JOHN ASTIN'S NEXT ACT

The professor is already inspiring undergraduates in his acting and directing classes. But his true quest is to bring the theater major back to Johns Hopkins. **p.28**

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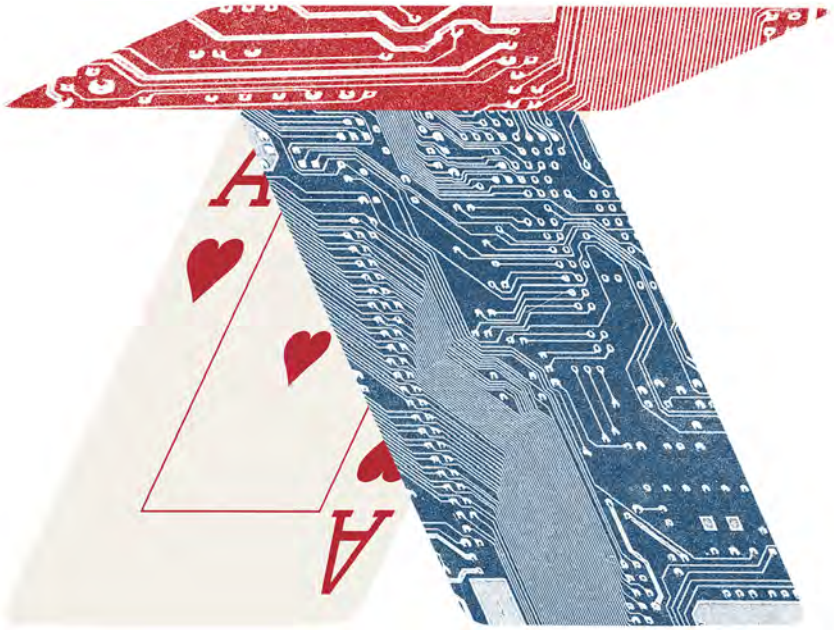
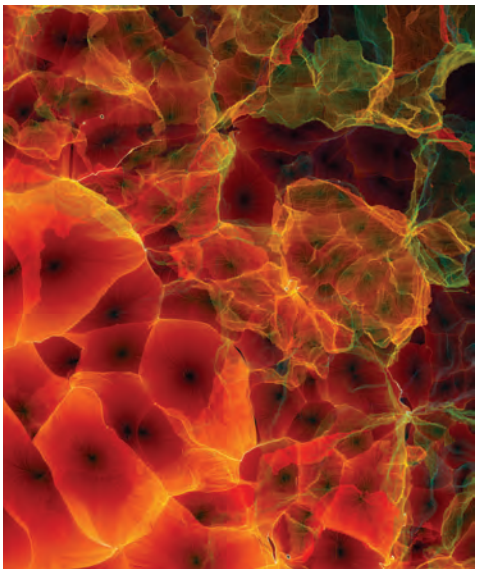
CONTENTS

34 Computing Texas Hold 'em



12 The Cosmic Web



FRONT

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Contributors

Cathy Shufro ("Renewing Ties to Myanmar," p. 16) is a freelance journalist who has reported on global health from Bangladesh, Nicaragua, Haiti, and Thailand. This spring, she reported from Myanmar on a fellowship from the International Reporting Project, a program at the Nitze School of Advanced International Studies that allows U.S. journalists to do in-depth reporting overseas.

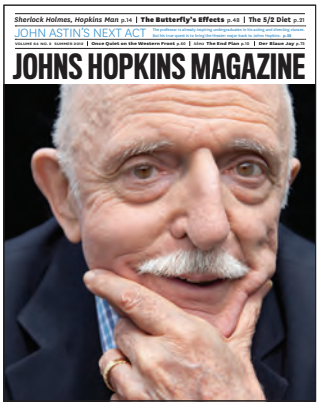
David Driver ("Applying a Slide Rule to Baseball," p. 20) is a freelance writer whose work has appeared in the *Washington Post*, the *Washington Times*, the *Sacramento Bee*, the *Cleveland Plain Dealer*, and the *Seattle Post-Intelligencer*. A former college baseball player, he now covers sports in and around Washington, D.C., where he has lived for 20 years.

Eda Akaltun ("Computing Texas Hold 'em," illustrations, p. 34) employs traditional printmaking and digital collage to create her illustrations, which have appeared in the *New York Times*, the *Telegraph*, *Wired*, and *New Scientist*, among other publications. Originally from Istanbul, she lives and works in London.

Marshall Clarke ("Making Waves to Fight Cancer," photograph, p. 68) is an independent photographer based in the Baltimore and Washington, D.C., areas. His work has appeared in exhibitions at the Fraser Gallery in Washington and at the Baltimore Museum of Art, and his clients include magazines, universities, multinational corporations, and nonprofits.

Jennifer Walker ("The Read on Culture," p. 70) is a freelance writer based in Baltimore, where she writes about health, food, business, and arts and culture. Her work has appeared in *Urbanite*, *Johns Hopkins Nursing*, *Healthcare Traveler*, and *SmartCEO*, among other publications. She blogs about food and cooking at mymorningchocolate.com.

On the cover
Actor and theater professor John Astin was photographed for our cover by **Christian Witkin**, a New York–based fashion and portrait photographer. This cover photo of Astin was taken outside the Merrick Barn, recently renovated and renamed the John Astin Theatre. Witkin's work has appeared in a number of publications, including *Vanity Fair*, *Vogue*, and the *New York Times Magazine*, and in advertising campaigns for (RED), Nike, Microsoft, and Calvin Klein.



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PHOTOGRAPH BY CHRISTIAN WITKIN

VOL. 64

Just another day in the Land of Pleasant Living.

It was ambitious to schedule a double photo shoot—one of them outside—for mid-April. We had a terrific photographer named Christian Witkin coming down from New York for back-to-back sessions with theater professor John Astin, A&S '52 ("Staging a Revival"), and undergrad Liza Brecher, A&S '13 ("Parental Guidance"). The timing had to be nearly perfect, so I attended the shoot to make sure things went smoothly. We got started a little late when Astin turned out to be charming and loquacious and full of wonderful stories. And when we went outside to photograph Brecher, the day clouded over and a small sprinkling of rain was followed by a full-on hailstorm. Not exactly perfect, but it's springtime in Baltimore—what can you do?

My favorite part of the day was when, between shoots, Astin introduced himself to Brecher. She mentioned that her dad, Gerald Brecher, A&S '67, participated in theater when he was a student. Astin graduated too early for them to have crossed paths, but he thought for a minute and said, "Any relation to Irving Brecher?" Irving Brecher was a screenwriter who, among other things, wrote for the Marx brothers. Turns out he was a first cousin of her grandfather, Walter Brecher, A&S '34. Irving himself was not a Johns Hopkins graduate, but the moment still felt very Smalltimore.

It's just kind of nice that at a university that gathers people from all over the country and around the world, you can still have small-town moments like that.

PHOTOGRAPH BY MAX HIRSHFELD

EDITOR Catherine Pierre

Connections

I just received your new and splashy magazine and I am compelled to write, not just because of the suave appearance but also because so many items in that issue have a personal connection for me.

Dale Keiger writes about Sidney Offit, A&S '50, and Kurt Vonnegut [Forefront, "Pals with Pens," Spring]. Sidney and I were both in Bob Jacobs' writing class and I still remember with fondness Sidney's enthusiasm and wit, especially when reading one of his own stories. John Barth was also in that class. I also recall that when I did not have the nerve to make the call, Sidney telephoned Ogden Nash at his home to invite him to our Pi Delta Epsilon honorary fraternity dinner. I stood to one side and listened, amazed at Sidney's charm and persuasion. Of course Nash attended, even got there early to schmooze with us at the bar.

There was also a photograph of John Astin, A&S '52 [Campus, "Astin's House," Spring]. I had the privilege of sharing the stage with John during my Hopkins days, once in *Macbeth* and most memorably in *Our Town*.

Finally, I was delighted to read "A Hopkins Guy" [Alumni, Spring] by Tristan Davies, A&S '87 (MA). He is the author of an unusual and entertaining volume of short stories, *Cake*. He and I corresponded frequently years ago when he did write-ups about Hopkins lacrosse games before the days of Ernie Larossa and emails. Nobody did it better.

William J. Fenza, A&S '51
Macungie, Pennsylvania

> When it comes to helping physicians deal with increased workload and overbearing bureaucracy, we are missing the boat.

Healthy tech

I read with interest Mary Garland's comments on "Paying Attention to Distraction" in the Spring issue [Dialogue, "The Perils of Distraction"]. Clearly, when it comes to helping physicians deal with increased workload and overbearing bureaucracy, we are missing the boat.

Technology, when used thoughtfully, can be a godsend. It has revolutionized many industries, particularly banking, communications, and retail. No one today wonders if their mobile phone will work as they travel between cities.

We are entering a period in health care where our technologists in general and health care IT specifically must come to the rescue. There will be too many people to care for in an increasingly difficult environment. Those who build and fund technology must get physicians to the requirements table and learn from industries that have already crossed the technology chasm. Obviously, a lot has been learned already. Why repeat the process?

John May, Engr '86 (MS)
CEO, TrustNetMD
Trustee, Sibley Memorial Hospital
Potomac, Maryland

Food for thought

While the efforts of David Love to extend urban farming to the fisheries sector are admirable, it is also a dead end and a waste of his time and our JHU money [Wholly Hopkins, "Farming for Urban Tilapia," Winter 2011].

Believe me, it is almost as useless to try and raise commercial quantities of fish in a living room aquarium as it is to attempt what he is doing in the backyard. To paint this doomed effort as properly scientific research with a real potential for game-changing results is a failure to discriminate fact from fantasy. Your story did note the risks of high antibiotics, steroids, hormones, and pesticides in fish tissues absorbed in ponds and tanks (and these things are needed to ensure that the fish grow as fast as possible, consume as little food as possible—called "feed conversion ratio" in the fishery business—and avoid diseases that can and do often wipe out the

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entire crop in a matter of days). As we already import such tainted and contaminated fish from Vietnam, China, and Chile, what is the advantage of repeating these cost inefficiencies and poisonous additives in a Baltimore backyard?

Tilapia is also widely regarded in the food industry as garbage fish, with among the lowest omega-3 fat content of any fish we eat. If the intent is to provide a more valuable, healthy food (protein) supply, tilapia is among the last fish anyone would recommend.

I would challenge David Love to address these very real concerns, which were only alluded to in passing in the article.

Charles Kestenbaum
Director, KZO Sea Farms
Vienna, Virginia

> It is almost as useless to try and raise commercial quantities of fish in a living room aquarium as it is to attempt what [Love] is doing in the backyard.

Saving the Chesapeake

I always enjoy reading the quarterly magazine, and I noticed your note on Chesapeake Bay improvement in "Now We Know" [Winter 2011]. While I was happy to read that, on average, our bay is getting healthier, one should always keep in mind those averages of bay data do not hold true for every subwatershed. The U.S. Geological Survey has been gathering data in the entire multistate bay watershed for many years. That data reveals that the Choptank River bordering Talbot and Dorchester counties is not getting better; in fact, it is getting worse. It is one of only two rivers that the USGS has sampled over the years that shows still increasing levels of nitrogen, largely from agriculture. Other Eastern Shore rivers face the same problem. Here on the Eastern Shore, we are not yet able to celebrate improving water quality because politicians refuse to adequately address nutrient and sediment pollution from agriculture.

Jane Bollman, A&S '92 (MLA)
Easton, Maryland

You wrote in response to our redesign. We made a word cloud.

Those who can, do

More than 60 years ago I "ran rats" in a simple maze in Gilman Hall. A bit later, I spent 35 years fulfilling the glib prophecy, "Those who can, do. Those who can't, teach." And I did, through teaching, come to understand more fully the value of basic science.

What a pleasure now, past my mid-80s, reading of Michela Gallagher and her associates ["Forgetting of Things Past," Winter 2011], particularly in a discipline—then psychology or behavioral science—that 60 years ago was almost entirely closed, at a doctoral level, to women.

Lewis B. Frank, A&S '50 (MA)
Georgetown, Maine

CORRECTION

In "Telling Baltimore's Stories" [Alumni, Spring], we incorrectly stated Gil Sandler's degree information. His correct affiliation is A&S '67 (MLA).

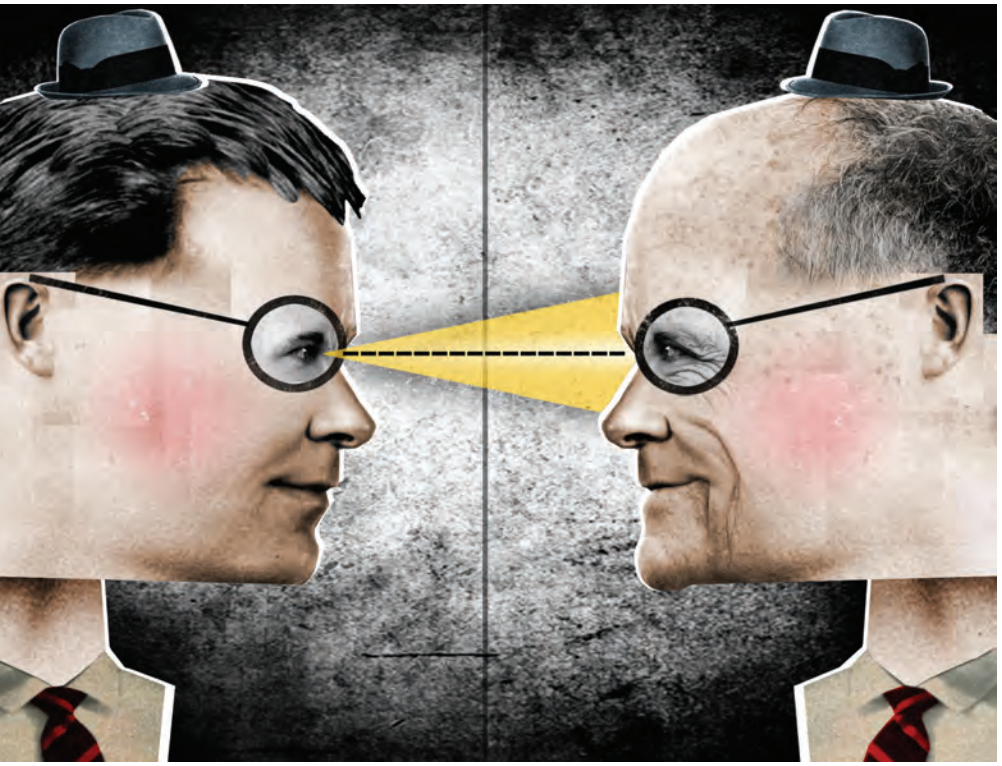


ILLUSTRATION BY AARON THOMAS ROTH

Happier Endings

Interview by **Michael Anft**

Americans are in denial about death, says Dan Morhaim, and that takes a toll both on their ability to make decisions about how they want to die and on public health budgets. Morhaim is an adjunct professor of health policy and management at the Bloomberg School of Public Health and author of The Better End: Surviving (and Dying) on Your Own Terms in Today's Modern Medical World *(Johns Hopkins University Press, 2011). The book is the result of research into how people view death and prepare for it, as well as Morhaim's 30 years of experience as an emergency physician. "I've spent a career seeing people whose lives were hanging in the balance," he says. "Many of them hadn't thought about how they wanted to die. I'm hoping to inspire people to take action before a health crisis occurs and it is too late to plan."*

Context

Morhaim also serves in the Maryland General Assembly, where for 18 years he has dealt with health policies surrounding end-of-life issues. He has attempted to liberalize medical marijuana laws so more people can legally smoke pot to relieve cancer symptoms and chemotherapy side effects. He has also noted the rigors that colleagues, friends, and relatives have undergone as they have passed on; Morhaim was particularly inspired by his stepfather, who refused life-prolonging treatment for a terminal kidney ailment. Along with assistant professor Keshia Pollack and others at the Bloomberg School, Morhaim conducted a study to gauge how Marylanders view advance medical directives—living wills, medical power of attorney papers, and other legal documents that entrust someone with carrying out one's wishes shortly before death.

Data

The researchers found that even though 80 percent of Marylanders 18 and older say they want their final wishes to be honored, only one in three has created an advance directive. That number jibes with national figures on the subject. When Morhaim teaches classes to health professionals, the figures dwindle: Only about 20 percent raise their hands when asked if they have made legally binding arrangements. Morhaim believes that many people would not opt for expensive treatments that only prolong their lives by days or weeks, especially if they are mentally compromised or in pain. If people are incapacitated, their loved ones must decide whether they will receive drugs or therapies that keep them barely alive. Such decisions affect not only the lives of individuals and their families but taxpayers as well.

One-fourth of Medicare's $500 billion annual budget is spent on patients during the last six months of their lives.

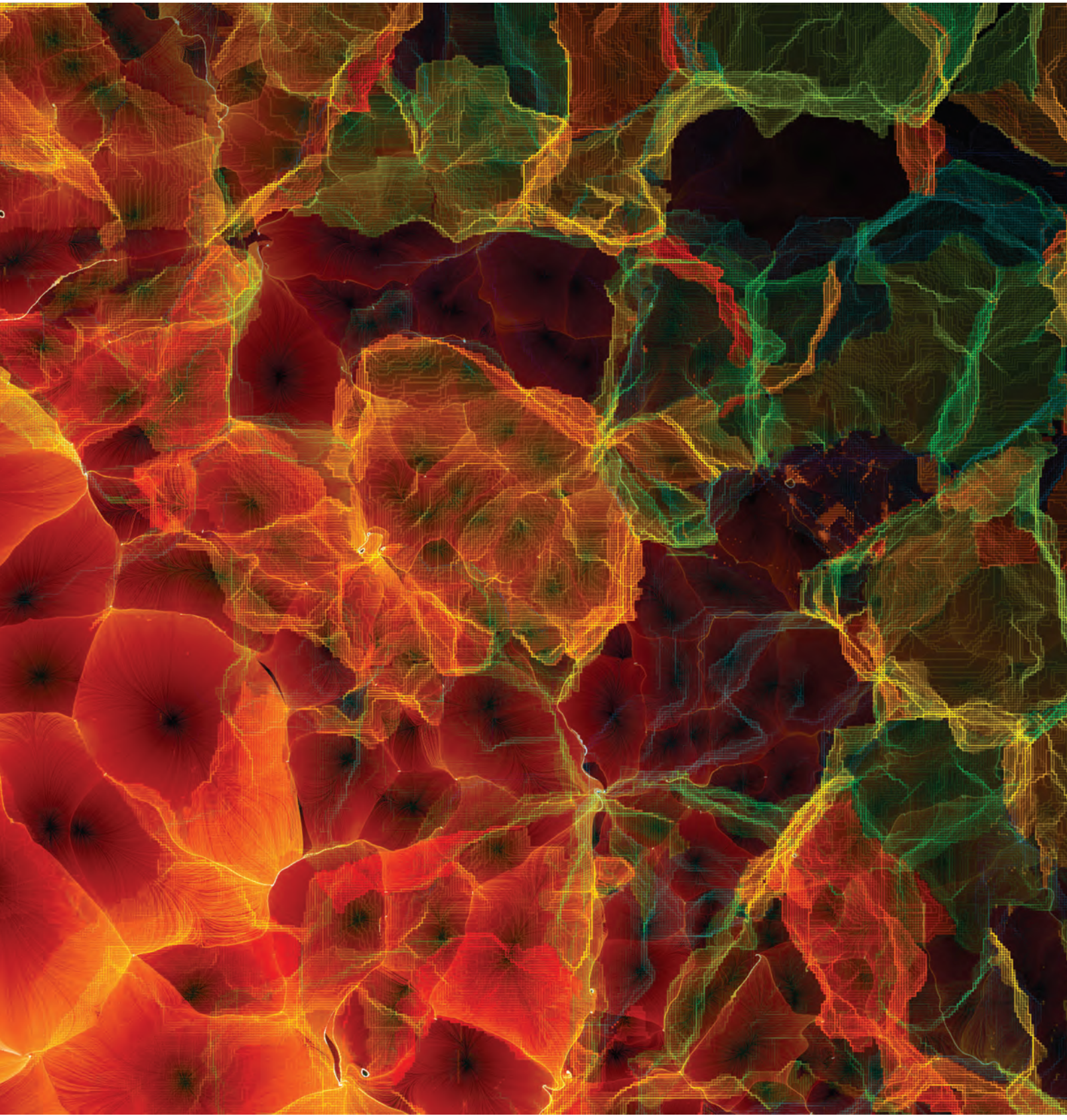
Upshot

Morhaim makes it clear that he is not talking about assisted suicide. He rails at the idea of so-called death panels, phantom committees created by opponents of President Barack Obama's health care reform act when a draft of the law included Medicare compensation for physicians who discuss end-of-life options with patients. He thinks that Americans should be having more of those discussions, and then convert them into action plans that carry the force of law. "I want everyone 18 and older to have some kind of advance directive. To me, this is as important as maintaining your driver's license or paying your car insurance," he says. "There's a way to be upbeat about this. Because of new technologies and treatments, people are living longer. This gives them more time to prepare. The boomers are the first generation that has the power to say how they die," adds Morhaim, 62.

Conclusion

Society needs to change its views on death to reflect its natural place at the end of our lives, Morhaim says. "We've seen a change over the last few decades in how births are viewed. They used to be mostly medical experiences, but people demanded that there be more humanity to it all—and that brought about change. As baby boomers watch their parents die and envision their own deaths, they are starting to look at the end very differently. Americans are people who like to have control over things, but somehow we haven't gained control over our own deaths. This is something people need to be more comfortable talking about."

THE COSMIC WEB Reminiscent of the brilliant orange rock formations of Antelope Canyon in Arizona, the orange bubble-like structures below depict something far less tangible—the flow of matter. The illustration, which offers a glimpse of the invisible forces that form galaxies, is excerpted from an informational poster created by Miguel Aragon-Calvo of the Department of Physics and Astronomy. See the full image—which won the National Science Foundation's 2011 International Science and Engineering Visualization Challenge—at magazine.jhu.edu/artifact. **Kristen Intlekofer**



FOREFRONT

At a Glance

1

CHEMISTRY

The Case of the Bivalve Epicure

Bret McCabe

Just to placate his parents, Ira Remsen earned a medical degree from Columbia University's College of Physicians and Surgeons in 1867. But it was organic chemistry that really protonated his hydrocarbon. The New Yorker earned his chemistry doctorate in 1870 in Germany, and stayed to assist a mentor. He returned to the States in 1875, took a position at Williams College, and published *Theoretical Chemistry*, a text that caught the eye of an educator setting up America's first research university. Daniel Coit Gilman recruited Remsen to be the inaugural chemistry chair of the start-up Johns Hopkins University.

Chemists revered Remsen, and his reputation spread hither and yon. It may, in fact, have reached a precociously logical young Englishman who would've been interested in Markovnikov's rule during those gap years after college and before starting a career. "Sherlock Holmes is an organic chemist—he had to have heard of Remsen," says Art Renkwitz, an integrated technology resources teacher on Maryland's Eastern Shore. And, yes, he is talking about Sir Arthur Conan Doyle's fictional character. "And to know that a university was opening its doors in America with one of the best organic chemists of the times, that would have been a lure. It would just be a question of getting on a boat and coming over here."

Welcome to "The Great Game," in which Sherlockians imagine the life of Holmes. That impulse can produce spinoff tales like Laurie R. King's Mary Russell mystery novels or the recent *A Study in Sherlock* collection, wherein contemporary authors such as Lee Child and Neil Gaiman invent new cases for Holmes or reconsider old ones. But The Great Game also involves speculative consideration of Holmes as an actual historical figure, chronicled in stories like "The Adventure of the *Gloria Scott*"—which ostensibly takes place in 1874—and "The Adventure of the Musgrave Ritual," set by Doyle around 1879. Players of the game adhere to the "facts" laid out in the 56 Holmes stories and four novels. The time between the two stories occupies roughly five years in which Holmes' whereabouts are unknown—and Johns Hopkins' founding falls squarely within those years. "There's a dropout period in there that Doyle never accounted for, which is kind of like those missing years with Jesus," Renkwitz jokes.

Renkwitz isn't alone in thinking Johns Hopkins University might've tempted Holmes to cross the pond. Philip Wilson considered the idea in a 1986 article titled "Holmes at Hopkins? Elementary, Writer Says" in Baltimore's *Evening Sun*. The piece builds on a rumination made by Christopher Morley in his 1934 essay "Was Sherlock Holmes an American?" Morley knew what Johns Hopkins could offer the intellectually curious. His father, Frank Morley, chaired Hopkins' mathematics department in the early part of the 20th century. "My own thought is that the opening of the Johns Hopkins University in Baltimore in 1876, and the extraordinary and informal opportunities offered there for graduate study, tempted [Holmes] across the water," Morley wrote. "He was certainly familiar with papers in

the chemical journals written by Ira Remsen, the brilliant young professor who took charge of the new laboratories in Baltimore. Probably in Baltimore he acquired his taste for oysters and on a hot summer day noted the depth to which the parsley had sunk into the butter."

Morley founded the granddaddy of all Sherlockian scion societies, the Baker Street Irregulars, in 1934. The Baltimore sister organization, the Six Napoleons of Baltimore, was started in 1949, and over the years a fair share of Johns Hopkins alumni have filled its ranks. From there, playing The Great Game gets out of hand pretty quickly. For example, the office of the late Johns Hopkins chaplain Chester Wickwire invited Holmes collector William Bennett Shaw to present a slideshow over a Sherlockian Weekend at Homewood in June 1978. British writer John Hopkins wrote the screenplay for the 1979 Holmes-Watson movie mystery *Murder by Decree*. A July 1981 *Newsday* letter to the editor from Robert S. Katz of Johns Hopkins defended Watson's modest detective skills since he was, of course, trained as a medical practitioner and was serving as Holmes' informal biographer. Television's most recent Holmesian character, Gregory House, of the popular eponymous television series, spent his undergrad years at Homewood and was kicked out of the Johns Hopkins School of Medicine. And so on.

"Two of my favorite avocations are Sherlock Holmes and Hopkins," offers Andrew Solberg, SPH '77, a former Six Napoleons of Baltimore member and current member of Watson's Tin Box, based in Columbia, Maryland. He's also a Baker Street Irregular, where he serves on the board of trustees and directs the organization's oral history project. He was kind enough to forward one more Morley passage, which speculates that Holmes remained attuned to Johns Hopkins in his later years: "No one read with more interest the reports of Dr. Osler's famous farewell address at Johns Hopkins [February 22, 1905], quoting Trollope on the chloroforming of men at the age of 60. It is more than coincidence that the last testimony we have ['His Last Bow'] showed him at that age."

