

 Washington University in St. Louis

Washington

FALL/WINTER 2017



PURSuing A PRECISION PARADIGM

Dean David Perlmutter, MD, promotes a revolutionary approach to health care, positioning the medical school to make an even bigger difference in patients' lives.



The university welcomed 1,780 new students Thursday, Aug. 17. For them, the exciting day included moving into new living quarters on the South 40; meeting new friends, faculty fellows and RAs; learning cheers and customs of their residential colleges; and hearing from faculty and student leaders at Convocation, pg. 2.



COVER: Dean David Perlmutter, MD, is aligning resources at the School of Medicine to focus on personalized, precision medicine: managing health instead of disease, providing the right treatment for the right patient, and developing drugs and other therapies faster and at lower cost, pg. 10. (Cover photo: James Byard)

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Why move from current standards of patient care to a more personalized approach to treatment? Experts at the School of Medicine describe today's medical landscape as they plan for the care — and cures — of the future.

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Hillary Anger Effenbein, an organizational behavior expert, studies emotions in the workplace — how easy they are to miss or misinterpret, and how they impact performance.

28 **THE PROBLEM WITH FOOD**

The way we're feeding ourselves is devastating rainforests, widening waistlines, exploiting small landholders and causing thousands of pounds of food to go to waste. Alumni and Washington University researchers are working hard to change how we put food on our table.

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James Byard



Daniel Delgado

Alumni are working on new innovations to help address the food problem. One such alum, Jacob Elster, co-founded From Crop to Cup to help subsistence coffee farmers in Africa. See full story beginning pg. 28.

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James Byard

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Digging deep

Mark Katzman



On Oct. 6, I announced to the university's Board of Trustees my intention to conclude my term as chancellor, effective no later than June 30, 2019. The university will conduct a global search for my successor, under the leadership of Craig D. Schnuck, chair of Washington University's board and chairman emeritus of Schnuck Markets Inc.

I am very proud of the progress Washington University has made during my 22 years as chancellor. In partnership with a long list of strong, effective leaders, we have accomplished something extraordinary, building upon the remarkable foundation established by Chancellor Emeritus William H. Danforth.

Every one of our schools has become stronger, thanks to the dedicated and creative leadership of our deans, and we have launched major interdisciplinary initiatives focused on our most important strategic priorities. But we have much work to do to enhance the quality and impact of our university. I will continue to do my best to serve as chancellor until my successor is in place. And I will continue to keep you informed on major developments as the months unfold.

One of our top priorities is to advance human health. In our cover feature, we share a vision for the future of medicine expressed by David Perlmutter, MD, executive vice chancellor for medical affairs and dean of the School of Medicine, and several key physician-scientists at the school. Overall, they aim to improve patient care by "focusing on managing health instead of disease, providing the right treatment for the right patient, and developing drugs and other therapies faster and at lower cost." Through a precision paradigm, they aspire to have an even greater impact on the health of our community. For more, see pg. 10.

Another major development is the project to transform the east end of the Danforth Campus. At press time, the team has completed a three-month excavation phase, and they are now drilling and building out foundations for the new facilities. The image on pg. 3 shows progress as of mid-August 2017.

When finished, we will have three new academic buildings; two new multiuse facilities; an expansion of Mildred Lane Kemper Art Museum; a state-of-the-art underground parking facility; and welcoming green space, Ann and Andrew Tisch Park. Moreover, the two-year capital project will allow us to set a course for the next era of academic excellence and pioneering research.

To follow the transformative project's progress (literally, through one of three webcams), visit campusnext.wustl.edu. For a look back at the groundbreaking ceremony and the important and impressive community support for the initiative, see pg. 40.

At the university, we approach facilities as a means to transform education for all our students. This fall, Washington University welcomed the Class of 2021 — 1,780 new members of the university community. Off to a great start, they began their intellectual experiences with the Common Reading Program and an exploration of Mary Shelley's *Frankenstein* in honor of the 200th anniversary of the novel's publication. See frankenstein200.wustl.edu for more on events celebrating the novel and its still-relevant themes.

I hope you enjoy these stories and more in this issue. I also invite you to visit the Source at source.wustl.edu for more news of today's discoveries and activities.

As always, thank you for your continued interest and support.

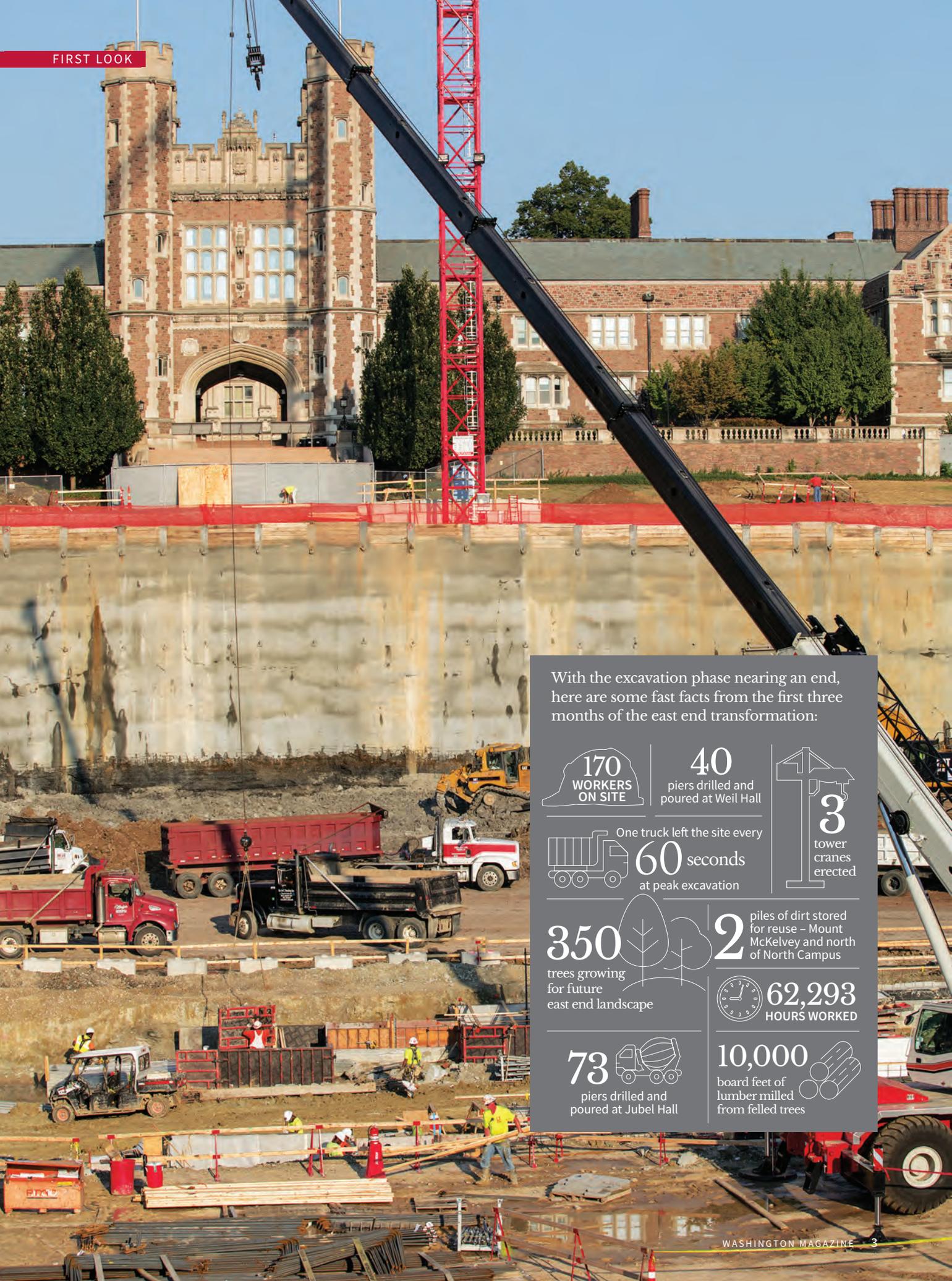
Sincerely,

Mark S. Wrighton

Mark S. Wrighton
Chancellor

You are invited to follow the progress of the east end transformation. Visit the "Campus Next" website to sign up for updates.

[campusnext.
wustl.edu](http://campusnext.wustl.edu)



With the excavation phase nearing an end, here are some fast facts from the first three months of the east end transformation:

170
WORKERS
ON SITE

40
piers drilled and
poured at Weil Hall

3
tower
cranes
erected



One truck left the site every
60 seconds
at peak excavation

350

trees growing
for future
east end landscape



2

piles of dirt stored
for reuse - Mount
McKelvey and north
of North Campus



62,293
HOURS WORKED

73

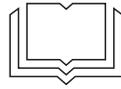
piers drilled and
poured at Jubel Hall



10,000

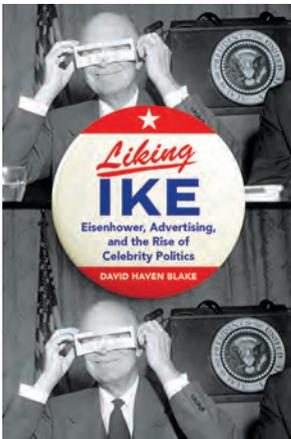
board feet of
lumber milled
from felled trees





Must-reads

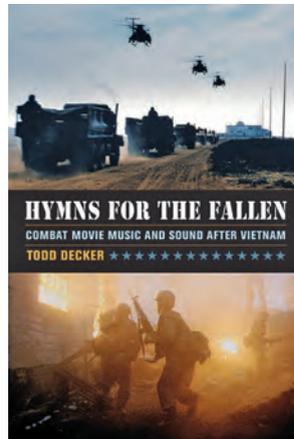
On topics from Eisenhower to atheists,
here are the latest faculty and alumni books that are sure to
provoke, delight and enlighten.



David Haven Blake

Liking Ike: Eisenhower, Advertising, and the Rise of Celebrity Politics

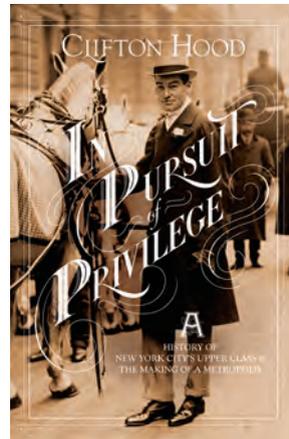
"I like Ike," the campaign slogan for Dwight D. Eisenhower, is one of the most famous in modern history. According to David Haven Blake, PhD '94, in his award-winning book *Liking Ike*, this was no happy accident. Blake argues that it was Eisenhower, not JFK, who was the first politician to harness the power of advertising and celebrity culture for his political campaigns, thus changing America's political and cultural landscape.



Todd Decker

Hymns for the Fallen: Combat Movie Music and Sound After Vietnam

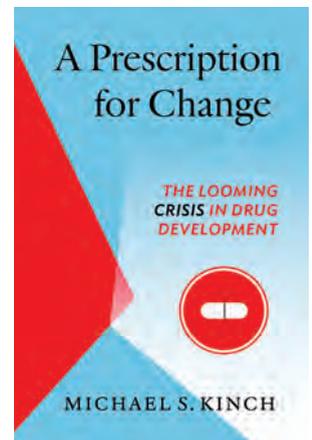
You can learn a lot by listening, as Todd Decker, professor in music and film and media studies, shows in his book *Hymns for the Fallen*, a look at post-Vietnam War Hollywood film sound. Films such as *Apocalypse Now*, *Saving Private Ryan* and *Platoon* use sound — dialogue, music and sound effects — to let audiences encounter what the modern American soldier went through in war, in an experience both patriotic and memorializing.



Clifton Hood

In Pursuit of Privilege: A History of New York City's Upper Class and the Making of a Metropolis

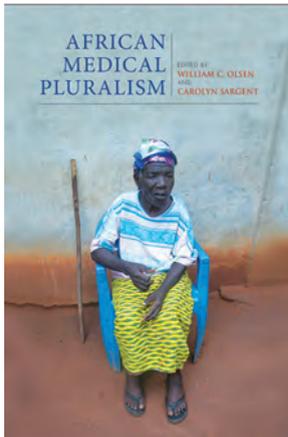
In 1888, there were — stated Ward McAllister, an arbiter of Gilded Age society — 400 members of the New York aristocracy. Just a decade later, Cornelia Bradley-Martin's costume ball included 800 professed aristocrats. Five years later, there were 25,000. *In Pursuit of Privilege*, Clifton Hood, AB '76, tells the story of this changing NYC aristocracy and how it grew despite efforts to keep out newcomers.



