I did feel as if I had some sort of wind knocked out of my system. Minutes later, I was asleep.

The next morning, I woke to lively Cambodian folk music being played on the family’s cheap cassette player. The sound no longer hurt my head. My migraine had finally disappeared, and for an instant, I managed to fool myself into thinking that the events of the previous day were a bad dream.

Dressing quickly, I headed out of my room. There, not more than five feet from my door, sat the mother, fast asleep in a chair. She opened her eyes as I tried to sneak past her and greeted me enthusiastically. I smiled and thanked her while she, in turn, thanked me for being so compliant.

“There’s just one thing I wanted to ask you,” she said sheepishly. “Why did you keep on saying that your head hurt?”

I paused, studying the worried look in her eyes. For a moment, it seemed as if she feared that she had done something wrong in her zeal to take care of me.

“Do you really feel better now?” she asked slowly.

In my heart, I knew that her coining had played an insignificant role in aborting my headache, which would have disappeared on its own after 24 hours. Yet, I felt a curious need to protect her. After all, I had been a difficult patient. I was a stranger in her world—sick, weepy, unable to communicate what was going on with my body. One year of medical school was enough to teach me how draining such patients can be for those who care for them. I knew what I had to say.

“Well, when I get a headache, the sick wind enters through my head and then goes to my arms, legs, and stomach. That’s why the coining worked. You were able to make the bad wind leave my body.”

The mother listened to my stuttering explanation with rapt attention. She looked at me for a moment, unsure of how to respond. We were both foreigners seeking to understand each other. At last she smiled, stood up, and hugged me in a tight embrace. “Just two days ago, you arrived in my country—and already, you think like a native Cambodian.”

I grinned. My “sick wind” migraine description was far removed from the neurotransmitter-related explanation I had learned as a medical student. However, as being in Cambodia taught me, there are some situations where the best explanations of illness are those that can simply be understood.

Margret Chang is completing a scholarly concentration in global health.

ZOOM

BY EILEEN O'GARA-KURTIS

UP CLOSE AND PERSONAL WITH KARTIK VENKATESH

Bound by Tradition

An MD/PhD student tries to disrupt the transmission of HIV while respecting local culture.

The first patient of the day was a 50-year-old man — successful, robust, and in good spirits. He had come to the clinic at the Y.R. Gaitonde Centre for AIDS Research and Education Clinic (YRG CARE) in Chennai, India, to receive his antiretrovirals, as he had done since his diagnosis four years earlier. His wife, diagnosed with HIV shortly thereafter, had since died. Today, the man had a surprise announcement for his YRG staff counselors and Kartik Venkatesh '06 MD/PhD. “I have brought a new wife with me. She does not know I have HIV.”

His request: that the staff break the news. Before they had a chance to respond, the patient was introducing them to the young woman. Faded henna imprints from their wedding celebration were still visible on her hands and feet. It was she who broke the silence. “I chose to marry him, and yes, I knew he had HIV when I decided to marry him.”

She was the man's niece. Still unwed at 18, she had been aware of her family's growing concern that she might not marry or have children — both of paramount social and economic importance for women in India. Her uncle, recently widowed, had two small children to care for. And marrying within the family — an accepted practice in that part of the country — meant that her parents need not provide a dowry.

Although the man had not shared the news of his diagnosis with his family, they had deduced the truth from his weight loss and other symptoms, followed by his improved health after spending time away from their village.

“I was honored to marry my uncle,” the woman said.

Venkatesh didn't know if she was speaking from the heart or on behalf of her husband and family.

He still doesn't know.

Health disparities in the developing world are often framed in socioeconomic terms. But gender is often as potent

a risk factor as poverty, and far more entrenched. Driven by cultural and social mores, gender disparities persist even amid growing prosperity. And in the world of HIV, behavioral factors and access to care — often very different for men and women — are matters of life and death.

That divide is the province of Venkatesh's research.

YRG Care is a “hub” hospital, drawing patients from all over southern India who come for subsidized, specialized health services. The first time Venkatesh visited the YRG clinic six years ago, as a PLME student, the hospital was located on a muddy road on the outskirts of the city. Today, it's on a six-lane highway leading to Chennai's IT parks. Founded by the visionary microbiologist Dr. Suniti Solomon in 1994, eight years after she and colleagues first documented the presence of HIV in India, YRG is a microcosm of a society in the midst of sweeping change.

“This is ... a time when there is more and more opulent wealth along with gaping inequities,” says Venkatesh. “For women [in all socioeconomic circumstances], those inequities can be rooted within traditional belief systems.

“Ultimately I think this work may help not only [women] with HIV, but also help to effect wider-level change in health care delivery.”

WHAT CAN WE DO ABOUT MARRIED MEN?

The story of the new bride and her uncle-husband, which Venkatesh wrote about in the *Annals of Internal Medicine*, is not unique, he says. In India, one of the great challenges is the plight of the monogamous, married woman.

Most Indian women are married by the age of 18, with tremendous societal pressure to bear children. About 90 percent are monogamous for their entire lives. Many men

are not — and, in fact, many have regular contact with commercial sex workers. The husband acquires HIV, returns to a home setting where condom use is rare and a wife whose primary goal is pregnancy, and thus the cycle begins.

Venkatesh remembers one case in which the husband acquired HIV, passed the virus to his wife, and donated blood to his daughter when she developed anemia during pregnancy. The daughter and her baby also ultimately tested positive.

Getting to the root of that situation is the subject of Venkatesh's PhD dissertation. "It's the big question. If you were going to intervene, addressing condom use and other risk-taking behaviors, how would you do it? What can we do about married men?"

HIV, TB, AND MORE

It takes an agile mind to go from a double concentration in Anthropology and Sanskrit to tackling HIV in India. But Venkatesh has a talent for linking disciplines and experiences with a kind of elegant practicality.

"I started out as a Hispanic Studies concentrator," he remembers, "but I found that I wasn't that interested in translating Spanish texts." He decided to hone his language skills instead, becoming fluent in Spanish while following his interests in human behavior and ritual to the Anthropology and Classics departments. "Sanskrit was fascinating, in that here was this ancient language that's still being used in important rituals — such as marriage — in contemporary society."

His undergraduate thesis took Venkatesh to southern India, where he discovered the urgent imperatives of HIV. At Brown, he developed a diverse roster of faculty mentors and collaborators. His interest in health disparities launched a community-based asthma research project with pediatric asthma expert Robert Klein and child psychiatrist Gregory Fritz. An interest in gender economics led him to anthropologists Lina Fruzzetti and Patricia Symonds, who in turn introduced him to HIV/AIDS issues, which led him to infectious disease luminaries Charles C.J. Carpenter and Kenneth Mayer. Mayer has served as Venkatesh's mentor and MD/PhD adviser

for more than three years. More recently, his focus on epidemiology as a PhD candidate has led to collaboration with Mark Lurie, a social epidemiologist in the Public Health Program who studies the concurrent HIV/AIDS, STI, and TB epidemics in sub-Saharan Africa. Venkatesh is also working with Susan Cu-Uvin, who directs The Immunology Center at The Miriam Hospital, to study the biology of HIV in the genital tract.



"This work is by nature very multidisciplinary, and I think a lot of it can be transformative," says Venkatesh. "What we've learned in preventing and treating HIV and TB can serve as a model for addressing a whole spectrum of other diseases and conditions that are no less catastrophic, and in fact affect larger numbers of patients, such as maternal mortality, childhood malnutrition, and cardiovascular disease."

This summer, Venkatesh will spend August and September with his colleagues at YRG Care in Chennai. But first, he will spend June and July in Johannesburg with Lurie. Then he'll be back in Providence, where he'll continue his research and volunteer as a Spanish translator at the Rhode Island Free Clinic.

It's a full plate, but eminently doable, says Venkatesh. "If you're passionate about something, you make it work."

Eileen O'Gara-Kurtis, a frequent contributor, is founder and president of Silver Branch Communications, LLC.

Self Service

Med students must protect the parts that make them whole.

Recently, I've been fortunate enough to have the chance to talk with students at many different medical schools. I'm usually invited to speak under the auspices of humanism in medicine, but students often want to talk with me less about medicine and more about the important aspects of their identities that existed before they began medical school.

The students practically blurt out the descriptions of their former selves. They were writers or musicians, researchers or dancers, karaoke champions or triathletes. And because they have learned that I was a writer before I became a doctor, the most frequent theme that comes up for students when we meet is the longing they feel for their own past selves. How did I manage, they ask, to write during anatomy lab? I wanted to, too, they tell me; I can see how helpful it would have been as a way to sort out the stress and emotion of dissection to write a poem (or play my guitar, or ride my bike) but—and here the refrain is always the same—there was just too much to study, and I didn't have time.

Since my own first days of medical school, I've thought a great deal about the many roles that gross anatomy lab plays in medical education. Among the most important is that it is truly a young doctor's first charge to initiate balance. How do we balance our own lives with medicine's insistent call? The pull of medicine reaches far beyond our first semester—the library hours of the preclinical years bleed into the overnight calls of clinical rotations, which give way to the 80-hour-workweeks of residency training. And anatomy, with its factual and emotional demands, mimics medical practice in a way that other preclinical courses such as histology or physiology simply cannot do.

I was reminded of this need for balance when I was preparing last summer to give an address at the University of Chicago's

white coat ceremony. The day before the ceremony, I received an email from the folks at the medical school, cheerily informing me that they were very much looking forward to my talk, and by the way, the forecast for Chicago was 93 degrees, and though the Rockefeller Chapel in which the ceremony would be held was exceptionally beautiful, it had no air conditioning. My first thought was this: *What a fitting initiation into medicine, a field known to stretch its trainees beyond all normal physical extremes. We're bringing these poor students into a sweltering room—and giving them coats.*

One of the great ironies of medicine is that those who work the hardest—who take on the additional burdens of doctoring like an extra coat on a hot day—sometimes end up depleted and unable to care well for their patients. During my surgery rotation as a medical student I followed a very bright and hard-working surgical resident who had had 40 minutes of sleep for the umpteenth night in a row. When a patient on another resident's service died, he said, "Why couldn't Mrs. Z have been under my coverage? Then I'd have one less person to round on." I don't think his harsh lack of compassion was unique. In fact, a paper in the journal *Clinical Anatomy* states bluntly, "Medical students' empathy tends to wane with each year of education, and by the third year many medical students want to distance themselves from their patients."

We all need some way to counteract the temporal and emotional demands of medicine, or else we are apt to blame our patients and their illnesses for our own imbalance. The result is a diminishment of the very empathy that likely brought us to medicine in the first place.

As overachievers, our shared and automatic impulse is to work harder and longer. To do more. To problem solve. But acknowledging our limitations is also self-protective. By owning up to our weaknesses, we no longer need to distance ourselves from our patients in moments that are wrenching for us.

When I was a medical student, a visiting hospice doctor spoke to my class about palliative care, and ended the lecture with a cautionary tale about physician shortcomings in the face



of dying patients. He spoke of a middle-aged woman with ovarian cancer. Her disease course had been prolonged, and she had been treated—and treated well—over the duration of her illness by a highly regarded oncologist. The oncologist had a well-earned reputation as an expert in his field, frequently on the cutting edge of treatments; he had prolonged or saved the lives of many, many people. There came a time for this woman, however, when her disease became widely metastatic. The cancer encroached further and further in spite of aggressive treatment, and the combination of the treatment and the cancer was taking a ruthless toll on the woman. When she was awake, she was overcome with nausea and pain. Yet so much medicine was required to control the nausea and pain that when comfortable, she was so sedated she could not interact with her loved ones. Eventually, even the ever-hopeful oncologist, who over the course of her treatment had become a dear friend to the patient, acknowledged that the illness was terminal, and that further treatment was likely to do more harm than good.

Here, the hospice doctor paused as if to signal to us all to listen closely. “If I were to tell you that was the last conversation the doctor and patient ever had, you might not be surprised,” he said. We nodded in agreement. Her illness was terminal after all; she might die at any time.

“But,” he continued, “what if I told you it was the last conversation they ever had despite the fact that she lived another six weeks? Despite the fact that she had questions about her disease and its course and called her oncologist’s office multiple times, but was never called back?” The story was a true one, he told us. The oncologist, who had been a

comforting and essential presence at every step of this woman’s illness, became suddenly unavailable when treatment faltered and death was imminent.

Perhaps the oncologist truly believed his job in caring for his longtime patient had ended when her treatment stopped. But if our charge in doctoring is to care for patients as they struggle with illness, then we are equally compelled to be with them when medicine triumphs and when it fails. If we hold on too tightly to the models of success and accomplishment that have served us well to get us into medical school, through anatomy practicals and board exams, then we risk perceiving our patients’ deaths—inevitable as many of them will be—as our own failures as healers. Then, like the oncologist in the story, we may abandon our patients at the very moments they are most in need of our care.

We should, of course, fight to preserve the lives and the quality of the lives of our patients. But just as vigorously, we should allow that inevitability of death, evident in our careers from anatomy lab forward, to remind us that we doctors are every bit as human—and therefore as fallible—as our patients.

Our successes as physicians are only partially measured by how well we memorize the anatomical landscape of our cadavers. Our ability to help our patients is more fully measured by our humanity, and the degree of comfort—be it physical or emotional—that we can bring to our patients.