Watson's Tin Box also puts on an annual Scintillation of Scions event over the summer, where Sherlockians come to talk Holmes. At the 2008 event Renkwitz presented his "Holmes on the Shore" argument that the budding detective visited the Eastern Shore during his time at Johns Hopkins, merely to taste oysters—a delicacy he's quite fond of in the canon. A running thread in The Great Game is where Holmes went to college—Cambridge or Oxford? Doyle seemingly toyed with that debate in "The Adventure of the Creeping Man," which has Holmes and Watson traveling to Camford University, a clever portmanteau of Holmes' disputed alma maters. But could it also be a wry nod to those Eastern Shore towns of the same names, formidable oyster seaports in the late 19th century?

"You have to go back to the canon, find something that lends itself to innuendo if nothing else, but then you have to historically support it," Renkwitz says. "And so sometimes we have to be a little bit tongue-in-cheek—well, most of the time, actually."

2

INTERNATIONAL RELATIONS

Renewing Ties to Myanmar

Cathy Shufro

Burma was an up-and-coming democracy in 1954 when Johns Hopkins established its Rangoon-Hopkins Center for Southeast Asian Studies at Rangoon University. Burma had been independent from Britain for only six years, but it had already emerged as a leader in the Non-Aligned Movement, and Rangoon University's medical school was perhaps the best in Southeast Asia.

Founded by the newly established Nitze School of Advanced International Studies, the Rangoon-Hopkins Center was staffed by a professor and a handful of Johns Hopkins graduate students who taught English, ran a library, and did research. But the center only survived eight years. It closed in March 1962 when Gen. Ne Win seized power. That July, after Rangoon University students protested against the coup, the military dynamited the student union, killing as many as 100 students inside. Those explosions became the overture to five decades of violent military repression and isolation.

And so the arrival of Johns Hopkins University President Ron Daniels in Rangoon (now Yangon) in January constituted a reconciliation of sorts between Johns Hopkins and Myanmar (Burma's official name since 1989). Daniels and colleagues from the provost's office, SAIS, the School of Medicine, and the Bloomberg School of Public Health had come to explore how the university might help Myanmar emerge from isolation and modernize. "The most striking thing," Daniels says, "is just the magnitude of the cost that the country has faced as a consequence of the decisions that it has made over the last several decades, just the unimaginable cost, the poverty, the sense of isolation, the low health outcomes."

Despite the country's isolation, ties between Johns Hopkins and Burma were never fully ruptured. During the 1970s and 1980s, the Burmese government sent students destined for the diplomatic corps to study at SAIS. Johns Hopkins scholars traveled to Burma when they could get visas. And in the 1990s, faculty from the Bloomberg School gave advice to various groups inside Myanmar, a country the World Health Organization in 2000 ranked as 190th of 191 nations for the quality of its health system.

In 2003, however, Myanmar stopped granting visas to some Bloomberg School faculty. Researchers moved to countries bordering Myanmar and began to provide cross-border medical care to ethnic minority groups that, embroiled in 50 years of conflict with the junta, had been cut off from even minimal health services. The researchers trained backpack medics not only to provide medical care but also to collect data inside the conflict zones; a 2006 survey by the medics found that one in five children died before age 5.

As the years passed, military oppression in Myanmar persisted. But then, beginning in the summer of 2011, something remarkable began to take place: top-down reform. The nominally civilian government that had taken power in March loosened press censorship, released some political prisoners, and sent peace envoys to meet with armed resistance groups. The United States acknowledged these reforms by sending Secretary of State Hillary Rodham Clinton to Myanmar in late November 2011.

Weeks after Clinton met with President Thein Sein and opposition leader Aung San Suu Kyi, Daniels and his group met with them, too. They also met government ministers, military officials, academics, and activists. "Probably the most poignant moment came when we walked on the campus at Rangoon University, now Yangon University," Daniels recalls. "It's a campus that is overgrown. Several of the buildings are crumbling. There's a fraction of the students that were once there. You can see what was once the glory of Southeast Asia in terms of higher education."

According to Daniels, the decision to re-engage with Myanmar grew out of disparate discussions among faculty. When the Johns Hopkins contingent visited Myanmar, Burmese government officials named two priorities: health reform and institutional capacity building in government. "It turns out," Daniels says, "these are areas where we have lots of expertise."

On April 8, an 11-member delegation from Myanmar arrived at Johns Hopkins. Myanmar's minister of health, Pe Thet Khin, headed the group, which met with professors and students, aid groups, and officials from the State Department, USAID, and other agencies. In a talk delivered at the Bloomberg School, Pe Thet Khin, a British-trained pediatrician, described the quality of health care professionals in his country as "compromised" and said that his ministry's crucial task is improving maternal and child health. "To tackle all these problems, we have to have a strong, well-trained, and well-motivated health workforce," he said. But that requires money. "The economy, as you know, is not very good over the past 20 or 30

years, partly because of sanctions but partly because of some mismanagement, shall I say."

He also said that reform required that people think for themselves, particularly government officials, who are "so much used to asking for permission or orders from the ministers," he said. "The most difficult thing is to change our mindsets, but it's most important."

Daniels says that he sensed optimism in Myanmar. "You felt that despite what the country has suffered in terms of decades of authoritarian government, at the same time, there was this sense of hopefulness that they were turning the corner." To support Johns Hopkins' role in that renewal, SAIS and the Bloomberg School have landed nearly $1.3 million in pledges from foundations and other donors, all for projects in Myanmar.

Still, the future remains uncertain. Human rights abuses and sporadic fighting persist in some ethnic areas. Pe Thet Khin obliquely addressed this in an interview when he said, "I'd like to improve the health of the entire nation, all the ethnic tribes, all our brothers and sisters in the whole country. Delivering good health care is not just a humanitarian [project]. Equitable health care to all people helps our national unity and reconciliation, and it will contribute to the stability of our country. Without stability, we can never prosper."

One member of the delegation to Johns Hopkins, Burmese President Thein Sein's chief political adviser, has called Myanmar's political reform "irreversible." Aung San Suu Kyi was more guarded on May 2 as she took the oath to join Parliament. When a reporter asked her about the day's significance, she replied, "Only time will tell." Johns Hopkins has a stake in whatever happens next.

PHOTOGRAPH BY BRITT OLSEN-ECKER

3

PEABODY

Rockin' the Viol

Bret McCabe

Spotting Amy Domingues, Peab '12 (MM), in a coffee shop isn't difficult. She's the stylish, auburn-haired woman lugging around an instrument case the size of a small refrigerator. It contains her viola da gamba, a fretted, seven-stringed instrument that looks a bit like the cello but has a much richer, velvety resonance. She was exposed to it in the 1990s through the recordings of famed viol player Jordi Savall and Alain Corneau's 1991 movie, *Tous les Matins du Monde*, starring Gérard Depardieu as composer and viol player Marin Marais. It wasn't only the instrument that attracted her but the creative space afforded by the viol's early music repertoire. Early music—the umbrella term for pre-baroque, pre-1600s Western music—appeals to her desire for an authorial voice. "It's different from mainstream classical music in that there is room for improvisation, because we don't know exactly how people played this music," she says.

Domingues says the viol was most popular in the 16th and 17th centuries, particularly in England, France, and Germany. As the cello became favored over the viol in orchestral music, people stopped playing and writing for it, which makes preparing an early music piece an interpretive process. "It's like a musical history detective game," Domingues says. "You have to constantly be researching how people would have played it. It's less cut and dried, in terms of what the musician's role is. A lot of it is not specifically notated on the page."

Domingues mentions that her husband, Stefan Bauschmid, a rock drummer who is not classically trained, has been enjoying early music more than baroque pieces. "The

rhythms are a little more analogous to rhythms that we come across now in pop and rock music. Some have really complex stuff that's almost like math rock." She laughs over comparing early music with a genre of rhythmically complex guitar rock. But she has experience in both worlds. She grew up in an all–classical music household, taking up the piano at age 5 and the cello at 9, before earning a degree in cello performance from James Madison University. Though she hadn't encountered popular music until she was 11, once she became an undergraduate in Harrisonburg, Virginia, in the early 1990s she caught the rock bug hard. She was exposed to the underground music streaming out of nearby Washington, D.C., and started playing cello and bass in punk-inspired bands.

Then Jenny Toomey tapped her to join indie rock darling Tsunami for a national tour. "Cello is a really excellent instrument to incorporate into the rock mix because of the contrast of the sort of aggressive and the melodic components," says Toomey, who is now the Ford Foundation's program officer for media rights and access. "Amy seemed really balanced and smart and a great player. She plays with a lot of emotion, she doesn't phone it in, and it's clever." Domingues soon started plying her cello's melodic nuance off rock's jagged edges for a number of bands, becoming Washington's go-to cellist for hire and appearing on more than 50 recordings, from post-punk legend Fugazi to former Hüsker Dü leader Bob Mould. With Toomey's encouragement she started writing for herself, first on Wurlitzer and then on cello, forming the band Garland of Hours as the vehicle for her own songs in 2000.

Her music often combines a lyrical, layered melodic sense with rock's dynamic tempos to create an engaging hybrid, equal parts chamber music spaciousness and catchy pop. She put out *Lucidia*, her third album, earlier this year, and it includes a 16th-century viol piece.

"When I initially came to Peabody I was really trying not to tell anyone about my secret rock-and-roll past," she says. "I wanted to be taken seriously. And I didn't want people to be, like, 'Oh, she's this *rock* musician.' I wanted these things to be separate. But in some ways it's becoming obvious that each can inform the other."

Last year she joined Sonnambula, a New York–based early music consort that is, like a number of contemporary classical ensembles, taking the music out of the symphony hall and bringing it to churches and art spaces. It's hard work—she typically heads up to New York before a concert for a string of four or five 12-hour rehearsal days—but the music more than rewards the effort. "It's really tremendously complex music, but it's so rewarding to play," she says. "It's fun to get to that point where you're working on music and you know it well enough that you can take some risks."

4

NURSING

Spit, Please

Kristen Intlekofer

"Don't Spit! It is indecent. It is dangerous. It is against the law. It Spreads Disease." In the late 19th and early 20th centuries, public admonishments like this one from the Anti-Tuberculosis League in New York City started to crop up in urban areas. Americans were terrified of tuberculosis, and with good reason: At the time, TB was the leading cause of death in the United States, killing 150,000 people and infecting more than 1.5 million every year. Originally thought to be a hereditary disease, tuberculosis was revealed to be spread by bacteria in 1882, when bacteriologist Robert Koch discovered the tubercle bacillus. As this new germ theory of TB became well known, doctors and city dwellers became concerned about the "promiscuous spitting" problem—on sidewalks, in train stations, and in other public places. "In neither [Denver nor Colorado Springs] can a woman walk down the street without gathering on her skirts a sickening mass of bacilli-laden sputa of all ages and stages quite sufficient . . . to sow a family harvest of death," ran an 1896 editorial in the *Denver Medical Times*.

A century later, medical researchers are looking more kindly at spit. In fact, the Johns Hopkins School of Nursing has an entire lab devoted to the stuff. The Center for Interdisciplinary Salivary Bioscience Research is directed by Doug Granger, a professor of acute and chronic care who holds joint appointments in the School of Nursing, the Bloomberg School of Public Health, and the School of Medicine. Granger has been at the forefront of salivary research for the past 20 years, founding two companies to support salivary researchers—Salimetrics in 1998 and, more recently, SalivaBio, a one-product company that launched earlier this year with help from the Johns Hopkins Technology Transfer Office. Sometimes referred to as the "Spit King" by colleagues, Granger has fun with it.

"People say, 'You've got to be kidding me. You guys need saliva? I've got tons of saliva, I'll give you all you want,'" Granger says with a laugh.

Granger first became interested in salivary research in the early 1990s while working as a postdoc at the University of California, Los Angeles, where he was doing a behavioral study with children. Finding it difficult to get children involved in a study that required multiple blood draws, Granger and his colleagues started looking into saliva collection, which was emerging as a less invasive alternative to blood tests. The problem, Granger says, was that in the early '90s, saliva bioscience was still a fledgling field. He and his colleagues found that the assays being run weren't really designed for saliva; they were modifications of blood tests. And research protocols were crude and not uniform between labs. Realizing that there was enormous room for improvement, Granger and his colleagues dived right in. He says, "We spent the next 20 years working on the details of how do you collect saliva from an insect, how do you collect saliva from a walrus, how do you collect saliva from a horse, from an adult, from somebody who's sleeping? Does it change the way the measurement is done when you have a material that absorbs the sample, or are there other ways to get the sample out of their mouths that would be minimally invasive, that would preserve the integrity of the specimen?"

Along the way, salivary bioscience researchers have made some big strides. The leading edge of this research, says Granger, is detecting HIV in saliva. In fact, OraSure Technologies, a company that has been producing oral fluid HIV tests for years, is currently developing an over-the-counter version that, if approved, will allow consumers to test themselves at home.

Granger says that more recent work has come out of behavioral studies, with researchers looking not only at individuals but at correlations among groups. For example, a lot of early saliva research focused on the stress hormone cortisol. A recent study found that cortisol levels are correlated between mothers and their babies, and researchers saw similar correlations between college students who were seriously dating. "This raised some really fascinating questions for the researchers about the shared experience and the notion of contagion," Granger says. "My level of stress hormone is not just driven by what I'm experiencing, but it's also driven by what the people around me are experiencing. There's some really cool stuff about social networks. It connects working groups and families and sports teams and special forces teams."

Researchers working at Granger's center are exploring other applications, such as a recent study that tested the use of spit screening to detect heart disease risk. The study, published in the May issue of *Brain, Behavior, and Immunity*, found saliva to be a reliable measure of CRP (C-reactive protein), a risk factor for heart disease. The possibility of one day using a saliva test instead of a blood test, Granger says, could increase the number of patients who get tested regularly, leading to more early detection.

Granger teaches "spit camps" all over the United States to help researchers in the social sciences and other disciplines incorporate salivary bioscience into their research. "Saliva is a great tool because they can do it really simply," says Granger. "They don't have to have a phlebotomist, they don't have to have their own laboratory. They can come to spit camp for two days and learn the basics of what they need to know."

Spit has come a long way in 100 years. Far from being the problem, spit could hold answers. So, please spit (at least for research purposes). It is safe. It is painless. It helps detect disease.

5

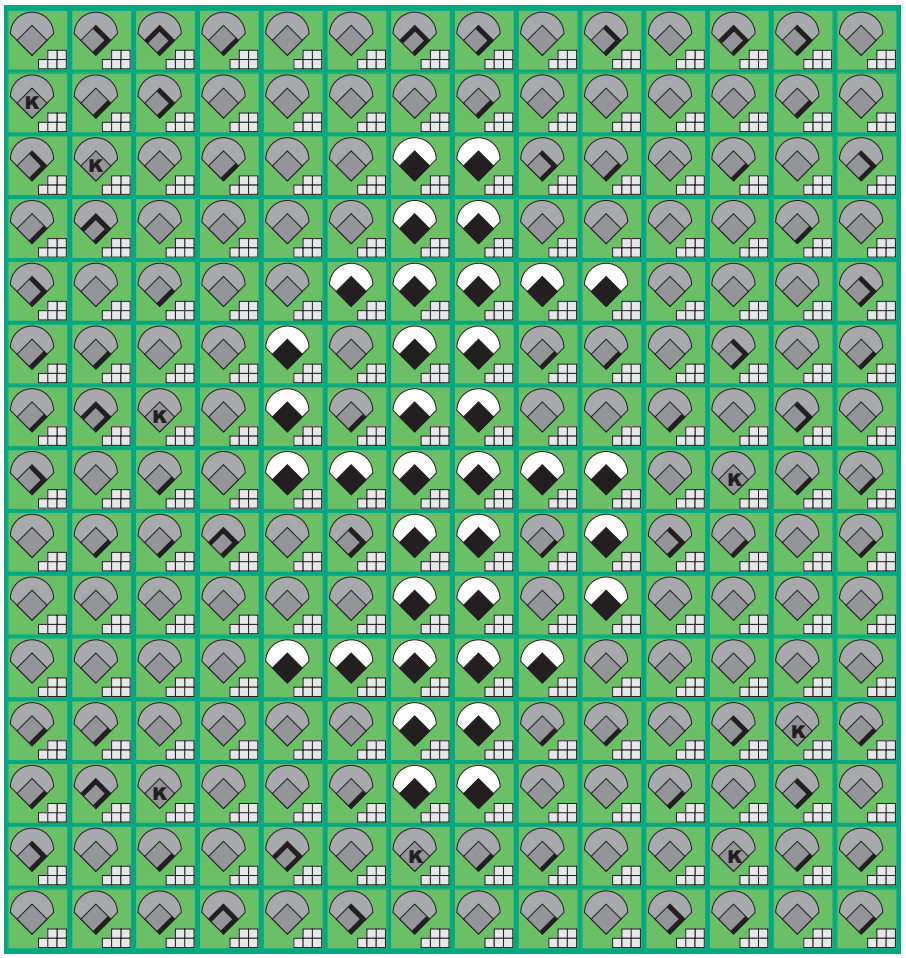
ENGINEERING

Applying a Slide Rule to Baseball

David Driver

The book and subsequent film *Moneyball* tell the story of Billy Beane, the general manager of Major League Baseball's Oakland Athletics. To compete against richer teams such as the New York Yankees and Boston Red Sox, Beane began to look closer at the statistics of undervalued players who could help his team score runs without inflating the payroll. Beane's approach was grounded in a form of baseball data analysis that has come to be known as sabermetrics, defined by one of its foremost practitioners, Bill James, as "the search for objective knowledge about baseball."

James brought sabermetrics to popular attention in the 1980s, but one of the seminal works on objective analysis of baseball data was written by a Johns Hopkins professor of chemical engineering named Earnshaw Cook. The MIT Press published Cook's *Percentage Baseball* in 1964, and in the foreword he wrote, "This book has been written for those aficionados of percentage baseball who have managed to retain vestigial recollections of freshman mathematics. In a small concession to sanity, many derivations and calculations have been relegated to separate tables as less to interfere with continuity of discussion. The argument is not difficult but it is complicated because baseball is an exceedingly intricate game." Cook's publisher noted, "Among other theories that Cook



attacks with irrefutable mathematical findings are the benefits of the sacrifice bunt, the use of relief pitchers, the traditional batting order, the hit-and-run play, and the standardization of baseball itself."

In *Percentage Baseball*, Cook, who was born in 1900 and died in 1987, notes that his father played shortstop for Gettysburg College, one of his uncles played for Lehigh University, and a distant cousin, George Earnshaw, won a league-high 24 games as a pitcher with the Philadelphia Athletics in 1929. Sportswriter Frank Deford interviewed Cook for an article in *Sports Illustrated* when *Percentage Baseball* was published, and recalls, "I remember him as quite the gentleman, extraordinarily helpful to someone like me who was so ignorant of math. He had a nice little sense of humor. He loved baseball and was amused that it was still played more traditionally than realistically. As such, he was well ahead of Bill James and all the latter-day statistical savants. Earnshaw wasn't smug about his statistics. He just was astonished that nobody had figured it out before him."

The sabermatrician James does not concur with MIT Press' assessment of Cook's work as "irrefutable." In his 1981 self-published *Baseball Abstract*, James wrote, "Cook knew everything about statistics and nothing at all about baseball—and for that reason, all of his answers are wrong, all of his methods useless." Wrong or not, Cook—or at least a copy of *Percentage Baseball* and the slide rule that he used while working on it—is part of the permanent collection of the National Baseball Hall of Fame and Museum in Cooperstown, New York.

6

NEUROSCIENCE

Don't Feed Your Head

Michael Anft

Fish, we're told, is brain food. So are blueberries, as they contain nutrients that help us remember things. But could it be that the brain, the hoggish human command center that makes up only 2 percent of our total body weight but requires 20 percent of the calories we consume, is actually better off when we deprive ourselves of food altogether? Scientists at the National Institute on Aging, led by Mark Mattson, a professor of neuroscience at the School of Medicine, think so. In several papers Mattson discussed during a meeting of the American Association for the Advancement of Science in February, he and other researchers say that depriving ourselves via fasting twice a week could significantly lower the risk of developing Alzheimer's disease or Parkinson's.

The findings resonate with decades-old studies that show a link between caloric intake and oxidative

"rusting"—the stress on cells that comes when people get older and take in food. "One of the only ways to slow down the progression of aging that involves disease or organ malfunctions is to reduce energy intake," says Mattson, who has been studying Alzheimer's and the brain for 20 years and, according to Thomson Reuters' database, is the most cited neuroscientist in scholarly journals worldwide. "As is similar to what happens when muscles are exercised, the neurons in the brain benefit from being mildly stressed. To achieve the right kind of stress, people might benefit from severely minimizing their food intake."

Mattson and others have tested their theories on animal models and small groups of human subjects. In studies involving experimental mice, neurons in the brain become more active when the rodents are hungrily searching for food. What's more, fasting animals develop protective measures against damage from stroke and other mechanisms that cause degeneration in the brain. "What we've discovered in both animal and human studies is that it's good to submit your brain to challenges, especially in the short term," Mattson says, citing research done by several groups in recent years.

But why fasting? Wouldn't reducing calorie intake overall also help the brain? Apparently not, or at least not as much. Sticking to an intermittent crash diet, with no more than 500 calories two days per week, primes the brain for protection, he says. Studies show that keeping calories at around that level stimulates two messaging chemicals that operate at the cellular level and are key to the growth of brain cells in animals and humans, Mattson explains. The shock of fasting leads the brain to create new cells. As neurons are coaxed to grow, the brain becomes more resistant to the effects of protein plaques that underlie cases of Alzheimer's, or the damage inflicted by Parkinson's.

"Fasting imposes more stress on the cells, but in a good way," he adds. "There's an increase in adaptive stress responses when people intermittently fast that is good for maintaining the brain."

Dietary changes have long been known to have an effect on the brain. Children who suffer from epileptic seizures have fewer of them when placed on caloric restriction or fasts. It is believed that fasting helps kick-start protective measures that help counteract the overexcited signals that epileptic brains often exhibit. (Some children with epilepsy have also benefited from a specific high-fat, low-carbohydrate diet.) Normal brains, when overfed, can experience another kind of uncontrolled excitation, impairing the brain's function, Mattson and another researcher reported in January in the journal *Nature Reviews Neuroscience*.

The intermittent fasting advocated by Mattson and others for overall brain health may be linked to how humankind has evolved. There are reasons why the intermittent shocks of hunger do a brain good. "Our ancestors undoubtedly had to go without food for stretches of time," Mattson explains. "It hasn't been that long since humanity lacked regular supplies of food. When you search for food when you're hungry, the brain is really engaged. The individuals who survive the best—the ones whose brains are more attuned to predators and who can remember where food sources are—are the ones who've survived."

Partly because he is worried people might not be able to stick to it, Mattson isn't promoting a strict, water-only fast. He advises people to drink plenty of water or unsweetened tea and to eat no

more than 500 calories per fasting day via fiber-rich vegetables. He warns, however, that fasting is not recommended for the very young, who need many more calories to keep them growing, or people over 70, whose brains seem to derive little benefit from intermittent food deprivation.

7

COSMOLOGY

Big Bang of Citations

Michael Anft

Researchers flourish by placing their scientific writing in journals. When they publish, they often build their investigations on the backs of other useful studies, citing them as references or footnotes. In some ways, having one's research mentioned often in others' published work is the highest form of professional flattery. So, when a far-reaching, decade-long study of the essential stuff of the universe took the top three spots on a list of the most frequently cited science articles of 2011—the first time in history that one research program has dominated such listings—the scientific world took notice.

The list of citations, gathered by *ScienceWatch*, a website run by the British media firm Thomson Reuters, centered on scores of papers created by the Wilkinson Microwave Anisotropy Probe. Better known by its acronym, WMAP is a telescope mounted on a NASA spacecraft launched in 2001, and it is designed to answer questions about the universe's beginnings. WMAP is headed by Charles L. Bennett, a professor of physics and astronomy at the Krieger School of Arts and Sciences. Now winding down as its team finishes a final data analysis, the project's publications also topped the *ScienceWatch* most-cited list in 2003, 2007, and 2009. "But we nabbed the first three spots this time around, which is amazing given the size of the field we work in," says Bennett. "Most research journals are in the biosciences. The medical research community is enormous in comparison with astrophysics and cosmology. We have reasons to be proud."

Simon Mitton, a Thomson Reuters consultant, concurs. "The WMAP papers are far and away the most successful series that we have ever featured in *ScienceWatch*," he says. "Nothing else comes close." Mitton adds that sky surveys such as WMAP maintain their high profiles by annually releasing new data that prove useful to astrophysicists. "WMAP is one of a small number of programs that are dedicated to finding the fundamental cosmological parameters. Everyone working in observational cosmology quotes the WMAP papers," Mitton says.

WMAP's investigations of cosmic microwave radiation, a lingering remnant of the universe's period of rapid expansion followed by cooling, popularly known as the Big Bang, have reaped more and more interest as new findings have been published. Since WMAP citations first were charted in 2003, they have grown sixfold, from around 1,100 at the start to 6,500 in 2011. "These are annual numbers, not cumulative ones," Bennett points out. "The level of interest goes up every year. Anyone who does research on the universe needs context, and WMAP provides that." And, he adds, interest likely will continue to climb as more researchers use WMAP's findings to investigate topics that include universal geometry and the expansion of the universe.

When the craft carrying the WMAP telescope was launched, Bennett and his crew wanted to measure the fluctuations and polarization of cosmic microwave radiation. But Bennett is astounded by how much more knowledge WMAP accumulated. For example, the project's team calculated within a 1 percent margin of error that the universe is 13.75 billion years old. It also quantified observations of other scientists that the universe is mostly composed of an antigravity called dark energy, while only 4.6 percent of it is composed of atoms that make up Earth's living things, as well as other planets and stars. "We have a strong standard of cosmology now," Bennett says. "It's not at all obvious that we can understand the entire universe, but we do understand an enormous amount because of the cosmic microwave background. We're very lucky."