Michael S. Kinch

A Prescription for Change: The Looming Crisis in Drug Development

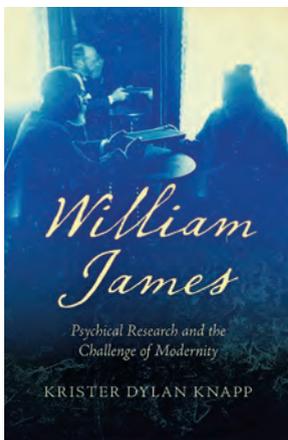
In *A Prescription for Change*, Michael Kinch, associate vice chancellor and director of the Center for Research Innovation in Biotechnology, tells about the looming crisis in the pharmaceutical industry. Bringing a drug to market costs \$2.6 billion, and most pharmaceutical companies have shut down their research and development wings as a result. To keep new drugs coming to market, Kinch argues, we must find ways to lower the cost of producing them.



Carolyn Sargent (and William C. Olsen)

African Medical Pluralism

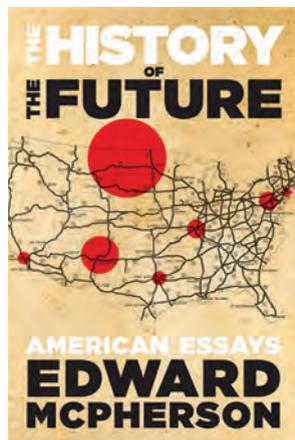
In this collection of ethnographic essays, editors Carolyn Sargent, professor of anthropology and women, gender, and sexuality studies, and William C. Olsen examine health care on the African continent. Most patients in Africa draw on a “therapeutic continuum” that includes traditional medicines like herbs, religious healing and the latest biomedical technology. Through a look at these treatments, scholars examine how Africans perceive sickness and understand suffering.



Krister Dylan Knapp

William James: Psychical Research and the Challenge of Modernity

William James, the “father of American psychology,” taught the first psychology course in the U.S. and influenced great thinkers such as Bertrand Russell, W.E.B. DuBois and Emile Durkheim. Senior lecturer Krister Dylan Knapp’s *William James* looks at the great thinker’s psychical research, which was part of a broad transatlantic trend of Europeans and Americans trying to balance science and religion as they moved forward in an uncertain modern time.



Edward McPherson

The History of the Future: American Essays

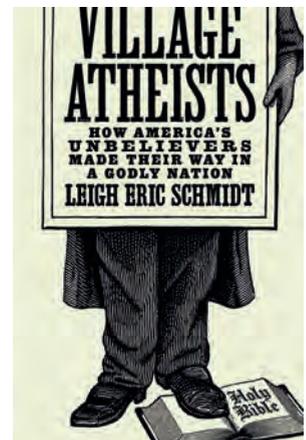
Edward McPherson’s new book, *The History of the Future*, looks back to move forward. In prose that blends personal narrative and historical research with folklore and myth, the assistant professor of creative writing compares Dallas to *Dallas* and fracking to digging for dinosaurs in North Dakota boomtowns. With this approach, McPherson points out our need for a moral imperative of preservation rather than profit if we want to have any future at all.



Sara Flannery Murphy

The Possessions

In *The Possessions*, by Sara Flannery Murphy, MFA '09, Edie’s job is to be possessed by the dead, so mourning Elysian Society clients can talk to lost loved ones — usually. Sometimes people have far more sinister aims, and Edie can’t remember what happens while she’s possessed. When handsome Patrick Braddock shows up, mourning his late wife, Sylvia — who died under mysterious circumstances — Edie’s controlled life begins to unravel as the line between her and Sylvia grows ever thinner.



Leigh Eric Schmidt

Village Atheists: How America’s Unbelievers Made Their Way in a Godly Nation

What does it mean to be atheist in America? Leigh Eric Schmidt, the Edward C. Mallinckrodt Distinguished University Professor at the John C. Danforth Center on Religion and Politics, tells the history of American secularism and the many individuals — such as atheist sex reformer Elmina D. Slenker — who dissented, at their peril, with prevailing pieties. Despite separation of church and state, Schmidt shows faith and citizenship are often interwoven.



Joe Angeles

Three questions on Why science matters with Dean Barbara Schaal

BY ROSALIND EARLY

Nowadays, nearly everything seems to be politicized. Even science, with its nonpartisan mission to understand how the natural world works, is caught in the crosshairs. A large portion of scientific funding in America comes from the U.S. government and is facing significant cuts.

“[The cuts] seem to be related to a wider national conversation about whether science is simply opinion versus consensus fact,” says Barbara Schaal, dean of the Faculty of Arts & Sciences and the Mary-Dell Chilton Professor in the Department of Biology.

As past president of the American Association for the Advancement of Science, the world’s largest general scientific society, Schaal has often stepped in to defend science. Here, she explains the importance of government-funded research.

Why can’t private institutions fund science instead of the government?

If we want to develop the technologies of the future — the advances in health, in agriculture, and the technologies that stimulate new businesses and help our economy remain stable — we need to have a vigorous basic science enterprise. Basic science provides the raw material for future

developments. The U.S. government has provided the financial resources to support basic research in, for example, biology, molecular biology, cell physiology ... and that has resulted in tremendous advances in medicine. [Private] foundations do a tremendous service to society. But they have very specific agendas and very specific objectives. The value of government-funded

research, allocated by competitive grants, is that it allows the best and brightest people to pursue science across the range of its disciplines.

Why doesn’t it have the same impact if the science is focused only on applied areas?

We don’t know what’s going to be the next game-changing technology of the future, and we don’t know which scientific discoveries will lead to that technology. For example, the workhorse of molecular biology that allows us to do DNA sequencing and has fostered amazing advances in treating diseases like cancer is the result, in part, of scientists noticing that there’s abundant bacterial growth in hot springs. They wondered how these bacteria can grow under temperatures that are deadly for most life forms. (If the temperature gets too hot, biological life stops because proteins — enzymes — denature and no longer function.) The discovery of thermostable enzymes led to the development of PCR (polymerase chain reaction), which is the backbone of molecular biology.

How can we get more people to understand the value of science?

I don’t think it is inherent that people dislike science. We haven’t done a good job of making science generally interesting or in communicating the excitement and value of science. When you look at some school curricula, students are just memorizing. What you want instead is to teach someone how fun and exciting science is. How do bacteria live in hot springs? How do geckos run up a wall or stay on glass without falling off? How does the touch screen on your iPhone work? There’s a whole world of topics that are fascinating! People tend to think science is only for geniuses; it’s not at all. Science is about knowing and understanding the natural world.



These quotes are from *Hold That Thought*, a podcast produced by Arts & Sciences, where in 15 minutes you can learn about the allure of Shakespeare, the most attractive personality traits or the secrets stored in rocks. Check it out on Soundcloud, Stitcher, PRX, iTunes or thought.artsci.wustl.edu.



THE BLUES “For several decades ... the tent shows were a huge entertainment form. They were largely [staged by] all-black companies . **And they had the blues.** In these huge tents ... a new sound was coming to life.”

— Paige McGinley, assistant professor of performing arts, in “*Staging the Blues: The Ma Rainey Story*”

UNIONS “Labor unions brought working people into the political sphere. Now we’re in a situation where **organized labor** has vastly declined in its ability to do that.”

— Jake Rosenfeld, associate professor of sociology, in “*Right to Work? Unions & Income Inequality*”



LIBRARY “As soon as I saw this ... there was no doubt that we have an **authentic Michelangelo document in our library.** It was completely unknown — or completely unpublished — at that time.”

— William Wallace, the Barbara Murphy Bryant Distinguished Professor of Art History, in “*The Many Lives of Michelangelo*”



ASTHMA “It’s the No. 1 reason that children miss school. It is a chronic condition. ... And statistics do show that asthma disproportionately impacts **poor and minority children in urban centers.**”

— Kelly Harris, doctoral student in education, on what inspired her to use Geographic Information Systems to map “hotspots” of childhood asthma in St. Louis in “*Mapping Asthma: The Geography of Inequality*”

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Adopting health

1 Reduce 'friction costs'



"Behavioral science teaches us that we can increase our chances of succeeding at a desired behavior by reducing 'friction costs.'

The idea is that the more steps something requires, the harder or more frustrating we find it. The reverse is true as well — the easier something is, the more likely we are to do it. So think about streamlining processes so it's easier to make healthy choices. For example, cutting up fruits and vegetables as soon as you get home from the store increases the chance that you will turn to them for a snack or last-minute meal."

— **Michal Grinstein-Weiss** is a professor at the Brown School and founding director of the Envolv Center for Health Behavior Change. She is also associate director of the Center for Social Development and studies behavior-based health-care interventions.

2 De-stress by giving up overcommitting



"[Requests are] usually for some time that is far into the future — say, a month from now. You look at your calendar, and it looks rather empty. So you say to yourself, 'Since I'm mostly free a month from now, how can I say no?' But our future is not really going to be free; the details are just not filled in yet. [So] when you receive a request, imagine that you ... are fully booked that day without the ability to switch anything around — maybe you are out of town. Now, try to gauge your emotional reaction to this news. If you feel sad, you should go ahead and accept the request. However, if you feel relieved that you can't do it, turn it down."

— **Dan Ariely** is faculty director of the Envolv Center for Health Behavior Change and a leading researcher in behavior economics. This is adapted from his book *Irrationally Yours: On Missing Socks, Pickup Lines, and Other Existential Puzzles*.

hy behaviors

3 Look for social support, if and when you need it



“Not everyone needs social support to change every habit, but the ones that are more social in nature (like going out to eat with others) may require some negotiation and invitations for support. Family members who do not support healthy-eating intentions or tobacco-cessation attempts will make it much harder for the person trying to make a change to succeed. Co-workers can be helpful by not always bringing in cookies and cakes to the office and by suggesting walking or stretching breaks or meetings.”

— **Amy McQueen** is an assistant professor in the School of Medicine, co-director of the Health Communication Research Lab in the Brown School and lead faculty of the Envolv Center for Health Behavior Change.

4 Use a complete plan



“Excessive weight gain, weight loss and weight maintenance are complex outcomes influenced by biology; individual eating and behaviors; and family, social, community and environmental influences. (For example, an environment that promotes over-consumption through media and easy access can sabotage the best efforts to maintain weight loss.) These influences operate together to challenge weight loss and maintenance efforts. Any weight gain-prevention method that is not comprehensive, multi-component and sustainable is going to have less effectiveness. The more comprehensive an effort can be, including eating and regular activity, the more effective it will be.”

— **Debra Haire-Joshu**, the Joyce Wood Professor at the Brown School and the School of Medicine, is director of the Center for Diabetes Translation Research and the Center for Obesity Prevention and Policy Research, as well as faculty director of the Envolv Center for Health Behavior Change.

Faculty at the Envolv Center for Health Behavior Change, a collaboration among Washington University, Duke University and Centene Corp., share what it takes to make bad habits into good ones.

5 Keep kids healthy



Illustrations: Monica Duvel

“Parental modeling is critically important in forming a child’s eating and health habits. Children observe and want to emulate their parents, and parents are constantly, often unconsciously, sending important messages to their children about their eating behaviors. In school, limiting what kids can buy would promote healthier snacking. While policies may apply to foods sold as part of school food service, more comprehensive policies including vending and other food sources such as fundraisers (e.g., bake sales) and school stores are likely more effective. Another factor that can help children make healthy food choices at school is to limit advertising for items such as soda and fast food.”

— **Rachel Tabak** is a research assistant professor at the Brown School. She works in obesity prevention and community-based physical activity and nutrition strategies at the Prevention Research Center and the Envolv Center for Health Behavior Change.