This is by no means as simple as it sounds. Medical school

in general, and anatomy specifically, can breed a sense of inadequacy. And there comes a moment for most students when we feel fraudulent, as if we aren't fit for the lofty charge. Too often, in order to counteract those feelings of inadequacy, the culture of medicine discourages us from acknowledging the weaknesses and limitations that we recognize within ourselves. To that end, we are left in a profession that allows us to pretend we're superhuman, but one whose members kill themselves more than any other. For each of us, the risk is that our fears of mortality will cause us to work so hard in the service of medicine that we distance ourselves from a woman dying of cancer; our fears of failure will cause us to work so often that we skip family weddings and our own anniversary dinners; our fears of inadequacy will cause us to work so much that we hope a patient on our overflowing service dies to lessen the load. The risk is that we let those fears rule over the humanity of ourselves and of our patients.

Dissecting the dead provides a first opportunity to feel and recognize the distress and even antipathy that the work of doctoring can bring on. But the cadaver, unlike our future patients, cannot be harmed as we experiment with ways of balancing the demands of medicine within the context of our whole thinking, feeling, and yes, writing, sleeping, exercising selves. This charge to balance must continue throughout medical education and practice. If we want our future physicians to understand and treat us—their patients—as the complex, multi-faceted people that we are, then we must encourage young doctors to preserve and honor the realms of their lives which make them similarly whole.

Christine Montross is a third-year Brown psychiatry resident and the author of the nonfiction book, Body of Work: Meditations on Mortality from the Human Anatomy Lab.



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—Manuel S. Rose MD'86

Medical Director and Founder, Rose Radiology Centers, Inc.

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Darwin, Charles, et al.

The John Hay Library, home to Brown's collections of rare books and manuscripts, is putting its Darwinalia on display.

In addition to drawings, maps, photographs, letters, and the treasures pictured here, you'll find 17th-century discourses on the Great Flood's role in the formation of the Earth, Charles Lyell's influential *Principles of Geology*, Captain FitzRoy's *Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle*, and the proceedings of "Man's Contracting World in an Expanding Universe," a three-day Convocation held at Brown in 1959, at which the naturalist's grandson and namesake, Sir Charles Galton Darwin, a physicist, was a featured speaker. The exhibition, titled "The Origin of Theory: Tracing Darwin's Evolutionary Thought," runs through September 20. – SBB



Clockwise from top right: Darwin's *A Monograph on the Fossil Lepadidae, Or, Pedunculated Cirripedes of Great Britain*, which he presented to London's Palaeontographical Society in 1851. Letter from Darwin to G. Cupples from April 1873 about the Edinburgh Review. A page of drawings from *Pedunculated Cirripedes*. Alfred Russel Wallace's 1876 work *The Geographical Distribution of Animals, with a Study of the Relations of Living and Extinct Faunas as Elucidating the Past Changes of the Earth's Surface*.

For more images from the collection, visit <http://med.brown.edu/brownmedicine/spring2009>.

For information on exhibitions, hours, and other special collections at the Hay, visit <http://dl.lib.brown.edu/libweb/about/hay>.



to have shown me
for myself in what
the origin of my faith,
for I know I am
a genuine before hand.
I am a long review
I am teach me something.
If you write, I beg
you to tell me how you
are in health. — I hope
the Mr. Cupples is as
bright & active as ever.
Yours sincerely
Ch. Darwin
Been in my happy, cozy &
handsome.

RESIDENT EXPERT BY MICAELA HAYES, MD HS'09



The Good Death

A graceful exit inspires lessons for life's final stage.

Last year I had the privilege to take part in a rare yet beautiful event: a good death. While physicians frequently witness death, it all too often catches us unaware, robbing us and our patients of the opportunity to prepare emotionally, physically, and spiritually. It doesn't have to be this way.

As a child in the 1950s, my patient had been ravaged by polio during one of the last American outbreaks. The virus paralyzed her legs and weakened her lungs. Nonetheless, this woman led a full and active life for more than 50 years. By the time I met her, the lung damage had become her biggest problem. For some time she had required a special tight-fitting mask at night to assist her lungs and prevent a dangerous accumulation of carbon dioxide. Eventually her

breathing worsened despite the mask. She was admitted to the hospital, where I made her acquaintance.

For several days we employed all the steroids, antibiotics, and inhalers at our disposal but she continued to worsen. She now needed the mask at all times, only tolerating short breaks to eat or chat with visitors. To sustain her life further would require a tracheostomy and a ventilator. She had long known this day was coming. Rather than succumb to a seemingly endless cycle of intervention and complications that would prevent her enjoyment of life, she chose death.

Knowing the end had arrived, she summoned friends and family for one last goodbye. And did they come! I happened to be on call and witnessed an unending stream of visitors

throughout the night. Young and old, family and friends, they came – laughing, crying, talking, hugging, sharing stories, and revisiting favorite memories. Her sister gave her a haircut. Her family brought her favorite meal. I visited her early on that final morning, listening to her lungs and her worries alike. She was scared but certain of her decision. Her trusted pulmonologist arrived around noon, gave her morphine to alleviate any shortness of breath, and removed the mask. She died quickly and peacefully.

This woman's courage and self-insight provide a beautiful example of the benefits we reap when we acknowledge and prepare for death's ultimate arrival. Although most people do not have the degree of predictability afforded this woman, we have far more freedom to face death on our own terms than we

While CPR always works on television, in real life it is rarely so successful, leaving families to confront a battered body and overwhelming medical decisions.

What was different about this patient? Most importantly, she knew herself. When asked “would life on a ventilator be worth living?” she knew the answer. Time and a steady decline gave her ample opportunity to consider this question; when the time came she knew her answer and was sure. In addition, she discussed her desires with her family. Knowing her desires ahead of time helped alleviate the guilt and second-guessing that frequently accompany these decisions. Her pulmonologist was equally important to this process. He recognized the trajectory and end-point of her illness and facilitated her reflection and decision making. When

Young and old, family and friends, they came – laughing, crying, talking, hugging, sharing stories, and revisiting favorite memories. Her sister gave her a haircut. Her family brought her favorite meal.



realize. Our success at preventing young, tragic deaths from infection and trauma has led to the belief among patients and physicians that with the right intervention all ailments are curable and cure should be always be attempted. In doing so, we have lost sight of death as a natural and often predictable part of life. In failing to acknowledge the normalcy of death, we lose the ability to come to terms with our illness, to make peace with our lives, to say goodbye to our loved ones, to be at home if we desire, and to be free of suffering and unnecessary interventions.

In the months since this woman's death, I've wondered why her end-of-life path flowed smoothly when so many others founder. Part of the disparity stems from imperfect information. Physicians are inaccurate and uncomfortable prognosticators, typically overestimating life expectancy and hesitating to declare time frames for fear of playing God. When precise predictions prove elusive, we shy away from articulating broader time frames and possibilities. Often we know too little about our patients' home lives, personal history, spiritual beliefs, and generally what makes their lives worth living, leaving us ill-equipped to guide values-based end-of-life discussions. Similarly, patients and families are hindered by asymmetric information. They know themselves best but have limited understanding of what “do everything” entails or how a particular intervention may help or hurt.


her illness worsened, he remained supportive and insured a dignified and comfortable exit.

How can we help achieve a good death in patients when medical details are murky and prognostication imprecise? While underlying tenets of patient self-awareness, family involvement, and physician facilitation remain central to this process, the burden on the physician increases. When we can't reduce the medical and social picture to a clear and answerable question, we must focus on patient values. What does he enjoy in life? Do any spiritual or religious tenets guide her thinking? What quality of life would make life worth living? What would be unacceptable?

Ideally the physician uses her knowledge and experience to contextualize and interpret these values as they apply to the decisions at hand. In rejecting a paternalistic model for the patient-as-consumer model of health care, we burdened patients and their families with a false “freedom of choice.” Rather than offer a Chinese menu of all possible interventions, we can and should focus on those options that best fit the patient's goals.

Micaela Hayes recently completed her residency in Brown's general internal medicine program and is now practicing primary care in central Pennsylvania.



A stylized illustration on the left side of the page. It features a large, textured blue shape that resembles a hand or a sleeve, reaching upwards. Inside the blue shape, there is a yellow building with a white cross on top, representing a hospital. The background of the entire page is a solid light yellow color.

Home Sweet Medical Home

Rhode Island initiative helps **primary care physicians** adopt best practices in chronic disease care—and get paid for it.

By Kris Cambra

Illustration by James Yang

“Be the change you seek in the world,” Mahatma

Gandhi said. Regardless of health care reform discussions at the national level, stakeholders in Rhode Island have taken matters into their own hands, implementing a new model for primary care and chronic disease management. Called the Chronic Care Sustainability Initiative-Rhode Island (CSI-RI), the pilot project was designed to improve outcomes and lower costs for patients with chronic illnesses, remunerate providers for comprehensive preventive care, and improve both patient and physician satisfaction. Whether it will work is anybody's guess, but doing nothing was no longer an option.

The idea began with the help of the state's insurance commissioner, Christopher Koller, who is also a teaching associate in Brown's Department of Community Health. “The statutory responsibility of the insurance commissioner is to direct health insurers toward policies that promote system affordability, quality, and accessibility,” Koller says. “My office is supposed to identify things that health plans should be doing to help improve the system.”

Rhode Island's problems are emblematic of those everywhere else in the United States: increasing demands on primary care, failure of outcome measures to achieve targets despite high health care spending, and a looming crisis in primary care manpower.

“We in the trenches knew things had to change, and we are voting with our feet. It's become untenable over the past 10 or 15 years,” says Clinical Associate Professor of Medicine Thomas Bledsoe MD'88, P'12. “[Primary care physicians] have gotten more frustrated with how hard it is with relatively flat reimbursement and increasing practice expenses, and with more older and more complicated patients. Half to two-thirds of my patients are over 65, and many are quite active, healthy people, but with a number of medical problems.”

The insurance commissioner caught a break when a grant opportunity arose from the Center for Health Care Strategies, a nonprofit health policy resource center dedicated to improving health care quality for people with chronic illnesses and disabilities and other populations, which would provide funding for project management of efforts

to improve chronic care in the primary care setting. Koller's office contracted with Quality Partners of Rhode Island, the state's health care quality improvement organization, to manage the grant awarded. Bringing together physicians, insurers, Department of Health representatives, and health care quality experts, a system was designed that would collectively, and in a sustainable manner, align quality improvement goals and financial incentives among Rhode Island's health plans, purchasers, and providers, in order to improve chronic illness care in primary care settings.

PRINCIPLE VS. PRACTICE

The pilot built on something that was working—the Chronic Care Collaborative at the Rhode Island Department of Health and Quality Partners. The Department was successfully training health care providers based on research that showed how to improve the treatment of people with chronic illnesses and how to regear primary care practices to do it. But, Koller says, the concepts were not sustainable in practice.

“Docs were going through the training and saying, ‘I want to focus on my chronically ill patients, I want to get my staff to prepare for these visits, to communicate with patients in between, I want to build a disease registry to track what's really going on.’ Then they come out of the training and enter the world of commercial health insurance, and the only thing a primary care doc can make money on is seeing a patient every 15 minutes or less. There's no incentive to do all the things that the chronic care model really wants people to do,” he says.

The bottom line was they needed to align the evidence-based approach to chronic care with fair and sustainable reimbursement from payers. The potential to accomplish something in Rhode Island, “a small state where everybody knows each other and no one ever leaves,” Bledsoe says, seemed pretty good. It's a system with which no one is really satisfied. Health plan purchasers (employers) are unsatisfied with the product, patients are dissatisfied with access to their doctors, and health plans are unhappy with the high cost of care.

The genius of the project, and what separates it from pilots in other states, is that all major insurance companies in the state, Blue Cross Blue Shield of Rhode Island, United Healthcare, and Neighborhood Health Plan, are involved for all their lines of business. Medicaid is also at the table. While Medicare pays for a large portion of the health care provided in Rhode Island, it is barred by federal law from

participating in such collaboratives.

“Payers can agree that yes, the way I pay you doesn’t make sense. But no payer by themselves is going to change,” Koller says. “This is an important principle: We’re asking [a physician] to change his practice. He cannot practice one way for Blue Cross and another way for United. He wants to practice the same way for all his patients. But he’s not going to do it until he has the money to make it work, because he wants to stay in business.” The all-payer initiative aligned enough money in the same direction for whole practices to change what they are doing.

Since federal anti-trust laws prohibit competing insurance companies from coming together to discuss payments to providers in such a way, the Office of the Insurance Commissioner was pivotal in these discussions. There is an allowance in federal law, Koller explains, that exempts companies from those laws if a public official—such as Koller himself—convenes them.

MI CASA ES SU CASA

From this working group, the Chronic Care Sustainability Initiative-Rhode Island was born. The approach was based on the chronic care model developed during the 1990s by Edward Wagner, MD, MPH, and colleagues at the MacColl Institute for Healthcare Innovation and Group Health Cooperative of Puget Sound, a staff-model health maintenance organization in Washington.

“We said, we believe in the Chronic Care Model but we need to find a way to help practices implement it by changing the way we pay,” says Clinical Assistant Professor of Community Health Deidre Gifford, MD, who works for Quality Partners and is now the CSI-RI project director. At the same time, however, the primary care professional societies (American College of Physicians, American Academy of Family Physicians, American Academy of Pediatrics, and American Osteopathic Association) came out with a set of joint principles for the “patient-centered medical home.” “The chronic care model is part of the patient-centered medical home, except that it is broader,” Gifford says.