Bennett now has turned his attention to CLASS, or the Cosmology Large Angular Scale Surveyor, another telescope-based project. This time, Bennett—who is building much of the apparatus along with Johns Hopkins undergraduate and graduate students—and Tobias Marriage, an assistant professor of physics and astronomy, will try to gather evidence of gravitational waves and their effect on inflation, the working theory of how the universe expanded immediately after it began.

Despite the success associated with WMAP, Bennett isn't exactly sentimental about its end. "Some people have come up and said, 'Isn't this a sad time?' Well no, actually. I'll miss working with this team. But we set out to get some information and ended up with much, much more. It's like we've won the lacrosse game and someone comes over and says, 'You just won the game. Aren't you sad it's over?'"

8

MEDICINE

Aching for a Role

Michael Anft

On a given day, Tom Wyatt might be told that he's abusing alcohol and tobacco. Or that he has cancer. Or, several times over the course of a shift, that he just became a widower. On the Johns Hopkins medical campus, it's Wyatt's part to suffer the slings and arrows of outrageous medical fortune over and over again. He is a "standardized patient" (SP), engaged to portray sick or injured people or their concerned family members in order to help medical students develop people skills.

A middle-aged Baltimore actor, choreographer, and director, Wyatt is one of 150 SPs at the School of Medicine's Simulation Center. It is the SP's role to present burgeoning physicians with the charged human interactions they'll face once they take their MDs, and it's hardly a star turn. "We're not here to put on a show," Wyatt says. "It's all about helping students, getting them to identify things in the ways they deal with people that they might not be aware of."

SPs do more than create conversational characters. They serve as guinea pigs for aspiring physicians, acting as patients. They perform cameos as homeless patients and battered women. Specially trained actors make presentations and instruct students how to sensitively conduct examinations of the genitourinary tract and abdomen. They help train physicians on how to bring up the idea of organ donation to devastated loved ones, and how best to disclose medical errors and apologize to patients and their families for making them. The Simulation Center, a bustling place with various medical classes receiving instruction—often with the help of "Sim Man," a manikin that mimics a batch of medical conditions and is most often used in cases where resuscitation is called for—provides the setting. Members of the medical school faculty watch the student-SP encounters through one-way glass. Almost all of the simulated meetings are videotaped and discussed with students later.

During one simulated case, six senior med students are asked to diagnose the breathing problems of a patient (Sim Man, portraying someone called "Mr. Hill") and deal with his worsening symptoms, which, they eventually figure out, are caused by giving him an antibiotic he is allergic to. But the students botch the resuscitation effort before saving Mr. Hill—something each must then explain to SPs who portray Mrs. Hill. The actors' emotional responses vary, with some appreciating the honesty of students who tell them of the mistake. Others let them have it. ("This is Johns Hopkins! Y'all are supposed to be better than that," bellows one.)

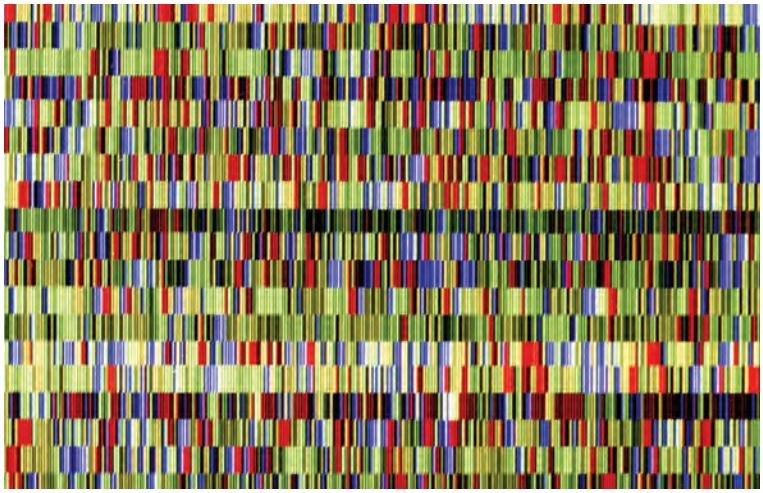
Often, SPs in similar situations are called upon to cry—with real tears. Neva Krauss, an SP since 1999 and a trainer of them for the past three years, calls on her knowledge of Constantin Stanislavski's century-old method-acting techniques to get the waterworks going. To open the faucet further, she'll picture the scene in *Titanic* right before the big boat sinks. "There are days when you have to cry on cue over and over again—stopping it on a dime, and then getting the tears flowing again," she says. "That's a draining day." Wyatt, who has been an SP since 1996, seconds that post-death scenes take their toll: "When we're doing the end-of-life scenarios in the morning, I'll have to go home, take some Tylenol, and get a nap in before returning in the afternoon." Wyatt adds that portraying someone in intense physical pain is even harder than playing another who is emotionally devastated. "Not only do I have to constantly grimace and groan, but I have to remember what the med student is saying so I can grade how they do," he says.

Otherwise, Wyatt finds the job more taxing on his brain than his heart. Because SPs must learn and understand a wide range of scenarios, memorize the facts of cases that often involve complex medical and social problems, and get a grasp of the family dynamics in many of them, they are challenged to juggle several shards of information at the same time—and sometimes several roles per day.

Not surprisingly, the annals of SP life are filled with eye-rolling anecdotes about callow med students—such as one who summarily blurts out that a loved one has suddenly died, and another who habitually ends her sentences with ". . . OK?," telling a mother, "Your son has just died, OK?" (The SP responded with, "No, it's not OK!") Sometimes, SPs angered by the insensitivity of a student have flipped them the bird—all of which is recorded on videotape. "We tell them that's a big no-no," Krauss says.

Still, perhaps because of the work of SPs, students are getting better at handling simulated situations, says Wyatt. "There's been dramatic improvement. We try to be open to what the student brings to the situation, and then add reactions and observations. A lot of times, we'll be there afterwards to discuss how an encounter went. Our instinct is to be judgmental—'Oh! I hated how he handled that!'—but we're here to be constructive."

Genome sequencing data: not a good predictor of common disease.



Mind your doctor's weight: It may affect how he treats you.

RIGHT: PHOTO BY VEER.COM
LEFT: PHOTO BY MAURO FERMARIELLO / PHOTO RESEARCHERS, INC.

Sequencing Not a Crystal Ball

By Michael Anft

For more information on these discoveries, go to magazine.jhu.edu/evidence.

Referring to a study involving thousands of identical twins, Johns Hopkins researchers say that the sequencing of an individual's genome isn't the diagnostic tool many scientists had hoped it would be. "Sequencing isn't a crystal ball," says Bert Vogelstein, a professor of oncology at the School of Medicine and one of the study's lead researchers. "Just because people may receive a negative test for having a genetic predisposition to a certain disease doesn't mean they won't develop it. There are all kinds of nonhereditary factors that can cause disease." Vogelstein and other investigators examined health records of twins—each pair shares the same genome—from Scandinavian countries and the United States. They collected information on the incidence of 24 diseases, including cancer, and then used a mathematical model to see if one twin's experience could help predict whether the other twin would develop a similar illness. The investigators found that sequencing is of some value in the case of inherited diseases, but it is a poor predictor of common disease. "We looked at the maximum theoretical potential of genomic mapping and concluded that no amount of knowledge of your genetics will prevent you from getting disease."

MORE DISEASES AND GENES

AIDS experts at Johns Hopkins have calculated precisely how effective certain anti-HIV drugs are. Used alone or in more than 850 combinations, the drugs suppress the virus that can cause AIDS. The findings could more easily point physicians toward the best individualized treatment for their patients.

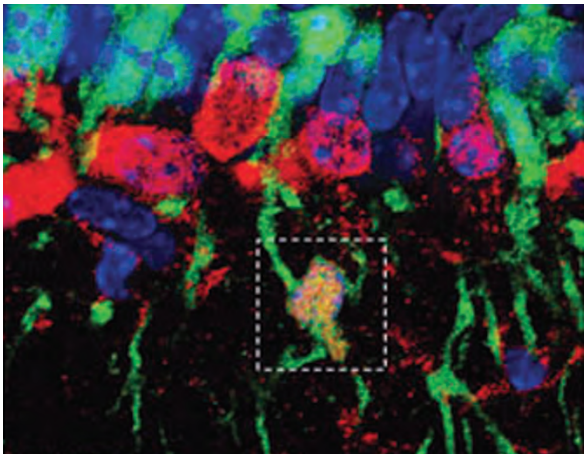
In a separate study, researchers used human immune system cells to devise a new vaccination strategy that prepares the immune system to attack HIV.

RACE, CLASS, AND HEALTH

Bloomberg School of Public Health researchers have discovered that female sex workers in developing countries are 14 times more likely to become infected with HIV than the rest of their country's population.

The number of black women in six U.S. urban areas who contract HIV each year

The nerve: Brain cells grow in mice plied with fat.



Fouled fowl: Farmed chickens harbor weird chemicals.

RIGHT: PHOTO BY ISTOCKPHOTO.COM
LEFT: COURTESY NATURE PUBLISHING GROUP

is five times higher than was previously thought. Sixty percent of newly infected women each year are black, though African-American women represent only 14 percent of the U.S. female population.

Scientists at Johns Hopkins and elsewhere have identified five previously unknown gene mutations linked to elevated blood-platelet counts in African-Americans. The finding could lead to drugs that lower risk for heart disease and stroke in African-Americans, who generally have higher counts of blood-clotting platelets than whites.

Primary care doctors with unconscious racial biases engender less trust from their African-American patients, researchers at the School of Medicine and the Bloomberg School have found. Doctors with biases tend to dominate conversations, pay less attention to social and emotional needs, and make patients feel less involved in making decisions about their health.

Latina mothers with young children prefer non-Spanish-speaking pediatricians with empathy and warmth far more than pediatricians who are merely fluent in Spanish, according to research done by the Johns Hopkins Children's Center.

DOCTORS AND DIETS

Doctors who are obese or overweight are less likely than physicians of normal body weight to discuss weight issues with patients, or to diagnose their patients as obese, according to a joint study by the Bloomberg School and the School of Medicine.

Parents generally understand the risks of a poor diet in children but aren't always aware that children can become overweight or obese as young as 2 years old, or that they require more physical activity to counteract weight problems, according to the Children's Center and All Children's Hospital in Florida.

Overweight people who shed pounds, particularly from the belly, have better blood vessel function than people who don't lose the weight—no matter the type of diet they employ, according to a study from the School of Medicine.

Large, regular doses of vitamin C may moderately reduce blood pressure.

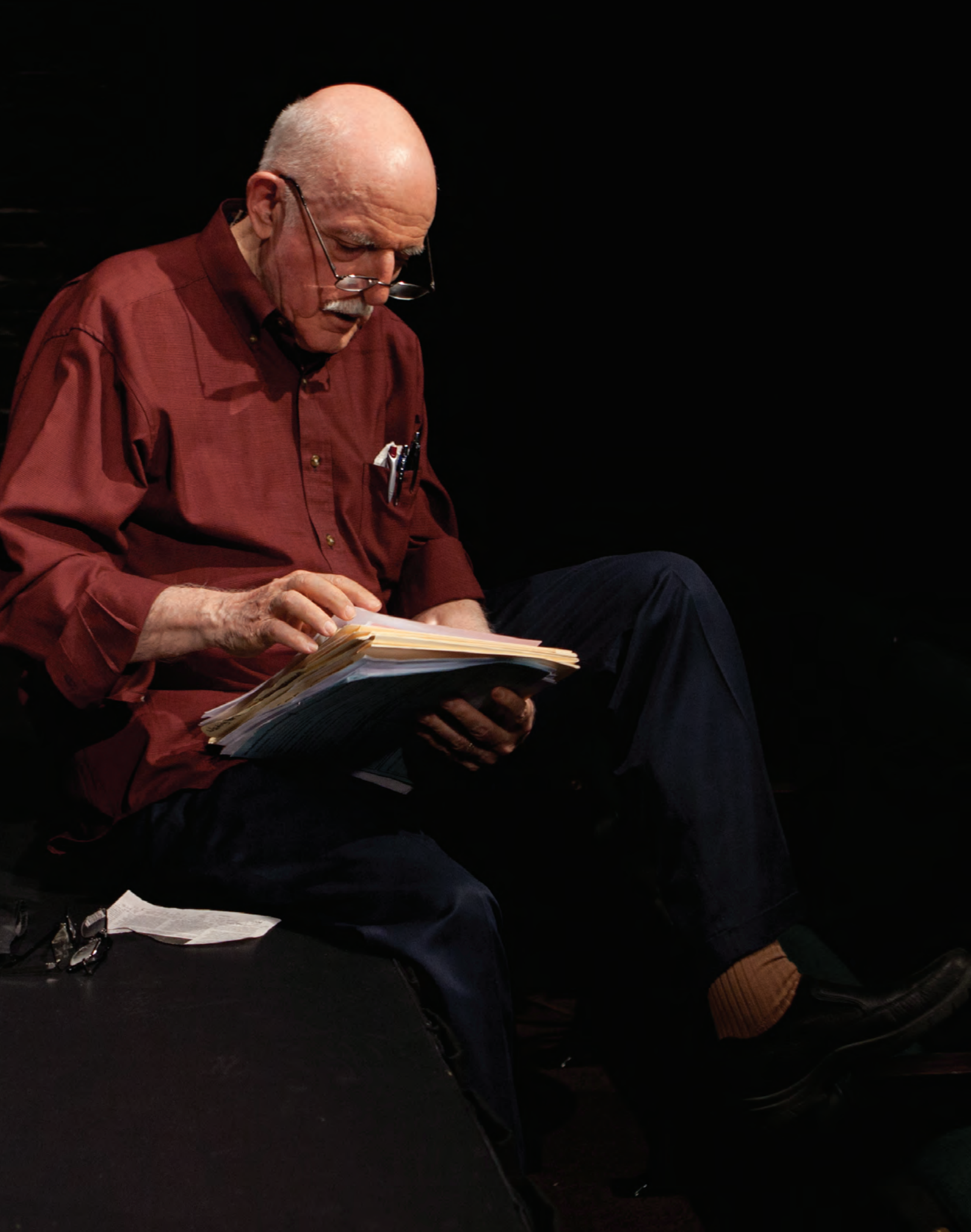
Mice who eat a high-fat diet grow a disproportionately high number of new nerves in their brains. The neurons appear to be clustered in a part of the brain that regulates eating.

Chickens are still ingesting antibiotics that have long been banned by the U.S. government, a study by scientists at the Bloomberg School and Arizona State University found. An analysis of farmed chickens' feathers also found traces of arsenic, caffeine, home care products, and Prozac.

Staging a Revival

After bringing spotlights back to Johns Hopkins, John Astin plans one final act.

Michael Anft | PHOTOGRAPHY Christian Witkin



Downstairs from the stage at the Merrick Barn, the most prominent actor on the Johns Hopkins Homewood campus tries to impart a hard-learned lesson, one he has absorbed over six decades in the limelight: Actors *don't* control the characters they portray. For all their preparation and the thespian bravado it allegedly inspires, there's a seat-of-the-pants element to treading the boards that keeps the vital player on edge, uncertain but electric. That composed, confident stage face? It's all an act.

To drive home the point, the professor leads his students, 11 undergrads who revel in theater but major in something else, in a game in which each adds one word to a story that emerges quickly around the circle they sit in. They are not allowed to ruminate. The tale of the moment, one that involves a girl going to a mall, temporarily comes to a halt when a student doesn't blurt out the next word fast enough. Where is the zap of voltage the actor is looking for?

"Do not plan!" the professor good-naturedly tells the student. "That took too long, Ellie. You'll destroy yourself by planning. Just listen—and answer quickly." He aims to hone their budding actors' instincts, to have them add something daring and extemporaneous only when they really feel it, to have new lines emerge organically. "You have to learn to forget"—he tells them as their narrative slowly unspools around the room, noting the paradox of memorizing for the stage—"so that a role or a line is fresh every time."

"He is tempering the harshness of the sciences with the humanity of the dramatic arts."

Edward Asner

John Astin—that professor—has spent a lifetime striving for those transcendent moments. In a career that has included Broadway, film, and television—most famously, his three-year turn in the 1960s as Gomez, the not-quite-unhinged patriarch of *The Addams Family*—the actor has portrayed characters high and low, broadly comedic and darkly tragic, bringing a brash energy and courageous intensity to each of them.

He's embraced the same shoot-for-the-moon approach for his latest role: reviver of the theater program at Johns Hopkins, his alma mater. When Astin, A&S '52, returned to campus in 2001 ("It was the day the Ravens won the Super Bowl," he marvels) at the tender age of 70, the campus's stage-scape was ripe for the taking—if only because Johns Hopkins had become a wasteland for drama, a *Waiting for Godot* of uncertainty (to name-drop one of Astin's favorite plays). Theater at Johns Hopkins, part of a department called Writing, Speech, and Drama during Astin's undergrad years, had petered out by the late 1970s. For a few decades following, undergrads would still put on shows, but they were do-it-yourself productions. "They might have learned about running an organization, but there were a lot of limitations otherwise," Astin says—such as a lack of courses, one-on-one coaching, and a guiding hand.

Since his arrival, Astin has gone from leading a class during one semester each year to teaching as many as eight classes annually across the entire academic calendar. He has moved to Baltimore year-round, raised money for the once-moribund department, reestablished a theater minor, hired faculty, and grown the program from an initial batch of 54 curious students to 140.

But there's one bit of transcendence, one implicit—as he sees it—plot point that has yet to play out: the return of the theater major. "About a quarter of our students are theater minors, but most of the people who study theater here say they want the major," says Astin, who now serves as a visiting professor in the Writing Seminars, which houses the drama and production courses. "It's a question they ask frequently. Some students already treat it like a major, and then build another major around their theater studies."

Many of Astin's students have followed in his footsteps, becoming regularly paid actors in New York (as Astin did right after graduating), Los Angeles, and even Bollywood. So, why worry about whether students graduate with a degree in theater or not? "It has more to do with attracting a broader cross section of students to Hopkins and offering them an aspect of culture they couldn't otherwise find here," he says. "In those regards, a theater major will have a great benefit for the university."

His cultural rescue effort has been the subject of plaudits on campus, including from university President Ron Daniels and Katherine Newman, dean of the Krieger School of Arts and Sciences. When the university renamed the stage in the Merrick Barn the John Astin Theatre last Decem-

ber, Astin's old friend, Edward Asner, came for the ceremony. He heard noises-off echoes of his old friend. "I talked with people who told me they were at Johns Hopkins because of John, that he'd given Hopkins something it hasn't had and that it desperately needs," says Asner, who met Astin a half-century ago when the two were playing off-Broadway in Bertolt Brecht's *The Threepenny Opera*. "He's tempering the harshness of the sciences with the humanity of the dramatic arts."

That's not exactly what Astin had in mind as a youngster in Baltimore, where he was born, or in and around Washington, D.C., where he grew up. Just as performing a role well allows for a surprise or two, Astin's path to Johns Hopkins, then back to it, was sinuous, unpredictable. A teenage math whiz whose father, Allen Varley Astin, was a postdoctoral physics fellow at Johns Hopkins during the Great Depression before eventually becoming chief at what was then called the National Bureau of Standards (now the National Institute of Standards and Technology), John Astin planned to follow in his dad's footsteps. It was at Washington & Jefferson College, in western Pennsylvania, where the footlights first intervened.

Astin had received a scholarship to study mathematics, and he wasn't about to dally in the arts and letters. Once humiliated by a high school English teacher, who responded to his misreading of *Moby-Dick* by calling him a cretin—"I had characterized it as a fine adventure but thought at times it was like one long plug for the whaling industry," he says with a shake of the head—Astin

was hardly game for studying humanities: "I was devastated by this. I had so much rage. I vowed never to take English again."

He met the teacher of freshman English "and told him I was only interested in the hard sciences," Astin says. "He said he'd let me off the hook but asked me if he could give me something to look at." He gave Astin a copy of Joseph Conrad's *Heart of Darkness*, which reminded Astin of the timeless value of fiction. Eventually, the same professor and some students pulled Astin toward the stage. He had already been wowed by a production of Thornton Wilder's *Our Town* (one that included Wilder himself in the role of stage manager) he had seen as a freshman. "It reminded me of the magic of day-to-day life," he says.

Astin and another student put on an on-campus production of Noël Coward's *Ways and Means*, with the professor's blessing. It was nerve-racking. But he got used to it. "At first, I was just terrified," he recalls. "But it seemed to get more comfortable as things went on. I didn't plan on making a living out of it, but I became fascinated by the process. There was an aspect of enrichment, a feeling of intensified living to it." After the show's two scheduled performances, Astin returned to the darkened makeshift theater, walking through the whole play by himself, in an attempt to "recapture that feeling of wonder," he recalls.

As he continued to study math intently, the tenor of things at Washington & Jefferson began to change. It was the early 1950s, when the House Un-American Activities Committee was questioning the loyalty of academics and government officials in an attempt to root out alleged communists. The college followed suit, grilling its educators and chasing many away. His professor friend left the school. Devastated, Astin soon did the same. He opted to transfer to Johns Hopkins because it was close enough to the family's Bethesda home "and they had this killer math department," he says.

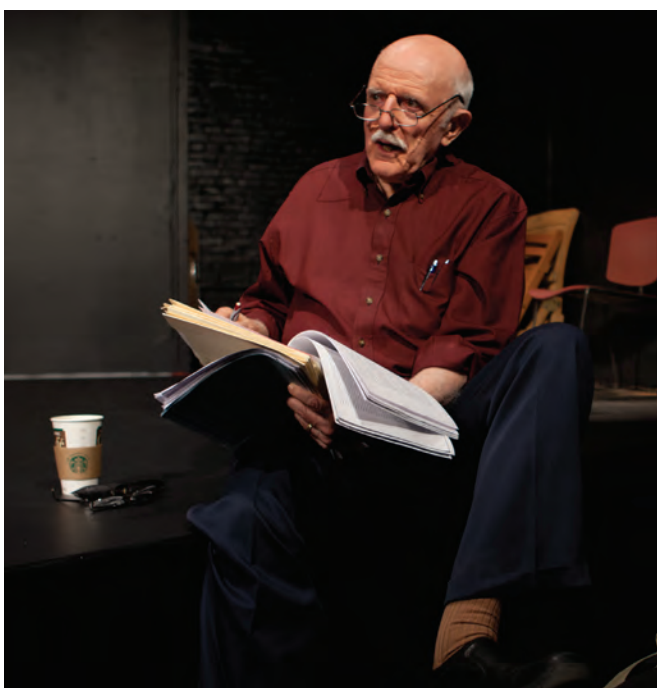
That's when the biggest plot twist crept up on him. The acting bug bit. Hard.

Despite a determination to study math, Astin, to the consternation of his father, found himself taking acting parts around Baltimore. Many of them. He ignored his physics labs and ditched his French classes. His lack of attention to academic detail earned him a carpet call from G. Wilson Shaffer, then dean of the university. To Astin's surprise, the dean suggested he apply for a scholarship, even though Astin, saddled at the time with incomplete assignments, didn't think he qualified. Shaffer encouraged him anyway.

"The generosity of that man—I'm eternally grateful for what he did for me," Astin says, citing that experience as a factor in his loyalty to the school. "I was so moved by that that I poured myself into my studies. My attitude became, 'Give it to me and I'll learn it.' At one point, I was taking 27 credits."

He would also soon make a fateful choice, swapping his natural love for math for his burgeoning appreciation of theater, becoming a regular at Merrick and the stage, then called the Johns Hopkins Play Shop, that would one day bear his name.

One warm late-winter morning, Astin teaches an elective course he created, called Contemporary Theatre and Film: An Insider's View, in the hall named after G. Wilson Shaffer. Now 82, with a fringe of white hair below and around his pate and the ever-present (though now ash-colored) mustache, Astin maintains an easy rapport with students, particularly those who place the stage at the center of their academics. At Shaffer Hall, the 35 kids in attendance—some rocking back in



chairs, others texting or checking their messages, all from a variety of majors and schools—provide more of a challenge. He keeps things moving, tossing out some deep background on theatrical conventions.

Astin starts class with some references to the bare-bones staging and gestures in *Waiting for Godot*, and then lurches backward into the tale of how Thespis and the ancient Greeks created first-person acting. (Prior to that, plays were written and acted in third person.) "Solon and other prominent Athenians thought that playing a character or singing a song that had 'I' in it was a form of lying," he says. "It was too close to Narcissus. Actors were thought to be unbalanced in those days. And that's an idea that has continued to the modern era. That's why in Hollywood—which was created not to make art but to make money, and it has needed to protect its image to do that—they included clauses in actors' contracts that rewarded them if they behaved and punished them if they didn't."

From there, Astin discusses the "humors" that the Greeks believed controlled emotions. Actors of the time used those humors as guides for the gestures they created onstage. In the 19th century, American and European thespians tied emotions to the gestures instituted by François Delsarte, Astin notes, just as those in the last century were inspired by the "psychological gestures" created by vaunted stage teacher Michael Chekhov. "If the emotion one is portraying isn't genuinely felt, then the gesture won't be honest—it won't work," he tells the students.

As he wraps things up, Astin ties the concept of the psychological gesture to his most famous role, as Gomez. The cartoons of Charles Addams, whose characterizations led to *The Addams Family*, gave him his cues, as did his acquaintance with Chas Addams himself. "His cartoons always had these tales of implied violence behind them, like when the family is on the roof getting ready to pour hot, molten metal on Christmas carolers," he says. "But there was never any violence actually carried out, so we laughed. I think what Addams was trying to do was shake us out of our boredom and routines so we could get in touch with this thrill of living." Astin applied that idea to Gomez, whose eyes and smile were as wide as his thrown-open arms. "He waved a cigar around and danced, and punctuated it all by an 'aha!'" he says, gliding seamlessly into character, to the delight of the students.

Those who have witnessed Astin at work at Johns Hopkins, or who have heard him speak about it, can't miss how he has embraced the idea of theater at the university. "He is as devoted to the mission of rebuilding the program as is humanly possible, probably because he loves it so much," says his son, the actor Sean Astin. "In my mind I have this image of my father, almost a spectral figure whose true age is a mystery, swooping around the [Merrick] Barn locking up late at night as he surveys the domain of his creative life. He considers restoring the drama program to a full major as the crowning achievement of his life."