6 Know what’s outside your control

“The behaviors that lead to obesity (e.g., unhealthy dietary behaviors, inadequate physical activity) are complex. While in the end, individuals make choices about their behavior, these choices are influenced by many factors, some of which are out of their control. These include genetic, environmental and policy factors. Research has demonstrated that genetics may make a significant contribution to the risk for obesity. Environment and policy factors influence what foods are available in an individual’s neighborhood and the relative affordability of these foods (i.e., if healthy foods are cheaper than unhealthy foods). With respect to physical activity, the choice to be active is much more difficult if an individual feels her neighborhood is unsafe.”

— **Rachel Tabak**

PURSUING A PRECISION PARADIGM



Why move from current standards of patient care to a more personalized approach to treatment? Experts at the School of Medicine describe today’s medical landscape as they plan for the care — and cures — of the future.

BY TERRI NAPPIER

Of the top-grossing domestic movies of 2017 to date, three of the Top 5 feature superheroes: *Wonder Woman*; *Guardians of the Galaxy, Vol. 2*; and *Spider-Man: Homecoming*. Similarly, in 2016, five of the Top 10 movies focus on adventure and heroes, including *Captain America: Civil War* and *Batman v Superman: Dawn of Justice*. Studying the genre, examples emerge at the top of movie lists year after year. In these films, the “heroes” venture out and engage in great and noble deeds against incredible odds on behalf of a group, population or civilization.

The battle between good and evil is a consistent theme in art and considered a timeless and universal element of the human condition — not unlike the age-old battle between health and disease.

Cancer, Alzheimer’s, multiple sclerosis, inflammatory bowel disease, diabetes, heart disease and more are formidable foes. Yet in their quest to conquer these debilitating, sometimes life-threatening adversaries and save lives, the Washington University Medical Center and its bold team of physicians and research scientists are starting to wield new, more precise weaponry.

As these bright, committed men and women stand on the threshold of a revolution in medicine, they are primed to confront new obstacles and venture down new pathways in their pursuit of precision therapies designed for individual patients.

THE VISION: imagining what science can do

David Perlmutter, MD, might question the label “hero,” yet he focuses his highly developed skills on behalf of society. Among his proficiencies is transformational leadership. As executive vice chancellor for medical affairs and dean of the School of Medicine, he directs a vast organization: hundreds of brilliant physicians, physician-scientists and research scientists; the No. 1 program in the country training MD/PhDs (the physician-scientists of tomorrow); the No. 1 Alzheimer’s disease research center; the No. 3 cancer center; and leading departments and centers in genomics, immunology, microbiology, pediatrics and more.

Perlmutter also possesses keen vision. He sees the future of medicine right now: a “precision paradigm,” supporting the personalized treatment of patients, rather than the current standards of care that guide treating all patients with the same condition. By leveraging the medical school’s incredible strengths today, Perlmutter is positioning his team to make an even greater impact on human health tomorrow.

The landscape en route to making this revolutionary shift is also being made over. The Washington University Medical Center — Barnes-Jewish and St. Louis Children’s hospitals, BJC HealthCare and the Washington University School of Medicine — is in the middle of a multi-phase, long-term campus renewal project. The objective: to foster more collaborative medical discovery and improve patient care.

From his office on the 12th floor of the new Mid Campus Center, Perlmutter is situated at the heart of this renewal. Underlying his vision and these infrastructure modifications is a major transformation in the academic, medical profession in general: a big change in the way physicians and research scientists view patients.

For a very long time, the medical profession has known that patients have different characteristics impacting their disease, but because of the state of knowledge, clinicians and research scientists had to lump them into disease groups. Perspectives started to shift once the sequencing of the human genome was completed in 2003. Researchers could then begin to see the genetic variations in patients and consider their unique susceptibilities to disease.

Perlmutter shares an example from his time as a clinician to further explain. A pediatric gastroenterologist, he has many years’ experience taking care of children with inflammatory



David Perlmutter, MD

pa/g sauler

“This shift demonstrates the true value of understanding disease and taking care of disease — and being able to imagine what science can do to improve on that.”

bowel disease (IBD), which, according to the textbooks, can be broken down into two disease types: ulcerative colitis and Crohn’s disease. Yet Perlmutter knew early in his career that not all of his patients diagnosed with having ulcerative colitis responded the same way to the standard treatment for the condition, and the same was true of his patients with Crohn’s disease. Fast forward to today, and through genetic sequencing and analysis, researchers now know that more than 220 genetic variants are associated with IBD.

“We were practicing medicine for children with IBD — and we still are today — based on a two-disease view, and treatments are designed for this two-disease view,” Perlmutter says. “But the truth is, one person’s disease is different from the next person’s.” This treatment model — not knowing or considering the different mechanisms occurring in individual patients — is behind the shortcomings of current IBD therapies as well as treatment for other diseases.



Skip Virgin, MD, PhD

Robert Boston

“We study genes and figure out why a variation is related to a disease; we study environmental triggers; and then we do our very best to take apart a specific pathway ... that will lead to the development of therapeutics.”

Still, Perlmutter emphasizes, it isn't enough just to note these genetic differences — these sequence variants — among patients.

“Our position now is to figure out *how* to capitalize on these differences, not only to understand the disease better, but to develop better diagnostics and better therapies that lead to better patient outcomes,” Perlmutter says. “Further, by investigating variants, we are almost always learning something new about the function of the affected gene, and this means advancing new knowledge about basic biological mechanisms of the living organism. And that's very motivating.”

Another very important outcome of the personalized medicine paradigm, Perlmutter says, is that clinical trials will happen more quickly, will be more likely to give a definitive answer, and will be much less expensive because subjects of the trials will be genomically defined. “With a better evidence base and the ability to target expensive therapies to specific patient subgroups and, in some cases, avoid the need for any

interventions, we will put ourselves in a position to reduce the cost of health care in a transformational way,” he says.

Perlmutter is promoting personalized, precision medicine because it's a “powerful and revolutionary idea.” He says that it's an enlightened view as well — and why he believes Washington University is so well-positioned to lead this transformation in medicine.

“The School of Medicine is one of several places in the world where the physician-scientist has been a primary focus, and in many ways this shift is the next evolution of the physician-scientist,” Perlmutter says. “This shift demonstrates the true value of understanding disease and taking care of disease — and being able to imagine what science can do to improve on that. It's the validation of *why* we want to have people who understand both clinical medicine and very sophisticated basic science.”

THE LANDSCAPE: determining genes, environmental triggers, pathways

By design, scientists who fit that archetype blanket the School of Medicine. Some of these dreamers, seekers, hunters, explorers and investigators lead departments, institutes, centers and labs; some work at the bench, creating model systems and searching for genetic variants, mutations, signals and pathways; and

still others delve into environmental influences, bacteria and viruses — pursuing clues to deciphering the causes of disease while decoding possible novel sites for targeted therapies.

This article can highlight only a very few of the brilliant minds who, through their dogged determination, are hastening the school's evolution toward personalized, precision medicine by focusing on managing health instead of disease, providing the right treatment for the right patient, and developing drugs and other therapies faster and at lower cost.

One such investigator is Herbert W. “Skip” Virgin IV, MD, PhD, the Edward Mallinckrodt Professor and head of the Department of Pathology and Immunology.

Virgin explains that you can personalize care for people only if you can diagnose what about them needs a specific therapy, and that's where his department comes in. On the pathology side, for example, if a person has cancer, it isn't always true that a certain chemotherapy will work or work

well. So Virgin's department deep-sequences cancer genes in tumors and then reports back to the oncologist. Then the oncologist can know what therapeutic choices might be most beneficial for a particular patient.

On the immunology side, using IBD as an example (as Perlmutter referenced), Virgin explains that in the last 10 years, researchers discovered a strong genetic component for both the susceptibility and the severity of ulcerative colitis and Crohn's disease. One question researchers have subsequently asked is, How much of the risk, say, for Crohn's disease, is in the genes? The generally accepted answer is less than 20 percent, meaning that 80 percent of the risk is due to something else. And researchers now think that "something else" is environment: where we live; what our current exposures are; what our exposures were early in life, including to antibiotics, which could change our gut bacteria and permanently imprint our immune system; and what our microbiome — the bacteria, viruses, fungi and worms that live in and on us in enormous quantities — is like.

In Virgin's lab, researchers specialize in a part of the microbiome that's called the virome, and they have been among the leaders in relating viruses to susceptibility in inflammatory bowel disease, AIDS, risk for HIV acquisition, diabetes and more.

In a recent diabetes study, for example, Virgin discovered viruses that conferred risk for type I diabetes as well as a virus that looked as if it conferred protection against the disease. "It's a virus that could be good, and it just makes sense," Virgin says. "We've got bacteria that are good for us: They digest our food; they make vitamins that are very important for our body. And then there are pathogenic bacteria. Viruses are the same. We don't want HIV, hepatitis C, influenza. But there's a huge number of nonpathogenic viruses, which probably confer benefit to the host."

In Virgin's lab, they're also researching a certain set of genes in a process called autophagy, which is an intracellular degradation system that can also be a major determinant of disease susceptibility and outcomes. They're studying the mechanism and then developing drugs — compounds to correct defects or take advantage of what they've learned about this pathway to treat disease.

Again with IBD, researchers are going after this specific pathway therapeutically because they have discovered that one of the genes for Crohn's is an autophagy gene. Now, can they make a drug that targets autophagy and treats Crohn's disease? "That's what we're trying to do, and we'll know when we've done it," Virgin says.

Like Perlmutter, Virgin imagines this as the future of all advances in medicine. "We study genes and figure out why a variation is related to a disease; we study environmental triggers; and then we do our very best to take apart a specific pathway — a gene or a pathway — that will lead to the development of therapeutics," he says.

Building the foundation for discovery

According to Dean Perlmutter, the School of Medicine will continue making strides toward a precision paradigm where it has "enormous" capabilities: Alzheimer's disease, antibiotic resistance, autoimmune diseases, cancer, diabetes, emerging infections, obesity and more.

To enhance these capabilities and improve efficiency, the school is building key infrastructure between clinical medicine and basic science.

ELIZABETH H. AND JAMES S. MCDONNELL III GENOME INSTITUTE

One of only three NIH-funded large-scale sequencing centers in the U.S., the McDonnell Genome Institute is a world leader in genome sequencing and analysis. Acting director: Susan Dutcher, PhD, Professor of Genetics

ANDREW M. AND JANE M. BURSKY CENTER FOR HUMAN IMMUNOLOGY AND IMMUNOTHERAPY PROGRAMS

Researchers work to understand the immune system and its potential for treating cancer, fighting infection and providing novel treatments for immune disorders. Director: Robert Schreiber, PhD, the Andrew M. and Jane M. Bursky Distinguished Professor of Pathology and Immunology

THE EDISON FAMILY CENTER FOR GENOME SCIENCES AND SYSTEMS BIOLOGY

The center addresses global health issues by researching how microbes, especially our gut microbiome, affect our well-being. This research has fundamentally changed our understanding of obesity and childhood malnutrition. Director: Jeffrey I. Gordon, MD, the Dr. Robert J. Glaser Distinguished University Professor of Pathology and Immunology (See "The father of the microbiome" in spring 2017, magazine.wustl.edu.)