With that, CSI-RI developed into a larger project, which is transforming the participating practices into

HOME IMPROVEMENTS

The tenets of the patient-centered medical home espoused by CSI-RI are:

- 1 The ability to identify patients belonging to a particular primary care physician;
- 2 Care coordination/case management, including planned visits, care coordination agreements with specialist providers outside the office, and care from a practice team in the office;
- 3 Self-management support, such as group visits pertaining to a certain disease;
- 4 Electronic health records or chronic disease registry, with prompts to providers on indicated care and the ability to generate follow-up reminders to patients and to monitor practice’s performance on quality measures, as well as e-prescribing;
- 5 Remote access to problem/medication list for covering doctors
- 6 Care based on evidence-based guidelines embedded into daily clinical practice, and sharing guidelines and information with patients to encourage participation; and
- 7 Enhanced access to care, including open access scheduling, email visits/consults with providers, telephone follow up for patients with chronic illness, and answering machine/service after hours to non-ER options.

Credit: derived from the National Committee for Quality Assurance, www.ncqa.org

patient-centered medical homes. Five diverse primary care practices from around the state agreed to be part of the project: Thundermist Health Center, Coastal Medical, Hillside Family Medicine, Governor Street Primary Care Center, (where Bledsoe practices and which is part of the University Medicine Foundation, making it the only academic medicine practice involved), and Family Health and Sports Medicine. Blue Cross Blue Shield of Rhode Island and United Healthcare agreed to split the cost of the full salary of a nurse care manager at each site. They also contribute \$3 per patient per month. All told, the health care plans are spending \$2 million for the two-year project that began in October 2008.

This amount only covers the patients insured by the participating plans. But, Bledsoe says, all the patients in his practice, including the considerable number of Medicare

The standards of the patient-centered medical home espoused by CSI (see sidebar on page 29) map fairly well to those of the National Committee on Quality Assurance (NCQA), an accrediting body that offers designation as a patient-centered medical home in three tiers. The five participating practices in CSI-RI are required to achieve NCQA Level 1 accreditation as a patient-centered medical home. They all met an April 1, 2009, application deadline and will learn if they've been accredited later this year.

HOW AM I DOING?

The patient-centered medical home sounds logical in theory, but what does it look like in practice? CSI-RI focuses on three chronic diseases: diabetes, coronary artery disease, and depression. Bledsoe says they chose these three because they

Care delivered in a patient-centered medical home is consistently associated with **better outcomes, reduced mortality, fewer preventable hospital admissions** for patients with chronic diseases, lower utilization, improved patient compliance with recommended care, and lower Medicare spending.

patients, will get the same treatment. “[The physicians] said from the start, all guests in my home receive the same treatment, I don’t treat one guest one way and another, a different way. All patients will receive the same care.”

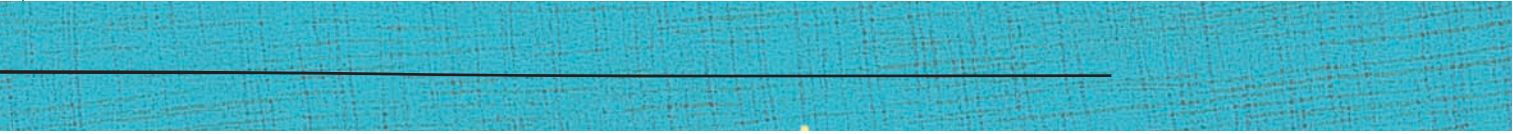
The patient-centered medical home concept has been around since the late 1960s, when the American Academy of Pediatrics first described it. In 2007 the Patient-Centered Primary Care Collaborative, a coalition of more than 300 major employers, consumer groups, patient quality organizations, health plans, labor unions, hospitals, clinicians, and others who have joined together to develop and advance the patient-centered medical home, released its study of the model’s impact on quality and cost. They found that “care delivered by primary care physicians in a patient-centered medical home is consistently associated with better outcomes, reduced mortality, fewer preventable hospital admissions for patients with chronic diseases, lower utilization, improved patient compliance with recommended care, and lower Medicare spending.” The American College of Physicians, in its position paper, endorsed the concept, citing its potential impact on the shortage of primary care physicians and the steadily declining number of medical students entering internal medicine residency programs on the primary care track.

are common diseases with high costs that can be positively affected by proven, measurable interventions. Take coronary artery disease, for example. Says Bledsoe: “There’s strong evidence that beta blockers taken daily after a heart attack decrease the risk of having another heart attack. Solid science there.” Practices will measure how many of their coronary heart disease patients are on beta blockers.

Bledsoe says patients are probably just starting to notice the changes, now that some of the infrastructure for the program is in place. Each patient receives care from a physician-led health care team. The team helps the patient manage the illness, and the patient is actively engaged in his or her own care. Most notable are the nurse case managers. Their role is to facilitate prepared, proactive practice.

The nurse managers review orders for additional tests and referrals and ensure, for example, that for a patient who was sent for a blood test, the blood was actually drawn and the results are in and ready to be reviewed. The result, Bledsoe says, is that “when the patient gets to the doctor, they are teed up. They know what they are doing, the loop on the referral is closed, and the patient and I have a productive interaction.”

Beyond the patient-doctor interaction, the health care team helps patients connect with additional services such as nutritional counseling or smoking cessation, and checks



in with the patient in between visits with the physician. The ideal team is closely connected with outside resources, and can help make patients aware of support in the community.

Measurement is a major part of the patient-centered medical home. As part of the contract, each practice will collect and report key data on its patients with chronic disease. For diabetes, the practices are measuring glucose control, lipid levels, blood pressure control, and yearly eye exams. For coronary artery disease, they will measure how many people who have had heart attacks are on beta blockers. For depression, the goal is that all patients be screened annually. And all patients should be offered smoking cessation counseling. But the practices are not being held to any outcomes just yet. The insurers have not required them to demonstrate any cost savings or lower utilization numbers.

"It's not pay to perform, it's pay to participate," Bledsoe says. "In good faith, we're going to make a lot of changes to our practice, and we agreed to collect the data and monitor and measure it, not to achieve some benchmark. Many people believe just measuring it will lead to better outcomes. I've never had time to measure before."

"The reason it is ongoing measurement is because the quality measures, rather than being outcome measures, are actually a tool for improvement," Gifford explains. "Practices don't have real-time ways of knowing how they are doing at taking care of patients. So the quality measures are really a tool for the practices to focus in on, for instance, 'I'm doing well on smoking cessation counseling, but there's room for improvement in depression screening.'"

The pilot will receive thorough evaluation at its completion. Gifford says, "Once it became clear that we were going to be one of the earliest pilot projects, The Commonwealth Fund said they would fund the formal evaluation. Two researchers at the Harvard School of Public Health will evaluate the program overall. Using claims data from all of the payers, they will look at clinical quality before and after the program, how practices progressed on the NCQA recognition tool, and they'll talk to practices in a qualitative way about what worked well, what were the barriers to care, and then they'll look at the patients' experience of care through patient surveys. It's a very comprehensive evaluation."

A GOOD START

During these first few months, the practices have been ramping up, Gifford says, doing the invisible yet critically important infrastructure building. Just the submission of each NCQA application was about 80 hours' worth of work.

"If you look at the principles of a medical home, it's really a complete transformation so it's not realistic for someone to decide one day, 'Today I'm a medical home' and hang out a shingle. It really requires a new way of thinking, a new culture, a new way of delivering services. For the practices we have in the pilot, some of them have had pieces of the medical home in place, so it won't be a complete change, but for some it will," says Gifford.

So far, she says, the major problem is resource limitation. "It's a lot of work. Patients haven't stopped needing to see their doctors. The jobs their staff had before October 1 are still present, and now they are given this new body of work. They are given additional resources so that they can have some breathing room to make those changes but even with that, resource limitations in primary care are a problem."

That said, Gifford feels encouraged about the goals of the project and the agreements they were able to work out between providers and insurers. "Given that we are one of the very first (Pennsylvania was the only one to launch before us) and given the number of unknowns—about the right level of payment, right staffing levels, and the right support—I think our pilot is very strong. One of the strengths was that we have everyone around the table; it wasn't developed by payers working in isolation, or policy-makers in isolation."

S IS FOR SUSTAINABILITY

Its leaders all hope that CSI-RI will make primary care in Rhode Island a more attractive career choice for physicians, and will turn the tide of primary care physicians who leave their practices for specialties or administrative positions. Bledsoe, who teaches residents in the Brown Internal Medicine Program, says that of the residents who go into internal medicine residencies with the intention of going into primary care, less than 10 percent are actually going into practice. What's more, after 10 years, only 78 percent of the people who went into primary care are still in it.

"Talking more medical students into primary care isn't the problem. We need to fix the primary care environment and make it more professionally rewarding and able to measure quality. Hard work doesn't necessarily achieve good results when you are just doing paperwork and cranking out patients. Being effective as a physician is a big part of professional satisfaction. If I can be part of an office that does things well and gets people better and prevents complications ... that feeds back into professional satisfaction." ■



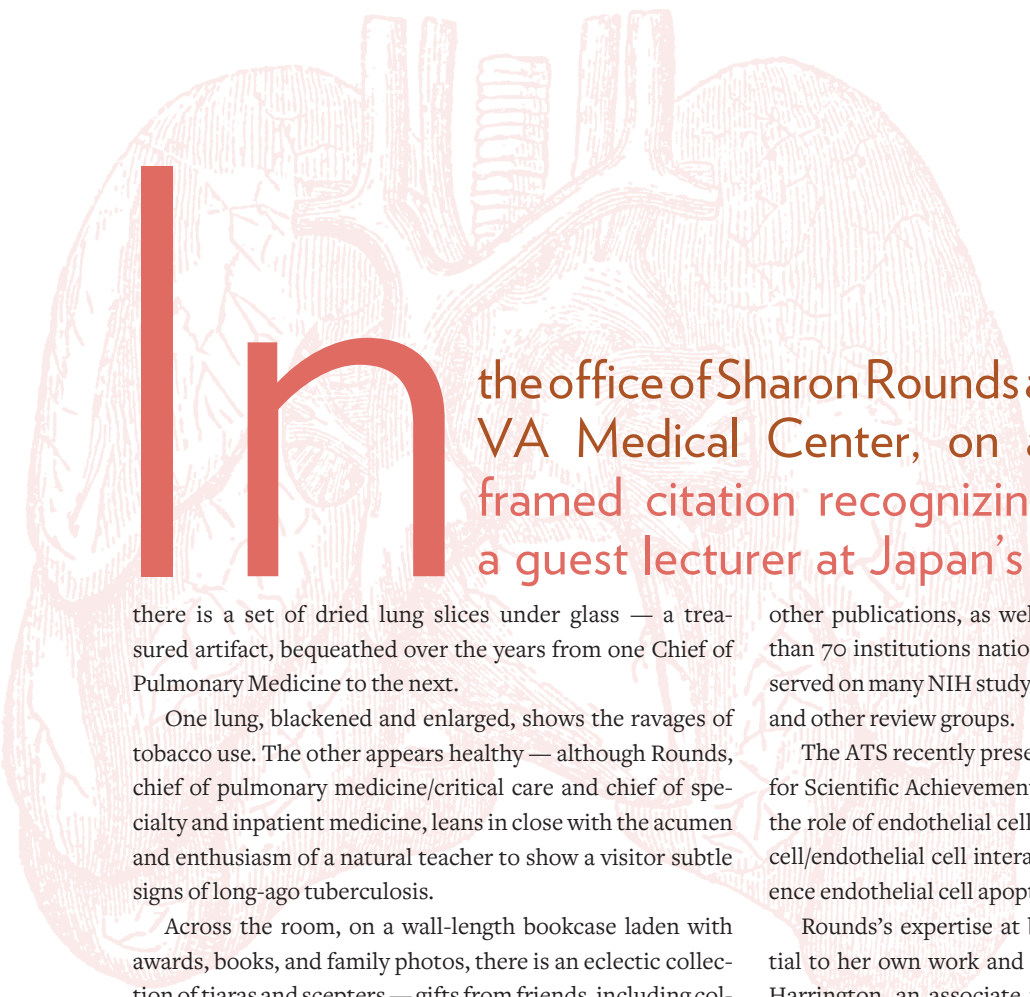
Photograph by Karen Philippi



by Eileen O'Gara-Kurtis

rand rounds

Every time she takes
a step, she shows
someone else
the way.



In the office of Sharon Rounds at the Providence VA Medical Center, on a table under a framed citation recognizing her service as a guest lecturer at Japan's Keio University,

there is a set of dried lung slices under glass — a treasured artifact, bequeathed over the years from one Chief of Pulmonary Medicine to the next.

One lung, blackened and enlarged, shows the ravages of tobacco use. The other appears healthy — although Rounds, chief of pulmonary medicine/critical care and chief of specialty and inpatient medicine, leans in close with the acumen and enthusiasm of a natural teacher to show a visitor subtle signs of long-ago tuberculosis.

Across the room, on a wall-length bookcase laden with awards, books, and family photos, there is an eclectic collection of tiaras and scepters — gifts from friends, including colleagues from the American Thoracic Society (ATS), of which Rounds is a past president. “They used to call me ‘Queen Sharon of Rounds,’” she confides with a wry laugh. “‘Your Queenliness.’ [Being president] was a lot of fun.”

In fact, Rounds, a professor of medicine and of pathology and laboratory medicine, is one of only four women to lead the ATS in its 104-year history. She now recruits the Society’s future leadership as a member of its nominating committee.