But it's an act that has yet to play itself out. Bringing the major back depends upon the university's doing more to embrace the arts, including funding them. The Krieger School is pondering ways to ramp up its performing arts offerings—and not just theater. An arts task force created in 2010 recommended that the school make the arts a new point of emphasis.

As for theater, Krieger dean Katherine Newman and Astin agree that there should be enough money to hire someone to eventually replace him. "We have to plan for a post-Astin world, though we really don't want to think that way," Newman says. "He's a walking miracle. We owe a huge debt to him. Whatever we end up doing regarding theater, he'll be recognized as the founder of it."

For Astin, who says he wants to "make it to the century mark," the quest for the legitimacy and commitment that attend a full-fledged theater major means more than having his name attached to another physical feature of the university. He's waiting for that surprise, that crystallizing moment that shatters expectations. Treating theater with the respect he believes time has earned it would be that moment—both for him and for Johns Hopkins.

"The university is so good at so many things it does," he says. "We generate all this knowledge, and it's not just about the medical school. What we need more of is wisdom, humanity. Hopkins is missing that chunk of humanity that it used to have. But we can bring it back."

Michael Anft is a senior writer at *Johns Hopkins Magazine*.

"I think what Addams was trying to do was shake us out of our boredom and routines so we could get in touch with this thrill of living."

John Astin

To view a video about John Astin and the craft of acting, visit magazine.jhu.edu/astin.

A computer scientist goes all in for poker.

COMPUTING TEXAS HOLD 'EM

Avi Rubin looks at his cards. Looks at his chips. Ponders his options. He has made it to the last table of a poker tournament at Delaware Park Casino, near Wilmington, Delaware, but he is perilously close to elimination. Stacked before him now is $8,000 worth of chips—the chips are merely to keep score; he bought into the tournament for only $65—and his eight remaining adversaries have among them $298,500. To win the event he must win all of their chips, too, and he is tired, worn down by the struggle this tournament has been. The game is Texas Hold 'em, the most popular poker variant, and the two cards in Rubin's hand are the ace and 4 of spades. Not the strongest hand, but he has $13,000 already invested in this pot. He thinks some more. Then he shoves his remaining chips into the center of the table. He is all in. If he wins the hand, he keeps going. If he loses, he goes home.

Rubin does not play poker for a living. He is a 44-year-old professor of computer science in the Whiting School of Engineering, plus technical director of the Johns Hopkins University Information Security Institute, plus director of the Health and Medical Security Lab at the same institution, plus a well-paid computer security consultant. If his name seems familiar, it is probably because in July 2003, he gave a technical paper he had co-written to a *New York Times* reporter. The paper proved that a

Dale Keiger | ILLUSTRATIONS **Eda Akaltun**

Diebold Election Systems touchscreen voting machine that had been adopted by 38 states in time for the 2004 U.S. presidential election was so insecure a clever teenager could hack it and subvert its vote tally. Much to Diebold's annoyance, Rubin soon was in major newspapers and on CNN explaining why a supposedly tamper-proof voting machine was anything but.

About five years ago, Rubin's father mentioned that Avi's younger brother, Yaacov, had been winning money playing poker online. Soon after, Avi suggested to Yaacov that they play sometime. "He kind of laughed at me and started asking a few questions about hands and situations," Rubin recalls. "He said, 'You know so little about poker, you don't realize that you don't know anything about poker.'" Rubin thought his little brother was just being arrogant, but when Yaacov recommended a poker book called *Harrington on Cash Games: Volume I,* Rubin read it at a few sittings, highlighting the text, making notes, utterly engrossed. "It was probably the most fascinating experience I've ever had, to read that book and understand the science and the math behind poker and to realize that a game I'd considered fun my whole life actually had more depth than I'd ever considered," he says. After his family and his work, poker became Rubin's main interest, displacing pocket billiards, his previous obsession. He is a man of strong enthusiasms, serially all in, you might say, and now he bought every poker book he could find and studied them for hours, rereading the best ones. He started seeking out games with better players, learning by losing until he began to win. And he set a goal—to play his way into the World Series of Poker in Las Vegas, the biggest poker tournament in the world, by the time he was 50.

After his family and his work, poker became Rubin's main interest, displacing pocket billiards, his previous obsession.

Rubin is so young in appearance, he once had a Las Vegas casino question the validity of his photo ID, and there is something childlike in his enthusiasm for poker. On the day we went to Delaware Park, when I arrived at his house I found him already in his car, sitting impatiently at the end of the driveway. Once we were at the casino, the closer he got to the poker room the faster he walked. I half expected him to break into a trot.

His plan was to play a cash game in the morning, then enter the casino's noon tournament. In a tournament, the entrants vie for prizes awarded to the top finishers. Prize money in most daily tournaments is modest and the players risk no more than the entrance fee, so tournaments tend to attract more casual participants and poker tourists. But in a cash game, the players vie for each other's money, and because there is no limit to how much can be won (or lost), cash games attract professionals for whom a casino is the office. Soon after Rubin sat down at one of the cash games in progress at 9:30 a.m., a pro in a black T-shirt quit, holding more than $4,000 in chips. Rubin was happy to see him go. You don't win that much money at a small-stakes table unless you really know what you're doing.

Texas Hold 'em is the game you see on cable television poker shows. In Hold 'em, each player tries to make the best five-card hand out of two cards dealt facedown and a set of five communal cards faceup in the center of the table. The cards are dealt in four rounds—first each player's facedown cards, then three communal cards (called "the flop"), followed by a fourth ("the turn"), and finally a fifth ("the river")—with betting after each round. Texas Hold 'em rewards a good head for odds and a good memory for what everyone else does in the course of the game. Cautious at first, Rubin spent several hands sizing up the other players. He guessed that at least three were professionals. They had substantial chip stacks and cool, appraising faces, and they were not making mistakes. Still, after about 45 minutes he began winning some pots and seemed to be holding his own. He played well for another 45 minutes, until he tried to bluff with a weaker hand, failed to fold when he should have, and lost $240 to one of the pros. On a break soon after, he said of the player who'd just beaten him, "I should have realized he was strong. But every time I bet, the pros on the other side of the table were raising me and I was folding, and I was getting a little fed up. So they got in my head a little." He checked his iPhone. Years ago, he had made a substantial investment in Apple stock at a great price. Now he noted that the company was up $5 per share in morning trading. He chuckled. "The good news is I've made more on Apple this morning than I've lost here."

Between the cash game and the tournament, Rubin wolfs down a sandwich at the casino's On a Roll Deli. While he eats, he enters the morning's results on his phone, using an app that lets him record and chart his earnings and losses. He says that over the long haul he is ahead, this morning's $240 blunder notwithstanding.

When he began studying poker, Rubin frequently thought in terms of how a computer might model the game. Several disciplines were applicable—game theory, expert systems, machine learning, combinatorics. The latter is a branch of mathematics concerned with finite countable structures. The various combinations of cards in a poker hand are finite countable structures. As he trained himself to be a better player, Rubin would make up combinatorics poker problems, then solve them on a computer. He has considered studying the game by creating decision trees, branching diagrams that plot a chain of if-then options and are routine for a computer scientist. For example, he could start with a single hand, then chart all the variables—his position in a round of betting, the texture of the flop (that is, does it have potential to create strong hands like straights or flushes), whether he is playing against three others or heads-up against a single remaining opponent—to see what might happen. "For any given spot in the decision tree," he says, "I could come up with a probability distribution of different plays. Then I could write a learning program that I could use as a simulator on the computer and play a thousand times with particular settings, then tweak the settings and run it again to see if I do better, and work backward from it to infer why that was a better play in that situation. The thing is, there are so many variables and so many factors you rarely find yourself in a precise situation that you've studied. What you have to do is abstract out the reasoning used to get to that decision, then apply that logic and process to whatever situation you're in."

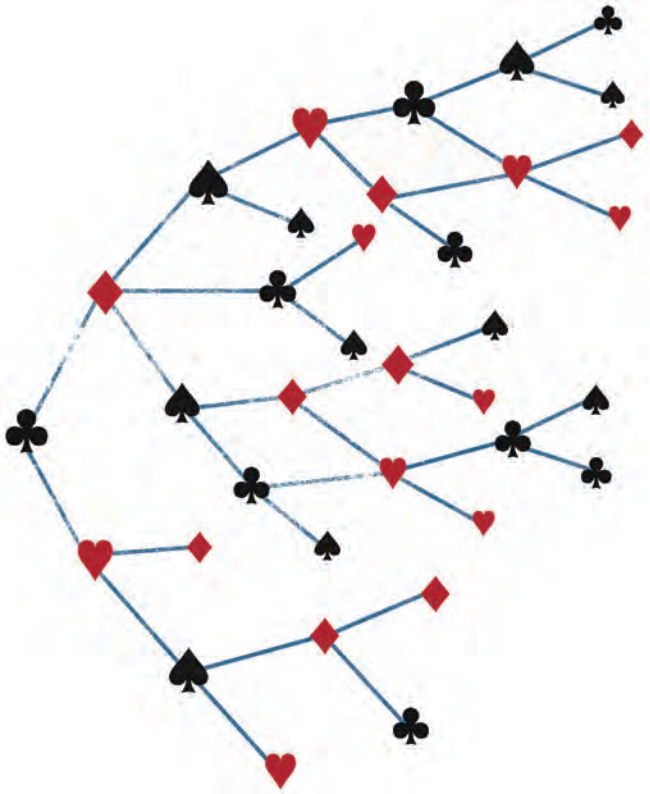
In his regular Monday night games with friends—his wife, Ann, got him to agree to limit poker to one night a week—Rubin plays against lawyers and doctors. "The lawyers tend to be better," he says. "The math in poker is basic arithmetic, it's not that hard. But you still have people, like a lot of the doctors that I play with, who'd rather not bother with all the math. They feel that they have enough intuition for the game." Rubin is pleased to point out that they're frequently wrong. "The fundamental math is much more important. If you're a solid mathematical player, in the long run you're going to kill the intuitive player.

"I think what really helps me is being a computer security guy. In security, we think of everything in terms of adversaries and action-and-response. You're worried about hackers and always trying to stay one step ahead, trying to predict what they will do if you take this defense measure, and in poker, you always have to stay a few steps ahead. It's almost exactly the same threat model that you have in network security."

At noon, the Delaware Park tournament begins with 43 entrants dispersed to four tables. Everyone starts with $7,500 in chips. Lose all of your chips and you are out of the tourney, which goes on until there's one man standing. (And it will be one man. The only women involved on this day are dealers.) The top five finishers will win cash prizes, with $723 for first. (Prizes at the daily casino tournaments are calculated by a formula and tied to the number of entries.)

Soon it becomes apparent that Rubin's initial table will be an action table, with people playing a lot of hands instead of cautiously folding. Early on, he gets ace-king, a strong hand that he bets. But he does not get the cards he needs on the flop and loses. Not much later, he's dealt a pair of jacks. This is also a good hand, so when someone raises him, Rubin raises back. The flop comes up king-7-4. Rubin now has to worry that the one player still in is holding a king. When that player bets, Rubin is forced to fold. No more than 20 minutes into the tournament, he has lost half his chips. He's not playing badly, but he's not getting the cards he needs to win.

Some of the casino's video monitors show data from the tournament: how many players started, how many are still playing, and the average number of chips held by each. Rubin's chip stack quickly falls below the average and he will spend the day clawing back from the edge of oblivion. At 12:54 p.m., he's dealt a pair of kings and bets the hand. One of his opponents refuses to fold, and Rubin goes all in. If he loses the hand,



he's out of the tournament in less than an hour. The players turn over their cards and the opponent has only king-jack. Rubin survives.

Twenty-seven years ago, Rubin entered the University of Michigan with no intent to become a computer scientist and security expert. As a freshman he was premed. But he harbored a strong interest in applying computers to medicine, so he listed computer science as his major while he embarked on the premed curriculum. Starting at a sprint, he enrolled in six classes for his first college semester, and got five As and a B+. The B+ was in chemistry, a class he hated so much it drove him out of medicine. "I told my parents that if I had to take another chemistry course, it wouldn't be worth it to be a doctor." He would concentrate on computers.

He stayed in Ann Arbor for his graduate degrees, and one year the university offered an intersession course on pool, taught by a pro who was ranked 17th in the United States at the time. Most of the students were merely amusing themselves between semesters. Not Rubin. Taken with the complexities of what seemed like a simple game, he practiced diligently, studied books and videos, watched every Hollywood film that involved pool players, and found himself improving quickly, which fueled his desire to get even better. Years later, when he and Ann were looking for a house in Baltimore, he rejected a few because they didn't have any rooms big enough to accommodate the tournament-size pool table he wanted. Once they had the house and he had the table, he practiced in the evenings and on weekends. He converted a competitive friend to the game, and they would play until 1 or 2 in the morning. "That was before either of us had kids."

Ann says that early in their relationship, Avi's capacity for obsession was not so apparent, perhaps because they had little money and he was busy finishing his doctorate. Ann is a lawyer, smart, patient, and bemused by life with a husband who does not seem to grasp the everyday meaning of "casual pursuit." She can tick off other examples of his tendency to go all in. When the two of them decided that sailing might be fun, she had in mind occasionally going out in a rented boat. But it wasn't long before they were taking lessons and the owners of their own sailing vessel. The Rubins have three children, and when the oldest brought home her annual school photos one day, Avi was unhappy with the quality and decided he could do better. There ensued the purchase of cameras, lenses, lights, backgrounds, and books; a period of study and practice; the setting up of a home studio; and the establishment of an annual photo shoot in which the kids dress up and Rubin takes hundreds of pictures to get portraits that satisfy him.

"He's fortunate that his interests coincide with mine," Ann says. "Except for the poker one." Rubin calls poker the biggest source of friction in his marriage. Ann seems more good-humored about it than her husband would suggest but admits, "Poker became an annoyance, really, because it was much more of an obsession than anything else. Part of this obsessiveness is he wants to talk about it." She does not share his enthusiasm for analyzing poker situations. Nor is she comfortable with the amount of money that can change hands. "I don't like gambling," she says. "Mah-jongg I play for quarters. To go to a game and potentially lose hundreds of dollars in an evening? I don't know. It bothers me. He's ahead, but still."

Nevertheless, for one birthday she took him to Atlantic City and turned him loose to play while she shopped, and for another birthday took him out to dinner while friends slipped into the house

and set up a surprise tournament for her to bring him home to. The Rubins are building a new house, and the basement, with her blessing, will include a poker room with three tables. Avi has urged Ann to play more, and says he thinks she could be the better player if she worked at it. She's not much drawn to that idea but has suggested that he take cooking lessons. Her calculation is that if he dives into that like he dives into everything else, by the time the house is done he'll be able to cook some very good food whenever he hosts a Monday night game. She might not play, but she'll be happy to eat.

A little more than an hour after the start of the tournament, five players have gone broke and are out. At 1:45 p.m., Rubin, down to less than half of his initial stake, goes all in again, and his two opponents fold. He starts to rebound, winning a couple of hands. He doesn't say much, and his right foot jiggles constantly. Half an hour later, with only 29 players left in the tournament, he's all in yet again. His two pair, aces and queens, beats a pair of 7s. Each hour, the tourney breaks for 10 minutes, and on one of these breaks Rubin says, "This is what you call grinding it out." By 2:30, the field is down to 20 players and Rubin folds a pair of 3s. It's the right play for such a weak hand, but he then has to watch as the pot grows large and the other two 3s turn up in the flop. Had he stayed in the hand, he'd have won big with four of a kind. All he can do is shake his head.

Three hours into the tournament, he's forced to go all in yet again, but wins when everyone else folds. By 3:30, for the first time all day he has clawed back to holding what the video monitor says is the average number of chips. Ten minutes later, he's all in for the fifth time today, and again he wins.

He makes it to the final table. When another player crashes out, Rubin is only four places out of the money. At 4 p.m., he peeks at his cards and sees ace-4 of spades. Not a great hand. Still, all but one other player has folded, and that one just lost $6,000 when confronted by an all-in raise. Rubin knows that the by-the-book play with ace-4 is to fold. That's what a computer scientist's grasp of the probabilities says, that's what all the poker manuals he has studied for months say, that's what cold logic says. But he looks at his chips, ponders his options, and convinces himself that on the previous hand his adversary displayed a tendency to back down against a show of strength and might do that now. Or he might be upset enough to play a losing hand out of frustration. Either way, Rubin wins. He pushes forward $10,000 in chips, adding to the $3,000 he already has at stake.

The other man raises and goes all in—the one possibility Rubin hadn't considered. Now he is backed into a corner. He is "pot committed," meaning it no longer makes mathematical sense to fold. So he, too, must go all in, hoping he hasn't blundered. Maybe he'll get an ace on the flop. Or three spades, which would give him a flush. But sensing imminent demise, he looks back at me and says, "Let's go home," as he pushes his remaining $8,000 in chips into the center of the table. He does not get the ace. Nor does he get the spades. His opponent beats him with a pair of 9s and Rubin is out. He finishes the tournament eighth. Only the top five finishers earn prize money.

In a conversation two weeks earlier, he had said, "Sometimes when I leave a poker game I'm lost. I have this really terrible feeling inside. I can't stand it if I leave a tournament because I did something really foolish." On the drive home now, he has 90 minutes to brood over that last hand. "That was a bad play. I should have given more thought to the position pre-flop. Maybe it was the strain of playing that long." Twenty minutes later: "Oh, I'm kicking myself for that play. Kicking and kicking." Half an hour after that: "Definitely misplayed that hand. But in my defense, I was exhausted." He does note one benefit. Because of his early exit from the tournament, he will be home in time to take his son to soccer practice. That will make Ann happy.

He could buy his way into the World Series of Poker simply by showing up and handing over $10,000. But he doesn't want to do that. He wants to bring his skill up to where he can qualify by playing his way in. Ann believes he could do it. She says, "When Avi sets his mind on something, there's no stopping him." Right now, though, he just keeps replaying that last hand. Turning onto his street, he sighs loudly.

Three hours into the tournament, he's forced to go all in yet again, but wins when everyone else folds.

Dale Keiger is associate editor of *Johns Hopkins Magazine*. Thanks to Ann Rubin for relaxing her one-poker-game-a-week rule for this story.

Parental Guidance

Navigating the special education system can be daunting. Liza Brecher wants to help.

Bret McCabe

PHOTOGRAPHY **Christian Witkin**

Toby's mother knew her son was different from the beginning. She could pick out his high cry from among other newborns', and he was always restless in her arms. His fidgetiness continued through preschool, where his teachers started to complain that he disrupted the classroom, like the time he climbed a bookshelf to get an out-of-reach toy truck—and ended up sending everything and himself to the floor. He was moved to a different class.

This pattern marked his early education: Hyperactivity led to behavioral issues, the handling of which interrupted his schooling. He had difficulty learning the letters in his name. He could do puzzles but was completely uninterested in reading. By the time Toby got to fifth grade, his reading comprehension problems were so pronounced his teacher paid closer attention.

Over the course of a few months, Toby's teacher tried several learning and behavioral interventions to document his performance before referring him to the school psychologist, who tested Toby on a series of reading and spelling tests: the Wechsler Intelligence Scale for Children–Revised, the Wide Range Achievement Test, the Broad Reading and Broad Written Language subtests of the Woodcock-Johnson Psycho-Educational Battery. He performed above average on one, poorly on the other two. More testing ensued. The Hudson Education Skills Inventory–Reading showed Toby's poor performance in phonic analysis, structural analysis, and comprehension; the Classroom Reading Inventory showed that his reading comprehension was at the second- or third-grade level while his listening comprehension was at the seventh-grade level. At this point the teacher contacted the school's learning disability teacher and asked to have Toby removed from her classroom. She was through with him.

"So, what would you talk to Toby's mother about if this case was yours?" Liza Brecher asks one of the undergraduate volunteers taking part in her Homewood Educational Advocacy Resource (HEAR) program. Brecher, herself a Johns Hopkins undergraduate, organized HEAR to

train students to serve as pro bono advocates to Baltimore parents during Individualized Education Plan (IEP) meetings, the annual sit-down between the parent of a child in the special education system and representatives from the public school system.

Tonight is the second of five planned training sessions. The students have broken into two small groups to discuss the case, sitting in desks in a Maryland Hall classroom on the Homewood campus. A laptop is plugged into the overhead digital projector to show a training website. Empty carryout salad boxes sit on the table at the head of the class.

One of the young women brings up the teacher's efforts that did have a positive impact on Toby, such as the observation that practicing saying words before reading a story decreased his mistakes while reading. Brecher and the others bat around ideas to build on these observations: setting goals to decrease the number of Toby's errors per 500 words, providing him with fewer options—such as practicing 15 words instead of 20—and incorporating such practice into his lesson plans. They discuss ways to encourage a parent to talk about setting specific, measurable goals with the IEP team during the meeting. After about 20 minutes, they finish with Toby's sample case and move on to their next section of training.

In Maryland, a student's Individualized Education Plan is a 20-plus-page document, not including addenda, that identifies his or her emotional, psychological, or cognitive challenges; current performance levels; academic goals; and strategies for achieving those goals, among other issues. It's the road map the school system uses to address a child's special needs as mandated by the Individuals with Disabilities Education Act of 1990.

For parents of kids with special needs, the annual IEP meeting can be daunting, and sometimes adversarial. The parent sits across a large table from the team of school system experts: the IEP chair, an IEP case manager, a school psychologist, a speech/language pathologist, a social worker, a general educator, a special educator, a guidance counselor, and, if required, the school system's attorney. If she can afford it, she can bring along a representative, such as an attorney or professional advocate. If the meeting proceeds without interruption or discussion, the parent endures a nearly hourlong monologue about test results and standard scores that might not mean anything to a noneducator. The IEP team goes through last year's plan and makes recommendations for the coming year. Sometimes, an IEP meeting can feel like a lecture informing a parent of all the things her child can't do.

"It's a really intimidating process," says Maureen van Stone, director of Project HEAL at the Kennedy Krieger Institute. Project HEAL is a medical-legal partnership between the Johns Hopkins Children's Center and the Maryland Volunteer Lawyers Service. "Most of my families are single-parent households, moms who are low-income, who may be raising multiple kids, and so they're going to be doing it alone. This is not their area of expertise by any means. And they're surrounded by a team of professionals who have all of the data available to them. They have all of the child's reports. They have educational expertise. And they have numbers. [Parents] should feel like they're an equal partner at the table, but parents never, ever feel that way."

Liza Brecher started HEAR to let parents know they don't have to go through this alone. She is training HEAR advocates to be able to support a parent hoping that a child isn't segregated into special ed–only classes, to recognize when an IEP meeting is venturing into territory that requires legal representation, and how to refer parents to appropriate service providers. "A big part of being an advocate is listening to the family and understanding how they're feeling and why they're feeling that way," she says. "Because for so many families, they just don't have any support. They have nowhere they can go and say, 'I'm worried about my kid,' or 'I don't know what to do next,' or 'No one is listening to me.'"

Brecher, a class of 2013 history of science major at Johns Hopkins, had no idea what she was getting herself into when she enrolled in January's Leading Social Change intersession course. She had just returned from a semester in Arica, Chile, where she was researching what resources exist for families of kids with Down syndrome. Growing up with a trisomy older brother—Down syndrome is also known as tri-

somy 21 because it occurs when a child is born with an extra 21st chromosome—Brecher has known since high school that she wanted to work with children with special needs. "My ultimate goal is to create Down syndrome clinics like the one we have in Boston," she says.

That clinic is the Down Syndrome Program at Children's Hospital Boston, a comprehensive, multidisciplinary clinic where trisomy kids (and their families) see everyone from pediatricians and psychologists to dentists and nutritionists, from birth through young adulthood. It's where Louis Sciuto, Brecher's brother, went and where Brecher volunteered and worked growing up.

"The clinic is probably the first pediatrician [a] baby is going to see," she says. "It's a very important thing for families, to have that support from the get-go. So, hopefully, I want to start clinics like that all over. I mean, there's still plenty of cities in the United States that don't have them. And there's actually legislation right now, if it ever gets through Congress, that will allocate funding specifically for Down syndrome clinics."

That goal is what attracted Brecher to Leading Social Change, a class that asks students to come up with socially conscious business plans. But the class turned out to be aimed toward local projects instead: Students research needs specific to Baltimore and develop sustainable solutions to address them. They present their ideas at the Social Entrepreneurial Business Plan Competition, and winners receive grants for seed funding.

Baltimore already had a clinic—at Kennedy Krieger, where she did research—so Brecher reconsidered her idea. "What other challenges do families face? A big one has always been education," she says. "I mean, nine out of 10 families who come into the Down syndrome clinic in Boston are asking us how we can help them get enough therapy in school or the right services."

Brecher recalled a Spanish-speaking mother who came into the Boston clinic; her son had a number of behavioral issues. "The doctors were thinking he might have a dual diagnosis with autism," Brecher says. "So one of the things they were stressing was that he needed to get a functional behavioral analysis." Evaluation requests have to be made in writing, but the mother didn't write in English. Brecher drafted the letter for her. "That opened my eyes to the fact that so many of these families don't have anyone helping them," she says. "So many parents say, 'Oh, the school knows best,' because, obviously, these are the teachers, these are the trained specialists. You trust your teachers to do what's best for your child. And that doesn't always happen, especially in the special ed system, because it's expensive and hard and time-consuming, and schools are strapped."

Brecher looked into Baltimore's special education situation and discovered that of the 84,000-plus students enrolled for the 2011–12 year, about 16 percent were in the special education system—roughly 14,000 kids. She also found out that there were only 20 volunteer advocates in the entire state of Maryland, and only two advocacy agencies in Baltimore. (Private legal advocacy is an option, but an expensive one—averaging $75 an hour.)

Her project was one of three awarded a $5,000 grant at the end of January. Brecher immediately asked friend and classmate Rachel Muscat to help coordinate the project, and the two recruited an inaugural class of student advocates. They contacted local advocacy agencies and nonprofits for training advice. They called special-needs organizations to reach out to families. They tried to let schools know they existed. They wanted to train five to seven student advocates and then meet with families by the end of the spring semester, so that come fall, when the IEP meetings start, they would have a plan.

They quickly learned just how many challenges they faced. Kids in Baltimore's special education system primarily deal with behavioral and emotional issues—which are sometimes subtle enough to go undiagnosed and can be more complex to address—rather than developmental ones. The school system and advocacy groups have, on occasion, had a more adversarial than collaborative relationship. And in 2010, the Baltimore City Public School System settled a special education civil suit that directly informs the school system's attitude at the IEP meetings. The suit was filed in 1984—seven years before Brecher was born.