CENTER FOR CELLULAR IMAGING

Researchers provide advanced microscopic imaging of cellular structures to improve the understanding of human health and disease. Scientific Director: James Fitzpatrick, PhD, Associate Professor of Neuroscience and Cell Biology and Physiology

CENTER FOR DRUG DISCOVERY AND THERAPEUTICS

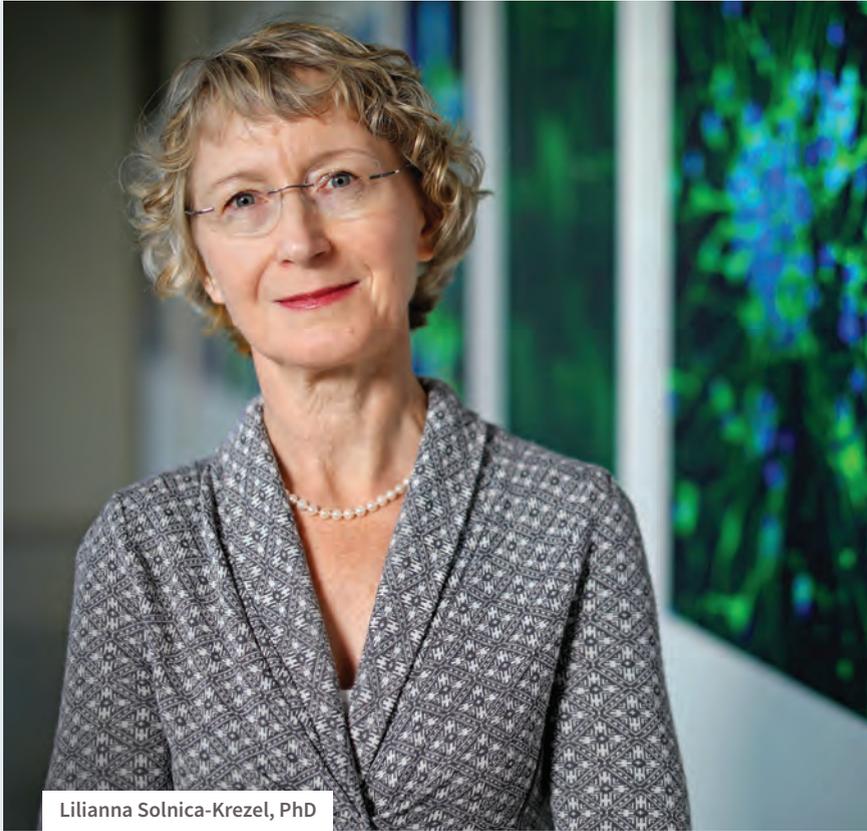
The center advances new drug discovery and finding better, safer and more effective ways to use existing drugs to treat disease and improve human health. Director: Michael Kinch, PhD, Associate Vice Chancellor and Director, Center for Research Innovation in Biotechnology

CENTER OF REGENERATIVE MEDICINE AND SIMPLE MODEL ORGANISMS

Scientists explore the regenerative properties of cells and tissues to develop new treatments that could regrow organs and restore health. Co-Directors: Farshid Guilak, PhD, Professor of Orthopaedic Surgery; Lilianna Solnica-Krezel, PhD, the Alan A. and Edith L. Wolff Distinguished Professor and Chair, Developmental Biology (With Gary Silverman, MD, PhD, the Harriet B. Spoeher Professor and

THE DREAM: fixing mutations and altering pathways

Jeff Milbrandt, MD, PhD, is a dreamer. One of the medical school leaders who first recognized the need for using DNA sequencing in the clinical arena, he now heads the James S. McDonnell Department of Genetics. Milbrandt, the James S. McDonnell Professor of Genetics, says that we're living in the "fanciful era" now — an era of genome editing, in which researchers have the power to alter genes. Further, they're able to generate induced pluripotent stem cells (iPSC), taking skin cells or cells from blood



Lilianna Solnica-Krezel, PhD

head of the Department of Pediatrics, Solnica-Krezel co-directs PreMIER [Precision Medicine Integrated Experimental Resources], a new initiative to harness the power of simple model organisms and human pluripotent stem cells for precision medicine.)

GENOME ENGINEERING AND INDUCED PLURIPOTENT STEM CELL (iPSC) CENTER

The center offers genome editing technologies to assist in generating modified cells and organisms; produce precise disease models; and support investigators in all aspects of generating, maintaining and differentiating induced pluripotent stem cells to study directly or differentiate into a variety of cell types. **Director:** Xiaoxia Cui, PhD, Assistant Professor of Genetics

INSTITUTE FOR INFORMATICS

The institute uses advanced computational expertise to explore massive data sets and help discover individual and population-wide health benefits. **Director:** Philip Payne, PhD, FACMI, the Robert J. Terry Professor

Along with Farshid Guilak, Lilianna Solnica-Krezel (above) co-directs the Center of Regenerative Medicine and Simple Model Organisms. Angela Bowman, assistant professor of developmental biology, serves as executive director.

**For more on the brilliant physicians and scientists leading these centers, visit magazine.wustl.edu.*

or urine and transforming them into stem cells. These stem cells can then be converted into almost any cell in the body, providing a system for studying how specific mutations lead to cell malfunction and cause disease.

To do this, scientists use CRISPR technology — a powerful editing tool that allows them to easily alter DNA sequences and modify gene function. In addition to editing cell lines and generating iPSCs, they can create model systems to explore and screen for thousands of drugs to see if any reverse a specified mutation. This is all happening now.

have good leads on small-molecule drugs that might work in neuropathy, but they are also testing whether gene therapy with viruses can fix the degeneration directly.

“As we delve more deeply into the fundamental pathways that are being altered by these diseases, we start to see commonalities,” Milbrandt says. “For instance, the axonal degeneration that happens in neuropathy also happens in Alzheimer’s, Parkinson’s, MS and other diseases. By dreaming big and discovering a way to block that sort of degeneration, we could possibly impact all these disorders.”

“In the next five years,” Milbrandt says, “we’re going to go from *cataloguing* mutations — and saying, ‘This mutation is causing this particular problem’ — to *fixing* the mutation using CRISPR. Then we’re going to inject these CRISPR components, in the form of a virus, into your body and basically, magically, fix the mutation.”

Milbrandt says that although some ethical concerns remain, progress is inevitable. He says he can visualize incredible advancements on the horizon — a day when someone with muscular dystrophy will walk, or when someone with retinitis pigmentosa will see. “This is not futuristic stuff anymore,” he says. “It will soon be reality.”

To position the medical school at the leading edge of this work, Milbrandt and others have created the Genome Engineering and iPSC Center to assist other investigators in using CRISPR genome engineering for their studies. (To learn more about centers playing pivotal roles in the medical school’s efforts in precision medicine, see sidebar at left.)

In his own work, Milbrandt studies peripheral neuropathy, a condition that develops as a result of damage to the peripheral nervous system. Symptoms range from muscle tingling and weakness to pain and paralysis. This condition can be inherited or induced by diabetes or chemotherapy treatment for cancer. Chemotherapy is helping save more and more lives, yet at the same time, more folks are affected by the painful neurological side effects of their treatment.

Using the latest technologies, Milbrandt and collaborator Aaron DiAntonio, MD, PhD, the Alan A. and Edith L. Professor of Developmental Biology, are working to understand the exact pathways that lead to the root cause of neuropathy: axonal degeneration. They have found the central executioner of this destructive process and

A MODEL: personalizing cancer care

Perhaps no area at the university is as far ahead in the progression toward personalized, precision medicine as the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine.

In the last 20 years, mortality from cancer — the No. 2 leading cause of death today in the United States — has decreased by 25 percent. And, according to Tim Eberlein, MD, director of Siteman Cancer Center, that drop in mortality is going to accelerate, because researchers are “now at the threshold of being able to control the disease instead of the disease controlling us.”

With that goal in sight, Siteman has established very large, robust programs in leukemia, lymphoma, myeloma, breast cancer, lung cancer, brain cancer and more. And it has outlined four major strategic initiatives in collaboration with other departments to advance care: genomics, immunology/immune therapies, technology and imaging, and prevention.

Regarding the first initiative, researchers at Washington University have made a massive effort since the sequencing of the human genome to identify genomic information associated with cancers. Eberlein estimates that nearly 99 percent of the mutations associated with human cancer have been identified. Siteman Cancer Center and the Elizabeth H. and James S. McDonnell III Genome Institute led this global effort. (See sidebar at right to learn more about the work of Timothy Ley, MD, who inspired and collaboratively led the team that sequenced the first cancer genome in 2008, and the challenges he has faced and insights he has gleaned in treating patients with acute myeloid leukemia ever since.)

“We realize now that cancer is thousands of different diseases,” says Eberlein, who is also the Bixby Professor of Surgery and head of the Department of Surgery at the School of Medicine. “So Patient A’s breast cancer, for example, may be very different from Patient B’s breast cancer, even if the two cancers look the same under a microscope, are the same size or are in the same breast. These differences are based on molecular and genetic markers that cause the cancer to behave in different ways.”

Eberlein says the question now is, How do scientists apply that knowledge to diagnose and treat the next individual patient who walks through the door?

Siteman’s second initiative centers on immunology and targeted immune therapy. For years, researchers — including Robert Schreiber, PhD, the Andrew M. and Jane M. Bursky Distinguished Professor of Pathology and Immunology and director of the Andrew M. and Jane M. Bursky Center for Human Immunology and Immunotherapy Programs (another pivotal center

Undaunted explorer

Timothy Ley, MD, the Lewis T. and Rosalind B. Apple Professor of Medicine, has been investigating leukemia, particularly acute myeloid leukemia (AML), for decades. A glimpse of his research over just the past 10 to 15 years — featured in journals like *Nature*, *Cell*, the *New England Journal of Medicine* and *Journal of the American Medical Association* — illustrates how challenging the journey has been, yet it also showcases the resolve that he and his colleagues continue to display in their quest for answers and ultimately cures for this terrible disease.

After the human genome was sequenced in 2003 (after nearly 13 years of research and more than \$2 billion in funding), Ley proposed an audacious plan to find all the mutations associated with AML, which is a heterogeneous set of diseases with many subtypes. He approached Rick Wilson, then director of the university’s Genome Sequencing Center (now the McDonnell Genome Institute), with the idea, and they both knew it would be too daunting and too expensive to do at the time.

Yet they prepared for a day when the cost of sequencing would go down and speed would go up. Banking the right samples from people with AML, and tracking their disease to identify all the laboratory and clinical features, Ley and John DiPersio, MD, PhD, the Virginia E. & Sam J. Golman Professor of Medicine and chief of the Division of Oncology, and their colleagues laid the groundwork for research to come. In 2007, a technical breakthrough — next-generation sequencing — dropped the cost of sequencing a genome by nearly 1,000-fold and allowed them to proceed.

Cobbling together funding from various sources, the team from the Genome Sequencing Center and the oncology division began the initial sequencing work. But funding ran short, and none of the usual sources were willing to pitch in at the time. The work was new, unproven, expensive and risky. Soon thereafter, however, they received a visionary gift from Alvin Siteman to conduct whole genome sequencing on two patients with AML; these were the first cancer genomes to be sequenced in the world. The aim was to begin to define AML-specific mutations that could identify who would do poorly and who would do well after therapy. Each AML sample had about 1,000 mutations, but only 10 to 15 were in genes. This work catapulted their efforts into the national spotlight and was featured on the front page of *The New York Times*.

These findings created a blueprint for cancer genome sequencing and allowed the team to acquire major long-term funding from the National Cancer Institute. The WashU team then collaborated with The Cancer Genome Atlas to sequence hundreds of AML cases. This work led to the discovery of nearly all the genes mutated in AML patients and provided the foundation for a new understanding of the disease.

“The grand idea was that by retrospectively analyzing banked samples (from patients whose outcomes were known), we would be able to recognize mutations that would better predict who was going to do well and who wasn’t. We could then reclassify our

patients and tailor therapy for each person. But it didn't work out that way," says Ley, associate director of the McDonnell Genome Institute. "It turned out to be far more complicated than it had looked to be on first blush."

Their early studies of AML, however, led to an important understanding of the problem: clonal heterogeneity, which, according to Ley, is now at the center of all cancer genomics.

In short, when cancer cells are placed under therapeutic bottlenecks — when treated with drugs that try to kill them — some will adapt in response, "kind of like Roundup-resistant weeds in soybean fields," while others will be resistant up-front.

"AML tumors turned out to be clonally complex even before therapy, which was a great surprise to us," Ley says. "Every AML has a founding clone and also unique subclones (each with a unique set of mutations). It turned out that our existing therapies often eliminate only some AML subclones in a particular patient, and the resistant ones rise again to cause a relapse."

This finding has been extrapolated to most other cancer types in adults and represents one of the greatest challenges in cancer therapeutics. "Regardless of how difficult this problem is, it is important that we discovered the truth about it," Ley says.

Thinking about how to clinically address the clonal heterogeneity problem, the team used each patient's own AML cells to assess how different subclones respond to initial therapy. They sequenced AML samples from patients at presentation and then again after their initial therapy to see whether the mutations were cleared by the treatment. Surprisingly, about half of the patients — who were thought to be in remission using standard methods — had not cleared all of their mutations, and they relapsed a year earlier than the patients who *did* clear all measurable disease. This study has moved forward to a prospective trial to determine whether serial sequencing can help assign risk and help clinicians pick the least toxic and most effective therapy for each intermediate-risk AML patient who seeks treatment at Siteman Cancer Center.