“Sharon has made many, many contributions to the ATS — including major contributions to mentoring, initiating a program for membership in low income countries, and setting the direction of the Society for several years through her work on our strategic plan and vision statement,” says current ATS President Joe Rae Wright, dean of the Graduate School and vice provost at Duke University. “She also appointed the chair of our Public Advisory Round Table, which is our patient interest group, to the board of directors, and led a bylaws change to make this a permanent seat on the board.” (For more information on the Public Advisory Round Table, see *Brown Medicine*, Winter 2008.)

Rounds’s research is in the area of lung blood vessel function and pulmonary hypertension — a clinical condition with grave consequences — and she has long been recognized as a leader in her field. Her research, continuously independently funded since 1979, has resulted in almost 90 peer-reviewed publications and more than 20 books, book chapters, and

other publications, as well as invitations to speak at more than 70 institutions nationally and internationally. She has served on many NIH study sections, special emphasis panels, and other review groups.

The ATS recently presented Rounds with its 2009 Award for Scientific Achievement in recognition of her research in the role of endothelial cell vascular reactivity, inflammatory cell/endothelial cell interactions, and the factors that influence endothelial cell apoptosis.

Rounds’s expertise at both bench and bedside is essential to her own work and that of colleagues, says Elizabeth Harrington, an associate professor of medicine (research) who is also based at the Providence VA. “It’s very valuable to get Sharon’s clinical perspective on whether something is a viable [research] avenue,” says Harrington, who also studies lung function at the cellular level.

Linda Nici, a clinical professor of medicine, also based at the VA, agrees. “Sharon’s very forward-thinking. As a researcher, her heart is in basic science, but she saw from early on that basic science is only pertinent if you make it pertinent to clinicians. She takes a much broader view of medicine.”

Nici, who started her medical career in basic science, is now doing clinical research in pulmonary rehab, running the pulmonary rehabilitation program at the Providence VA. “It was a service that was very difficult to provide due to lack of coverage by Medicare,” she explains, “and I was desperate to start a program and get some research going. The VA was able to support the work, and Sharon suggested that I come and work here.”

“I was mid-career, and normally in medicine you don’t have an opportunity to start something new,” she continues. “There was no reason anyone should have given me this chance, but Sharon did. She gave me an opportunity that was priceless both in terms of my own career and in terms of the impact that I think we can have on patients’ lives.”

“We talk often, in medicine, about the ‘triple threat’ — people who are great teachers, researchers, and clinicians,”

says Staci Fischer, an associate professor of medicine based at Rhode Island Hospital. “Very few people excel at all three. But Sharon is one of those people.”

In 2005, Fischer was involved in one of the seminal moments of her career — and at the center of one of history’s great triumphs in medical sleuthing. An infectious disease specialist, she was treating two kidney transplant patients, both three weeks post-op, with multiple symptoms suggestive of a widespread viral infection. She discovered that there were two other patients, also both three weeks post-op, and both exhibiting similar symptoms, at two Boston hospitals.

The Centers for Disease Control (CDC) was called in. Blood and tissue samples from all four transplant recipients were flown to Atlanta. Ultimately, it was discovered that the organ donor shared by all four recipients — three of whom eventually died — had contracted lymphocytic choriomeningitis virus, or LCMV, from a pet hamster that the donor had acquired shortly before her death. Normally harmless, the virus had been lethal to the immunosuppressed transplant patients.

It was exhausting and exhilarating. “The surviving patient says he remembers me telling him that I thought it was a virus ... and then seeing me asleep at a computer monitor at the nurses’ station one night, after doing on-line research for hours,” she remembers.

The last thing on her mind was publishing. But a few months later, Sharon Rounds, who had met Fischer when Rounds was associate dean for faculty in clinical departments, approached her after she gave Grand Rounds on the topic.

“She said, ‘Please say you’re sending this to the *New England Journal of Medicine*,’” Fischer recalls. “‘And please make sure you’re first author.’ And she would keep reminding me via email and bringing it up every time I saw her — that my work was worthy of publication in the most prestigious journal in medicine, and as the clinician who discovered the outbreak, I deserved to be the first author on the paper.”

Ten months, scores of drafts, and 63 authors later, the piece appeared in the May 25, 2006 issue. Fischer was first author. “I think Sharon was prouder than I was,” she says.

Yes You Can

In the beginning, Sharon Rounds was a girl from Maine whose mother whispered a dream in her ear.

At Wellesley, majoring in chemistry, she studied with the best and brightest women of her generation. Hillary Rodham Clinton was in the class behind her. Diane Sawyer was a year ahead. Rounds married her high school sweetheart soon after graduation. “That’s what we did in those days,” she says.

Rounds was the only woman in her Wellesley class of chemistry majors to go to medical school. At Tufts University School of Medicine she was one of 14 women in a class of

110. At the University of California, San Francisco she was one of three female residents in her class — and also a chief resident. When she sat for her subspecialty boards she was one of two women in the room.

“She’s faced so much more than any of us have,” says Fischer. “She’s such a positive person, and such an incredible mentor.”

Says Nici: “Sharon walks the walk. She remembers when it was really, really difficult, having gone through very tough programs where it was uncommon to see women. And in the early ’90s, when research funding levels were low, she kept going. She’s a great example and gives you hope that, no matter what challenges might arise, you can be successful.”

By the time she had completed her fellowship years at the University of Colorado, where her research career had blossomed, Rounds had two daughters. She had concealed the first pregnancy as long as possible lest her colleagues and superiors should doubt her commitment to medicine.

“I was the first female pulmonary fellow there, and it was a tough, challenging rotation,” she remembers. “In retrospect, I wish I’d had the courage to tell them about the pregnancy and request a start date three months later. But I was afraid to do it.”

She had been drawn to critical care medicine almost from the beginning. “It’s physiology in action,” she says, “You see the sickest patients with all kinds of internal medicine problems. It’s difficult and high stress, but it’s exciting and rewarding.”

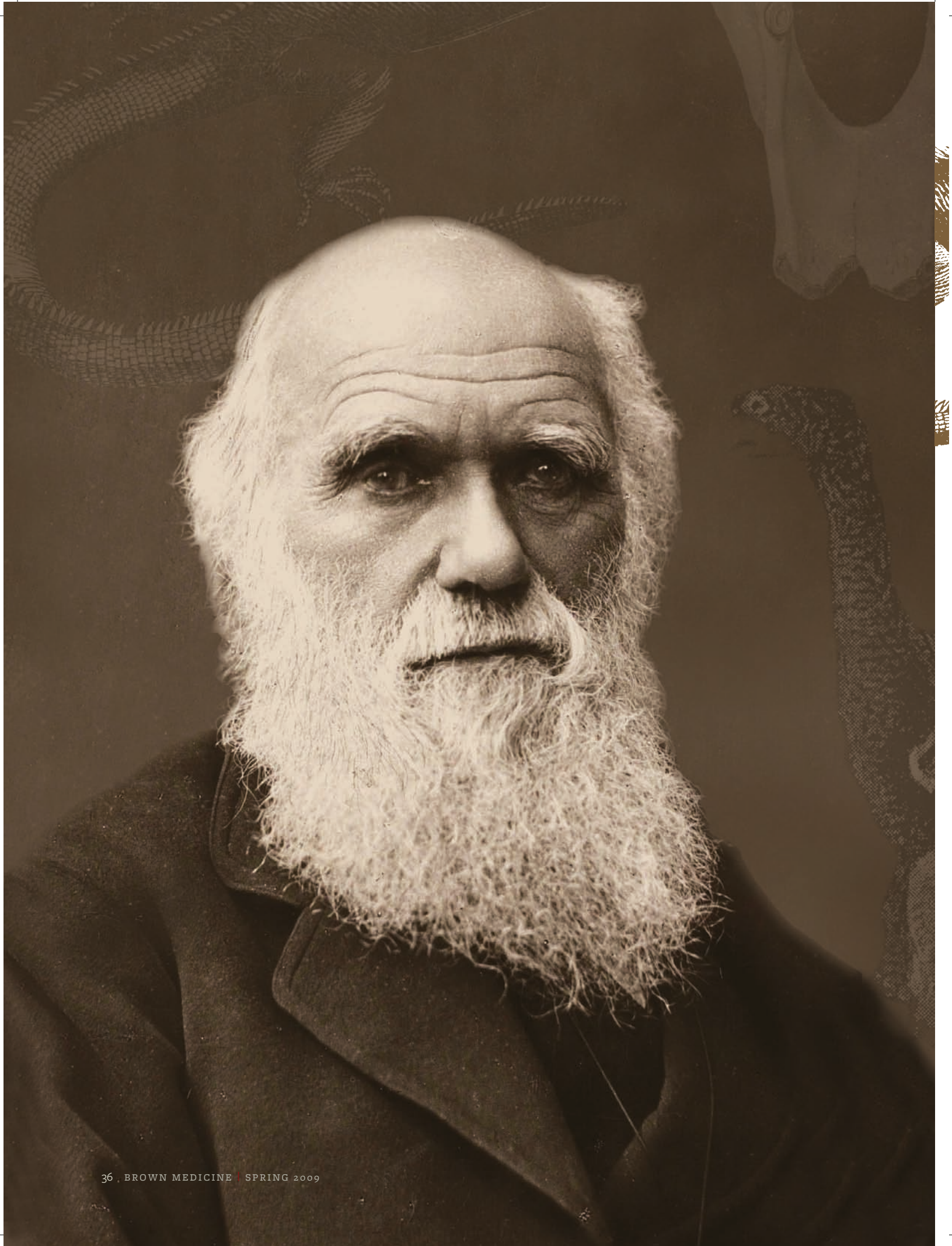
After Colorado, Rounds accepted a position at Boston University Medical Center, to be near her extended family in Maine. In 1987, by then a divorced mother of two, Rounds came to Brown and the Providence VA Medical Center. In 1994 — remarried now with four children — she became the first woman to be promoted to full professor in the Department of Medicine. Along the way, she has mentored scores of medical students, residents, and junior researchers who have gone on to become talented physician-scientists in their own right.

“The great thing about staying in one place for a long time,” she says, “is that you get to see people grow up.”

And who was Sharon Rounds’s first mentor?

“My mother was the first woman from Maine to sign up for the Army Nurse Corps in 1941, and served for four years in the Pacific — in New Guinea and Australia — during World War II,” says Rounds. “When she came home, she kept up her nursing, which was unusual for a married suburban woman in the 1950s.”

Her mother died when Rounds was 14. But she had already passed a powerful idea on to her daughter. “She always used to tell me ‘You could be a doctor.’” ■



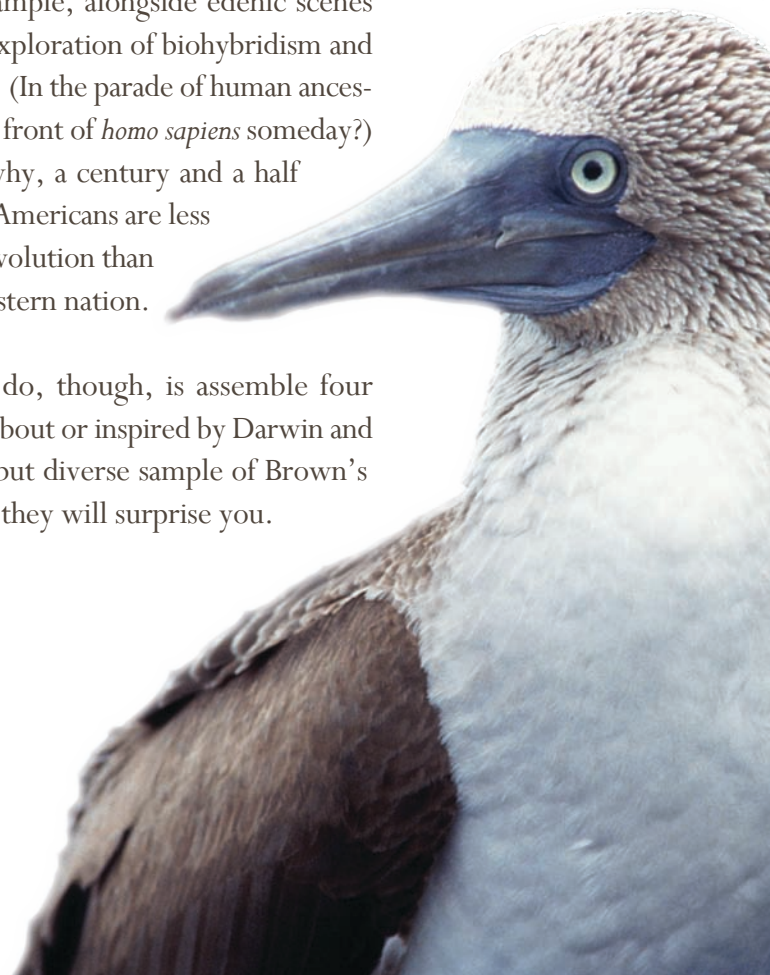


A SHROPSHIRE LAD

Giving Charles Darwin only a few pages of this magazine was a challenge. There are so many directions we did not have room to explore — anthropology, philosophy, theology. Or Darwin's influence on artistic expression — the emergence of paintings of prehistoric violence for example, alongside edenic scenes described in the Bible. Or an exploration of biohybridism and its effects on human evolution. (In the parade of human ancestors, will someone new step in front of *homo sapiens* someday?) Or a sociological analysis of why, a century and a half after the publication of *Origin*, Americans are less likely to accept the theory of evolution than adults in almost any other Western nation.