At their first meeting with the Maryland Special Needs Advocacy Project, its director Martha Goodman "gave me this binder that was like this big," Muscat says, her hands suggesting something

14,000
STUDENTS ARE IN THE BALTIMORE SPECIAL EDUCATION SYSTEM

unabridged-dictionary thick. "That was just the parent manual. That's the *minimum* that a person needs to know in order to engage with this issue."

"It's very, very stark," Brecher says of special education in Baltimore. "I mean, I knew that it was probably not going to be great and it's always a challenge. But I didn't realize quite how bad it is. So once I saw that, I was, like, I can't *not* do this."

In 1984, the Maryland Disability Law Center (MDLC) filed a class action suit in the District Court of Maryland on behalf of Baltimore City students with disabilities who were not receiving services to which they were entitled by their IEPs. The suit—*Vaughn G. et al. v. Mayor and City Council of Baltimore, et al.*—bounced through the Maryland courts for 26 years.

Leslie Seid Margolis joined the MDLC in September 1985 and worked on the *Vaughn G.* case through its 2010 settlement. It started as a matter of compliance and evolved into a reform effort. "When the case was filed, it was filed on behalf of kids for whom the timelines were violated for assessment and for implementation of IEPs," Margolis says. "At that point the city had a backlog of many, many kids who were not getting assessment on time and many kids whose IEPs were not being implemented in a timely fashion, and the city was remarkably unconcerned."

She recalls an early client, an elementary school–age girl with cerebral palsy who had not received a physical therapy evaluation even though the schools had the appropriate request for it. The evaluation was requested and it didn't happen. The next year the same evaluation request was made. Again, nothing. "Five years this kid waited for a physical therapy evaluation that didn't happen," Margolis says. "We go to the due process—I mean, why should I have to request a due process hearing for this? Go to the hearing. I say to the attorney, 'Your own documents reflect she didn't have it. Can we just agree that she didn't have it and resolve this?' No. He would not concede that. So we had to go through a local-level hearing, [then] we go through state-level hearing. And, of course, they find she *didn't* have the assessment she was entitled to."

The problem in the school system was systemic; issues started to be addressed with more seriousness when Andrés Alonso was appointed superintendent in 2007. "Overall, are things better than they were in 1984?" Margolis says. "I think, yeah—because in 1984, in 1990, in 1995, being able to talk about the quality of education was a luxury. That's now in the past. It looks like they get IEPs implemented pretty quickly. So the harder issues are the quality issues."

Those years of failed IEP compliance and institutional apathy, however, can still linger. "In this city, we started off extremely adversarial," says Project HEAL founding director Hope Tipton. She recalls going to an IEP meeting where, when she requested a progress report, she was forwarded a previous progress report where the date had been changed to make it look like a new one was performed. "And I was—pardon my language—pissed off, because that's deceitful and lazy. If you had just sent me the previous progress report I would just have thought you were lazy. But when you specifically white out the date to make it look current, that's deceitful.

"Where we have come with this kid in the last 18 months is miles and miles away with this team," she continues. "But where they started was absolutely horrible. And the school's attorney has told me, 'We see such a minute number of kids in the special ed system, doesn't it make you wonder about all the kids we're missing?' Those are the kids I worry about—the kids who have no intervention, have no advocacy, who are just slipping through the cracks that way."

It's some of those families Brecher and HEAR are trying to reach. They would like to pair each of the advocates with a family by the end of the 2011–12 academic year. They also plan to target the incoming class to recruit new student-advocates, and to grow the program each year.

The goal isn't just to help a handful of families but to become part of a growing network of special education support and advocacy. For instance, the MDLC co-created the CityWide Special Education Advocacy Project to build a grassroots base and to educate and empower parents, who are always going to be their children's best advocates. Tipton says she worked with a mother and her older son, and when the younger son entered the special ed system, the mother was able to navigate a great deal of it on her own. Now

"A big part of being an advocate is listening to the family and understanding how they're feeling. Because for so many families, they just don't have any support."

Liza Brecher

Tipton gives out this mother's number when parents contact her with similar problems.

Learning by doing is common in advocacy, and it's also a reminder of what's at stake in fighting for better integration of special ed into general ed. Education isn't merely pragmatic, where we teach our children the intellectual and social skills they need to become ostensibly functional members of society. It's also aspirational. It's where we imagine how society could be: desegregated, inclusionary, tolerant.

Those are ideals that drive Brecher because she's witnessed them in action. She knows her brother Louis was fortunate to have grown up with supportive parents and family. He participated in Special Olympics, but he also played typical sports with his peers. Louis and Liza had their bar and bat mitzvahs alongside each other. They grew up in a town—North Andover, Massachusetts—that incorporated special education into its school system early on. Today, Louis has a job.

Brecher also knows that not all people with Down syndrome are so lucky. In 2009, she spent a semester in high school at a pair of Camphill communities—planned living situations for people with special needs—in Ireland. "I was so used to how my brother and I were raised, it was very much in the community," she says. "When I got to Ireland and the villages, they were so isolated." She was struck by how few typical children were mixed with the trisomy kids at the children's community. "If there were any, they were the children of the director or the head farmer," she says. "But [the trisomy children] didn't have classes together with the typical children."

She witnessed a range of situations in Ireland. At Trinity College Dublin she encountered a program for adults who have special needs, where students get a peer buddy and the professors change their teaching styles to be more accessible. "I saw schools in Ireland where they had totally normal integrated classes, and I saw an institution where it was like going back to the 1950s," she says. "There were kids in wheelchairs sitting and watching a television screen for hours on end every day."

The previous summer Brecher attended a language program in southern China and worked on a research project about how people with disabilities were treated in China. She met a young man there with Down syndrome, and the only word he could say was *grandma*. His parents had sent him to an expensive private school, where the only things he learned to read and write were *one*, *two*, and *three*—very basic Chinese characters. Brecher says the young man's father took pride in his son, talking about how he helped at the store they own, how he brought him his lunch every day. "His mother wouldn't even talk to me," Brecher says. "She was so ashamed of him."

In the village of Lijiang she met a woman who had a 5-year-old son with Down syndrome who paid the fee to have a second child. "She said, 'I had my daughter so there would be someone to take care of my son when my husband and I die,'" Brecher says. "And that kills me."

With HEAR, though, Brecher is entering new territory. "I've grown up in a very specific disability community. We're learning that Baltimore tends to have more strict behavioral disabilities and emotional disabilities, and that's not something I'm really familiar with," she says. "And those tend to have very different effects on families."

A few weeks into training Brecher and Muscat were still a bit apprehensive. They had recruited four other student advocates, and they had reached out to a number of local advocacy groups who were helping them try to connect with families, but it was slow going. The schools had been completely nonresponsive; none of the special educators had returned any calls or emails. And the semester's end was inching closer.

There is a tinge of discouragement in her voice, but Brecher knew the project was going to be difficult. She realizes that raising a child with special needs is never a cakewalk, but she also knows that the first step in being a successful advocate is being there and ready when that first parent reaches out for help. "They need to see that we're actually following through," Brecher says. "A lot of time what happens is people have good ideas for this community and they think it's going to be really great but then it doesn't really get off the ground. So I think we kind of need to prove ourselves first. We need to show that we're actually going to do this and we're actually going to help."

20 VOLUNTEER ADVOCATES SERVE THE ENTIRE STATE OF MARYLAND

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Aping Nature

We can't talk with the animals. But by observing their most awe-inspiring traits, we can learn enough from them to create new medicines and robots.

Michael Anft

The hills of science are littered with wreckage, the remnants of failed attempts to touch the heavens of knowledge. The case of Otto Lilienthal explains this all too clearly. A late 19th-century German inventor, Lilienthal wowed his compatriots with newfangled flying machines. He buckled himself into a developing series of contraptions, jumped off hills outside Berlin, and soared around them. As he and his brother, Gustav, honed their glider technology, Lilienthal climbed to nearly 1,200 feet. In the process, he converted himself from oddball to visionary, drawing ever-larger crowds to his experiments. He made human flight seem possible.

In his attempt to perfect his gliders, Lilienthal took clues from nature, especially the flight dynamics and wing conformations of the white stork. In 1889, he published *Birdflight as the Basis of Aviation*, in which he speculated that aircraft that imitated the flapping wings of birds could generate enough power to stay aloft. He incorporated into his gliders some of his theories on shifting one's weight to maintain flight, but he wouldn't have time to work out all of his ideas. In August 1896, after one last successful voyage, Lilienthal's glider lost contact with the drafts that had suspended him in midair some 2,000 times before. Lilienthal plunged 56 feet back to earth, breaking his neck. He died a day later, using his last breath to tell Gustav that in science, "sacrifices must be made."

PHOTOGRAPH BY JOEL SARTORE/NATIONAL GEOGRAPHIC STOCK

If it could, Lilienthal's legacy would comfort him—Berlin's airport is named after him, and his work inspired the Wright brothers in their much less tragic quest for sustained human flight. And, despite Lilienthal's sacrifice, scientists today happily follow in his footsteps. They consider him the father of biomimetics, the study of the unique characteristics of animals, undertaken to create something of value from what we learn.

Part biology and part engineering, biomimetics and its nature-inspired spinoffs (such as the engineering-centered field of biomorphics) mimic individual species' evolutionary talents, then use the underlying principles to devise new medical treatments, craft more lifelike human replacement parts, and build cleverer robots. The fields regularly yield improvements in technology. For example, scientists who observed the gecko's ability to cling to walls have developed a sticky substance similar to what the gecko uses to defy gravity. Others have investigated the self-cleaning surface of sharks to develop boat hulls that resist contamination or staining by oil and other nuisances.

PHOTOGRAPH BY ISTOCKPHOTO.COM

Some animals have such strange superpowers that they invite investigation just to see how they do what they do. Take the hawk moth. It contains an unfolding proboscis that is one and a half times its body length. It uses significant pumping power to pull nectar from plants into its belly. Could we make a moth-inspired mechanical pump that is as powerful? Other examples abound. Might the planarian worm's endless ability to regenerate yield clues as to how to slow cells' aging? Is it possible that the bacteria-killing peptides secreted by the skin of certain Australian frogs could provide humans with hints about protection from antibiotic-resistant infections?

"What's exciting about this kind of research is that bio-inspiration is all around us," says Rajat Mittal, a professor of mechanical engineering at the Whiting School of Engineering. "You never know where you'll find a novel solution." Mittal became nature motivated 15 years ago while watching a NASA presentation at the University of Florida, where he served as an assistant professor. A NASA scientist, echoing Lilienthal, was talking about creating an aircraft that could change the shape of its wings in midflight, as some birds and insects can. "I had never in my life thought we could learn anything from birds about aircraft design," Mittal says. From that moment on, he began to search in earnest for nature-centric solutions to mechanical problems, making it one of the focal points of his career.

Mittal is hardly alone. Since the turn of the century, bio-inspired research has grown by leaps and bounds, he says, including at Johns Hopkins University. Scientists at the Applied Physics Laboratory have studied hypersensitive dog noses to learn how they might develop a mechanical smell detector that could be used in airports or in contaminated regions too dangerous to risk search-and-rescue dogs. Engineers at the Whiting School who study neuromorphics—the science of creating networks of animal-like "nerves" in computerized robots and prostheses—researched lamprey eels to figure out how to electrically mimic the eel's ability to regenerate a severed spinal cord.

There are several ongoing experiments at Johns Hopkins that seek to unlock the secrets of animals. Here's a handful of the critters researchers are finding useful.

SQUIRRELS

Admit a very ill human being to a hospital, put him in the intensive care unit, tend to him while he is comatose, and watch him (hopefully) recover. He still won't be completely healthy. Much of his muscle mass will have disappeared, so he'll weigh a good bit less and have difficulty moving. Such wasting is a challenge for patients who may have already been too weak to move around, especially the elderly. Four in 10 people over the age of 80 suffer from sarcopenia, an irreversible withering of the muscles. For younger people who have degenerative muscle diseases, such as muscular dystrophy, the search for a medical answer to wasting is a matter of life and death.

As part of that search, scientists have looked to certain mammals that sleep for seasons at a time but somehow manage to maintain their dexterity, strength, and muscle mass. One researcher, Ronald Cohn, an associate professor of genetics, neurology, and pediatrics in the School of Medicine, has spent much of the past five years examining squirrels for clues.

"When I was a boy of 10 or 11 years old, I was fascinated by bears and wondered how they could do what they do after hibernation," says Cohn. "But working with bears would be too unwieldy, so I landed on squirrels." Bears also shiver as they hibernate, perhaps enough to keep their muscles toned while they sleep. On the other hand, hibernating ground squirrels, which are native to the American Midwest and the Arctic, don't. They also don't eat, drink, or move for four to six of the coldest months of the year. Yet when they wake up, they run around without so much as a simple quad stretch. How?

To find out, Cohn keeps squirrels in automated hibernation for months at a time in his lab, during which, and afterward, lab workers perform chemical analysis and genetic testing on them. "We're looking to see if there is a master regulator, perhaps some kind of hormone or molecule, that has a domino effect on the molecular pathways in their muscles," Cohn explains. Finding such a chemical or chemicals would give researchers some idea of what's keeping their muscles toned, and what kind of drugs could be developed that could keep humans from wasting.

The problem is they haven't found a regulator yet. Cohn has learned, however, that the squirrel's entire body, including its organs and brain, goes through sweeping changes that likely begin even before it tucks itself in for its winter sleep. He just doesn't know how exactly it happens. "We haven't found patterns yet, or any answers as to why or how they go through these multiple changes," Cohn says.

But that doesn't mean the experiments have failed. As is the case with most basic science research, small discoveries add up. So far, Cohn has uncovered what he calls "a molecular signature of muscle endurance"—a number of proteins that signal how muscle mass is maintained. The way squirrels use those proteins is unique. "In essence, they're running a sprint and a marathon at the same time," Cohn says. "This is how they retain their muscle mass—even as they're hibernating."

Such clues may serve as the building blocks to cures for degenerative muscle diseases, Cohn adds. "The squirrel has figured out what science hasn't—yet. We've tried to study wasting for decades. Now, we've developed a good model to help us catch up with what squirrels innately understand."

ALLIGATOR GARS

For every fluffy, adorable creature like the squirrel that possesses an odd talent, there are several animals of seemingly less, er, aesthetic and anthropomorphic value that nonetheless prove useful to biomimetics and biomorphics. Consider the elusive alligator gar, a fish that swims near the surface of the lower Mississippi River and other freshwater rivers in the South and in Mexico. Capable of growing up to 10 feet long, the solitary gar is known for its jagged, alligator-like teeth and ungainly snout.

It may not make for a nice stuffed animal that ends up in a crib, but the alligator gar has several things going for it. It can live as long as 70 years and its scales are extremely hard (something that may factor into its longevity). That tough exterior has piqued the interest of the U.S. military, which regularly enlists the help of Johns Hopkins engineers. For the past several years, Whiting School researchers have sought insight from other waterborne creatures, including the abalone and its durable shell, in a search for clues as to how to build better armor for military cars, tanks, and infantry soldiers.

Some animals have such strange superpowers that they invite investigation just to see how they do what they do.

"What we're looking for are substances that are strong enough that they rarely break, are tough so that they maintain some integrity when they do break, and are of low weight," says K.T. Ramesh, a professor of mechanical engineering at the Whiting School. "The advantage in looking to nature for useful substances is that nature has developed a very wide range of possible microstructures over time, and selected the very successful few of them. Some have evolved interlocking hierarchical microstructures that make these surfaces tough." Evolution provides a valuable lesson for nature's mimics, he adds. "Nature does the opposite of what engineers usually do. We look for ways to build things simple and fast."

As an abalone shell develops, it grows different structures at the millimeter level than it does at the microscale and nanoscale. One level may be made up of a hardened material that makes the shell or scale strong, while a softer layer (usually a polymer) interlocks with it to make it tougher. Those tiers link together with other layers of tough stuff.

The alligator gar scale is similar. Recently, Ramesh and his lab mates began to look at the fish's interlocking ganoid scales, which are made up of enamel over a base, covered by a layer of ganoin, a shimmery hard material that makes up the scale's surface. The scales, shaped like diamonds, are prized for their durability—so much so that Native Americans used them to make arrowheads and jewelry. Gar scales and some seashell varieties, because they are complexly grown over time, are ripe for applications made by engineers. "When biomaterials are hit by something, the microstructure forces the cracks to take these long, convoluted pathways. Because damage to these pathways doesn't compromise the system involved, they retain some toughness," says Ramesh.

Over the coming years, Johns Hopkins engineers hope to investigate how individual scales hold up during testing. ("We're interested in the scale itself, not the gar scales' interlocking features," Ramesh explains.) They'll subject scales to repeated hits from "microscale projectiles," bits of material shot at high velocity. To document how the scales react to the barrage, the results will be recorded by a high-speed camera system. Researchers will measure the material's strength, create a theory to explain and quantify it, and then see if they can develop a similar material via research engineering—the art of modeling something natural into something that isn't. The resulting product could then be used to protect troops and equipment during battle.

Besides offering the benefit of having a model to study, bio-inspired research contains another advantage: It makes it easier to explain the work at hand to others, Ramesh says. "People—funders, students—can connect to a biological analogue. Once the intuitive connection is made, it's much easier to engage people's intellects."

Ramesh's lab's approach indeed has its appeal. In April, it won a $90 million grant from the U.S. Army to lead a consortium of private industries and universities that will investigate the basic science behind materials, like a soldier's armor, that are subjected to tremendous impacts.

Fortune's work has implications not just for birds but other species, including humans who dance in pairs, reading cues and coordinating movements in time as they tango.

SONGBIRDS

How do members of species cooperate? Are they programmed to dance or sing in tandem? Or do they learn how to work together?

To find answers, Eric Fortune, an associate professor of psychological and brain sciences in the Krieger School of Arts and Sciences, treks regularly to Ecuador, where he studies how male and female members of the species *Pheugopedius euophrys*—the plain-tailed wren—coordinate the territorial duets they sing on the side of an Andean volcano. In a study published in *Science* last December, Fortune reported that by analyzing the wrens' shared song and measuring their brain activity, he and his team discovered that the birds hear acoustic cues as they trade notes. They actually change sequences as they cooperate. "The wrens segregate those cues in a very discrete way in time," Fortune says. "Pairs of birds can sing the duets even when they can't see each other."

Even though they sing alone as well, their brains act differently—cooperatively—when they croon in pairs, evidence that they learn exactly how to do it. "We had expected the brains of each wren to respond most strongly to its own part, but surprisingly we found that neurons respond most strongly when the pair is singing the duet," says Fortune. "Each bird has a memory of the complete duet, which a single bird cannot produce alone."

Fortune's work has implications not just for birds but other species, including humans who dance in pairs, reading cues and coordinating movements in time as they tango. "When animals interact, it's incredibly complex," he says.

The study's first application may not be in the animal kingdom, however. Understanding how brains work together is important for developing machines that can mimic behavior in "animal time," as opposed to the regularity of the rhythms robots are usually programmed with. Fortune's findings allow scientists who work with robots to imbue them with the relatively imprecise time that people use when dealing with one another. Fortune and colleagues are using wren data to develop prostheses that respond more like human arms would, such as by recognizing when and how to shake hands, and how to work in tandem. "If you shake hands with a child, they don't always get what it's about—you have to instruct them what to do. It's the same with robotics. A prosthetic arm would need to have a memory of shaking a hand in order to cooperate and shake your hand in real human time," Fortune explains, adding that a "noisier, messier" timing mechanism could now be developed, based in part on his research.

As a biologist, Fortune finds the ever-present similarities between species fascinating. But because each has its own behaviors and physicality, science has a chance to learn something new and potentially valuable from every species. "Animals and humans are exactly the same and completely different at the same time," he says. "We may share 99 percent of our genetic material with chimps, which means that we're almost identical, but the devil is in the details—that 1 percent represents a large number of differences, an amazingly complex set of issues. We evolved from the same point, but the differences are telling."

COCKROACHES

It might seem absurd that the vaunted National Science Foundation would grant millions of dollars to researchers investigating the utility of *Periplaneta americana*, the humble American cockroach. But it has, and for several years now, and there's a very good reason why: The cockroach's ability to instantaneously make 25 turns per second while following along a darkened wall is the result of a highly developed and calibrated system—one that could prove useful in making robots that travel blindly into dangerous areas during military operations and search-and-rescue missions.

Robot eyes don't navigate well without light, something that cockroaches, outfitted with a specialized antenna that measures how far they are from surfaces, excel at. The antenna does this using a sense of touch that complements its extraordinary design. The insect can run 20 body lengths per second in complete darkness without mishap, thanks to the 200 hairy, sensitized segments packed into the antenna's 5 centimeters. "The hairs on the antenna provide a steady flow of information on how far a cockroach is from the wall," says Noah Cowan, an associate professor of mechanical engineering at the Whiting School. With the help of about $100,000 in grant money, he has been researching the insect along with colleagues at Johns Hopkins and the University of California, Berkeley, for the past decade. "They allow the cockroach to gather and process very detailed information incredibly rapidly. They also serve the mechanical purpose of orienting the antenna to points where it is most useful," he adds.

As with many bio-inspired studies, Cowan's goal isn't to imitate nature completely. The cockroach's unique ability to situate its antenna in a certain way may be of interest to science but may or may not be relevant to engineering. "When

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PHOTOGRAPH BY ISTOCKPHOTO.COM

you're translating biology into engineering, the first trick is to understand," he says. "Once you understand the principles behind a natural system, you can copy the elements that are most relevant—not necessarily the entire system itself." What's more, it is not always obvious to engineers how to copy a design because, Cowan says, "we tend to think in a more modular way. But animals have evolved complex, integrated systems over time. Teasing out the function of a system can be challenging because it has had to work on many levels at once, such as feeding, navigation, and reproduction. We must understand how nature's design applies to the engineering task at hand, and strip away features that serve no engineering purpose."

To get at the cockroach's special sensory powers—what engineering finds useful about the insect—Cowan and his crew used a laser to burn off the antenna's hairs to see what would happen without them. As an example of just how sensitive the cockroaches are, Cowan says they can sense, via pressure waves, when a human walks into a room. "That's why you rarely know when you have cockroaches in your house," he says. "They've already been traveling one and a half meters per second before you've even turned on the light."

After gathering information on the insect's sensitivity, the team did what bio-inspired engineers regularly do—they developed mathematical models of the antenna and the insect's behavior. That data has been used to build an antenna-like sensor that feeds navigational data to the robot's controller. Cowan hopes the design will be useful in robots that will make their way through tight spaces, such as in buildings that have collapsed during earthquakes, to find people who are trapped.

Research on animals keeps him focused on his robotics problems, Cowan says. "I don't think I even know how to do basic engineering science. It's easier for me to sink my teeth into trying to understand how an animal works. That helps me generate hypotheses. Then, I get to work in the lab. We often end up discovering things we never expected."

SUNFISH

The U.S. military also has an interest in using robots underwater to identify mines, perform search and rescue, and navigate safe routes through hostile bays, oceans, and rivers. Traditionally, it has relied on trained dolphins to sniff out danger. But the highly intelligent mammals cost a lot to train, can become overstressed, and are mortal. Submersible robots called autonomous underwater vehicles (AUVs) promise to be cheaper and more reliable. But they have their issues as well, including not being able to move as smoothly and nimbly through water as a fish (or a dolphin) does. The typical engineering solution for watercraft—a propeller—is great for moving a vehicle forward fast and straight. But it's horrible for anything else, especially evasive maneuvers.

The answer? To study fish and how they glide and dart through water, and then create something mechanical that is very similar to it. "When I look at a fish, I see a creature that has evolved over a very long time and developed a variety of sophisticated engineering systems," says Mittal, whose job it is to convert military grants into AUVs. He gets help from biologists who understand fish. "There's an elegance to it—maybe too much elegance for our purposes."

Mittal, his team, and outside collaborators have been entrusted to build a robotic pectoral fin for a small AUV. Studying the graceful movements of the pliable fins of the bluegill sunfish proved valuable to his research—and counterintuitive, he says. Building something sturdy, even impregna-

ble, may seem like a worthy goal for an engineer, but that doesn't apply in this instance. "What we learn from fish, and even from butterflies, is that flexible structures are, in fact, good," says Mittal. "As engineers, we've been trained to make things as strong and invulnerable as we can. In nature, maybe because there's no steel around, or maybe because it's smarter than we are, we see all these flexible systems that impart great advantages over rigid structures. All of this is opposite to how engineers have been taught to think."

As with Cowan's work, engineers have found an easier way to achieve the same effects as nature. The fin of a bluegill sunfish has 14 finger-like rays that help it move smoothly and quickly through the drink. But Mittal found, with the usual aid of advanced math and computer modeling, that he needed fewer fins to make the submersible robot travel in ways similar to it. "Our computer models showed us that only five of the rays are needed to produce thrust and efficiency similar to the fish fin," he says. "The other rays aren't there to increase thrust but for other purposes, such as defense."

Mittal, who has also conducted research on the systems of various insects, tends to see bio-inspired solutions wherever he looks. Recently, while watching a BBC television program, he noticed that bubbles come off the bodies of penguins as they shoot out of the water. "Those bubbles could have some huge implications for drag reduction," he says excitedly, adding that he and another professor hope to study the birds. "Is the down of penguins covered with air, which would help them move faster through the water? It's an amazing opportunity to learn whether that's true and what it might mean."

BUTTERFLIES

Whiting School researchers don't limit their designing skills to robots that roam the land and sea. Aided in part by more military grants, they also investigate ways to fill the air with flying machines that can perform reconnaissance, rescue, and other military operations, particularly in dense, urban neighborhoods. In order to fly under the radar of various surveillance systems, the flying machines need to be small, very mobile, and easily directed by human controllers. The bug-sized robots also need to perform aerial maneuvers worthy of some of nature's most accomplished fliers. It makes sense, then, for engineers to learn as much as they can from butterflies, which are easier to manage during experiments than birds, and to see if the results can be applied to the development of so-called micro aerial vehicles (MAVs).

For the past two years, Tiras Lin, a 21-year-old junior mechanical engineering major from San Rafael, California, has investigated the motion of butterfly wings. The study was suggested to Lin by Mittal, his adviser on the project. Lin concentrated on the painted lady butterfly, a globally ubiquitous species that flaps its wings 25 times per second. Central to his study was Mittal's suggestion that engineers have too often underestimated the role a concept called "moment of inertia" plays during flight, especially when the insect is maneuvering.