The same serial-sequencing approach was also recently used by the group to define which patients were responding to a less toxic form of therapy with a drug called decitabine, which is often used in older AML patients who cannot tolerate the aggressive therapies used in younger, more fit patients. This study provided yet another surprise: Patients with the most lethal form of AML, harboring mutations in a gene called *TP53*, all responded favorably to this milder form of therapy. Again, these results have led to the development of new clinical trials using this therapy earlier for patients with this mutation, which truly represents the central goal of precision medicine: matching the mutation to the right drug.

In the 60 percent of AML patients who have an intermediate risk of relapse, some respond well to conventional treatments, while others do very poorly. "When we started these studies, the mutations associated with this kind of AML were not understood. These patients represented the biggest therapeutic conundrum in the field," Ley says. After years of research, Ley and his team now understand the initiating events for most of these



Timothy Ley, MD

James Beard

cases, including the 35 percent who have mutations in the gene *DNMT3A*, which was discovered in the first AML genome the team sequenced. "The discovery of the major initiating mutations for this kind of AML was crucial," Ley says, "because it has allowed us to begin to think about new approaches to target these mutations."

Currently, the only AML-initiating mutation that can be targeted specifically is a fusion gene that causes one subtype of AML, called acute promyelocytic leukemia (APL), which comprises about 10 percent of cases. APL patients are now routinely treated with drugs that destroy the protein that initiates the disease — without traditional chemotherapy — and nearly 95 percent are cured. "This is the poster child for what we want to do for all AML cases: find drugs that eradicate cells harboring the initiating mutations. And now that we know what these mutations are for nearly all patients, we have new hope that we'll find novel ways to target them," Ley says.

Ley admits that his team still has a lot of work to do, but they at least know the face of the enemy. "We don't have everything solved," he says, "but we now have a sound understanding of the problem: the mutations that we need to go after aggressively, the ones we can go after less aggressively, the nature of the mutations that need to be targeted and why patients relapse."

Note: Professor Ley acknowledges that this research has required a large team effort over the years. See magazine.wustl.edu for names of some of the many contributors.

mentioned on pg. 14) — have been studying how to turn on a patient's immune system to make it recognize and destroy cancer cells, as well as how to control the process so it doesn't also destroy normal cells and normal function.

"Genomic analysis on breast cancer patients' tumors, for example, has shown there are different mutations that are signatures to individual patients," Eberlein says. Researchers collect these unique mutations, create a vaccine that targets them and then administer it to individual patients to stimulate their immune system to recognize the specific mutations. "This is more precise in destroying diseased cells than radiation or even surgery, and there is less damage to healthy tissue," Eberlein says.

Today, researchers are conducting such trials in breast and brain cancers, and they're in various stages of development in head and neck, lung, lymphoma, melanoma, pancreas, prostate and retinal cancers. "And we don't do this research in silos," Eberlein says. "We gather experts in these various areas and discuss developments as a group: 'What did you learn in studying brain cancer, and how could we apply that in breast cancer, and vice versa?' Cross-fertilization is a strength of Siteman's, and it helps accelerate how fast we can do these kinds of studies."

The third initiative encompasses technology and imaging. For example, Siteman has the ability to detect cancer cells through photo-acoustic imaging. And it can insert an individual gene into a normal cell to study its impact, if any, on cell growth and division. Siteman also has invested heavily in understanding the molecular mechanisms of various pathways in cancer.

Again, how does exploring pathways promote progress toward precision medicine? Eberlein explains that "as we study these pathways, we're beginning to realize that some of them drive the growth of cancer cells. So we're beginning to develop drugs and interventions that interrupt these pathways."

To further explain, Eberlein hypothesizes two patients, Patient A and Patient B, who have the same leukemia.

If each patient's cancer is promoted by a different pathway, each cancer will respond differently to the same drug therapy, if at all.

There's another benefit of discovering these pathways. "In lung cancer, for example, we identified a mutation that also occurs in a minority of colon cancers," he says. "We have a drug for this subset of colon cancers that we never would have thought to use for lung cancer before we discovered this similarity."

The discovery is another example of how understanding the biology of the disease and the molecular and genetic information of the pathways can inform physicians on how to treat certain patients in a very personalized way.

"These developments aren't going to happen in 50 years," Eberlein says. "They're happening *right now*."

One of the most ambitious developments in Siteman's plan to save lives and help communities is conceivably through its fourth initiative: prevention.

The BJC HealthCare organization has collaborative relationships with eight other health-care systems — not hospitals, but entire systems that together cover much of Missouri and the southern half of Illinois. The region includes four of the top six counties in the country for cancer deaths. And Siteman, recognized as a Comprehensive Cancer Center by the National Cancer Institute since 2005, is proposing to these systems a collaborative and mutually beneficial arrangement: Siteman would provide effective, evidence-based cancer prevention programs and help oversee them in exchange for access to their patients' genomic and clinical information. The goal is twofold: advise the other systems on how to care for their patients and build a large, relational database at Siteman. Such a database would help researchers develop algorithms for managing different populations and individuals who have breast cancer, lung cancer, prostate cancer and more.

Eberlein clarifies how this database would help personalize treatment. In early breast cancer, for example, stage one/ stage two breast cancer, the vast majority of female patients are treated with lumpectomy and radiation therapy, and

IMAGINE THE FUTURE*

**Adapted from Alan E. Guttmacher, MD, former director of the Eunice Kennedy Shriver National Institute of Child Health and Human Development*

2025

- Sue is born prematurely (one of only 200,000 premature babies).
- She develops necrotizing enterocolitis (NEC).
- Analysis of Sue's gut microbiome shows a bacterium that helps cause NEC.
- Before Sue's birth, a clinical trial showed an entirely new class of drugs effective against this bacterium.
- Sue's genome-based newborn screening shows that she won't suffer serious side effects if she receives one of these drugs.
- She receives the drug, and her NEC is cured.

2027

- Sue also has a genetic variant that interacts with dog dander to cause asthma.
- Grandma buys her a cat instead of a dog.
- Illness prevented; Sue never develops asthma.
- Sue has seven genes that increase her risk of early heart attack.
- Medicine precisely targeted to her genetic makeup keeps her healthy.



Timothy Eberlein, MD

James Beard

“One of the first major impacts of precision medicine is that it’s going to show us which patients we should *not* be treating aggressively,” which will lead to a reduction both in unnecessary treatment and in costs of health care.

says. “But if I had a massive database, I could compare, say, Mrs. Smith’s genetic signatures computationally to those of all the other women in the database to see if she had a match for recurrence. If she didn’t, we could provide her with statistical validation and say, ‘You won’t need multidrug-regimen chemotherapy.’ If she did have a match for recurrence, we might have to say to her, ‘Mrs. Smith, you match the type of woman who has a high risk of having recurrence, so we recommend aggressive chemotherapy.’”

Although it’s going to take time to work through all the various mutations and pathways in all the

some have a mastectomy. After these treatments, 80 percent of women with early breast cancer are cured of their disease. Twenty percent, however, have a risk of recurrence.

“Until very recently, if their tumors were bigger than a centimeter, we would treat almost 100 percent of these women with multidrug-regimen chemotherapy,” Eberlein

types of cancer, Eberlein is excited about what’s happening already. “One of the first major impacts of precision medicine is that it’s going to show us which patients we should *not* be treating aggressively,” he says, which will lead to a reduction both in unnecessary treatment and in costs of health care.

2055

- Sue is pregnant.
- Due to her family history of prematurity, Sue’s pregnancy is followed closely.
- She is given a probiotic that prevents early delivery.
- During Sue’s pregnancy, doctors learn that the fetus has an elevated risk of severe autism.
- Sue avoids a specific environmental exposure that interacts with this gene to cause autism.
- George is born full term, and he never develops autism.

2075

- Sue’s husband, Thomas, is diagnosed with metastatic melanoma.
- Genomic sequencing of the tumor alongside his white blood cells reveals potential targets for a vaccine.
- Candidate vaccines are tested on cells from Thomas’ biopsy.
- A schedule of vaccines is provided at Siteman Cancer Center at Barnes-Jewish West County outpatient facility.
- Six months later, Thomas is free of melanoma. Two years later, there has been no recurrence.

2100 (and beyond)

- At age 75, Sue develops left arm pain that she assumes is due to gardening, but her primary care provider knows about her higher risk and diagnoses an acute heart attack.
- The drugs to treat her are selected based on her genome sequence.
- Sue survives, is active well into the 22nd century and becomes a great-great-grandmother.

THE STRUGGLE: advancing Alzheimer's treatment

Another major concern for physician-scientists is the aging population. The average lifespan in the U.S. for a male in 1912 was 51.5 years, whereas in 2012 it was 76.4. For women, the increase jumped from 55.9 years to 81.2. We're living longer because we're surviving cancer, heart disease and other disorders. That's the good news. The bad news, however, is that with an increase in longevity has come an increase in the diseases that occur more commonly with age — the diseases of the brain — which currently have no great treatments.

Overseeing the department charged with untangling the mysteries of neurological disorders, including neurodegenerative diseases, is David Holtzman, MD, the Andrew B. and Gretchen P. Jones Professor of Neurology, the Charlotte and Paul Hagemann Professor of Neurology, head of the Department of Neurology at the medical school, and neurologist-in-chief at Barnes-Jewish Hospital. Under his direction is a deep bench of resolute researchers working on Alzheimer's, frontotemporal dementia, Parkinson's, ALS, MS, stroke, subarachnoid hemorrhage and more.

The most common neurodegenerative disease is Alzheimer's disease, in which both age and genetics play a role. In the neurology department's Charles F. and Joanne Knight Alzheimer's Disease Research Center, led by John Morris, MD, the Harvey A. and Dorismae Friedman Distinguished Professor of Neurology, researchers have determined a number of genetic markers that are risk factors or causative for certain forms of the disease. In addition, in studies of early-onset Alzheimer's disease, there is a huge research effort in the Dominantly Inherited Alzheimer Network (DIAN) and treatment unit, led by Randall Bateman, MD, the Charles F. and Joanne Knight Distinguished Professor of Neurology. These studies are determining the biomarkers and time course of the disease, both before and after the onset of symptoms, as well as testing novel treatments.

"In terms of personalized medicine for early onset, individuals are being identified and put in novel clinical trials based on family history and specific genetic information," Holtzman says. And for late-onset Alzheimer's, the most common form, Holtzman says the center is identifying people before they're symptomatic, trying to determine whether researchers can predict the onset of symptoms. Some individuals are in clinical trials based on their biomarkers.

"Many individuals in our various clinical research studies are having their genome sequenced completely by researchers



James Byard

David Holtzman, MD

"Many individuals in our various clinical research studies are having their genome sequenced completely. ... And that's providing important information about new genetic factors that lead to the disease, as well as identifying new targets for treatment."

such as Carlos Cruchaga, PhD, associate professor of psychiatry," Holtzman says. "And that's providing important information about new genetic factors that lead to the disease, as well as identifying new targets for treatment."

Discussing innovations, Holtzman says that researchers are making advances in better diagnostics that are not as expensive as PET scanning or as invasive as spinal tap. "It needs further development," Holtzman says, "but there's a blood test that may enable screening of people for whether or not they're developing the pathology of Alzheimer's."

The blood-based screening test, discovered in Bateman's lab, aims to detect certain forms of amyloid beta, which collects in brain amyloid plaques, that are thought to contribute to Alzheimer's disease and its progression in people before they become symptomatic.

Regarding new therapies, one treatment, developed in Holtzman's lab a few years ago, is now in Phase II clinical trials.

It's an antibody to tau, which in some people collects into toxic tangles that damage brain cells and contribute to neurodegenerative diseases. (See sidebar at right and at magazine.wustl.edu to learn more about doctoral students contributing to such discoveries in Holtzman's lab.) And another researcher, Tim Miller, MD, PhD, the Clayson Professor of Neurology, has made a discovery on antisense oligonucleotide treatment for tau, trying to prevent disease onset or halt disease progression, that will soon enter trials.

Further, researchers are making major new discoveries on what's called the innate immune system, studying how cells in the brain — microglial cells — figure in modulating innate immunity, both to better understand Alzheimer's and to develop treatments. "These cells can create, decrease or increase inflammatory reaction in the brain," Holtzman says. "And we have some of the best people in the world working on this, trying to understand which molecules to modulate to turn the cells on or off."