What we have been able to do, though, is assemble four thoughtful and original pieces about or inspired by Darwin and evolution, written by a small but diverse sample of Brown's many great thinkers. We hope they will surprise you.

— Sarah Baldwin-Beneich



WEDGES AND IMPACTS:

By Jessica H.
Whiteside, PhD

DARWIN'S ENDURING LEGACY

AS WE CELEBRATE DARWIN'S 200TH BIRTHDAY, it is interesting to speculate what he would think of the massive scientific endeavors developing his work, from genome-sequencing, with its "smoking guns" showing the chemical continuity of all life, to the uncovering of feathered dinosaurs in China, to the discovery of a layer of iridium in the Earth's crust that illuminated the cosmic role of collisions in bringing animal species to extinction. Of the three great prophet-looking intellectuals of the 19th century—Freud, Marx, and Darwin—only the latter's intellectual star continues to rise.

Darwin was a scientist, careful in his claims and indeed, as his decision to publish *On the Origin of Species* only after he learned of Alfred Russel Wallace's similar work makes clear, reluctant to make them. In an 1856 manuscript, Darwin compared nature "to a surface covered with ten thousand sharp wedges . . . representing different species, all packed closely together and all driven in by incessant blows." Sometimes a wedge, a new species, driven deeply into this imaginary surface, would force out others, affecting species across "many lines of direction." What is prescient about this metaphor—which Stephen Jay Gould lauds, and claims distinguishes Darwin's thoughts from prevailing Victorian ideas of progress—is how ably it depicts both the interconnectivity of species and the importance of external impacts. Charles Darwin used the hammering of wedges image only as a metaphor to emphasize that there was limited space for organisms to adapt, and that their ability to do so depended not upon absolutes but upon the niches, if any, made available by their fellows. He was not thinking of the violent sequellae of celestial impacts or catastrophic episodes of volcanism, the sorts of things that I explore in my work. A geologist, Darwin focused more on Earth than on space. Only one part of his great early ambition, to create a "simple" geology based on Earth's crust, survives in a form similar to the one in which he envisioned it—a theory on the formation, structure, and distribution of coral reefs.

To Darwin, evolution proceeded quite gradually and extinction resulted from both a lack of fitness to the environment and an inability to withstand competition. His emphasis on gradualism (partly because of Charles Lyell's uniformitarianist geological theories, and partly because "sudden" evolution smacked of the special creation he was contesting) did not specifically envision cosmic impacts that allowed some species (such as those diatom species, already adept at waiting until better times, when the silica they needed to make their bodies arrived from ocean upwelling arrived) to

A SELECTIVE CHRONOLOGY OF EVOLUTIONARY THEORY AND RELIGIOUS THOUGHT.



1ST CENTURY BC

In *On the Nature of Things* the Roman poet Lucretius describes the development of the cosmos, the Earth, living things, and human society through purely naturalistic mechanisms, without any reference to supernatural involvement.

11TH CENTURY

Islamic scholar and scientist Abu Rayhan espouses experimental scientific method and empirical data.

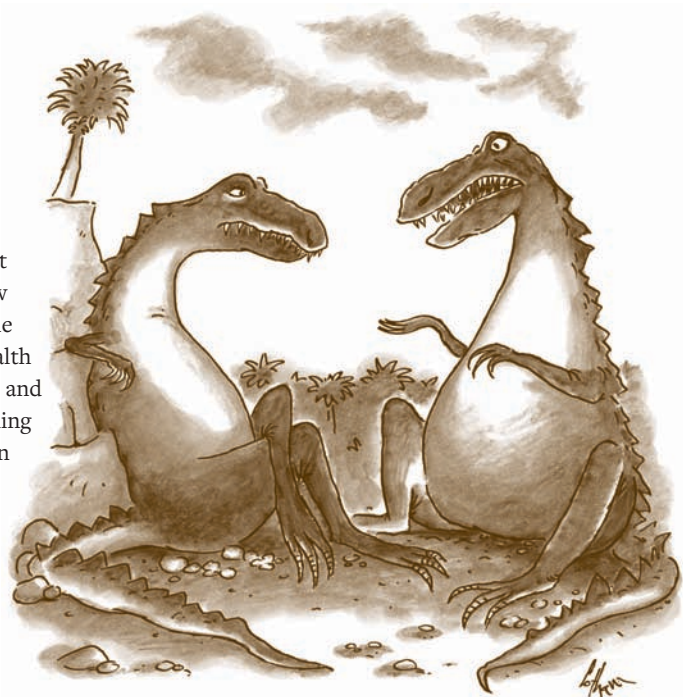
4TH CENTURY

Ideas on evolution are expressed by ancient Chinese thinkers such as Zhuangzi (Chuang Tzu), a Taoist philosopher.

BC

survive, while others bit the proverbial dust. But the random act of cosmic violence that we now know contributed to or completely caused the end-Cretaceous extinctions testifies to the wealth of Darwin's thought, the felicity of his prose, and the open-endedness of his metaphors. Extending Darwin's wedge metaphor, a cosmic collision is like a wedge that drives out a great many other wedges. Such wedges from space are, in a sense, real: we now know—or at least, as scientists, are deeply persuaded—that much of evolution, and occasional dramatic climatic shifts, can be attributed to rare meteorite collisions, and possibly mega-volcanic eruptions. Among the ecological and evolutionary events that I study, both the ascent of the dinosaurs and their extinction (excepting that of birds) lie outside of Darwin's original formulation of his theory. But both underline the subtle point embedded in Darwin's abstract metaphor of the wedge: that life evolves not with a monolithic tendency toward perfection but continuously, adventitiously, but without direction, and in intimate interconnectedness to its fellows.

If Darwin were alive to see the body of work grown from the seeds of his comprehensive scientific vision, he might experience the same kind of awe he felt upon first understanding the evolution by natural selection that inspired it.



"All I'm saying is now is the time to develop the technology to deflect an asteroid."

Assistant Professor of Geological Sciences Jessica H. Whiteside is currently a visiting scholar in biology at the University of Washington, where she recently spent time sampling the Cretaceous of Southern and Baja California.

1796

Georges Cuvier publishes his findings on the differences between living elephants and those found in the fossil record.

1809

Jean-Baptiste Lamarck proposes a theory of evolution by acquired characteristics, later known as Lamarckism. He uses the giraffe's elongated neck to illustrate how use affects traits over time.



1819

First discoveries of dinosaur bones make it hard to deny the importance of change to the history of the Earth.

1790

1820

DARWIN'S PLACE IN THE HISTORY OF HUMAN EXPERIMENTAL PSYCHOLOGY AND MODERN NEUROPHARMACOLOGY

By Peter J. Snyder, PhD

CHARLES DARWIN, the great English naturalist and father of Evolutionary Theory, provided the evidence and model that forms the cornerstone of modern biology, as well as the framework by which we place advances in genetics and molecular biomedicine into context. Far less known is his unique contribution as an “experimental psychologist” and as the progenitor of a line of enquiry that is being used to this day in the discovery of novel therapeutics for the treatment of several devastating human diseases, including autism spectrum disorders and schizophrenia.

In accumulating the research evidence to prepare his book on the expression of emotion, Darwin corresponded with dozens of academic scientists, medical practitioners, philosophers, clergy, and missionaries throughout the world. This rich correspondence allowed him to amass the evidence he needed to support his theories that emotional expression is largely an innate capacity that is similarly produced and interpreted cross-culturally, that it is not dissimilar from what is observed mechanistically across the primate line, and that it shares common features with a variety of other species. Darwin sent inquiries to and received responses from his correspondents, with the aim of exploring the human expression of emotion from a developmental perspective across the entire lifespan, and he had a special interest in the examination of emotional

expression in patients who were committed to lunatic asylums, as he firmly believed that “...the insane ought to be studied, as they are liable to the strongest passions, and give uncontrolled vent to them.”

One of these correspondents was the French physician and physiologist Guillaume-Benjamin-Amand Duchenne. Darwin was intensely interested in Duchenne’s experimental manipulation of human facial expression of emotion, by applying Galvanic electrical stimulation directly to facial muscles. Duchenne had produced a set of 65 photographic plates to illustrate his view that there are different muscles in the human face that are separately responsible for each individual’s emotion, and Darwin studied this material very carefully — and he received permission from Duchenne in 1871 to reproduce several of these images in *The Expression of the Emotions in Man and Animals* (1872).

Darwin had doubted Duchenne’s view that there were individual muscle groups that mediate the expression of dozens of separable emotions, and he wondered whether there might instead be a set of core emotions that are expressed with great stability worldwide and across cultures. Darwin’s belief in a smaller, core set of human emotions that vary in intensity along a broad continuum and that are cross-culturally stable and represented across all races and societies anticipated the semi-

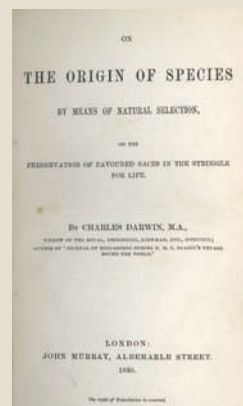
1831

H.M.S. Beagle sets sail on a five-year expedition around the South American continent with Charles Darwin aboard.



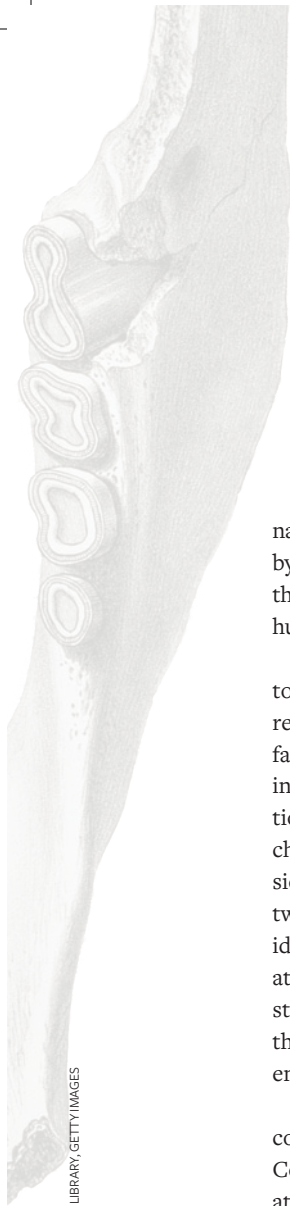
1859

Charles Darwin publishes *On the Origin of Species*. The first printing sells out on the first day.



1864

Philosopher Herbert Spencer coins phrase “survival of the fittest” to describe natural selection in his book *Principles of Biology*.



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nal work of Dr. Paul Ekman by a full century. Prompted by his doubts, Darwin conducted what may have been the first-ever single-blind study of the recognition of human facial expression of emotion.

Darwin was unsure which of Duchenne's 65 photographic plates were the best exemplars of core and readily identifiable human emotions, and he was faced with choosing which of these many plates to include as woodcut engravings in his book on emotional expression. To resolve this problem, Darwin chose 11 of these plates, listed their labeled expressions on the y-axis of a data table that he created on two pages, and then showed these images without identifying titles to 15 successive guests at his home at Down House. All "subjects" in this psychological study of perception of emotion were asked to look at the subset of the Duchenne plates and to describe the emotion represented in each photographic image.

These handwritten data tables were re-discovered during a trip that I made to the Darwin Correspondence Project and the Darwin Archives at the Library of Cambridge University in 2005. It is clear from Darwin's notes that he tabulated the results to determine which few of these 11 plates were associated with the most agreement — in the identification of the emotion being displayed — by



Photographic Plate No. 61 – Duchenne Series. From the folio owned by C. Darwin. Image courtesy of the Syndics of the Cambridge University Library.

This image was used to create the woodcut print for Fig. 20, ch. XII of Expression. Lower left in pencil writing, and then crossed out by Darwin: "contraction of muscles in neck and of the frontal muscle, together with depression of jaw." Darwin's notations to the woodcut engraver (in middle, under photo), read: "Attend to wrinkles on neck & forehead - form of mouth. Omit galvanic instruments & hands of operators"

1871

Darwin's *The Descent of Man, and Selection in Relation to Sex* confronts how evolutionary theory would extend to human kind.

1879

Term "Social Darwinism" is first used.

1883

Sir Francis Galton, Charles Darwin's cousin, invents the term "eugenics" in a book called *Inquiries into Human Faculty and Its Development*.

1912

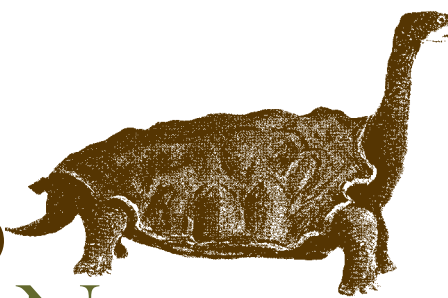
Famous hoax of the "Piltdown man" — a fake evolutionary "missing link" combining the jawbone of an orangutan with the skull of a fully developed modern man— throws the reconstruction of human development off the track for decades.



1923

Canadian George McCready Price, a Seventh-day Adventist and armchair geologist, publishes *The New Geology*, which assumes the literal truth of a global flood as described in the Genesis account of Noah's Ark. For adherents, the global flood and its aftermath are believed to be the origin of most of the Earth's geological features.