To describe the phenomenon, Lin draws a comparison to an ice skater performing a spin. "Just as the skater redistributes his mass by drawing his arms inward or outward to rotate faster or slower, butterflies modify their moment of inertia by reconfiguring their wings in flight," he says. Using pictures taken by three high-speed cameras of painted ladies inside an aquarium tank (at a rate up to 3,000 images per second), Lin discovered that flapping wings have a significant effect on the insect's moment of inertia—even though the wings themselves make up only about 10 percent of the insect's total mass. In other words, a low-weight part of the butterfly's body can have a disproportionately large effect on how it keeps itself aloft and hyper-maneuverable.

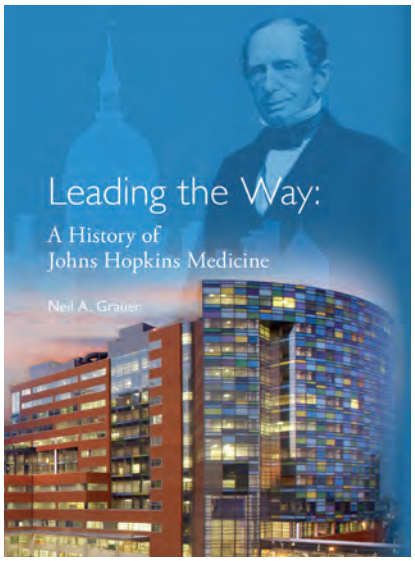
Understanding the role of the moment of inertia more clearly has major implications for designers of flying robots, Mittal says. "It's always been an idea that was swept under the rug. Butterflies turn 90 degrees with two wing flaps, which is incredible. Imagine an aircraft that could do that." As always, he's enthusiastic about other avenues for study. "Flies get swatted, yet can gather themselves and fly away, and we see wind gusts that blow flying insects around all the time, yet their flight is so robust in the face of all these perturbations. How do they do it?"

Michael Anft is a senior writer at *Johns Hopkins Magazine*.

"When I look at a fish, I see a creature that has evolved over a very long time and developed a variety of sophisticated engineering systems. There's an elegance to it—maybe too much elegance for our purposes."

Rajat Mittal

Leading the Way: A History of Johns Hopkins Medicine
Neil Grauer



HISTORY

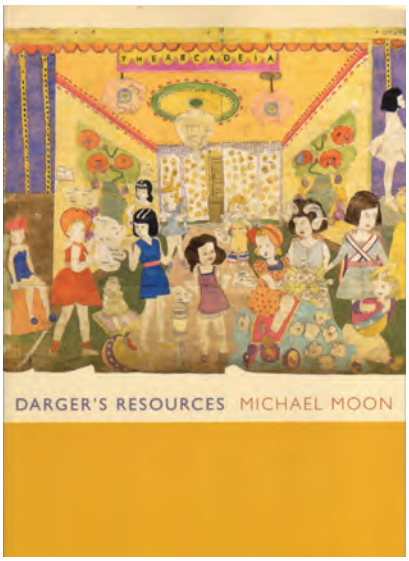
Hospital Props

Before Elliott Coleman founded the Writing Seminars in 1947, a Johns Hopkins–set novel had already cracked the best-seller list. Augusta Tucker Townsend's *Miss Susie Slagle's* spent half of 1939 as a best-seller and was eventually turned into a movie starring Veronica Lake. Lillian Gish played the titular Susie Slagle, who runs a boarding house where men stay while attending medical school at Johns Hopkins. The book's runaway success persuaded students to apply to the university, prompting longtime *Baltimore Sun* book columnist James Bready to deem it "the best possible propaganda for this institution."

That quote comes from *Leading the Way: A History of Johns Hopkins Medicine* (Johns Hopkins University Press, 2012), introducing the chapter covering the East Baltimore campus from 1940 to 1988. It's more than a mere transitional anecdote, though, because author Neil A. Grauer, A&S '69, understands that the story of Johns Hopkins Medicine is a combination of its own timeline and its social reputation. The book's publication coincides with the opening of the $1.1 billion Sheikh Zayed Tower and the Charlotte R. Bloomberg Children's Center, the latest upgrades to Johns Hopkins Hospital's East Baltimore footprint, and on the heels of the hospital's 21st consecutive year atop the *U.S. News & World Report*'s best hospitals list. Johns Hopkins Medicine is well aware of its prominence, and Grauer is savvy enough to recognize that this expectation of excellence is forged by the personalities who have learned, worked, succeeded, and tried, failed, and tried again at the hospital over the past 123 years.

Grauer, assistant director of editorial services in the Johns Hopkins Medicine Office of Marketing and Communications, has a sharp eye for the illuminating story, and it's the little details that make *Leading the Way* a refreshingly engaging read. Whether it's Victor McKusick, Med '46, leaving cardiology in the 1950s to foolishly—according to colleagues—pursue an unimportant subject called genetics, or how the hospital learns from and responds to the tragic 2001 deaths of pediatric patient Josie King and asthma study volunteer Ellen Roche, Grauer allows individual stories to add up to a bigger picture of just what sets Johns Hopkins Medicine apart from its peers. **Bret McCabe**

Darger's Resources
Michael Moon

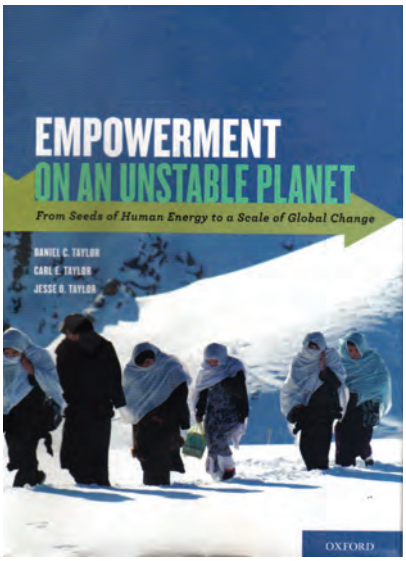


HUMANITIES

Fetishist or Fantasist?

When a Chicago janitor named Henry Darger died in 1973, he left behind a mammoth, extravagantly illustrated text about enslaved children, particularly girls, rebelling against their adult overlords. Darger has long been regarded as a touchstone American outsider artist; in *Darger's Resources* (Duke University Press, 2012), Michael Moon, A&S '89 (PhD), convincingly places the writer's vivid, imaginary worlds alongside those of other such fantasists as L. Frank Baum and H.P. Lovecraft. In the process, Moon upends conventional suspicions about lifelong loner Darger that critics, when considering the scenes of violence and at times oddly sexualized girls he depicts, have read into his art. **BM**

Empowerment on an Unstable Planet
Daniel C. Taylor, Carl E. Taylor, and Jesse O. Taylor



ECOLOGY

Learning to Adapt

The late global health pioneer Carl E. Taylor was the founding chair of the Department of International Health at the Bloomberg School of Public Health, working on improving health care for people in more than 70 countries. His son, Daniel C. Taylor, A&S '67, was knighted for his conservation work in Nepal. *His* son, Jesse O. Taylor, has examined the language and literary traditions of ecological activism. And all their various expertise informs *Empowerment on an Unstable Planet: From Seeds of Human Energy to a Scale of Global Change* (Oxford University Press, 2012), a disarmingly potent alternative paradigm for community-based cultural development, one rooted in human social adaptability more than economic investment, and inspired by generations of fieldwork in India, Nepal, and Afghanistan. **BM**

...Sheri Lewis

Hollis Interviews

Sheri Lewis
Global Disease Surveillance program manager

ILLUSTRATION BY ANJE JAGER

PHOTOGRAPH BY ED WHITMAN, APL

Hollis Robbins, A&S '83, is chair of the Humanities Department at the Peabody Institute; she teaches courses in literature, drama, film, and aesthetics. She has a joint appointment in the Center for Africana Studies at Homewood, where she teaches African-American poetry and civil rights.

Travel schedule: In the last 24 months, she has traveled to Cambodia, Peru, Nicaragua, the Philippines, Singapore, Thailand, and Ecuador.

Favorite TV show: *House Hunters International*

Your project at the Applied Physics Laboratory is called SAGES. What exactly is that?

The Suite for Automated Global Electronic bioSurveillance is an assortment of software tools that facilitate rapid collection and analysis of health data. We use tools we develop and, when available, existing platforms to monitor the outbreak, spread, and containment of emerging infectious diseases. Electronic disease surveillance (EDS) is relatively new, even in the U.S. As recently as 12 years ago data was not collected electronically, but with pen and paper. The goal with EDS is to identify disease outbreaks as early as possible, around the world.

What is new about the project?

The benefit of our project is that we can help identify a local outbreak immediately. Many epidemics are expected. Dengue fever is very commonplace—countries know they're going to have an outbreak every year. We can train individuals to use their cell phones to collect data if someone is seeing cases in an isolated village, for example. Governments can set up a voice-response phone tree to enter data about the age, gender, and number of cases. We use text-messaging systems, too, in countries where that is easier or less costly.

Why is this sort of public health work being done at APL?

APL has had a program known as ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics) since the late 1990s. SAGES leverages the success of the existing system and adds components for analysis and visualization, communication, and modeling/simulation/evaluation. We're working with the Global Emerging Infections Surveillance and Response System, which is part of the Armed Forces Health Surveillance Center.

So all of your travel has to do with this global disease surveillance work?

Yes. But we are not conducting surveillance of other countries—we are helping them learn to do that on their own. Much of the work we do is teaching countries who ask for help from the United States how to collect their own data. The term surveillance is not as frightening a word in countries that don't have the same sense of personal privacy as here. But at the same time, in countries with high HIV and AIDS numbers, privacy remains a priority. We focus on collection of data and analytics to predict—and contain—the spread of emerging disease.

I'm assuming they interpret data as well as collect it . . .

Local governments interpret the data once they collect it. Interpretation has to be done carefully, though; for example, Twitter has to be monitored very carefully and specifically to ensure you get good data. In our own research on social media, for example, a

researcher who was reviewing tweets for the word *fever* was inundated with the Twitter data for *Bieber fever*.

Ha! So what are you most frightened of?

My biggest worry is influenza. It's very easy to transmit. Every year there's genetic drift and the virus can change. H1N1 was scary—we were not nearly as prepared as we could have been. Diseases like SARS are a concern, too—any novel respiratory pathogen that could be on one side of the globe today and on our doorstep tomorrow.

Ah, like that film *Contagion* that came out last year. Did you see it?

I did! I watched all the way to the credits and saw that they had some of the best people in the field as technical advisers. It was good from an epidemiological perspective—the film showed well how the Gwyneth Paltrow character became the index case for a deadly outbreak, and how the epi investigators work as disease detectives.

Are there countries that you won't work with or that won't work with you?

We only deal with countries that ask for our assistance. We aren't everywhere. We aren't in the Middle East, for example. And we're not in Europe. We're mostly in Central and South America, Southeast Asia, and parts of Africa. We don't go to places that are too dangerous, though we're working with the World Health Organization in the refugee camps in Somalia.

What's the No. 1 thing people can do to keep from getting sick?

Wash your hands with soap and water and stay home if you're sick.

Traveling so much, do you ever get sick?

Never! So far, I've never even gotten sick from eating local food. I love authentic cooking, which is strange because I was such a picky eater growing up. I love Peruvian dishes, Thai food, Cambodian and Vietnamese food . . .

What is your least favorite food?

Lamb chops.

Sheri Lewis is the Global Disease Surveillance program manager in the Applied Physics Laboratory's Homeland Protection Business Area, where she works with a team of analysts, epidemiologists, physicians, and computer scientists who are leaders in the field of electronic disease surveillance.

One Opera, One Pulitzer

We have it on good authority that when you win the Nobel Prize, you receive an early morning call from the Nobel committee. If you are awarded a MacArthur Fellowship, similar thing—you get a call from the MacArthur people. But composer Kevin Puts did not learn he had won a 2012 Pulitzer Prize until an Associated Press reporter called him in midafternoon, seeking comment on his new accolade. Puts recalls, "There was cheering in the background because the AP had won one, too."

The composer, who is also a Peabody Conservatory faculty member in the Composition Department, won for his first opera, *Silent Night*, which is set at the Western front of the First World War. The libretto, by Mark Campbell, is adapted from the screenplay of the 2005 film *Joyeux Noel*, directed by Christian Carion and based on an actual spontaneous 1914 Christmas Eve cease-fire that occurred in the trenches when Scottish, German, and French soldiers decided to stop shooting at each other in observance of the holiday. The work was commissioned by the Minnesota Opera in 2009 and premiered last November.

Prior to *Silent Night*, Puts had composed four symphonies and several concertos and chamber pieces, but he had little experience composing for voice. This made for some challenges. "I was sort of vague about where one voice type ends and another begins, as far as range," he says. "On a bassoon, for example, you know what the lowest note is, and you know the quality of the upper register, too. But with voice, every voice is different." Plus he had to write vocal parts in five languages: English, Italian, Latin, French, and German. The last two caused the most difficulty. He says, "I had to say the German over and over again in my head before I felt comfortable coming up with music to attach to the words. Rhythmically, German is pretty easy because it's like English, it has clear stresses and weak beats and strong beats. But French is very difficult because they almost don't stress syllables at all when they speak."

Composer and Peabody faculty member Kevin Puts won a Pulitzer Prize for his opera, *Silent Night*, which premiered last year at the Minnesota Opera. Here, Lt. Audebert (Liam Bonner) and Lt. Gordon (Gabriel Preisser) lay down their arms in a Christmas Eve cease-fire.

There was another tricky element. Central to the story were Scottish troops playing Christmas music on bagpipes. Puts had never written for them. The instrument plays in only one key, B-flat, so Puts had that imposed on him. He adds, "The other difficult thing is they are so incredibly loud that we finally couldn't have them on the stage. We had one of the actors miming the pipes and the actual bagpipe players were as far back offstage as we could put them."

Puts is still adjusting to his new good fortune. He says, "I wake up in the morning and it's just a jolt. It's a good thing, but it's also a scary, stressful thing." He has heeded advice given to him by another Pulitzer winner, composer Jennifer Higdon, who told him to get right back to work. "When I compose, that's a world that makes complete sense, and I have control," he says. "It's where I feel most comfortable, dealing with notes and sounds and telling a story."

Dale Keiger

Inspiring Portraits

By the time James West retired from Lucent Technologies in 2001 at the age of 70, his research had won a parcel of awards and a spot in the National Inventors Hall of Fame. Most notably, he co-invented the foil electret microphone, which now serves as the model for microphones found in mobile and standard telephones, hearing aids, and video cameras. In 2002, he joined the faculty of Johns Hopkins University as a research professor in the Whiting School of Engineering and was named the school's first chair of the Divisional Diversity Council.

West is one of the 37 accomplished individuals included in *The Indispensable Role of Blacks at Johns Hopkins* exhibition (with accompanying website and booklet) that is traveling around the university's Baltimore campuses. Co-sponsored by university President Ron Daniels, External Affairs and Development, and the Black Faculty and Staff Association (BFSA), *Indispensable* takes a deep, institution-wide look at black experiences at the university.

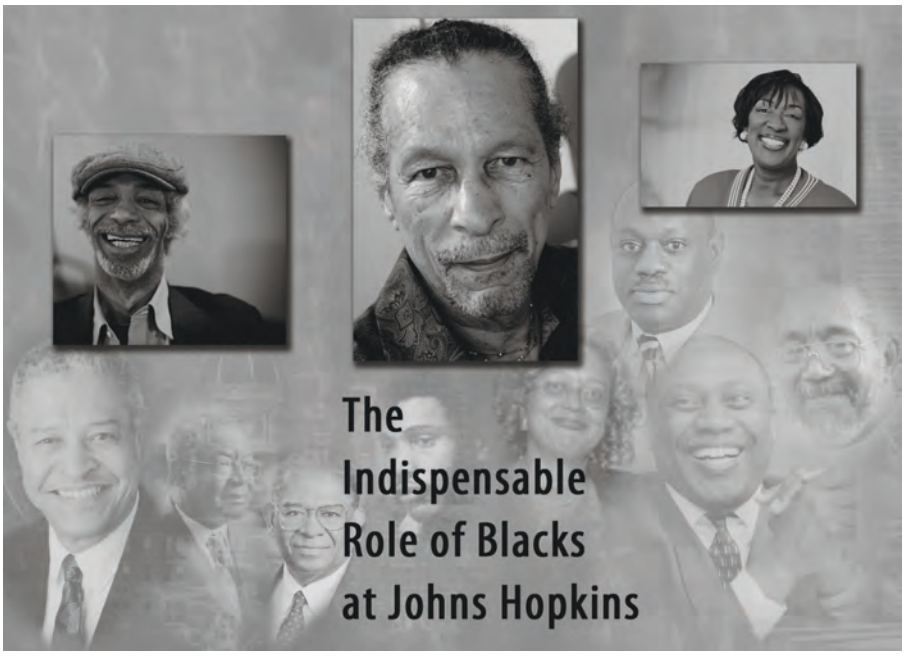
The exhibition was inspired in part by a lack of visual acknowledgment of that experience. While touring campus, prospective students and their parents see plenty of portraits of esteemed white alumni and faculty. "One of the parents was with her daughter, who was black, and asked, 'Where are the blacks? You don't have pictures of black people on the wall,'" says Deborah Savage, the Krieger School of Arts and Sciences' IT manager for student technology services. A BFSA member, she served on the *Indispensable* committee alongside Sharon Morris, a library services manager in the Sheridan Libraries, and Lisette Johnson-Hill, a senior research associate at the Bloomberg School of Public Health. "We never really thought about it like that. So we shared that with the president, and he said we could do something about it."

In 2003, Morris put together an undergraduate independent study project that produced an online exhibition titled *The History of African Americans @ Johns Hopkins University*. It included a timeline of black history at Johns Hopkins and profiles of significant figures, such as Kelly Miller, the first black student to enroll in 1887. *Indispensable* builds on that work, not only noting the 1969 establishment of the Black Student Union by Bruce Baker, A&S '71, SAIS '74; John Guess, A&S '71, SAIS Bol '76 (Dipl); and Douglas Miles, A&S '70, but also recognizing, among others, author Wes Moore, A&S '01, epidemiologist Lisa Cooper, and Emmanuel Chambers, a waiter at the Baltimore and Maryland clubs who invested his tips to create a foundation that benefited institutions including Johns Hopkins Hospital and the Peabody Institute.

Johns Hopkins is an institution that is proud of its history, but that history can be diffuse; people can work hard at the same place without knowing what's going on across the hall. "When I first came here there were not very many blacks—as a matter of fact, the only black people I saw were people who cleaned and served food," Savage says. "It was an eye-opener. I'd walk through this campus and never see anybody who looked like me, but they were here."

The ultimate goal is for black achievement to become a more permanent part of the university's visual history. "We are hoping to see pictures on the walls," Savage says. "When students walk through Mason Hall, we want them to see somebody who looks like James West or Ben Carson on the walls. Give them something to aspire to." **Bret McCabe**

PHOTOGRAPH BY MICHAL DANIEL



The Indispensable Role of Blacks at Johns Hopkins, a traveling exhibition and accompanying website, takes an institution-wide look at black experiences at the university.

LEFT: PHOTOGRAPH BY KAVEH SARDARI
RIGHT: PHOTOGRAPH BY KEITH WELLER / JHMI

New Dean for SAIS

In March, the Nitze School of Advanced International Studies announced that Vali R. Nasr had been selected as the eighth dean of the international affairs school in Washington, D.C. Most recently a senior fellow at the Brookings Institution and a professor at Tufts University in Boston, Nasr is a highly regarded scholar, foreign policy adviser, and commentator on international relations, especially in regard to the Middle East. From 2009 to 2011, he served as an adviser to the late Richard Holbrooke when Holbrooke was President Obama's special representative for Afghanistan and Pakistan. His most recent academic position has been associate director of the Fares Center for Eastern Mediterranean Studies at Tufts.

Born in Tehran, Iran, the 51-year-old Nasr received a doctorate in political science in 1991 from the Massachusetts Institute of Technology. A prolific writer, he is a columnist for *Bloomberg View* and has contributed to the *New York Times*, the *Washington Post*, *Foreign Affairs*, and *Foreign Policy*. He has also authored several books, including *Forces of Fortune: The Rise of the New Muslim Middle Class and What It Will Mean for Our World* (Free Press, 2009) .

Nasr succeeds Jessica P. Einhorn, who is retiring after a decade as dean. He will assume his new post on July 1. Announcing the appointment, university President Ron Daniels said, "I have been as impressed with Vali's warmth and humility as with his intellect, vision, and accomplishments. He has an excellent understanding of the challenges facing graduate schools of international studies, including SAIS, and an appreciation for the opportunities ahead."

In a statement released after the announcement of his appointment, Nasr said, "The nature and focus of education in international affairs are changing, as global challenges require innovative approaches, greater attention to technology, and addressing new demands in the job market. SAIS has a very important leadership role to play in shaping the future of education in international affairs." **DK**

Opening Day

May 1 marked the beginning of a new era for Johns Hopkins Hospital when it opened the doors to its new $1.1 billion, 1.6 million-square-foot building. The facility features two 12-story patient towers, 560 private patient rooms, 33 state-of-the-art operating rooms, and new adult and pediatric emergency departments, as well as healing gardens, light-filled lobbies and rooms, and an impressive collection of 500 works of art.

The Charlotte R. Bloomberg Children's Center houses pediatrics, including neonatal and pediatric intensive care units, and has many amenities to make patients and their families more comfortable. The Sheikh Zayed Tower is home to the Johns Hopkins Heart and Vascular Institute, neurological and neurosurgical services, trauma care, orthopedics, general surgery, labor and delivery, and a rooftop helistop for patients arriving by helicopter. **Catherine Pierre**

Burn App
Stephen Milner and Harry Goldberg

Outta Here
Commencement Day

RIGHT: PHOTOGRAPH BY HOMEWOODPHOTO.JHU.EDU
LEFT: PHOTOGRAPH BY KEITH WELLER

Burn App

In treating burn victims, the first eight hours are critical—every minute counts. After a medical mission to Kenya following two catastrophic fires in early 2009, Stephen Milner, director of the Johns Hopkins Burn Center, set out to find a quick and effective way to teach people how to stabilize patients in those first crucial hours after a burn. The result is the Burn Medical Education app, or BurnMed, which Milner created in collaboration with Harry Goldberg, director of academic computing at the School of Medicine. The mobile app uses video, text, and 3-D images to explain proper care. "This app is designed so the user can understand the underlying procedures used to treat a burn victim within a few minutes," Goldberg says.

The free app, among others being developed at Johns Hopkins Medicine, is part of the Johns Hopkins Global mHealth Initiative, which uses mobile technology to improve global health in areas of the world with limited resources. **Kristen Intlekofer**

Outta Here

By the time you receive this magazine, Johns Hopkins University will have graduated the class of 2012 in its annual universitywide commencement ceremony on Homewood Field. At press time, there were 7,529 degrees, diplomas, and certificates to be awarded on Commencement Day, with 1,664 bachelor's degrees going to graduating seniors. Of the university's nine schools, the Krieger School of Arts and Sciences and the Whiting School of Engineering are typically responsible for the largest number of graduates, with an estimated 2,240 and 1,412 degrees and certificates, respectively, awarded this year.

Samuel J. Palmisano, A&S '73, chairman of the board at IBM and a former Johns Hopkins University trustee, was scheduled to be the featured speaker at the May 24 event, during which the university also planned to award him an honorary doctorate of humane letters. After earning his bachelor's at Johns Hopkins in 1973, Palmisano was hired as a salesman at IBM, where he began a long and successful career. He took over as CEO in 2002 and, over the past decade, has built a legacy that includes growing the company to over 433,000 employees worldwide, increasing revenue to nearly $107 billion, and investing heavily in R&D. Palmisano stepped down as CEO in January but continues to serve as chairman of IBM's board. "Sam is a daring and visionary leader, whose dedication to discovery and refusal to accept the status quo guided one of the great transformations in business history," university President Ron Daniels said.

Other speakers lined up for the week's graduation events at individual schools included Jeffrey R. Immelt, chairman and CEO of General Electric, at the Carey Business School's graduation ceremony; neurosurgeon and CNN chief medical correspondent Sanjay Gupta at the School of Medicine's convocation; and Treasury Secretary Timothy Geithner, SAIS '85, at the Nitze School of Advanced International Studies' graduation event in Washington, D.C. **KI**

Love, Sex, Good TV

Intersexions, a steamy South African television drama, was recently awarded a George Foster Peabody Award, which acknowledges outstanding international achievement in broadcast media. The program was recognized alongside CNN's and Al-Jazeera English's coverage of the Arab Spring and Arab awakening uprisings, HBO's *Treme*, and Showtime's *Homeland* drama series.

Co-produced by Johns Hopkins Health and Education in South Africa (JHHESA), an affiliate of the Bloomberg School of Public Health's Center for Communication Programs (CCP), *Intersexions* explores through 26 interlinked episodes how HIV moves through society: A popular deejay admits he is HIV-positive over the radio and scares a bride-to-be, his former lover. A traveling husband cheats on his wife and possibly exposes her. A trusted teacher preys on students. In the final episode, HIV gets personified and provides a voice-over narration to the entire series, showing how the virus spreads regardless of class, race, or education. "Nature has given me a job to do," HIV says, "and I cannot be blamed for the terrible things you do to each other."

The series is one aspect of JHHESA's nearly decade-long HIV prevention work in South Africa, which is funded by the U.S. Agency for International Development and, more recently, the United States President's Emergency Plan for AIDS Relief (PEPFAR). It's one of many entertainment-education efforts, including a previous TV show called *Tsha Tsha*, which, like *Intersexions*, was created in partnership with South African Broadcasting Corporation Education and Curious Pictures. *Tsha Tsha* focused on condom use and basic risk factors, but as the epidemic matured the messaging needed to evolve with it, says CCP director Susan Krenn. "There was a big push in many African countries, South Africa included, to look at multiple and concurrent partnerships and their impact on driving the epidemic. So the team came up with the idea of this intertwined series, with each episode being its own story and the link between the stories being the sexual network that ties them all together."