One molecule, called TREM2, was discovered about 15 years ago by Marco Colonna, the Robert Rock Belleveau, MD, Professor of Pathology and Immunology. "We didn't know then that it was connected with Alzheimer's," Holtzman says. "But four years ago, it was discovered that mutations in that gene put an individual at higher risk of getting the disease." Since then, researchers in Colonna's lab; Holtzman's lab; the lab of Laura Piccio, MD, associate professor of neurology; and others have been trying to better understand TREM2's role in the inflammatory response, trying to figure out whether to turn that on or off as a treatment.

In a recent study from Holtzman's lab published in *Nature*, it was shown that the most important genetic risk factor for Alzheimer's disease, *APOE*, appears to modulate brain injury in part through modulating the brain's innate immune response. Holtzman says the big-picture issue is that inflammation is definitely involved in Alzheimer's disease. Therefore, researchers are trying to determine how and when to alter that inflammatory response to best effect a change in progression at the individual level.

THE NEXT CHALLENGE: making progress

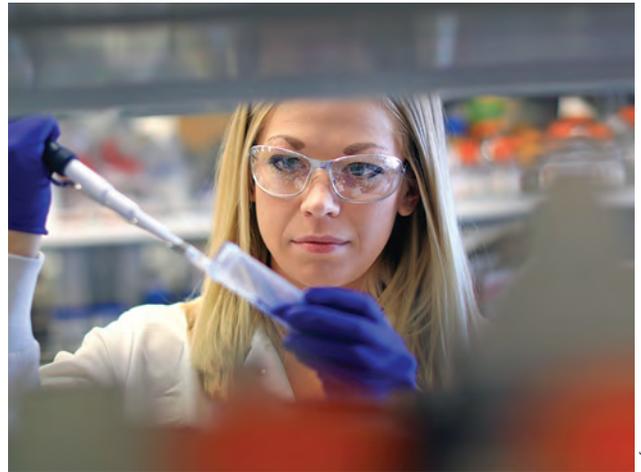
Looking toward the future on all these fronts, Dean Perlmutter says, "This is hard stuff and why Washington University needs to be at the forefront of what I call 'the next huge challenge.'

"We're in an era where medical researchers do sequencing, get big data, analyze it statistically, and then say, 'OK, this is the gene that causes the disease.' And many research centers will continue to do that," Perlmutter says. "But our vision here is to take that sequence variant, put it into biological systems that are faithful and tractable models, and try, first, to understand whether the variant is truly causing the disease (exactly how and why) and, second, to use that knowledge to develop new diagnostics and therapeutics."

Questions remain: How much effort will it take? And how much time? According to those on the front lines, it will take a massive effort and require lots of resources. And, as with any epic battle, it will require perseverance and incredible dedication and focus.

"But we're making progress so much faster now than even 10 or five years ago, and that feels very different," Skip Virgin says. "It feels as if we can run now, whereas before we were only crawling." 

Terri Nappier is editor of *Washington* magazine.



prelg sauer



James Brand

A PROMISING FUTURE

Cheryl Leyns and Phat Huynh (both above) are two of the promising graduate students spread out across the School of Medicine. Members of David Holtzman's lab, they research pathologies of Alzheimer's disease, the most common cause of dementia affecting an estimated 5.5 million Americans.

Leyns is a doctoral candidate in the Molecular Cell Biology program in the Division of Biology and Biomedical Sciences. In the lab, she focuses on the tau protein, a driver of Alzheimer's that also contributes to 25 other neurodegenerative diseases. And she's worked on two key projects: 1. investigating novel therapies, and 2. examining novel mouse models, studying the risk factor TREM2 and how it's impacting tau pathology and tau-mediated neurodegeneration.

An MD/PhD student, Huynh has been working on the *APOE* gene and its impacts on the metabolism of the amyloid- β peptide ($A\beta$). $A\beta$ is the main component of amyloid plaques, whose accumulation in the brain is the pathological hallmark for Alzheimer's. In recent experiments, he identified a previously unknown effect of *APOE* that carries important implications for diagnosis and treatment of Alzheimer's.

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WORKING *with* EMOTIONS:-|

Hillary Anger Efenbein, an organizational behavior expert, studies emotions in the workplace — how easy they are to miss or misinterpret, and how they impact performance.

BY JEANNETTE COOPERMAN

It all started with Sanskrit.

About to go to Harvard as a physics major, Hillary Anger Efenbein read a book that had been translated from Sanskrit — by someone humble enough to admit, in the introduction, that Sanskrit was essentially untranslatable.

She then wanted to read it in the original.

She added a major in Sanskrit, reasoning that a liberal arts degree had more to do with critical thinking than career prep. Her study of that language's orderly universe left her fascinated by Indian culture,

which eventually led her to volunteer with a women's rights group in Calcutta and a health organization in Mumbai (then Bombay).

Which was great, except that in the early weeks, she kept feeling as if people were yelling at her.

"I was constantly convinced that certain colleagues were angry," she says, "because I was misjudging the meaning of intensity." Luckily, she was primed to notice. By the time she went to India, she had worked at Monitor Company, a management consulting firm. There, she'd noticed how much time and effort people put into decoding each other's emotions. They scrutinized their boss's facial expressions for feedback; they worked to detect sarcasm or subtext in their colleagues' offhand comments; they tried, like kids playing jump rope, to figure out when it was their turn to speak. "The psychological dynamics in the workplace were much greater predictors of the success of a project," Elfenbein says she realized, "than the quality of the analysis."

For example, Elfenbein's consulting firm once was assisting a company with divesting a business unit and creating decision-support tools to examine the impact of various scenarios. "It was stressful for the company that this business unit was failing," Elfenbein says, "and the team leader spent a lot of time calming the client before the client could sit down to the tools we were painstakingly developing."

Intrigued by the slipperiness of our emotional language, she returned to Harvard to study for a doctorate in organizational behavior. (She also earned a master's degree in statistics and completed the course work for the MBA.) Now, as the John Wallace Jr. and Ellen Wallace Distinguished Professor at Olin Business School, Elfenbein studies the emotional currents and riptides of interpersonal communication. She's shared her findings with Congress, high-powered executives and students.

Applications — and implications — crop up in every arena of human life. But Elfenbein has a single, overarching goal: fathoming the sense we make of other people's feelings. When do we recognize them accurately? What subtle nuances do we miss? How, especially, do we decode emotion from facial expressions, tones of voice and body language?

Her students are fascinated by these questions — and grateful for the clarity and emotional support she offers as they explore. "As a mentor, she blends expert technical guidance with compassion and understanding," says doctoral candidate Elizabeth Luckman.

Hillary Anger Elfenbein, the John Wallace Jr. and Ellen Wallace Distinguished Professor at Olin Business School, teaches "Leadership Competence" in the Executive MBA program.



"This makes her not only a great teacher but also a good friend, always willing to take the time to help you wrestle with complex ideas."

Elfenbein's been wrestling herself with complex ideas for some time. She's already published more than 60 scholarly articles spanning psychology, business and medicine. And her work has about 3,000 citations in the Web of Science, an online subscription-based scientific citation indexing service. She could coast for a bit. Instead, "she continues to strive to improve so that she can be influential and relevant," Luckman says.

Elfenbein gathers some of her data in India and Kenya, because she's acutely aware of how skewed our understandings are. Until recently, the existing research all had focused on what are called the WEIRD countries — Western, educated, industrialized, rich and democratic. We have no idea, yet, how much of what's been learned is universal.

But her work is pointing out how often it's not.

"She's done some truly pathbreaking work in perception of emotions," says William Bottom, the Joyce and Howard Wood Distinguished Professor of Organizational Behavior and chair of the organizational behavior program at Olin. "The ability



James Beard



“Men and higher-status individuals are given more room to express anger and contempt. . . . **When women executives or political leaders express anger, they’re often critiqued.**”

— Hillary Anger Elfenbein

to understand and perceive how people are reacting to decisions, information, policies, potential deals is really fundamental, and Hillary was able to demonstrate that we have distinct nonverbal ‘dialects.’ These dialects make it far easier for us to perceive and understand local emotions — but this is far more difficult communicating across cultures.” In a global economy, this work “is just incredibly important,” Bottom says. “And she’s extended it to look at how groups function, how deals are made, how negotiations break down.”

Even within the U.S., there are dramatic differences and misunderstandings. Other researchers had concluded that African-Americans with schizophrenia had greater emotional deficits than whites with schizophrenia, Elfenbein says. “But my work shows that it’s easier to recognize emotion from one’s own group.” When researchers built on that insight, they found no greater deficits among African-Americans. “They’d just been given a culturally biased test.”

Another kind of bias crops up with power differences: “Men and higher-status individuals are given more room to express anger and contempt,” she notes. “These are emotions of power; they say, ‘I am in a position to judge you.’ When women executives or political leaders express anger, they’re often

critiqued. Women expressing anger are seen as irrational." Sadness, by contrast, "is considered an emotion of low power, and women are allowed to be sad whereas men are derided. This myth that women are more emotional? Men are emotional, too, but there are different emotions they are free to express."

Emotions have their place

Emotions we aren't free to express tend to come back again and again. We bury them, and they bubble up somewhere else; we bat them away, and they boomerang. We can't free ourselves from an emotion by suppressing it; we have to manage it. Reappraise, reframe, find the bright side, take the long view. "Talking to a friend is cathartic," Elfenbein says, "and hopefully the friend is helping with reframing."

Our bodies can help us, too — deep breathing, yoga, mindfulness, the endorphins of a good run, the indulgence of chocolate, the relaxation of a beer after work. "Every strategy that works for somebody can be taken too far," she adds hastily. "But there's a reason we call it 'comfort food' and have a drink at 'happy hour.' Those physiological methods give you a breather from the emotion, so you can regain perspective. It doesn't seem so bad anymore. You have better resources to cope."

When business executives turn to Elfenbein for help, they often ask how to manage anger and fear in the workplace "because both of these are thought of as very unproductive." She's not prepared to throw any negative emotion away, though: "Even the emotions we may not find pleasant have a function in our evolutionary history," she says. "We have needed them."

The accepted view of emotion is that it's an alarm system, "directing our attention to something important," she says. "Anger is about relationship repair: It shows us that there is something going wrong that needs to be addressed. Fear shows us that we are in danger. All emotions have their place." She grins wryly. "They are often out of place, but they have their place."

At work, Elfenbein continues, the problem with our emotions is that we're so often "squashed from doing something about them. Emotions are meant to move us. The word 'emotion' itself comes from the Latin root *movere*. But usually in the workplace, you can't act on your emotions," she says. The trick is to find a way around that prohibition — a way to act productively. Fear, for example, is about a lack of control, so take

back a little control, she advises. If you're scared of losing your job, polish your résumé.

Another workplace threat is jealous, malicious competitiveness — and it's extra hard to recognize, because it's one-sided, and those feeling it take pains to conceal the signs. "Some nonverbals are leaky," Elfenbein says. "Research has shown that we tend to be better at controlling facial expressions, next better at tone of voice. Yet it's much harder to control body language, especially posture and hand movements. It's not that you can't control these things, but people put less energy into trying to control them. So those are good places to look for leakage."

When somebody's silently resentful or scheming against you, though, "the best place to look is third parties," a trusted co-worker's take. "And look at what people do, rather than just what they say to you," Elfenbein says. "Then you can try to neutralize the jealousy, although that's hard. Sometimes you can try to offer things of value to that person: Do something that will help them succeed; tell them about an opportunity; show that you are useful as an ally."

Oh, and don't feel bad if it took you a while to even realize that this person was vying with you. In one study, she found that "the people best at seeing hidden messages were the least liked." They could read the negative emotions — anger and fear and sadness — beneath someone's tone of voice. "We call them 'eavesdroppers,' because they had a window into other people that was unwelcome."

Recognized or not, negative emotions clutter our workplaces. The most *underrecognized* emotion, Elfenbein says, is a positive one: flow, that blessed state when you're working at your peak on something that has meaning for you, rather than counting the hours and accumulating grudges. "Job satisfaction and job dissatisfaction have different sources," she points out. "Job satisfaction comes from flow and self-actualization. Job dissatisfaction comes from colleagues who weigh you down, a copier that always breaks — minor annoyances that are called hygiene factors." Getting rid of those annoyances isn't enough, though, because job satisfaction is not simply the absence of irritation. "Being satisfied is enjoying what you do, being good at it, having a sense of mastery and a sense of purpose," Elfenbein says.