GOD'S PLAN



By Kenneth R. Miller, PhD

AS A VOCAL PUBLIC defender of evolution and its place in our schools, I am often asked if evolution is compatible with faith. Specifically, since Western monotheism (in all its forms) makes reference to God as Creator, is the theory of evolution compatible with Divine creation? My answer is simple: indeed it is. An answer to that question turns, of course, on what we suppose the Creator might have fashioned. If we misconstrue the Book of Genesis as natural history, we find profound contradictions between its creation story and the modern sciences of astronomy, geology, and biology. Heaven and earth were not fashioned 6,000 years ago, all living organisms did not appear simultaneously, and the earth's geological formations were not laid down in a single worldwide flood.

What the modern theory of evolution does show is that the origins of all species, including our own, are found in natural processes that can be observed and studied scientifically. In other words, that our own existence is woven into the very fabric of the natural world. Seen in this light, the human presence is not a mistake of nature or a random accident, but a direct consequence of the characteristics of the universe. What evolution tells us is that we are part of the grand, dynamic, and ever-changing fabric of life that covers our planet. To a person of faith, an understanding of

the evolutionary process only deepens our appreciation of the scope and wisdom of the Creator's work. Ultimately, evolution does not limit God's involvement with his creation in any way. Rather, it places it on a deeper, more profound, and more intimate level. To place any science, including evolution, in conflict with God is to presuppose that His existence and His modes of action are scientific questions. They are not. Arriving at a deeper and more rational understanding of nature — the ultimate goal of science — will always beg the question of why science should work, why nature should open itself to reasoned analysis. For some, that question will never have an answer. But for others, the answer is found in the creative power of God, manifest in many ways, not least of which is the process of evolution.

Professor of Biology Kenneth R. Miller '70, P'02 is a Fellow of the American Association for the Advancement of Science. He was the plaintiff's lead expert witness in the landmark case Kitzmiller v. Dover Area School District, challenging the school board's mandate to incorporate intelligent design into the curriculum. He is the author of Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution, and Only a Theory: Evolution and the Battle for America's Soul.

GETTY IMAGES; NATURAL HISTORY MUSEUM (LONDON); ISTOCK

1950

Pope Pius XII issues the papal encyclical "Humani Generis," which states that evolution is compatible with Christianity but that to apply it to matters of spirituality is inappropriate.

1953

Discovery of DNA confirms the reality of evolution and shows how it reshapes living things.



1961

Henry Morris and John C. Whitcomb Jr. publish *The Genesis Flood* and spread their anti-evolutionary ideas at fundamentalist churches, colleges, and conferences.

1963

Federally supported Biological Sciences Curriculum Study biology textbooks are introduced, promoting evolution as the organizing principle of biology.

1968

A U.S. Supreme Court ruling in the *Epperson v. Arkansas* case repeals all remaining creationist laws. The Court supports a District Court ruling that the "Creationism Act" violated the Establishment Clause because it prohibited the teaching of evolution and required the teaching of a particular religious doctrine.

950

1961



THIS IS GETTING OLD: WHY ARE WE STILL AGING?

By Marc Tatar, PhD

AGING IS AN EVOLUTIONARY PARADOX. Why and how is it that natural selection leads to systems that degenerate with age? This question has been asked many times in the history of evolutionary theory and produced two explanations built on two key evolutionary ideas. First is that natural selection acts to increase the frequency of a genotype in future generations and not to build a functionally perfect organism. Second, because of compounded interest across generations, a gene passed on when an adult is young will grow to a higher frequency at some point in the future than a gene passed on from the same adult at later ages. Put another way, the force with which natural selection acts on a gene is strong at early ages and progressively weaker as the adult grows long in tooth. These principles led to our explanations for why and how organisms undergo senescence—that is, why and how they live to their healthiest until reproductive age and then die slowly and gradually thereafter.

The first explanation is Mutation Accumulation. Imagine that a new mutation arises in a gene within cells that produce gametes, and thus can be inherited. Further, imagine that in an adult produced from such a gamete, the mutant version of the gene (an allele) does not disrupt the gene's normal function but produces deleterious effects at late ages. Because the force of selection declines with age, there will be little action to keep the mutant allele out of future generations and the people who have this allele will experience its late-age deleterious effects. A commonly cited example is Huntington's disease. Individuals who inherit the mutant version of the Huntington gene may suffer from dementia caused by selective neural cell death typically beginning in their 30s and 40s. There is little selection against the mutant Huntington's allele because carriers have already passed it on to their children.

1970

Morris sets up the Creation Science Research Center and adopts the term "scientific creationism." Center later spins off as The Institute for Creation Research in Dallas, Texas.

1991

Darwin on Trial, by Phillip E. Johnson, popularizes the intelligent design movement.



1996

Pope John Paul II sends a message to the Pontifical Academy of Sciences stating that "fresh knowledge" requires one to realize that evolution is "more than a hypothesis."

1973

Peter and Rosemary Grant, of Princeton University observe evolution occurring in real time in Galapagos finches.

1994

Seattle-based Discovery Institute is founded. The non-profit seeks to advance the agenda of Intelligent Design.

1970

1994

If every person inherits a collection of mutant genes with late-age affects that impact various systems but each in a relatively mild way (compared to the single strong effect of Huntington), the sum of these genes could produce the cumulative degeneration we experience as senescence.

The second explanation for senescence is Antagonistic Pleiotropy. While Mutation Accumulation explains senescence as a consequence of recurring mutation pressure and weak selection, these are modest evolutionary forces that might not account for why senescence is so universal. Antagonistic Pleiotropy, however, solves this problem: alleles with late-deleterious effects can be actively selected for if they also confer a beneficial effect at young ages. These mutant alleles have multiple age-specific consequences (they are pleiotropic) that affect fitness in opposite (antagonistic) directions—good at young ages and bad at old. As a result, selection can rapidly drive senescence.

If, for instance, a new mutation increases the reproductive capacity of a young female by tapping bone stores of calcium while also increasing the risk of osteoporosis at older ages, selection acting during the reproductive years will directly favor this allele and increase its frequency across generations. Females with this allele will pay its survival cost only after they have successfully transmitted the gene to their offspring.

Evolutionary biologists recognize that Antagonistic Pleiotropy is a very powerful way for natural selection to shape senescence. The consensus is that this process, acted out among the ancestors of all animals, explains why we age. Our work now is to discover the actual genes that will explain the second part of our question — How do we age? — and, by this understanding, to learn whether we can manipulate the products of these genetically programmed pathways to live a healthy and perhaps long life.

Professor of Ecology and Evolutionary Biology Marc Tatar has studied the demography, evolution, and genetics of aging in a variety of insect systems to explore the regulation and basic mechanisms of life history traits and senescence. Current work in the Tatar laboratory focuses on genetic analysis of Drosophila to understand how insulin/IGF signals and lipid hormones regulate aging, and how these endocrine signals interact with nutrition. Tatar is an Ellison Senior Scholar, founding joint editor-in-chief of Aging Cell, and a past member of the Board of Reviewing Editors for Science.

WIKIMEDIA

2000

Brown University Biology Professor Ken Miller publishes *Finding Darwin's God*, wherein he argues that evolution does not contradict religious faith.

2002

Ohio State Board of Education partially adopts the new "Teach the Controversy" initiative of intelligent design activists.

2005

The federal court in Harrisburg, Pennsylvania, issues a sweeping decision asserting that intelligent design is just another name for creationism, that it is not science, and that it cannot be taught as science in public schools

2005

47% of Americans polled believe God created humans in their present form; 36% believe humans developed from less advanced forms, with God's help; only 12% believe humans developed without God's help.



2007

Pope Benedict XVI publishes *Creation and Evolution*, where he writes "[It] is also true that the theory of evolution is not a complete, scientifically proven theory."

2000

2005

2007

HIS OWN WORDS

The last lines of *On the Origin of Species*
by *Means of Natural Selection*
By Charles Darwin

IT IS INTERESTING TO CONTEMPLATE AN ENTANGLED BANK clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life, and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and the Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

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2007

The Creation Museum opens outside Cincinnati. It features several large rooms (some 48-feet high), animatronic dinosaurs, a planetarium, and more than 50 video displays to provide visitors with an evangelistic “walk through biblical history.” Some displays contain dinosaurs and humans together.

2008

Physicist Frank Tipler publishes *The Physics of Christianity*, in which he outlines practical experiments that can help prove the validity of the “miracles” at the heart of Christianity, including the Virgin Birth and the Resurrection.

2009

The Texas Board of Education upholds teaching evolution as accepted mainstream science.



Women's ward during the influenza epidemic of 1918. The sheets at the side of the beds were used to minimize infection.

ALUMNI ALBUM

CHECKING IN WITH BROWN MEDICAL ALUMNI

CLASSNOTES

1975

Mark Blumenkranz '72 MMS'76, P'05 P'08, chair of the ophthalmology department at Stanford University School of Medicine, was honored by the Foundation Fighting Blindness for his efforts to fight macular degeneration and other conditions that cause blindness.

Bonnie R. Saks '72 is president of the Society for Sex Therapy and Research (<http://SSTARnet.org>). She is also a clinical professor of psychiatry at the University of Southern Florida and runs a busy psychiatry practice which in-

cludes sex therapy and a gender clinic. She works with four advanced registered nurse practitioners, three therapists, and four AAs. She writes: "I strongly support Brown and the PLME program by doing BASC interviews and encouraging students to apply from Tampa and our second home in the Berkshires." Her ob/gyn and psychiatry and sex therapy training at Yale also keep her busy at sexology conferences around the world, from Sydney to Florence. Her happiest times are with her husband, hearing about their four children, and

getting together with Brown friends (most recently for Alice Price '72 and Andy Zaugg's '71 daughter Isabelle's '06 wedding last summer.)

1977

Robert Bigler '74, P'04 continues to work for Kaiser Permanente in Oregon while he searches for a medical practice in Iowa, where his wife, Lynda Ivey Bigler '74, has begun her work as a parish minister in Humboldt. Robert plays trumpet in two wind ensembles and last

ALUMNI ALBUM

winter won Best Restored Car 2008 at the Portland Roadster Show after restoring his father's 1949 Ford convertible. Daughter Sheryl Bigler '04 is applying to grad school and for fun is learning how to show her Shetland sheepdog. Son Scott (RPI '07) works for GM in Warren, MI, where he is on their show-car design team.

Susan Leitman '74 is deputy chief of the Department of Transfusion Medicine at the National Institutes of Health in Bethesda, MD (see page 51). Her research interests are in iron overload disorders and transfusion safety. So far, she has not been able to persuade either of her two older daughters that Brown is the place to go... but there is still one daughter left.

She writes, "We can only hope." She attended the wedding of her Brown roommate's (Donna Erickson Williamson) son in March. Ironically, both Susan's oldest daughter and Donna's oldest son are both at MIT this year.

1978

John Keats '75 continues to do well in his position as president/medical director of California HealthFirst Physicians, a multi-specialty group in Oxnard, Camarillo, and Glendale. "I enjoyed seeing many classmates at our 30th reunion this past May," he says.

1979

Edward W. Martin '76 MPH '07 has accepted a full-time position as Home & Hospice Care of Rhode Island's chief

medical officer. He has served as Home & Hospice Care of Rhode Island's medical director since 1991 in a part-time capacity and, before that, had been assistant medical director since 1987. In this new role, he has overall responsibility for the direction of the medical component of Home & Hospice Care of Rhode Island's patient care program.

1981

Robert Golomb '78 is still an ER doctor in Berkeley, CA.

1982

Cathleen Sloan Hood '79 is working in an independent family practice in the Westport, MA, Primary Care Partnership (see www.primarycarepartnership.com). She works in a recently renovated farmhouse that was previously the site of Dr. Stewart Kirkald's family practice, started in 1960.

She writes that she has one full-time nurse practitioner, one part-time nurse practitioner, one part-time PA, and an amazing group of support staff that includes two nurses, two MAs, and four office staff members. She writes that it is a "daily campaign against insurance interference/obstruction of patient care, but the patients and their stories are always wonderful." She's found a kindred soul in Sarah Shreter, MD, of Swansea (a graduate of the Brown University Primary Care Internal Medicine/Pediatrics Residency), who is doing the same work at Mount Hope Health Center. Hood reminds us, "It is more important than ever for doctors to recall 'the care of my patient will ever be my first concern.' Keeping lasting human relationships in health care is crucial, and we must advocate for ourselves as well as our patients."

Grant Price is a partner at Associated Radiologists, in New Jersey. He is married to **Frances Wu** '81 MD '84. Their oldest son, Jacob, will be coming to Brown soon, in the Class of '13.

1983

Mitchell Lester '79 has been practicing allergy/immunology in Connecticut for 10 years, the longest he has stayed anywhere since medical school. He has been serving on the AAP Section on Allergy/Immunology Executive Committee and is the president of the New England Society of Allergy. He would love to hear from friends and classmates at mrlester@optonline.net.

Ira Seigman '80 resides in Palm Harbor, FL, where he retired from the practice of cardiac surgery three years ago, due to wrist problems. He transitioned to medical administration and is now vice president of medical affairs at Morton Plant North Bay Hospital. He writes that he is "still able to be part of the daily life in the hospital, while also participating in the 'big picture' of medicine." He is taking courses toward certification as a physician executive, as well as a Master's in Medical Management. The best part of this change, he writes, is that he can spend more time with his wife, Ellen, (Cornell '83) and two sons, Reuben, 12, and Eli, 9.

1985

Antonia L. Baum '82 is pleased to announce that her college-bound daughter, Lily, asserted herself by applying early decision to Smith College and will be heading to Northampton this fall. There may still be hope for her younger daughter, Ava, to seek out Camp Bruno, as she has a strong interest in medicine at the ripe old age of 14.