The show was immensely popular in South Africa, and earlier this year won 11 of the 12 categories it was nominated for at the South African Film and Television Awards, including best drama, actor, actress, director, and writing. That popularity helps get the message across. "As we look at our research, we find that people talking about things is one of the predictors of actually practicing a behavior or having a positive attitude toward practicing a behavior," Krenn says. "Entertainment education enables you to get a consistent message out to millions and millions of people in a way that a poster simply won't do." **BM**

PHOTOGRAPH COURTESY CURIOUS PICTURES

Award-winning South African TV drama *Intersexions* aims to get viewers talking about HIV transmission. The series is co-produced by the Bloomberg School of Public Health's Center for Communication Programs.

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Abbreviated

Catherine Pierre

For the 32nd year, Johns Hopkins University topped the **National Science Foundation**'s list for academic R&D spending, performing $2 billion worth of medical, science, and engineering research in fiscal year 2010. Of that, $1.73 billion came from federal sources, including NSF, NASA, the National Institutes of Health, and the Department of Defense. NIH has awarded the university $15 million over five years to establish the **Center for AIDS Research. CFAR** will support more than 180 HIV investigators from Public Health, Medicine, Nursing, and other schools, a major priority being to address Baltimore's HIV epidemic. In spring, as part of its Implementation Plan for Advancing Sustainability and Climate Stewardship, the university installed more than **2,900 solar panels** on seven buildings on the Homewood and East Baltimore campuses. The panels should reduce the university's output of greenhouse gases by 1.2 million pounds each year.

KRIEGER SCHOOL OF ARTS AND SCIENCES

Film and Media Studies lecturer **Matthew Porterfield**'s current project hit No. 27 on ioncinema.com's "Top 100 Most Anticipated Films of 2012." *I Used to Be Darker*—the title of which was being tattooed on the auteur's arm during the film's Kickstarter pitch—follows Porterfield's critically acclaimed sophomore effort, *Putty Hill*. **Jon Faust**, an economics professor and the director of the Center for Financial Economics at Johns Hopkins, was named special adviser to the Federal Reserve Board.

WHITING SCHOOL OF ENGINEERING

Mounya Elhilali and **Mark Foster**, both assistant professors in the Department of Electrical and Computer Engineering, were among 26 scholars nationwide selected by the Office of Naval Research's Young Investigator Program to share $13.7 million in research funding. Elhilali's research looks into how our brains recognize sounds. Foster's work focuses on developing photonic techniques for manipulating signals on the fastest of time scales. The **Hopkins Baja Team** placed ninth at 2012 Baja SAE Auburn, an intercollegiate design competition put on by the Society of Automotive Engineers that has student teams design, build, and race cars. This year's event was hosted by Auburn University in Alabama and included 102 teams.

CAREY BUSINESS SCHOOL

The school announced in May that it is **reorganizing its degree programs** to focus on the study of business issues related to health care and the life sciences. **Terry Dunkin**, a member of Carey's Real Estate Advisory Board, was elected president of the International Real Estate Federation World Council of Experts.

SCHOOL OF EDUCATION

Assistant dean **Mariale Hardiman** has published *The Brain-Targeted Teaching Model for 21st-Century Schools* (Corwin Press, 2012), which offers teachers practical ways to apply research to the teaching and learning process.

SCHOOL OF MEDICINE

Facebook users can now share their organ donor status with friends and family, thanks in part to transplant surgeon and associate professor **Andrew M. Cameron**. He and Facebook COO Sheryl Sandberg came up with the idea at their Harvard class reunion as a way to use social media to spark dialogue and, they hope, encourage others to become donors. **Carol Greider**, Nobel laureate and director of molecular biology and genetics in the Johns Hopkins Institute for Basic Biomedical Sciences, was appointed to the President's Committee on the National Medal of Science.

SCHOOL OF NURSING

The school is **ranked No. 4** among nursing schools for total funding received from the National Institutes of Health. Professor **Pamela R. Jeffries**, associate dean for academic affairs, was named a member of the Institute of Medicine's Global Forum on Innovation in Health Professional Education.

PEABODY INSTITUTE

David Smooke, chair of the Music Theory Department, has been composing works for toy pianos, including *Nutshell Miniatures of Unexplained Death*, which he premiered in May at the Atlas Theater in Washington, D.C. Voice major and master of music candidate **Sonya Knussen** recently opened Mount Vernon Music Space, a storefront performance and teaching space for emerging and established professional musicians.

BLOOMBERG SCHOOL OF PUBLIC HEALTH

In May, the school presented Emmy Award–winning actor Sam Waterston its **Goodermote Humanitarian Award** for his longtime support of refugees around the world. The school was one

of five partner organizations to receive part of $220 million from New York City Mayor Michael Bloomberg, Engr '64, in support of the **Bloomberg Initiative to Reduce Tobacco Use.** The new funds will support tobacco-control efforts in low- and middle-income countries.

NITZE SCHOOL OF ADVANCED INTERNATIONAL STUDIES

In April, SAIS celebrated the 25th anniversary of the **Hopkins-Nanjing Center.** Founded in 1986 in Nanjing, China, the center is a postgraduate joint venture between Johns Hopkins and Nanjing universities, bringing American, Chinese, and international students together to live and study. In May, SAIS received one of the largest gifts in its history, a residential property worth $5.9 million, from an anonymous donor. Proceeds from the sale of the property will establish the **Betty Lou Hummel Endowed Fund,** which will give a permanent base of support to the school's Foreign Policy Institute.

APPLIED PHYSICS LABORATORY

The Applied Physics Laboratory celebrated its **70th anniversary** in March. APL scientists secretly came together in 1942 during the Second World War to develop the proximity fuze for the Allies. Seven decades later, a highly visible APL is working on more than 600 projects in the fields of air defense, undersea warfare, space systems, homeland protection, cyber operations, and others. The May issue of *Popular Mechanics* featured the APL-developed **Modular Prosthetic Limb** on its cover. The MPL is a neurally controlled artificial limb that has almost the same number of degrees of freedom as the human arm.

GOLOMB'S GAMBITS™

Word Changes

Solomon Golomb, A&S '51

Here are six words in each of eight groups. The words in each group can undergo a systematic change, unique to that group, that turns them into new words with new meanings. See how many of these transformations you can discover. (Changes may involve rearranging and/or adding letters.)

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
DELIVER	BARKER	EARTH	ASTERN	BULL	BET	BROTH	BE
EMIT	BRAD	EASEL	LATE	CIGAR	GREED	MIST	LOUT
LIVED	CARVE	LEAF	MISSION	CORN	ISLE	MOTH	LOVER
PARTS	CLAM	REEF	MOTION	INTERN	SPIRE	NUMB	PLUNDER
REPEL	DIARY	RING	QUALITY	SKILL	VENUE	SHOULD	TRASH
WARTS	WARP	TRIPS	RODE	TOIL	VERSE	WAND	WEIGHT

Solutions on page 78

Welcome

Johns Hopkins alumni are not content to sit on the sidelines. They're doers. Like Ted Smith, A&S '87 (at right). After his son was diagnosed with a rare form of cancer, he set out to raise $100,000 to help others with the disease. And Cindy Parker, SPH '00, who was arrested while protesting the Keystone XL pipeline in front of the White House last year (p. 76). And longtime friends Jerry Schnydman, A&S '67, and Stan Fine, A&S '65, who, in the early 1970s, started a tradition that continues to this day—an annual Homecoming reunion for their fraternity brothers (p. 74). Enjoy these stories, and more, in the pages that follow.

MAKING WAVES TO FIGHT CANCER

Written by | LESLIE F. MILLER

PHOTOGRAPH BY MARSHALL CLARKE

During times of stress, Ted Smith, A&S '87, goes swimming. Smith was the assistant swim coach at Johns Hopkins for four years, and, before that, he coached swimmers at the University of Tennessee and Mercersburg Academy, among them four Olympic gold medalists. Although he never competed himself, he often swims for exercise at Meadowbrook Aquatic and Fitness Center in northern Baltimore. That's exactly what he was doing on May 14, 2010, when he got the devastating news that his wife, Julie, had stage 3 ovarian cancer.

Julie Smith had gone to Greater Baltimore Medical Center that morning for a preventive hysterectomy. She had a family history of breast cancer, and both she and her sister, Kathleen Drake, had tested positive for BRCA1, the genetic marker for hereditary breast and ovarian cancer. The sisters had both gone in for the two-and-a-half-hour procedure that day. After spending the morning pacing in the waiting room, Ted says, "I figured I'd go to Meadowbrook and swim, and I'd come back. No problem. I left the phone number of the pool, and I told [Meadowbrook] that my wife was in surgery. I'm pulling up my pants in the locker room, and the surgeon is on the phone. She has cancer."

The news hit the parents of two especially hard. Their eldest, Jake, had been diagnosed with a rare form of pancreatic cancer just six months earlier. Twelve-year-old Jake was the youngest person ever to have the disease. Because the vast majority of cases are diagnosed too late, pancreatic cancer is often deadly. Fortunately, Jake's doctors at Johns Hopkins caught the tumor early, and he immediately underwent surgery and had it successfully removed.

Following his son's recovery, as Smith watched his wife endure chemotherapy, he became immersed in some of the issues surrounding cancer research—genetic testing and tumor mapping, genetic flaws and drugs that respond to them. "I read about 800 pages on this stuff," says Smith. After hearing about gene studies going on at Johns Hopkins, he learned that some cancers can be traced to a gene mutation, and mapping the mutation could lead to a cure for other patients down the line. But, Smith says, "Jake's [form of cancer] is so rare, it was way down the list." Moved to help others with the disease, he asked how much it would cost to map Jake's tumor: $100,000. Smith decided to raise the money himself.

That's when he sat down with John Dierkes, A&S '77. They had met years ago through their work at investment bank Alex. Brown & Sons and had recently become reacquainted through Johns Hopkins alumni swimming events. Knowing that Dierkes had broad contacts in the cancer fundraising community, Smith hoped to identify potential donors and match them to his cause.

It was through Dierkes that Smith became involved in Swim Across America, a national organization donating to cancer research centers in major cities. Dierkes, a melanoma survivor and a former competitive

"Immediate funding to map a tumor like Jake's wasn't available," says Ted Smith. "I wanted to speed up that process." Above: Jake (15), Kathleen (12), Ted, and Julie Smith enjoy a warm spring day at Meadowbrook Aquatic and Fitness Center.

swimmer (he was All-American captain of the Blue Jays and led them to their first NCAA championship in 1977), had been participating in Swim Across America events for several years. In 2010, Dierkes brought Swim Across America to Baltimore, reaching out to Baltimore native Michael Phelps, Meadowbrook (the facility where Phelps and several other Olympic swimmers have trained), and most of the Johns Hopkins swim team, who participated in the swim. That year, the Baltimore event raised over $465,000 for the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins, making it the most successful inaugural event in the organization's 25-year history.

In 2011, Swim Across America Baltimore raised more than $500,000. Smith raised $80,000 of that total. Within six weeks, the Swim Across America lab at Kimmel had mapped Jake's tumor. "Full disclosure," says Smith. "[Jake] did the swim. I did not." Originally planned as a one- or three-mile swim near Gibson Island on the Chesapeake Bay, the open-water swim had to be moved to Meadowbrook because of damage from Hurricane Irene. But so many people showed up to the pool, Smith says, he decided to sit out and give others a chance to participate. Jake, who is not a swimmer (he plays lacrosse), was a little daunted by the distance, but he completed the one-mile swim.

Jake, now 15, is already talking about getting a team together to participate in this year's swim, and Smith says they plan to be there as a family. Smith's wife and their daughter, Kathleen, would have been at last year's event to cheer Jake on, but they were raising money themselves at an ovarian cancer walk in Annapolis, Maryland, which fell on the same day. Even though Jake and Julie are both recovered from their illnesses, the Smiths are a family dedicated to finding a cure so that others can live. "I do have a fairly nice Rolodex of people to call," Smith says. "I am extraordinarily touched by what people would do."

THE READ ON CULTURE

Interview by | JENNIFER WALKER

Richard Kagan is a professor in the Department of History and has a joint appointment in the Department of German and Romance Languages and Literatures in the Krieger School of Arts and Sciences. He specializes in early modern European history, with an emphasis on Spain and the Iberian expansion.

For Manuel Colás-Gil, A&S '09 (PhD), the possibility of working with professor Richard Kagan, who has taught early modern European history since 1972, was a bonus in his decision to pursue his doctorate in Romance languages at Johns Hopkins. Although Colás-Gil gravitates toward literature and Kagan is a historian, the two are fascinated by the same period: the Spanish Golden Age from the late 15th century to the mid-17th century, when literature and the arts flourished across the country. By the time he graduated, Colás-Gil, who focused on 16th- and 17th-century Spanish literature, had completed several of Kagan's Spanish history seminars on subjects ranging from religion and the Inquisition to architecture and cities. In January 2011, Kagan and Colás-Gil co-taught a seminar on Spanish history and culture as part of a three-week study abroad intersession in Madrid. On a recent trip to Baltimore, Colás-Gil, now resident director of Johns Hopkins' study abroad program in Madrid, visited Kagan in his book-strewn office, where the two talked about the role literature plays in uncovering a culture's past.

Richard The Golden Age of Spain and its society are what I find interesting. The law, the history, the fiction and literature—they are all subsets. They're a way to learn more about this particular time and place and its culture.

Manuel Spain is well-known for parties and running the bulls, and sangria. But if you talk about all the early modern history, you really have to talk about paintings, architecture, sculptures, and urban history, including how the cities developed.

R Right. We have history, we have architectural history, we have religious history and literature. These are different windows into that time. We have some great works of literature like *Don Quixote*. And then we have documents that are stored in archives and libraries around Spain and other parts of the world. But they just provide us with glimpses. One of the tasks of the historian, or the literary historian, is to reconstruct this world, to get a better sense of it, and to see how its people use history to define their own sense of self.

M We are actually covering a period of Spanish history in which, even though most of the population couldn't read, Spaniards were obsessed with the written word. . . . Not only literature, but other kinds of work and discourses. Still, there was a lot of fiction, and there was also a huge debate about the legitimacy of fiction. I just study how history is represented in prose. This is fiction. It's false. It never existed. It never happened. But it's very interesting how the culture of early modern Spain affected how the authors of that time represented the society in literature.

R For example, isn't there a book that is a false second version of *Don Quixote* called *Segundo tomo del ingenioso hidalgo Don Quijote de la Mancha* by Alonso Fernández de Avellaneda?

M Yes, it was published in 1614. But at that time, there wasn't copyright.

PHOTOGRAPHY BY WILL KIRK/HOMEWOODPHOTO.JHU.EDU

When a work of fiction became extremely successful, other authors just wrote a continuation or a second part. Miguel de Cervantes published his *Don Quixote* in two books in 1605 and 1615. In the second book, Cervantes condemns the false continuation and kills his hero. Don Quixote dies at the end so there can be no other continuation of his story.

R But we can learn from that false version, too. In it, the town priest recommends that Don Quixote read *Lives of Saints* because it was full of stories about virtues and exemplary deeds.

M At that time, *Lives of Saints* was the kind of story people should be reading, according to the church. Because it was true. Don Quixote had read *libros de romances*, which are chivalric tales or adventures, but he read them irresponsibly and thought that those stories were true. That's when he decided to become a knight and imitate the lives of those fictional heroes. His actions show why these romances of chivalry were condemned and prohibited by moralists and the church—they thought the books contained false stories that could affect the reader's conduct. So, in Avellaneda's book, the town priest recommends that Don Quixote read *Lives of Saints* in order for him to recover his sanity. Cervantes said people could read whatever they want, though. They should just make sure that after they close the book, they go back to their social, professional, and family responsibilities. You did not bring art into life.

R From a historian's point of view, this is another way to understand what a culture thinks about itself. Spain is one of these early modern medieval societies in which religion occupied the entire social sphere. People defined themselves in religious terms, which is so different from many Americans. Post-Enlightenment Americans mostly keep society and religion apart. But we don't want to judge an era by our own standards. We want to judge it by the standards of that time. One of the most interesting and perhaps most accessible ways of understanding a time period is through literature. In fiction there are stock types, there are figures, there are stories. These books offer a wider lens on society. If you don't know the literature of a particular era, I don't think you can be a historian of that era.

M But historians have to be very careful when they read fiction. It's not like reading a legal document. These books are a product of someone's imagination. A fantasy.

R That's an important point. Because 100 years ago, historians would say that fiction is a faithful reflection of society. Now we know that it's a projection. Nevertheless, it's the way that some people want that society to be represented, and that can tell you a lot about the values of the time. You can't do history without literature.

M And you cannot do literature without history.

Manuel Colás-Gil teaches an introductory course on Spanish Golden Age literature at the Carlos III University of Madrid. This spring, he also taught a course on *Don Quixote*. Since 2005, he has worked for the Hopkins Madrid study abroad program and has served as its resident director since 2010.

HOPKINS TRUE BLUE

Written by | LAURA DATTARO

A Johns Hopkins education is not necessarily what you learn in the classroom. It's what you learn about yourself, and your capacity to achieve. Take Alexander Wolfson, A&S '98. He majored simultaneously in biology; Russian; and the history of science, medicine, and technology—and later became an anesthesiologist. "Hopkins turned me into who I am," he says. "So why not allow others to achieve their dreams?"

It's this mindset that spurred the creation of Cerulean, the new leadership giving society of the Johns Hopkins Alumni Association. When the Alumni Council voted last October to eliminate dues, it made all 172,000 Johns Hopkins graduates full members of the Alumni Association. The Cerulean Society was created at the same time to give alumni like Wolfson, who recently became a charter member, the means of getting more involved. Membership in the society, which is composed of those who have given $1,000 or more to the Alumni Association, represents a commitment to enriching the alumni experience and fostering beneficial relationships across the Johns Hopkins community, now and far into the future. "It enables those of us who feel strongly about the vision of the Alumni Association to have a little higher dedication to the mission," says Ray Snow, A&S '70, president of the Alumni Council and one of the creators of Cerulean.

Gifts to the Alumni Association directly fund special events and programs, finance alumni activity within the nine schools, sustain special awards for alumni and faculty, and fund grants for student projects. Membership in the Cerulean Society is an investment that will support the work of the Alumni Association for many lifetimes to come. The society helps fund programs that support the continuing success of Johns Hopkins graduates everywhere, even reaching out to them *before* they have received their diplomas.

For example, Charm City Clinic, a volunteer effort coordinated by Johns Hopkins medical students, helps residents from low-income Baltimore neighborhoods connect with health resources, such as state and federal programs that subsidize prescription costs and doctor's visits. And patients will soon have access to routine vision and cholesterol screenings, thanks to an Alumni Association equipment grant partially made possible by Cerulean support. Third-year medical student Claire Sampankanpanich, a Charm City Clinic board member and volunteer, says that Alumni Association involvement helps create community among students and alumni. "After graduation," she says, "I would like to stay involved and help with future projects. Who knows what will get started?"

It all ties back to the Alumni Association's fundamental mission, according to Snow, which is "to engage as many current and future alumni on as many different levels as we can and in as many different ways as we can." To learn more, visit alumni.jhu.edu/cerulean, email cerulean@jhu.edu, or call 800-JHU-JHU1.

ILLUSTRATION BY OLIVER JEFFERS

A VIENNA LEXICON

Written by | MIKE FIELD, A&S '97 (MA)

It's an imperial city that never lost its grandeur. A city of parks and woods that was "green" long before anyone used the term, Vienna is home to the Austria chapter of the Johns Hopkins Alumni Association. It was Vienna's own Sigmund Freud who once observed that "civilization began the first time an angry person cast a word instead of a rock." As residents of what may be the world's most civilized city, the Viennese have plenty of words to cast by way of welcome to the 5 million or so tourists who visit each year. Here are a few that intrepid Blue Jay travelers may find especially helpful should they find themselves footloose in the waltz capital of the world.

1. jour fixe Meaning "fixed day," these lively discussions are held the last Wednesday of every month at Café Landtmann, located on Ringstrasse, the boulevard that encircles the center of town. Guided by longtime Austria chapter leader Karl Krammer, SAIS Bol '79 (Cert), '80 (MA), these meetings have hosted a stellar lineup of guest speakers including journalists, high-ranking civil servants, and academics.

2. heuriger One of these city wine taverns, such as Heuriger Werner Welser in the wine-growing hills, hosts an informal chapter get-together each summer. Vienna is the world's only big city with a significant wine industry, with over 700 hectares (1,730 acres) of vineyards under cultivation, most of it on the city's hilly northern and western edges.

3. Sachertorte This rich Viennese dessert concocted of chocolate sponge cake, apricot jam, and dark chocolate frosting can be found at the Hotel Sacher, which holds claim to the original 19th-century recipe.

4. haaße Derived from the word *heiß* (meaning "hot"), this Viennese expression refers to the hot sausages served at small sidewalk kiosks. As these places are open until 4 a.m., you can enjoy a *Burenwurst* or a *Käsekrainer* with mustard, a slice of dark bread, and a beer at almost any time—day or night.

5. Riesenrad The city's famous 212-foot Ferris wheel is in the Prater amusement park, which was a focal point of the classic Orson Welles film *The Third Man*.

To join or learn more about the Austria Alumni Club, contact club chair Karl Krammer at international .alumni@jhu.edu.

LACROSSE BROTHERS, THE BEACH BOYS

Written by | GREG RIENZI

After forging a bond on the lacrosse field, Stan Fine (left) and Jerry Schnydman remain close friends, 50 years on.

Jerome Schnydman, A&S '67, and Stanley Fine, A&S '65, have a bro spot—two chairs planted in the sand on Bethany Beach, Delaware. Here these longtime friends watch the waves crash and talk for hours, until the sun goes down or their wives pry them away.

One favorite tale is the time the two played in the first game of Baltimore's box lacrosse league, televised live in 1962. Fine, six months older than Schnydman and then a freshman at Johns Hopkins, scored a game-high four goals in the winning effort for his club team. He couldn't wait to get a copy of the *Baltimore Sun* the next morning to relive his exploits. "The headline was 'Schnydman Steals the Show,'" says Fine, enthusiastically raising an octave. "The whole article was about Jerome winning face-offs and running around and through people. I got one mention at the end of the story. It said something like, 'and Schnydman surrendered scoring honors to Stan Fine,'" he says.

Fine gets to call Schnydman "Jerome," known as Jerry to most. He belongs to a core group who knew Schnydman before he started his distinguished career at Johns Hopkins, which officially ends on June 30, his retirement day. The two met at Baltimore City College and forged a bond on the lacrosse field. At Johns Hopkins, they pledged Phi Sigma Delta together and formed the backbone of a tenacious midfield for the lacrosse team. Following graduation, they stayed in Baltimore and kept in touch. Schnydman began an eight-year career in the insurance and pension business, returning to Johns Hopkins in 1975 to join the Office of Undergraduate Admissions. Fine went to law school. Today, Fine specializes in real estate development law at the local firm of Rosenberg, Martin, Greenberg LLP. Both say their bond only grew following graduation. "If I ever needed anything, I would call Stanley like you call a brother or a father," Schnydman says. "And I'm sure he would do the same thing for me."

The two say they rarely disagree and never argue. There are differences, however. "I got the big mouth," Schnydman says. "Stanley is more laid back. I'm wilder. Stanley is the smarter one. But we're both doers. We want it done five minutes ago." In the early 1970s, the two organized a Homecoming reunion for their fraternity brothers, an annual tradition that continues to this day. They also co-championed many a project for Johns Hopkins, several ideas born on the beach in Delaware.

And then there's Blue Jays lacrosse. For years, they attended home games together, sitting in the row directly behind the band. That tradition ended when Schnydman assumed his post as secretary of the board of trustees and executive assistant to the president in 1998, and began entertaining visitors and guests in the president's box.

But all that will change next lacrosse season, after Schnydman retires. "Herb Better [A&S '65] and I are saving Jerome a spot in the stands," Fine says. And, as always, they'll both save each other's spot on the beach.

1958

Leslie Norins, A&S '58, and his wife, Ann "Rainey" Norins, named Johns Hopkins University as a beneficiary of a $10 million bequest to fund an endowed student and faculty exchange program for the Krieger School of Arts and Sciences.

1968

Michael Merzenich, Med '68 (PhD), professor emeritus at the University of California, San Francisco, is studying how video and computer games can affect brain plasticity, specifically in schizophrenic patients.

1971

Raymond "Ray" Mabus Jr., A&S '71 (MA), secretary of the Navy, discussed his military and political careers as a guest on C-SPAN's *Q&A* in February.

1972

Wolf Blitzer, SAIS '72, lead anchor for CNN news program *The Situation Room with Wolf Blitzer*, received a 2012 Common Wealth Award of Distinguished Service for mass communications on April 21 in Delaware.

Jerry Doctrow, A&S '72, a stock market analyst for Legg Mason and Stifel Nicholas for 15 years, retired in February. He plans to continue working part time as an adviser for Stifel Nicholas.

Edward Prochownik, A&S '72, director of oncology research at Children's Hospital of Pittsburgh and professor of molecular genetics and biochemistry at the University of Pittsburgh School of Medicine, was awarded a grant in January from the National Cancer Coalition to purchase equipment for his research.

1975

Richard "Rick" Spinrad, A&S '75, is the vice president for research at Oregon State University after working for four different federal agencies and one lobby in Washington, D.C., for 23 years.

1976

Donald E. Buchanan, A&S '76, Med '80, HS '81, '83, a fellow of the American Academy of Pediatrics, was named medical director and senior physician of the state of Nevada's Early Intervention Services clinic in Las Vegas.

Jonathan Krant, A&S '76, SPH '83, is enjoying his second career as head of clinical research at Zalicus Inc., a biotechnology firm in Cambridge, Massachusetts, after spending 20 years in academic rheumatology.

Freda Lewis-Hall, A&S '76, chief medical officer of Pfizer Inc., was elected to the Save the Children Board of Trustees and will serve a one-year term.

1977

P. Rea Katz, Nurs '77, is an assistant professor in the Physician Assistant Department at Rosalind Franklin University of Medicine and Science in North Chicago.

1978

Knut Danielsen, A&S '78, has been director of finance for a Manhattan-based pre-IPO company since 2009. He lives in Greenwich, Connecticut, and recently married an old friend from high school, the former Laura ter Kuerst.

James W. Wagner, Med '78 (MS), Engr '85 (PhD), president of Emory University in Atlanta, received President Obama's intent to reappoint him as the vice chair for the Presidential Commission for the Study of Bioethical Issues.