What satisfaction is not, necessarily, is raking in a lot of cash. "Money is a very complicated reward," Elfenbein says. "It's as much symbolic as it is about the money itself." In one study, she asked graduating MBAs about their negotiations for a full-time job: What was the dollar value of everything they negotiated, and how did they feel coming out of the negotiation — as though they'd been treated fairly and built a healthy relationship? "A year later, we surveyed their job satisfaction," she continues.

“How they were treated predicted their job satisfaction; the dollar gain did not.” At work, often the best reward a boss can offer is “sincere recognition of a person’s humanity,” she says, “sincere appreciation of the things done well.”

Executives regularly ask her how to test for emotional intelligence — or train it into their employees. “It’s very hard to change emotional tendencies in adults,” she tells them frankly. “Consultants want to charge a lot of money to come in and train, but research suggests that it’s very hard to move that dial.” Currently, she’s exploring the behavioral genetics of emotional abilities, and, sure enough, the preliminary results suggest “that emotional intelligence is, to some degree, genetic.” Granted, emotional IQ is also learned — but early on.

“We train empathy; we even train children how to lie.” Elfenbein remembers explaining to her son, very carefully, the value in telling a “white lie” to show appreciation for, say, an unwanted birthday present. “We teach them the right time to lie and how to lie. Also, they spontaneously lie, and we catch them, and that trains them to lie better.”

What we *don’t* train very well, because we don’t or can’t give kids good feedback, is “self-awareness, emotion recognition, anything that is silent.” As for self-awareness, some of us are so clueless about our own feelings that we’re not even aware of our lack of self-awareness.

High-priced consultants can’t plumb those depths. “The bad news is that almost none of what they offer works,” Elfenbein says. “The good news is that the two things that do work are free: motivation and practice. Simply caring about these skills improves them.” In one study by another investigator, Group A was told that a test would predict their leadership abilities. Group B was told nothing about the test. “Guess who did better?” she asks, grinning at the obviousness. “The people who thought the test was important.”

Still, reading emotions is like reading Braille with callused fingertips. Sarcasm is an exaggeration that means its opposite, which can create a lot of misunderstanding across cultures. “We are a very sarcastic culture,” Elfenbein says, “and people from other cultures get tripped up by this.” So do people *within* the culture. How often have you hesitated, asking yourself, “Was that sarcastic?”

Another quality that can trip us up is a monotone voice, which we tend to automatically interpret in a negative way. “That’s partly why email is such a dangerous form of communication,” she explains. “It can read as a monotone, so it can seem negative.”

Hence, the emoji.

“My understanding is that the original emoticons were invented very quickly,” Elfenbein says, smiling. “We can’t get by without that expressive impulse.” 🙄



“Money is a very complicated reward.”
... At work, often the best reward a boss can offer is “sincere recognition of a person’s humanity, sincere appreciation of the things done well.”

— Hillary Anger Elfenbein



The Problem

The way we're feeding ourselves is devastating rainforests, widening waistlines, exploiting small landholders and causing thousands of pounds of food to go to waste. Alumni and Washington University researchers are working hard to change how we put food on our table.

BY ROSALIND EARLY



with Food



In the middle of the Amazon in the Brazilian state of Mato Grosso, Ruth DeFries — then a geography and environmental science professor at the University of Maryland, College Park — sank down onto a burnt log as her eyes filled with tears. Around her, aside from mud-spattered jeeps and other scientists from Brazil and America, was ... nothing. Well, not quite nothing. There were stumps, ash and felled trees where there once had been a verdant forest. Not long before she arrived, bulldozers with chains strung between them and men with chainsaws had rolled through an enormous swath of irreplaceable Amazon, destroying everything. And once it was flattened, they'd set fire to it.

The reason for this destruction? Soybeans.

The year was 2003, and Blairo Maggi, then governor of Mato Grosso and current minister of agriculture in Brazil, was clearing the forest to make way for soybean farms. Though not a native crop to South America, soybean is lucrative as the key ingredient of soybean meal, cheap feed for cows, pigs and chickens. The price for our cheap meat is nothing less than the Amazon rainforest.

That producing cheap food comes at a high cost is not a surprise to DeFries, AB '76. In her book *The Big Ratchet: How Humanity Thrives in the Face of Natural Crisis*, DeFries explains that humans have long been manipulating nature to get more food faster and cheaper. New innovations ratchet up food production, but they always come at a cost.

“Inevitably, any innovation reaches its limit, creating demands it cannot satisfy, generating too much pollution or creating some other unforeseen obstacle,” she writes. “Once again, specters of not enough food to go around appear, and prospects look grim. The hatchet falls. Then a new pivot, a new way to use nature’s endowments, emerges. The ratchet turns again, providing more and more people with food, committing civilization to keeping the growing number of people fed. At some point there’s an even bigger hurdle. ... Ratchet, hatchet, pivot, ratchet, hatchet, pivot.”

DeFries should know. Currently, she’s a university professor at New York’s Columbia University in the field of ecology and sustainable development. She is a member of the U.S. National Academy of Sciences, a recipient of a MacArthur “genius” grant and author of more than 100 scientific papers.

She got her start studying earth science at Washington University and went on to earn a PhD in geography and environmental engineering at Johns Hopkins University. After earning her doctorate, she went to work in India.

“Being in India, it’s just so abundantly clear that it’s not possible to separate out what we think about conservation or nature from people,” she says. “It’s so incredibly intertwined. That helped me a lot in thinking about large questions: What is working with the environment? What is working in conservation? What does trying to protect the environment really mean?”

For some, *The Big Ratchet* (published in fall 2014) is a bit, well, cheerful about the human impact on the environment. DeFries doesn’t come down on one side or the other with regard to DDT, monocultures, industrial farming or the other controversies surrounding food production. Even though she points out the downsides of all of these inventions (and their upsides), her tone isn’t disciplinary.

“We’re humans and we care about people having enough to eat,” she says. “The environmental side will look at the negative impacts of people on the planet. But if you look at what’s been going on, there are a lot of good stories

Ruth DeFries



Jennifer Weisbord

about the reduction of people living in poverty and declines in undernourishment. Lots of different indicators show that many people are certainly better off than they used to be.”

That’s the good news. The bad news is our decimated environment, an obesity epidemic, food waste, the inequities of the new agricultural revolution and more.

Though the problems are large, DeFries thinks that we are worrying about the right things by working on our next pivot to feed ourselves in a way that the Earth can sustain. While no one is positive of the way forward, many alumni are making small but noticeable changes in how we eat.



According to *National Geographic*, more than **40%** of the Earth’s land is devoted to agriculture.

GROWING WITHOUT LAND

Eric Ellestad, AB '10, and Matt Vail, BS '11, MS '11, want to feed the world using hardly any land, very little water and no soil. Instead of growing crops on a traditional farm, they're growing them in farms housed in shipping containers as part of a startup they co-founded called Local Roots Farms.

Ellestad, a pre-med, math and economics major, developed the idea while working with his family's business, which builds refrigerated semi-truck trailers for shipping perishables. He saw firsthand the challenges of distributing fresh fruits and vegetables. "The spoilage rates, costs and inefficiencies were pretty staggering," he says.

Ellestad figured there had to be a better way. He left his family business to work in early-stage venture finance, working with technology startups and investing in ones across industries including the food industry. After a few years of ideation, Ellestad called up Vail, a friend from his undergraduate days.

Vail, a pre-med and biomedical engineering major, saw the potential of Ellestad's idea, which was to leverage modern technology to create a controlled-environment farming system. These farms would be able to grow vegetables, particularly ones that have a high spoilage rate, in any climate year-round. Instead of using the lengthy existing supply chains, Ellestad envisioned putting the farming projects near the distribution centers of large corporate produce buyers, so food could be delivered in a matter of hours instead of days.

In 2013, Ellestad and Vail co-founded Local Roots Farms out of Ellestad's garage in Redondo Beach, California, with the mission of improving global health by building a better food system. The two built the entire system from the ground up. They designed the LED lighting, control-system architecture and a software platform that allowed them to take care of the plants remotely.

Less than a year later, they had their first commercial-scale farm in shipping containers stacked on a warehouse parking lot they rented. In 2014, they got the city to connect their first facility to electricity.

"That was pretty huge," Vail says. "We spent about three months operating the farm on a generator because we couldn't get the city to allow us to plug in to power."

Thirty days later, Local Roots harvested its first crop and earned its first dollar.

Now, the two oversee a team of plant scientists, software



Patrick Record

engineers, roboticists and others while Ellestad serves as chief executive officer and Vail as chief operations officer.

Local Roots Farms still has challenges to overcome before it can produce food on a large scale. Both Ellestad and Vail imagine one day feeding millions all over the world. "But for now, you simply continue climbing that mountain, celebrating the small victories as much as you can," Vail says.

But can hydroponic farming really work? And can it catch on? With most new "pivots," as DeFries calls them, or new innovations developed to solve current problems, people aren't certain anything will work. It's all trial and error.



Obesity worldwide has increased
82% since 1992.

Hydroponic farming does seemingly answer many of the ills that farming is wreaking on the environment. Hydroponic plants use 99 percent less water and require no pesticides or fertilizer. One of Local Roots' shipping containers grows the equivalent of five acres of farmland, and software allows a few people to oversee growing containers across the country. All of this might add up to reducing the impact growing food has on the environment and help keep our natural wonders safe.

A WHOLESOME MEAL ON EVERY PLATE

"The battle to feed humanity is already lost," wrote biologist Paul Ehrlich in his 1968 bestselling book, *The Population Bomb*. "We will not be able to prevent large-scale famines in the next decade or so." Little did Ehrlich or others know that the biggest problem of the 21st century would not be famine, but obesity. Mid-20th century scientific advances created a boom in agricultural production and led to the invention of high-fructose corn syrup and hydrogenated vegetable oils. Since then, the consumption of calories, sugars and unhealthy fats has soared.

The problem of obesity is complex and being addressed by many people — including WashU alums — in myriad ways. Luke Saunders, AB '10, for example, has decided to tackle the problem by making healthy food more convenient.

We've all been there. Starving, hurrying and trying to figure out where to go to get something that's fast and not fried. Most of the time, you can't find anything and either go hungry or compromise on the least unhealthy thing. Why is eating well so inconvenient?

Enter Farmer's Fridge, which sells fresh food like kale chicken Caesar salad, soba noodles and crunchy Thai salad with coconut chicken from vending machines unlike any you've seen before. In fact, the company calls them fridges. They're brightly lit and made of reclaimed alabaster wood, with slick modern touch-screen interfaces. Inside are rows of jars where the food is in colorful layers. It looks "the way fossils might look if the Earth had been created by meticulous vegans," Olga Khazan wrote in a feature about Farmer's Fridge in *The Atlantic*.

The fridges are in hospitals, office buildings, schools, apartments, O'Hare Airport and even 7-Elevens all over Chicago.

If you make healthy food more convenient, will people eat it? Saunders believes they will.

"I think there's a general misconception that people don't like eating healthy food or that it doesn't taste good or

whatever, and that's just not true," he says. "I think price is a very important factor and so is access."

Access is part of the reason Saunders started his business. In 2012, he was working as a traveling salesman for a metal finishing company, and the typical on-the-road, fast-food lunch options didn't appeal. "I had to pack my lunch every day," he says. "And I saw a huge opportunity."

He had seen how production worked for making, say, a granola bar. Miles of factory would take raw materials and create a bar that would be loaded on a truck and shipped across the country. By the time it reached the consumer, those initial raw ingredients could be weeks old. Saunders wanted to take raw ingredients, mix them together and get the healthy meals to the consumer as fast as possible. An automated fridge seemed the perfect system.

Saunders had to design the fridges himself as well as tinker with salad, breakfast and snack recipes. By the summer of 2013, he had the details ironed out. He and his wife had moved to Chicago for her job, and Saunders had his first fridge up by October.