BEAUTIFUL MUSIC

Medicine and music are a harmonious combo for Calvin Lee.

For **Calvin Lee** '93 MD'97, it took more than “practice, practice, practice” to get to Carnegie Hall. For this violin-playing surgeon and acupuncturist, it was “practice, record, upload.”

Along with hundreds of other musicians, Lee auditioned “virtually” for a spot in the YouTube Symphony Orchestra, the world’s first collaborative online orchestra. Led by Grammy-winning San Francisco Symphony conductor Michael Tilton Thomas, the group performed at Carnegie Hall on April 15.

“After we each submitted two video performances, representatives from some of the world’s most prestigious orchestras selected the first round of winners. Then, YouTube encouraged people to vote—as often as they wanted, but only once a day.”

The process may have been as competitive as applying to medical school: from more than 3,000 audition tapes, 200 finalists were chosen. Ultimately, Thomas selected some 96 performers from 30 countries. Lee was the only physician in the group.

“I was nervous because I cared, not because I was scared,” says Lee. “I wanted the world to see a good orchestra.”

This wasn’t Lee’s Carnegie Hall debut. His first performance there was in 1990 with the Brown University Orchestra, of which he was concertmaster, with guest artist Dave Brubeck. **Tammy Wu** '93 MD'97, a woman he’d dated briefly, did not attend that performance. Now his wife and professional partner, Wu was in the audience in April.

Even with years of classes and performances behind him, Lee was delighted that winning a coveted spot included two days of master classes, taught by world-famous musicians: Gil Shaham on violin, Yuja Wang on piano, and Joshua Roman on cello. “They called this the ‘musical summit,’” he says.

Lee remembers always wanting to be a musician, an acupuncturist, and a surgeon. At the age of 5, already a pragmatist, he started with music. After two years of piano lessons, his teacher recommended violin, which became his instrument of choice.

Lee makes the “devil’s instrument” sound heavenly.



“The **stage and an operating room are similar**: bright lights, people concentrating, and a performance that must be **masterful**. You can’t stop the surgery — or the performance — in the middle.”

According to Lee, the violin is “the devil’s instrument ... the notes are hard to find, it’s difficult to play one more than one note at a time, and it’s not the greatest for your back.”

For Lee, medicine and music are in perfect harmony. “Surgery and symphonies are complementary,” he explains. “The stage and an operating room are similar: bright lights, people concentrating, and a performance that must be masterful. You can’t stop the surgery — or the performance — in the middle.”

Watch Lee’s audition video at www.modestosurgery.com and hear the performance at <http://www.youtube.com/symphony>.

—By Nancy Kirsch

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Dr. Baum practices sport psychiatry in the Washington, DC, area and is on the faculty at the George Washington University School of Medicine.

Scott Haltzman '82 will publish his third book, *The Secrets of Happy Families*, in June 2009 (Jossey-Bass/Wiley). You can read more about Scott at DrScott.com or email him at DrHaltzman@SecretsofMarriedMen.com.

1986

Eli N. Avila, JD, MPH, '81 currently practices medicine part time and works as associate general counsel and chief science officer for an environmental biotechnology company in New York. After graduating from law school with honors, Avila practiced health care law. He became one of only 300 MD/JDs to be board certified in legal medicine. In 2007, he finished a fellowship in occupational and environmental medicine at the Mount Sinai School of Medicine and earned an MPH degree.

1990

Monique A. Anawis, JD '85, is in a private/solo ophthalmology practice, teaching residents and volunteering with an overseas physicians' NGO. She also works as a consulting attorney in health law assisting doctors, other health care practitioners, and hospitals.

Christopher Chiu '86 is doing community health education in western China.

Linden Hu '87 was recently promoted to vice chair of the Department of Medicine at Tufts Medical Center. He lives in the Boston area with his wife and two daughters, Amanda and Mad-die. He continues to be involved in both clinical and laboratory research on Lyme disease.

Peter H. Kilmarx is chief of the Epidemiology Branch in the Centers for Disease Control Division of HIV/AIDS Prevention in Atlanta. He enjoys returning with his family to visit family and friends in Rhode Island each year.

Anastasios Salesiotis MMS'90 is working at a private practice for internal medicine/medical oncology in Athens, Greece.

1991

Monique Chireau was the guest speaker at the MLK Ecumenical Service at the St. James Episcopal Church in New London, CT, in January. In 1976, she was the MLK Scholar from Waterford High School. Chireau holds a masters degree in public health from Harvard University and teaches and practices obstetrics and gynecology at Duke University Medical Center.

1992

Kay Chang '89 is associate professor of otolaryngology at Stanford University. She is also director of Medical Student Programs in that same department.

Audrey Kang '88 has joined an expanding maternal-fetal service at Middle Tennessee Medical Center. Kang completed her residency and fellowship at Vanderbilt University Medical Center in Obstetrics/Gynecology and Mater-

nal-Fetal Medicine, respectively. She has served as a reviewer for the *Journal of Maternal-Fetal Medicine* since 1999, and a reviewer for the *American Journal of Obstetrics and Gynecology* since 2003. She has received special recognition from both AOA and APGO for her excellence in medical education. She lives in Nashville.

Lisa Winterbottom '88 is thrilled with her administrative/clinical position at the Portland VA Medical Center in Portland, OR. She writes: "I have wonderful colleagues at Oregon Health and Sciences and the VA." Her job involves promoting cost-effective and evidence-based medicine at PVAMC and working on process improvements. However, she says, her most rewarding and challenging project yet is raising her 3-year-old daughter, Siobhan.

1993

Laura Garelick '89 lives with **Humberto Rossi** '89 MD'93 and their 9-year-old son, Louis, in Holliston, MA. Rossi is a partner in a multisite hematology-oncology group and practices at Emerson Hospital in Concord. Garelick is medical director of a family medicine group in Medfield and chief of the family medicine division at Beth Israel Deaconess Hospital Needham. She writes, "We will be at our 20th undergrad Brown reunion in May and would be happy to hear from classmates." Contact her at lgarelic@caregroup.harvard.edu.

Anthony J. Lombardi Jr. '89 and his wife, Julie, married in June 2005, and their son was born in March 2007. Anthony still practices internal medicine in Cranston, RI. Contact Anthony at drant102@cox.net.

THERE WILL BE BLOOD

One patient's treatment is another patient's cure.

As deputy director of the Department of Transfusion Medicine at the National Institutes of Health, **Susan F. Leitman** '74 MD'77 has overseen all aspects of blood donation and transfusion, from research and therapy to quality assurance and donor recruitment. She's also led numerous clinical trials involving apheresis and transfusion safety. But it's her research on iron that commands her attention these days—particularly her search for the best strategies to treat hereditary hemochromatosis, a genetic disorder in which patients absorb iron from their food at an accelerated rate.

Growing children easily use the excess iron, says Leitman, but by adulthood, the body begins loading it in the liver and other organs. In the liver, cell damage from iron deposition progressively leads to hepatic fibrosis, then cirrhosis, and sometimes cancer.

"This is not a benign diagnosis, even though only a small percentage of patients die," she says. "Some 30 to 60 percent have a major disruption in their quality of life. Fatigue, arthritis, and sexual dysfunction are common, and by age 60 many have had a hip or knee replacement."

Leitman advocates for regular screening for hemochromatosis in the ethnic group affected by the disease, which stems from a mutation in the HFE gene. That mutation has been traced back to the Vikings and was transmitted through their conquests of the British Isles and northern Europe. It is today's most common inherited disorder in Caucasians of European descent, with one in 10 having at least a single copy of the mutated gene; those with two — one from each parent — will develop hemochromatosis.

"If caught by age 18, none of the damage occurs, and the patient has a normal lifespan," says Leitman. Treatment consists of therapeutic phlebotomy, which involves removing one unit of blood weekly until iron levels drop to normal range. Patients then progress to maintenance phlebotomy several times a year.

Since most of her initial hemochromatosis patients were otherwise healthy, Leitman realized the blood from their phlebotomy treatments could be used for transfusion; now 15 percent of the red cell units transfused at the NIH come from hemochromatosis patients. Outside the research setting, however, federal regulations have restricted the use of blood from hemochromatosis donors in blood banks. That's something the patients themselves are actively fighting — with the support of the NIH, she says. Although legislation is still in draft form, Leitman is hopeful changes will take effect sometime this year.

Leitman has a new source of blood for banks.



"In what other **disorder** can treatment generate a product that **saves the lives of others?**"

"This would move their therapy from the doctor's office to the blood center," she says. When treated, 75 percent of her patients meet blood donor criteria.

"If every patient donated blood four times a year, we'd see a 10 percent increase in blood donations — and that's just from those on a maintenance schedule," Leitman adds. "We wouldn't have blood shortages in U.S. ... These patients could be national treasures."

Leitman has been married for more than 20 years to Dennis Klinman, an immunologist at the NIH National Cancer Institute. They have three daughters, ages 21, 19, and 16.

—By Mary Jo Curtis

CHANGE WE NEED

The health care system needs help, but this alum has hope.



Montgomery's goal? Cure health care.

John Montgomery '82 MD'93 always knew he wanted to do "something big" in medicine, something that would enable him "to help as many people as possible."

In the 16 years since he left Providence, he's made significant progress toward that goal. He's worked in private practice, for the U.S. Navy, in academic medicine, and as an epidemiologist for county health departments in Florida. He's helped build primary care clinics and brought family medicine into county health, and he's been involved with dozens of medical organizations, societies, advisory committees, and corporations. Following the 9/11 terrorist attacks, he spearheaded training in bioterrorism and weapons of mass destruction for physicians and first-responders.

Six years ago he turned in a different direction and began working for BlueCross BlueShield of Florida — he's now vice president of professional relations — a move he believed would allow him even more influence on health care.

"As I practiced and saw different areas of medicine, I saw that as physicians we need to be more engaged in the business of medicine," he explains.

"[W]e haven't been at the table when it comes to business, and we've been delegating that to folks who don't know what it's like" to make life and death decisions about patients.

"This isn't criticism of my MBA colleagues, but they don't bring that unique perspective of caring and compassion, of knowing at end of day that this is not about money, but about care."

Montgomery confesses public health "still gets me incredibly excited," and he's found plenty of issues to tackle since joining BlueCross, from teen health care and infant mortality, to the quality of school lunches and exercise programs. He's lately focused on childhood obesity, health information technology, care for diabetic patients, and planning for public health emergencies like hurricanes and pandemic influenza. And he's determined to find ways to provide care for the increasing number of uninsured Americans.

His efforts have not gone unnoticed: Montgomery was recently named the 2008 recipient of the national Robert Graham Physician Executive Award, given by the Academy of Family Physicians to a physician executive who has transformed health care delivery and improved patient care.

At 49, Montgomery's passion and enthusiasm is hardly wearing thin. He still sees physician roles he'd like to tackle — CEO, medical school dean, perhaps motivational speaker for young people. He's also been interested in "reaching out" to the Obama administration to offer his expertise and assistance; several friends have even suggested he'd be a good candidate for surgeon general.

People sometimes ask John Montgomery why he's so optimistic when others are not.

"It's because I've been involved in so many aspects of medicine," he says. "Eliminating racial and economic disparities in health care is a no-brainer, and we can improve technology and have a significant impact on improving quality of life.

"It is possible to move forward and solve our problems."

—By M.J.C.

ALUMNI ALBUM

1994

Apurv Gupta '89 recently received the 2009 American Medical Association Foundation Leadership Award for his work as CEO of Hospitalist Partners, LLC, which develops model hospitalist systems focused on improving health and treatment results for hospitalized patients. He is also interim vice president of medical affairs and medical director of the Hospitalist Program Norwood Hospital in Barrington, RI. In addition, he is a trustee of the Indian Medical Association of New England and co-chair of the Boston chapter of Akshaya Patra USA.

1996

Yeuen Kim '92 announces that Eleanor Heejoon (the name means joy and outstanding) Lee joined the family on January 31. Ben, 6, and Emily, 4, are proud siblings. Contact Yeuen at yeuenkim@yahoo.com. This email address is being protected from spam bots; you need Javascript enabled to view it

Mark D. Vannorsdall is a private practice nephrologist in Greenville, NC, with interests in interventional nephrology, transplantation, and clinical trials. He trains nephrology fellows from the ECU/Brody School of Medicine, where he holds an adjunct faculty appointment. He writes that "with a little more persistence" his wife, Laura, will graduate from the Harvard School of Continuing Studies, this spring. Their oldest son, John, is a freshman at St.

George's Academy, Newport, RI. Peter, Katie, and Emma are in school in North Carolina. They summer in Camden, ME.

Colette R. Whitby moved her hospital and practice situations to Emerson Hospital in October 2008. This has enabled a wider variety of services for patients and has also allowed her to spend more time with her husband, Robert, and the girls. They continue to live in Townsend, MA, where, she writes, "it seems to always snow."

1997

Rudrani Banik '93 and her family are moving back to the U.S. after having spent two and a half years in Mumbai. She's looking forward to being able to work again!

Yvonne Mark '92 and **Robert Sokolic** '96 live in Columbia, MD, with their twin 1-year-old sons Isaac and Lancelot. Yvonne is a clinic physician at Johns Hopkins University Student Health and Wellness Center. Rob is a staff clinician at the National Human Genome Research Institute.

1998

Wendy Wan-sir Lin '94 is currently an attending physician in the Department of Emergency Medicine at the Cedars Sinai Medical Center.