The Sound Guy

"A really good audio system suspends disbelief," says Sandy Gross, A&S '72. "When you're sitting in your living room and you put on John Coltrane or Jimi Hendrix, it's hard to believe that they aren't there performing for you." Gross discovered the power of a superior audio system while a student at Johns Hopkins in 1971, listening to two speakers the size of small refrigerators in his bedroom. A year later, eager to create similar high-quality sound at an affordable price, he joined fellow Johns Hopkins graduates Matt Polk, A&S '71, and George Klopfer, A&S '71, in founding Polk Audio (named after Polk because his was the easiest name to pronounce). Initially operating out of a Civil War–era home off York Road in Govans, the company became successful for designing speakers that delivered lifelike sound comparable to other brands that cost thousands more. Gross would eventually found two more speaker companies: Definitive Technology and, most recently, GoldenEar Technology, whose speakers have been praised by critics for their audiophile-oriented design. "Speaker design is what we've done all our lives," Gross said of GoldenEar's launch in 2010. "We love it." JENNIFER WALKER

PHOTOGRAPH BY MIKE CIESIELSKI

Marilyn Wyatt, A&S '78 (MA), '82 (PhD), wife of the U.S. ambassador to Pakistan, spoke at the third Karachi Literature Festival, which was held in Pakistan in February.

1979

Judy L. Smith, Engr '79, '85 (MS), vice president of business development for ITT Exelis' information systems division, was appointed to the board of directors of Women in Aerospace. The two-year appointment took effect in January.

1980

Robert S. Ford, A&S '80, SAIS '83, the United States ambassador to Syria, was interviewed by **Wolf Blitzer, SAIS '72**, on February 10 for CNN's news program *The Situation Room with Wolf Blitzer*.

1985

Deborah Wetzel, SAIS Bol '85 (Dipl), SAIS '86, who has more than 25 years of experience in development work around the world, was named World Bank director for Brazil, effective April 2.

1986

Amjad Ghori, SAIS '86, is the co-founder of the Aziza Ghori Charitable Foundation, which provides educational opportunities and safe homes for underprivileged children around the world. Aziza's Place, a home and learning center for impoverished Cambodian children, is one of the most active projects of the foundation.

Corinne Sandone, Med '86 (MA), an associate professor in the Department of Art as Applied to Medicine at the Johns Hopkins School of Medicine, was one of the judges for the 2011 International Science and Engineering Visualization Challenge. The challenge, which turns scientific exploration into art, was presented by *Science* magazine and the National Science Foundation.

1988

Jerilyn Allen, SPH '88 (ScD), will be one of 14 nurse researchers inducted into the 2012 International Nurse Researcher Hall of Fame later this year. The Hall of Fame recognizes Sigma Theta Tau International members whose research has impacted the nursing profession and patients, and who have received significant national or international recognition for their work. The award presentation will take place in Australia this August.

Beatrice McKenzie, SAIS '88, is a tenured professor in the Department of History at Beloit College in Wisconsin.

1992

Cherie Butts, A&S '92, '97 (MS), is an associate director of immunology research at Biogen Idec in Cambridge, Massachusetts.

Stacy Feldman, SPH '92, is a technology teacher/coordinator at Theodore Schor Middle School in Piscataway, New Jersey.

Richard Norland, SAIS '92 (MIPP), the international affairs adviser and deputy commandant at the National War College, received President Obama's intent to appoint him as the U.S. ambassador to Georgia in February.

PHOTOGRAPH BY WILL KIRK / HOMEWOODPHOTO.JHU.EDU

An Arresting Environmentalist

Cindy L. Parker, SPH '00, has a level of expertise that would ordinarily be welcome at the White House. When the assistant professor of environmental health sciences at the Bloomberg School of Public Health went there last August, however, she ended up in jail. Parker and fellow activists conducted a sit-in in front of 1600 Pennsylvania Avenue as part of an effort to persuade the Obama administration to block the proposed Keystone XL oil pipeline from the tar sands of Alberta, Canada, to refineries near the Gulf of Mexico. National Park Service police quickly arrested them, but the protesters' concerns—about threats from the pipeline to aquifers and environmentally sensitive areas in the Great Plains, and the imperative to find other ways to meet the world's energy needs—received a wide airing. In January, President Obama rejected TransCanada's initial construction proposal for the pipeline, citing the need for a thorough environmental review of the project. JAMES HUNT

1993

Erdem Basci, A&S '93 (MA), is the governor of the Central Bank of the Republic of Turkey.

Brian Ganz, Peab '93 (AD), completed the second performance of his decade-long quest to perform all of Chopin's approximately 250 piano pieces in front of a live audience. The performance was held on February 11 at the Music Center at Strathmore in North Bethesda, Maryland.

Nancy Kete, Engr '93 (PhD), the newly appointed managing director of The Rockefeller Foundation, will concentrate on the foundation's global work on resilience.

1994

David Tuveson, Med '94 (MD/PhD), was appointed director of research for The Lustgarten

Foundation, a private foundation that focuses on pancreatic cancer research, on February 7.

1995

Ron Capps, A&S '95 (MLA), who spent 25 years in the armed forces, is founder of and an instructor with the Veterans Writing Project, a nonprofit organization that helps people involved with the military tell their stories in order to promote healing.

Olivier Knox, SAIS Bol '95 (Cert), SAIS '96, is the White House correspondent for Yahoo News and the first ever White House correspondent for the website.

Anita Tarar, A&S '95, was promoted to partner at the Dallas office of Fulbright & Jaworski LLP in January.

Paul Wyse, Peab '95 (MM), a concert pianist, had two of his portrait paintings acquired by the Smithsonian's National Gallery in Washington, D.C., in 2011. One of Wyse's paintings, a portrait of Billy Joel, was unveiled at Steinway Hall in New York last December.

1997

Marie Nolan, Ed '97 (MSEd), will be one of 14 nurse researchers inducted into the 2012 International Nurse Researcher Hall of Fame later this year. The Hall of Fame recognizes Sigma Theta Tau International members whose research has impacted the nursing profession and patients, and who have received significant national or international recognition for their work. The award presentation will take place in Australia this August.

1998

Marie-Hélène Carleton, SAIS '98, produced a documentary about new archaeological excavations in southern Iraq, which aired on HDNet *World Report* in March.

Joshua M. Friedman, A&S '98, formerly with NPR and the Johns Hopkins Berman Institute of Bioethics, joined the ASU Foundation for a New American University as vice president for strategic philanthropy on February 1.

Kyle Pickett, Peab '98 (DMA), is conductor and music director for the Juneau Symphony. The symphony, which is the largest in southeast Alaska, has grown significantly since Pickett assumed his position in 2000.

1999

Kevin Callahan, Engr '99, and his wife, Maggie, live in Austin, Texas, and welcomed their first child last year. Callahan is co-founder of MapMyFitness, which operates a suite of social wellness–oriented websites and associated mobile applications. Additionally, Callahan was recently elected to the board of directors of Running USA.

2003

Lavonzell Nicholson, Bus '03 (Cert), is the founder of PlayNOLA, which organizes sports leagues and networking events for young professionals in New Orleans.

2004

Susan M. Anderson, A&S '04 (MLA), who has enjoyed a long career in orchestra management, was recently named director of operations and artistic administration for the Santa Barbara Symphony.

Holly D. Elwood, A&S '04 (MS), nicknamed "the green electronics lady," is a program manager of the Environmentally Preferable Purchasing Program at the Environmental Protection Agency.

2005

Catherine G. Sutcliffe, SPH '05, '09 (PhD), an assistant scientist with the Bloomberg School of Public Health's Department of Epidemiology, is researching new ways to eliminate malaria worldwide.

2006

Benjamin Beirs, Peab '06, '07 (MM), '09 (GPD), has just released *Widening Circles*, a new CD featuring his interpretations of contemporary classical guitar music.

2007

Bharati Chaturvedi, SAIS '07 (MIPP), founder of Chintan, an Indian environmental research and action group, accepted the first ever Secretary's Innovation Award for Women's and Girls' Empowerment from U.S. Secretary of State Hillary Clinton in March. There were two additional winners of this award.

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GOLOMB'S ANSWERS

Word Changes

Solutions (Puzzle on page 67)

1. Read backward to get: *reviled, time, devil, strap, leper, straw*.
2. Interchange second and third letters to get: *braker, bard, crave, calm, dairy, wrap*.
3. Bring last letter to the front to get: *heart, lease, flea, free, grin, strip*.
4. Precede with *e* to get: *eastern, elate, emission, emotion, equality, erode*.
5. Adjoin *et* to get: *bullet, cigaret, cornet, Internet, skillet, toilet*.
6. Precede with *a* to get: *abet, agreed, aisle, aspire, avenue, averse*.
7. Adjoin *er* to get: *brother, mister, mother, number, shoulder, wander*.
8. Apply pig latin to get: *eBay, outlay, overlay, underplay, ashtray, eight-way*. (This group uses pig latin by spelling. Using pig latin by pronunciation, we would lose *lover/overlay*, but could gain *wonder/underway*.)

Corinne Winters, Peab '07 (MM), a soprano from Frederick, Maryland, was one of six winners of the prestigious 41st George London Foundation Voice Competition.

2008

Jennifer Carinci, Ed '08 (MS), is co-editor of *New Horizons for Learning*, an online journal that publishes articles about teaching strategies and education-based research questions.

Meghan K. Davis, Peab '08, will represent Philadelphia in the "Mary from Dungloe" annual musical contest to be held in Ireland this summer.

Benjamin Peck, Peab '08, '09, a bassoonist, was the National Symphony Orchestra and Washington National Opera development intern from January to May.

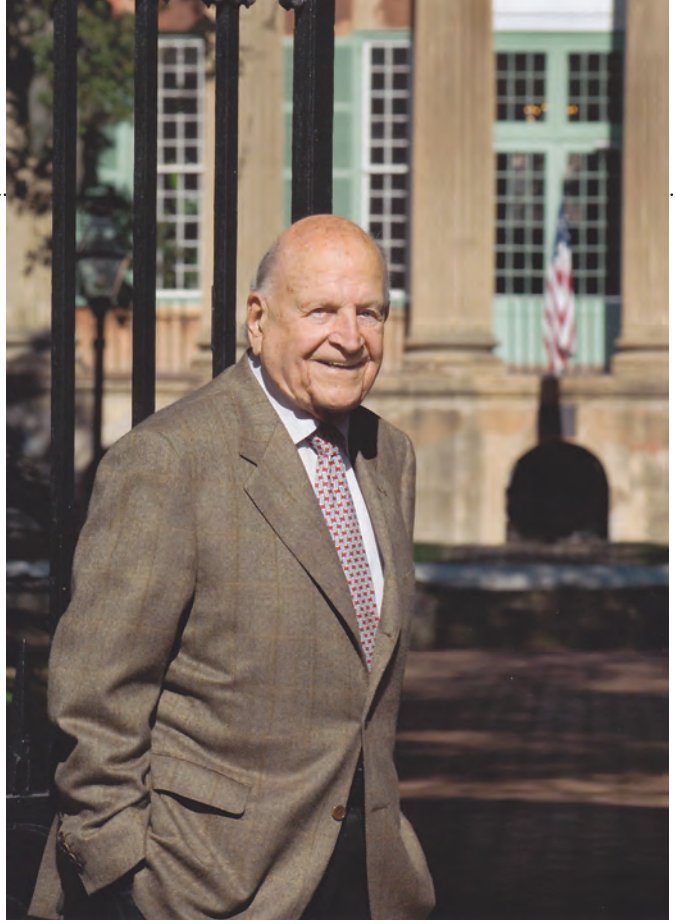
2009

Shalene Gupta, A&S '09, received a 2011–12 Fulbright scholarship to teach English and creative writing in Malaysia.

Melanie S. Hatter, A&S '09 (MFA), received the Washington Writers' Publishing House 2011 Fiction Prize for her novel, *The Color of My Soul* (Washington Writers' Publishing House, 2011).

Courtney Silverthorn, Med '09 (PhD), A&S '11 (Cert), an intellectual property specialist, is deputy regional coordinator of the Federal Laboratory Consortium's mid-Atlantic region.

Michael A. Tanenbaum, A&S '09, SAIS '10, and **Jillian MacNaughton, A&S '10**, launched a new online platform, ConnectCubed, that uses assessment games to connect aspiring traders and bankers with Wall Street recruiters.



PHOTOGRAPH BY JACK ALTERMAN

Leading the Southern Way

As he approaches his 100th birthday, Theodore "Ted" Stern, A&S '34, continues to serve and inspire his adopted hometown of Charleston, South Carolina. A native New Yorker born on Christmas Day 1912, he landed in the city in 1965 after being named commanding officer of the Charleston Naval Supply Center. Upon retiring three years later, Stern was asked to take on the presidency of the College of Charleston, then struggling to survive with fewer than 500 students. He led the integration and modernization of the school; its enrollment grew to more than 5,000 students by the time he stepped down in 1978. By then, he had also lent his considerable energy to the effort to launch the noted arts festival Spoleto USA. Called "the most profound leader of his era" by 10-term mayor Joseph P. Riley Jr., Stern continues to keep daily office hours at the college, offering insight to all comers. JAMES HUNT

2010

Gordon Mack, Engr '10, a video editor, is one of nine winners of the MLB Fan Cave contest. The winners are paid to dwell in the "Fan Cave" on the corner of Fourth and Broadway in Manhattan where they watch all regular season Major League Baseball games and chronicle their experiences through social media.

Lynn Molnar, Bus '10, founded Thankful Paws, an organization that helps people in financial need keep and feed their pets. They have partnered with Meals on Wheels to distribute pet food in Baltimore and surrounding areas. Visit their website at thankfulpaws.org.

Gabriel "Gabe" Plumer, A&S '10, only 23, is the newly appointed mayor of Alexandria Township, New Jersey, and one of the state's youngest municipal leaders.

IN MEMORIAM

Mary C. Walker, Peab '34 (Cert), December 22, 2011, Baltimore.

George S. Eager Jr., Engr '36, '41 (PhD), February 1, Montclair, New Jersey.

Edwin "Ed" S. Berngartt, Engr '37, December 21, 2011, Raleigh, North Carolina.

Charles T.J. Mewshaw Sr., Engr '38, February 17, Catonsville, Maryland.

David Seligson, SPH '42 (ScD), March 3, 2011, Chevy Chase, Maryland.

Curtis Prout, HS '43, December 2, 2011, Manchester, Massachusetts.

Charles "Charlie" A. Wilson Jr., A&S '43, January 3, Baltimore.

Edward E. Bauman, HS '44, December 3, 2008, Verona, Wisconsin.

Evelyn "Evie" Purdy, Nurs '44 (Cert), January 14, Elizabeth, New Jersey.

Alejandro Rodriguez, HS '44, '62, January 20, Palm City, Florida.

Karl E. Hofammann Jr., Med '46, HS '53, January 15, Birmingham, Alabama.

Sara S. Capps, Nurs '47 (Cert), December 30, 2011, Asheville, North Carolina.

William L. Stewart, A&S '47, Med '51, November 18, 2011, Littleton, Colorado.

Doris Kaminsky Mela, Bus '48, February 2, Alexandria, Virginia.

John W. Bolton, Med '49, December 22, 2011, Stuart, Florida.

George W. Heck Jr., A&S '49, June 12, 2011, Baltimore.

Edward B. Lauer, A&S '49, January 2, Severna Park, Maryland.

Walter F. Herman, A&S '50, March 2, Baltimore.

Albert C. Reymann, Engr '50, January 2, Baltimore.

William M. Waters, Engr '50, '56 (MS), '60 (PhD), December 17, 2011, Parkville, Maryland.

Robert W. Watson, A&S '50 (MA), '55 (PhD), February 27, Greensboro, North Carolina.

Martha R. Lumpkin, Med '51, October 18, 2011, Banner Elk, North Carolina.

Judah I. Rosenblatt, A&S '51, February 16, Tucson, Arizona.

William G. Watson, A&S '51, October 31, 2011, Camp Hill, Pennsylvania.

Frederic Printz, A&S '52, December 28, 2011, Allegany, New York.

Robert "Bob" W. Summers, Engr '52, March 1, Baltimore.

Bruce G. Belt, Med '53, HS '54, '58, January 9, Santa Ynez, California.

Basil Gordon, A&S '53 (MA), January 12, Los Angeles.

Philip M. Hastings Jr., Engr '53, March 5, Bangor, Maine.

Dorothy L. King, Nurs '53 (Cert), August 2, 2011, Crossville, Tennessee.

John M. Flexner, Med '54, December 27, 2011, Nashville, Tennessee.

John B. MacGibbon, Med '54 (PGF), December 24, 2011, Baltimore.

Edward S. Goldberg, Engr '55, February 20, Reno, Nevada.

John T. Jenkins, Med '55, August 31, 2011, Spokane, Washington.

James J. McNamee III, A&S '57, '60 (MA), March 9, Baltimore.

James A. Schoettler, Med '57, March 6, Chevy Chase, Maryland.

Howard J. Waskow, A&S '57, January 13, Portland, Oregon.

Allison F. Goddard, A&S '58 (MAT), January 4, Rockford, Illinois.

Francis "Frank" A. Zampiello, A&S '58, December 1, 2011, Philadelphia.

Edmund L. Auchter, SAIS '59, January 24, Sarasota, Florida.

John "Jack" H. Mulholland, Med '59, '62 (PGF), HS '66, December 11, 2011, Fort Myers, Florida.

Robert Ruth, SAIS Bol '60 (Dipl), November 4, 2011, Baltimore.

William "Bill" H. Taylor II, Engr '60, June 13, 2011, Lexington, Kentucky.

Warren R. Leonard, SAIS '61, June 1, 2010, Wilmington, Delaware.

Margot E. Louria, A&S '61 (PhD), November 28, 2011, San Ramon, California.

Thomas E. Quade, Engr '62, December 19, 2011, Odenton, Maryland.

John C. Fiege, Ed '63 (MEd), March 2, Onancock, Virginia.

Malcolm Tenney Jr., SPH '63, February 10, Staunton, Virginia.

James W. Causey, Engr '64, August 20, 2011, Columbia, Maryland.

James "Jim" Skarda Jr., Engr '65, November 27, 2011, Baltimore.

Jesse H. Hurst, Ed '70 (MEd), May 13, 2011, Joppa, Maryland.

John F. Hoffman, Engr '72 (PhD), October 10, 2011, Annapolis, Maryland.

Gilbert Scott-Heron, A&S '72 (MA), May 27, 2011, New York.

Theodore J. Booth, A&S '73 (MLA), '76 (Cert), July 25, 2009, Lewisburg, West Virginia.

Candace D. Lang, A&S '74 (MA), '79 (PhD), October 31, 2011, Atlanta.

Eileen S. Tarcay, A&S '74 (Cert), February 18, Salt Lake City.

Richard L. Cooper, Engr '75, February 18, 2011, Baltimore.

Maria E. Sliwinski, Nurs '77, January 2, San Juan, Puerto Rico.

Jane Anderson Flaherty, Bus '78 (MAS), August 12, 2011, Galena, Maryland.

Grace Angelina Bruno, Bus '83 (MAS), March 7, Avon-by-the-Sea, New Jersey.

Jeffrey "Jeff" A. Cynx, A&S '83 (MA), '86 (PhD), December 24, 2011, Poughkeepsie, New York.

Siegfried B. Christensen IV, A&S '84 (MA/PhD), December 28, 2011, New Orleans.

Constance A. Griffin, Med '84 (PGF), January 8, Baltimore.

Dennis S. Barlow, Med '85, January 20, Eastford, Connecticut.

Patrick T. Liu, A&S '85, January 25, Phoenix.

Nancy Kaye Johnson, A&S '87 (MA), January 21, Oakland, California.

Randall William Welfley, Engr '91 (MS), January 10, Alpharetta, Georgia.

Timothy D. Picciotti, Engr '92 (MS), December 27, 2011, Baltimore.

Donald "Don" A. Kreinbrink, Engr '94 (MS), January 31, Ellicott City, Maryland.

MY LIFE AS AN EGYPTOLOGIST

Written by |
JACQUELYN WILLIAMSON,
A&S '00 (MA), '09 (PhD)

ILLUSTRATION BY LAURIE ROSENWALD

It is still dark outside my cramped, freezing, airless mud room, but the village rooster is crowing, so it must be time to rise. I sigh, pull myself out of bed, and dress quickly in the stifling cold. I check to be sure my clothes provide sufficiently modest cover to avoid offending our gracious Egyptian colleagues. Opening the door sucks a waft of fresher, warmer air into the room.

As I brush my teeth over the sink in the shower house, my colleagues and I blearily but pleasantly greet each other. That is one of the great joys of working with British archaeologists: They are always polite, even early in the morning after two months in the field.

After gulping coffee down, we pile into the bed of a battered pickup truck, gripping the sides to steady ourselves as we lumber over the desert. When the truck stops, routine takes over. We check our squares first to be sure the strings demarcating the newly cut areas are still there. Mohammed, bless him, has started the fire for morning tea. Some of us return to the truck because we are traveling to the larger elite tombs to pursue a different avenue of research. I want to stay for the tea, but I also know that we have not set up a field latrine out there, so abstinence is probably wise.

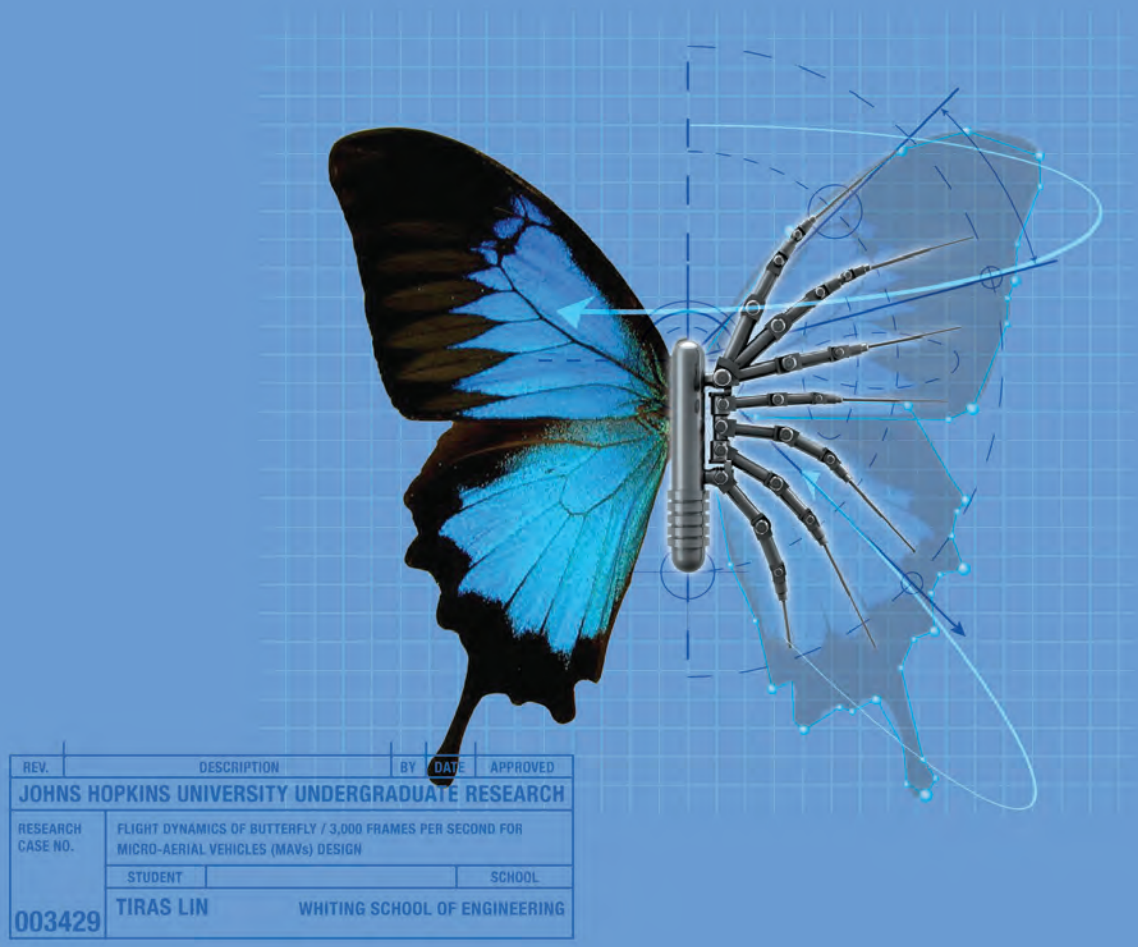
At our site, we trudge up steep hills, no longer really noticing the rolling pebbles underfoot. I wave to other team members who arrived earlier and are already mapping the cliff face. Shouting up the cliff, I promise to share "second breakfast" with them when we meet at the first tomb at 9:30, halfway through our dig day.

My Egyptian team members, all speaking Arabic so rapidly my morning brain can't begin to understand them, lead the way to the tomb we are photographing today. They open the door and bring in lights and scaffolding. I dump my bag by the door as always and enter the tomb. Time passes, my mind clears, my attention sharpens, and I miss second breakfast. A friend brings me a shot of tea and reminds me to eat some fruit. Five minutes later I have forgotten her advice.

Before I know it, it's time to reload my bag, return to the house, process my data, create tomorrow's to-do list. I look forward to "gin o'clock," our cocktail hour before dinner on the roof at sunset. I toast with the members of the dig house to another day done, to one another, to our work.

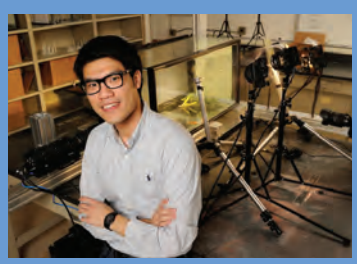
And I silently toast my Johns Hopkins professors Betsy Bryan and Richard Jasnow. Without their training and support, I would not be here in this tortured, difficult, magnificent place working with these brilliant people.

Jacquelyn Williamson is a postdoctoral fellow and lecturer in the Department of Near Eastern Studies at the University of California, Berkeley.



HOW TOMORROW TAKES WING

It starts with a shutterbug…



Specifically Tiras Lin, a rising senior and scholarship recipient, aiming his bank of high-speed cameras and snapping away at 3,000 frames a second. His subject: a tiny, frail butterfly that flits through tight spaces and around any obstacle, even against strong headwinds.

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