She writes: "My husband, Bergt, and I would like to share the wonderful news of the birth of our first child, Breanna Lin Bieler on December 19, 2008, in Los Angeles." The family has moved from the west side of Los Angeles to beautiful Calabasas.

1999

Melisa W. Lai-Becker '94 is excited to be starting and directing the new Division of Medical Toxicology at the Cambridge Health Alliance (Boston, MA). She continues to work as an emergency physician for Cambridge while consulting as a staff toxicologist with the Regional Poison Control Center serving MA and RI. She and **Kathleen Hogan** MD'00 have enjoyed a couple of New England outings with their little ones, Becker's son Aidan (9 months) and Hogan's daughter Izabel (7 months). She writes that Hogan has started orthopedic practice just over the border in New Hampshire, after completing a fellowship in knee and hip replacement at Brigham & Women's Hospital last year.

2000

Kathleen Hogan (see Melisa W. Lai-Becker '94 MD'99).

2001

Amit Joshi '97 (see Nikki Sanghera Ariaratnam MD'04).

2002

Deborah Archer '95 is working in Fort Collins, CO, in community pediatrics and living with her ever-expanding family. She now has Imani, 9, Nia, 7, and Darius, 2. She writes, "Shane and I would love visitors. Colorado is beautiful all year round." Archer can be reached at deborah_childoc@yahoo.com.

Abram Mozes '98 married Lindsey Kushner on November 9 in Oakdale, NY. Abram will be finishing a cardiology fellowship at Stony Brook University Medical Center in June before return-

ing to Boston to start a two-year fellowship in cardiac electrophysiology at Tufts Medical Center. Contact Abram at abemozes@yahoo.com.

2004

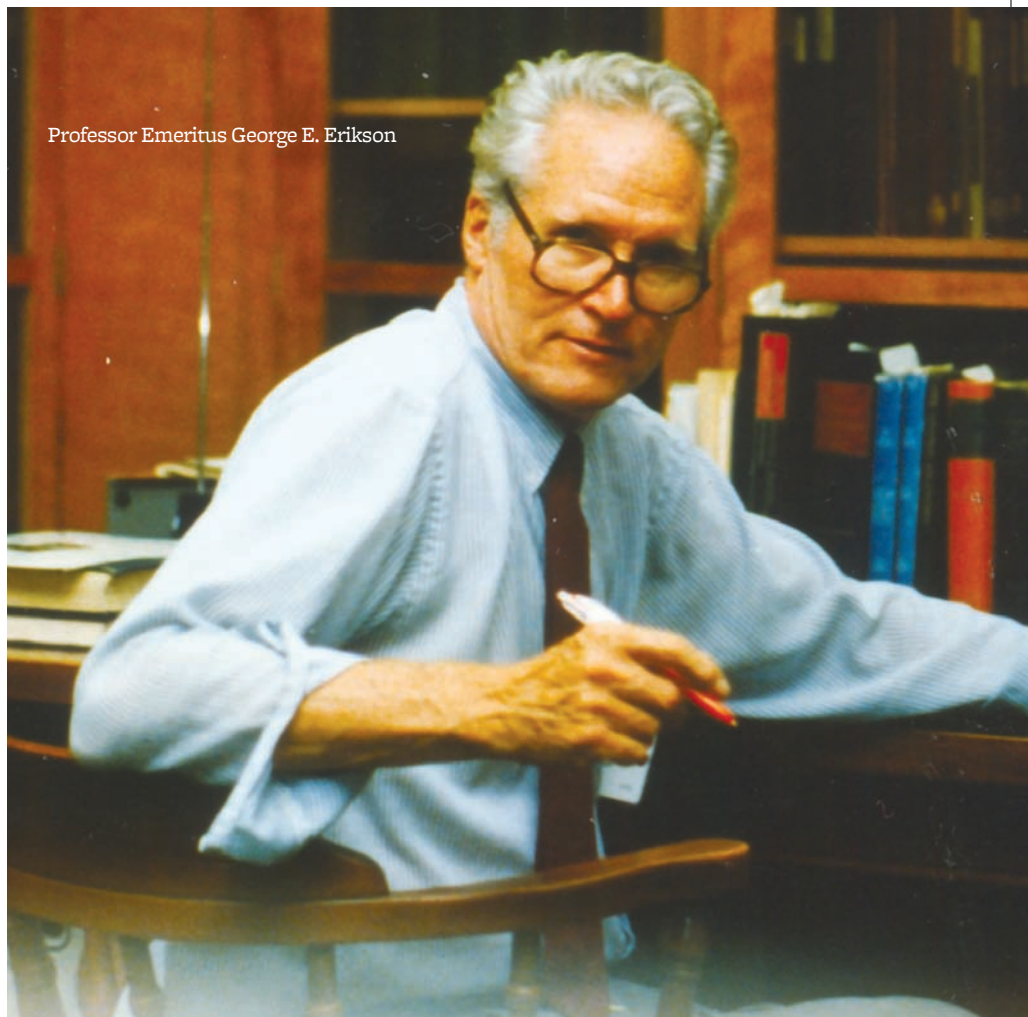
Nikki Sanghera Ariaratnam '00 and **Amit Joshi** '97 MD'01 announce the November 3 birth of their first child, Layla Ariaratnam Joshi. Nikki writes that she is enjoying maternity leave from her final year of radiology residency at Cornell-New York Presbyterian Hospital. Amit is on Cornell's surgical faculty at an affiliated hospital in Queens.

Contact Nikki at nikkiari@gmail.com.

2007

Pebble Kranz '91 is a second-year resident in family medicine at the University of Rochester. She writes: "I love my department (though of course miss everyone at Brown and lovely Providence) and every day during second year, I've become more sure that this was the best path for me to take. Looks like I'll be a chief resident for 2009-2010 and 2010-2011 in Rochester and will be taking classes in the Marriage and Family Therapy master's program there during that time. I'm slowly, but surely, moving toward my goals!"

Professor Emeritus George E. Erikson



HOUSESTAFF

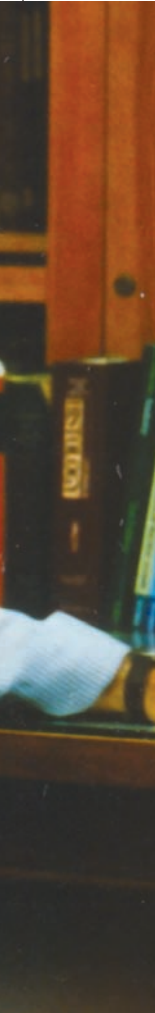
2009

Michael C. Park, MD, PhD, who will complete his neurosurgery residency in June, has been awarded the 2009 William P. Van Wagenen Fellowship. During his residency, he has been involved in the BrainGate project, a brain-machine interface developed at Brown, and its surgical implantation. As the Van Wagenen Fellow, Park will travel to Marseille, France, to study at Assistance Publique L'Hopital d'Adulte de la Timone for one year. He will investigate theoretical, clinical, and developmental aspects of intractable epilepsy.

OBITUARIES

FACULTY

Professor Emeritus George E. Erikson passed away on January 15, 2009. Erikson was an instructor and an associate professor of anatomy at Harvard Medical School before coming to Brown, where he served as professor of medical science from 1965 to 1990. During those years, he was co-chairman of the section of population biology, morphology and genetics, an anatomist in the departments of orthopedic surgery and neurosurgery at Rhode Island Hospital, a consultant anatomist for Surgical Techniques Illustrated, and a consultant anatomist for Dorland's *Illustrated Medical Dictionary*.



From 1990 to 1999 he was a visiting lecturer on surgery at Harvard Medical School and a senior anatomist in the department of surgery at Massachusetts General Hospital. He was a member of the American Association for the Advancement of Science, the American Association of Clinical Anatomists, the American Association for the History of Medicine, the American Association of Clinical Anatomists, the American Association of Physical Anthropologists, the American Society of Mammalogists, the American Society of Zoologists, the Anatomical Society of Great Britain and Ireland, the Oral History Association, and the Alpha Omega Alpha Honor Medical Society.

He received several awards and honors, and in 1990 founded the Erikson Biographical Institute Inc. in Providence. He enjoyed gardening and trav-

eling. He is survived by his wife, Suzanne; a daughter; sons John '80, Thomas '83 and David '76; seven grandchildren; and a great-granddaughter.

HOUSESTAFF

Michael Wiggins, MD HS'93 an instructor in orthopaedics at Alpert Medical School, died of previously undiagnosed heart disease April 10 while on a family vacation in Colorado. Wiggins, 48, lost consciousness while riding in a chair lift with his family at the Breckenridge Ski Resort and could not be revived.

A triathlete himself, Wiggins took a holistic approach to patient care that combined orthopedics and total body health and fitness. In 1998, he renovated a space in Providence's Foundry Building and opened Foundry Sports Medicine & Fitness.

Wiggins is survived by his wife, Clin-

ical Assistant Professor of Obstetrics and Gynecology Doreen Wiggins, and their five children, Steven, Brenden, Kai, Olivia, and Jade. A funeral was held for Wiggins on April 16 at Christ Church in East Greenwich. Memorial contributions have been suggested to Friends Way, a bereavement center for children and their families, and the Lance Armstrong Foundation.

WHERE DID EVERYBODY GO?

We don't know if you don't tell us! Take a moment to update us at med.brown.edu/alumni/ (click on "fill us in") or send your updated contact information, including email address, directly to us at Med_Alum@brown.edu. We're now accepting news and photos for the online Brown Medicine magazine. Send photos, especially good shots from Reunion, to Brown_Medicine@brown.edu

MOMENTUM

CAMPAIGN FOR ACADEMIC ENRICHMENT

MANY HAPPY RETURNS

Alumna endows scholarship to help lighten the load for medical students. | By Kris Cambra

“Why do you want to be a doctor?” Alexes Hazen’s grandfather once asked. “Just be a woman.”

But Hazen ’87 MD’96 wanted to help people, and though her path was a little more circuitous than most, she finally found her way to medicine. Now an assistant professor of plastic surgery at New York University and director of the NYU Aesthetic Surgery Center, Hazen was a featured speaker at the annual “Generosity and Gratitude” celebration of medical student scholarships on April 23, where she told the audience why she endowed the Alexes Hazen, MD, and Alex Ettl Medical Scholarship.

Her grandfather, Alex Ettl, was a very impressive — and imposing — self-made man. A sculptor, he turned a little family business importing artists’ tools into a nationally renowned company that made large-scale monuments.

“He became a millionaire, and instilled both terror and a work ethic in us,” Hazen said.

Self-described as a good but somewhat unfocused student, Hazen worked as an AIDS educator in a high risk neighborhood in New York after graduating from Brown and then served in the Peace Corps in Honduras. With a little life experience under her belt, her future came into sharper focus and she realized that yes, she really could be a doctor. She completed the post-baccalaureate premedical program at Bryn Mawr College and returned to Brown for medical school.

Hazen said she soon realized how privileged she was — with her parents paying for her tuition, her living expenses, even buying her a car — after seeing the experiences of her best friend, who was also a medical student.

“She had scholarships, loans, jobs ... I’d be going to the movies and she’d be going to work,” Hazen says. “She was under pressure to do well and she had to succeed. It was eye opening to me. I decided at that point if I ever had the means, that I would do something so that people had the chance to decide on whatever career they wanted and to go with their heart rather than what makes money.”

That opportunity came when her grandfather died at the age of 96. He established a foundation with his fortune and appointed his children and grandchildren directors. Shortly after she graduated from medical school, Hazen used some of the funds to establish the medical scholarship that bears her and her grandfather’s names.

As part of her giving to Boldly Brown: Campaign for Academic Enrichment, Hazen committed additional funds to the medical scholarship last year, in addition to supporting the Brown Annual Fund and the Brown Medical Annual Fund. Her gifts were matched dollar for dollar by the Women’s Leadership Challenge, established by the Women’s Leadership Council at Brown to both honor President Ruth J. Simmons’ commitment to higher education, particularly the education of women, and to inspire greater leadership giving from Brown alumnae.



Alexes Hazen with Dean Wing at the scholarship celebration in April.

MATT FRANCIS

HONOR SOMEONE SPECIAL

.....

ARE YOU PROUD OF YOUR BROWN MEDICAL STUDENT? WANT TO THANK A PROFESSOR THAT MADE A DIFFERENCE IN YOUR LIFE? SHOW YOUR GRATITUDE TO A BROWN DOCTOR? NOW YOU CAN BY MAKING A GIFT TO THE BROWN MEDICAL ANNUAL FUND IN SOMEONE SPECIAL'S HONOR.



Parents, don't forget you can double your money this year by making a gift of \$250 or more between now and June 30, 2009. Two parent couples will match those gifts up to \$50,000 – that's an incredible boost for the BMAF and the medical students who rely on it. BMAF dollars directly support medical education. When you give, your children benefit.

Your gift to the Brown Medical Annual Fund counts as a gift to the Campaign for Academic Enrichment. So be BOLD. Consider becoming a member of the Brown Medical Society with a gift of \$1,000 or more. Your gift – at any level – will help us reach our goal of \$830,000 by June 30. Send your check made payable to Brown University-BMAF to the address below or give online at www.gifts.brown.edu.

Questions? Contact the Office of Biomedical Advancement at 401 863-3231.



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Don't Look Now.

But do look on June 30!

*That's when the all-new online version of **Brown Medicine** magazine will go live.*

Be sure to visit the URL below.

You'll find the regular magazine content, plus special features like podcasts, blogs, book excerpts, news updates, and more.