Today, more than 60 fridges dot Chicago, and reviews are good. The *Chicago Tribune*, *The Daily Mail*, *Cooking Light* and several local news shows have featured Farmer's Fridge. *Time Out Chicago* ranked the salads among the city's 10 best, and *USA Today* named the company Chicago's best takeout. Saunders also was selected as one of *Forbes* magazine's 2016 30 Under 30.

All meals are made fresh and delivered each morning. Since sustainability is key for Saunders — his company composts, enables customers to easily return the salad jars and has low-energy fridges (less than \$10 per month of energy costs) — he didn't want those unsold dishes to be pitched. So he donates the food to shelters via a partnership with Zero Percent.

He hopes to spread Farmer's Fridge throughout the country so everyone can get healthy food without the hassle. "It's a virtuous cycle," Saunders says. "Once you eat healthy, you realize you feel better; it feeds on itself."

WASTE NOT, WANT NOT

We've all done it: bought that head of lettuce or new root vegetable with the best intentions. But then it wilts in the crisper drawer. With a pang of guilt, we toss it in the compost pile or the garbage and resolve to do better next time.

But food waste isn't a problem that's just happening in the average American kitchen. It is peppered along the food production chain from farm to fork. Only 60 percent of food



The EPA estimates that food makes up as much as **21%** of the waste stream in landfills.

Luke Saunders



Katya Hantel



produced in the United States actually ends up feeding people. Fighting that problem in different ways are Elana Goldstein, AB '02, and Katya Hantel, AB '02.

As undergrads, Goldstein and Hantel both participated in the Hewlett Program, now called the Pathfinder Program in Environmental Sustainability, which gave them an interdisciplinary look at how to create a more sustainable future. Goldstein is now an environmental protection specialist for the U.S. Environmental Protection Agency, working to reduce food waste in America. Hantel is also working to reduce food waste and increase sustainability as the director of sustainable development at Conagra Brands, which owns Orville Redenbacher's, Bertolli, Healthy Choice and other popular food brands.

For Goldstein, educating people about how and why to reduce food waste is key.

"For a lot of people, wasted food is out of sight, out of mind. We don't think about how much we throw out," Goldstein says. To combat that indifference, she says we should "teach children early on to value food by showing them how to grow their own food or participate in a school food-waste audit."

Elana Goldstein



Andres Alonso

At the EPA, Goldstein promotes the Food-Recovery Hierarchy, a guideline for reducing food waste. Best is reducing the volume of surplus food generated; next, donating extra food to food banks and soup kitchens; third, feeding food scraps to animals; fourth, converting it to energy through industrial uses; fifth, composting it; and, finally, the worst option: sending it to the landfill.

“Many people in this country are food insecure,” she says, “and thinking about where our food comes from, as well as how much is being wasted, is critical.”

For Hantel, the key to reducing food waste and increasing food sustainability is looking at changes in production. As part of its corporate social responsibility, Conagra Brands pledged to cut food waste in its operations by 50 percent by 2030, thus becoming an EPA/USDA Food Loss and Waste 2030 Champion.

The primary focus is on source reduction, but Hantel says they also try to “find creative and effective uses for the food waste that you inevitably have, even after you’ve optimized your manufacturing.” In making meat sticks and beef jerky, for instance, the ends of the sticks are cut off so everything is a uniform size. Now, Conagra packages up the leftover odds and ends and donates them to food shelters.

According to Hantel, most food companies have been looking for ways to make their products more sustainable while also reducing their triple bottom line: They reduce packaging, do more energy-efficient manufacturing and work with farmers to implement more sustainable growing practices.

“I think we’re at a real tipping point,” Hantel says. Consumer demand, corporate momentum and governments are all pushing for more sustainable food production. “We’re on a great path to make some headway.”

THOSE LEFT BEHIND

In the mid-20th century, Norman Borlaug — an American agronomist, Nobel Peace Prize winner and founder of the World Food Prize — revolutionized food production by breeding new, high-yielding crops and taking them to South America and Asia. This and other innovations led to the “Green Revolution.” Crop production boomed, feeding more people and financially benefiting large landowners. Though Borlaug tried to bring his innovations to sub-Saharan Africa, the infrastructure wasn’t in place for large, well-irrigated farms. On his deathbed in 2009, when his daughter asked him if he



needed anything, the Nobel laureate replied: “Africa. Africa. I have not finished my mission in Africa.”

Helping those left behind by the Green Revolution is Jacob Elster, AB '04, though his method is more sustainable than Borlaug’s. Instead of importing crops that will create profit only for a few large landowners, Elster is working with subsistence coffee farmers across Africa, Asia and Central America to make their crops into a specialty coffee that will net the growers more profits and create a growing demand for their products.

Elster’s interest in helping others was already evident while he was studying anthropology and international studies at



Roughly **65%** of sub-Saharan Africa’s population relies on subsistence farming.

Washington University. In 2003, he organized his own study abroad program in Switzerland at the School for International Training (SIT), hoping to work for the U.N. after graduating. While at SIT, Elster visited Uganda and knew he wanted to help.

Elster finished his studies in spring 2004 and returned to Uganda a month later to found Develop Net, a nonprofit Internet café that he built in rural Uganda. Citizens and NGOs had been asking for one, but it didn't lead to jobs and opportunities for residents as Elster had hoped.

"In doing this type of work, I learned a lot," Elster says. "One is to go to places where you encounter the most need, but then to work with those who are most able to benefit from the help you're giving."

Elster was asked to audit a dry mill in the coffee-growing region of Uganda. The dry mill had been mismanaged and was no longer operating. Farmers were losing money without a working dry mill nearby, and there were several third parties involved in the coffee distribution, further reducing profit. Noting this during the audit, Elster realized how he could best help the coffee growers.

The average coffee farm in the area had from 200 to 2,000 trees, and buyers would bulk together the coffee from multiple farms to sell it. But, "good coffee comes from good farmers," Elster says, which has since become his company's motto. He and his business partner, Taylor Mork, decided to use a technique called lot separation to keep the coffee from each of the growers distinct and traceable. Traceable coffee would add value to the product and allow Mork and Elster to offer a higher buying price.

"Putting a face to coffee benefits coffee farmers and coffee lovers alike," Elster says.

He and Mork launched Crop to Cup Importers in 2007. They have had such success that they are currently importing from 10 countries, including Burundi, Ethiopia and the Congo. They're still the only company doing lot separation for small holders.

Elster and Mork sell their imported beans to roasters (such as Starbucks), and individual customers can buy from their website (croptocup.com). Each line of beans has photos of the grower, descriptions of growing conditions and information about the bean's flavor notes. Elster wants his customers to know how their food can impact not only the environment but someone's life as well. "Let's actually pay for coffee knowing that there's a farmer on the other side of it," Elster says.

More pivots abound (see sidebar at right for more about innovations taking place at WashU) as people all over the world toil to solve the latest food crisis. The stakes are high. With our climate changing, DeFries points out, "the expectation of the stable Holocene climate — the climate that has prevailed since humans transitioned to farmers — is no longer valid." And with 7.5 billion mouths to feed — and growing — the stakes have never been higher. 🌱

Rosalind Early, AB '03 (English and American literature), is associate editor of *Washington* magazine.

Innovative pivots at WashU

BY ROSALIND EARLY & DIANA LUTZ

Plant discoveries

Washington University has a long history in the plant sciences: 28 of the first 29 PhDs granted were in botany. Here are three recent breakthroughs that may change the nature of farming:

➔ Helping plants make their own fertilizer

Himadri Pakrasi, the Myron and Sonya Glassberg/Albert and Blanche Greensfelder Distinguished University Professor in Arts & Sciences and director of the International Center for Energy, Environment and Sustainability, is developing a way for plants to get the nitrogen they need out of the atmosphere, by placing an apparatus in plants for converting nitrogen into a form plants can use.

➔ Harnessing photosynthesis

Robert Blankenship, the Lucille P. Markey Distinguished Professor of Arts & Sciences and a professor of biology, and his team were able to isolate the photosynthetic megacomplex from a cyanobacterium in its functioning form. For the first time, scientists were able to look at all parts of photosynthesis acting together.

➔ Finding the plant hormone switch

A plant's hormones dramatically alter its growth and development. Controlling a plant's hormones can kill it or make it grow. Joseph Jez, professor of biology and a Howard Hughes Medical Institute Professor, in collaboration with researchers in the European Synchrotron Radiation Facility and the European Molecular Biology Laboratory, discovered a family of hormones that responds to herbivore attack or changing growing conditions.

FOSTERING LIFELONG CONNECTIONS

A new network model helps alumni, parents and friends stay connected to and engaged with the university.

BY LAURA JOSEHART

In August 2017, the Alumni Association announced the creation of alumni networks as a new framework for connecting alumni, parents and friends based on geography, identity, student experience or professional interest.

Alumni, parents and friends are invited to participate in any and all networks that appeal to them, and there are many choices. Currently, the university has 33 regional networks (formerly known as WU Clubs) and 10 professional or industry networks, as well as the Black Alumni Council, Washington University Pride Alumni Network and WashU Asian Alumni Network.

Alumni have countless fond memories of their college experiences and just as many reasons to stay connected to the university. An alumna living in Atlanta may decide to serve on her 20th Reunion volunteer committee, attend a tour of the High Museum of Art with the Atlanta Network and interview prospective students through the Alumni and Parents Admission Program. A WashU parent living in Seattle may join the Sustainability Network via LinkedIn and attend a faculty lecture hosted by the Seattle Network. Some may choose to be involved year-round, and others may reach out and participate every five years — the possibilities are abundant.

The Regional and National Networks (RANN) Committee of the Alumni Board of Governors took a lead role in the transition to the alumni networks structure. “We began by asking, ‘How can we foster lifelong connections between alumni and the university?’” says Howard Epstein, AB ’86, MD ’91, former chair of the RANN committee. The committee recognized that alumni do not identify themselves solely on the basis of geography or alma mater; they also identify themselves through their occupations, backgrounds and personal attributes and interests. “People are multifaceted, and these networks allow alumni and parents to

continue to find value in their relationship with the university,” Epstein says.

The committee researched alumni clubs and networks at peer institutions across the country and found that a growing number of universities have moved away from the term clubs, which can imply membership dues or a physical location. “Networks is a more inclusive umbrella term for the various alumni communities that have connected over the years and formed social and professional groups,” says Susan Cohen, assistant vice chancellor of Alumni Relations.

“Networks is a more inclusive umbrella term for the various alumni communities that have connected over the years and formed social and professional groups.” — Susan Cohen

The new model also allows alumni to bring their own ideas to the table. As Epstein points out, “WashU alumni are highly intelligent, motivated, wonderful people who have their own great suggestions.” With that flexibility in mind, the alumni networks website (networks.wustl.edu) features resources for alumni who have feedback and ideas and want to get more involved. And the networks are not limited to alumni; several networks are co-chaired by parents, and parents often attend regional or city network events to meet other members of the university community.

“I think there are many alumni who, like me, think of their years as a student at Washington University as one of the most important points in their lives — a time that really helped shape who they are — and we want to continue to feel that we can contribute to, and receive value from, the university. We want to be a part of the larger Washington University community and keep that connection strong,” Epstein says. 🏡

33

REGIONAL NETWORKS

10

PROFESSIONAL OR
INDUSTRY NETWORKS

BLACK ALUMNI COUNCIL

WASHINGTON UNIVERSITY
PRIDE ALUMNI NETWORK

WASHU ASIAN ALUMNI
NETWORK

Professional and industry networks

WashU alumni and parents across the country have formed career-related networks online through social media and have hosted well-attended local networking events. These events are varied and may include expert panel discussions and happy hours. Attendees value the opportunity to meet other alumni in their fields. In 2016–17, nearly 3,000 alumni, parents, friends and students attended committee meetings, roundtables and large panel networking events hosted by these professional and industry networks:

- > WashU Defense, Aerospace and National Security Network
- > WashU Entertainment Network (New York television, music, theater and new media)
- > WashU Innovators and Entrepreneurs Network
- > WashU Fashion Network
- > WashU Finance Network
- > WashU Government and Public Policy Network
- > WashU Health Careers Network
- > HollyWU (Los Angeles entertainment and new media)
- > WashU Real Estate Network
- > WashU Sustainability Network

> GET CONNECTED

You'll find a list of alumni networks at alumni.wustl.edu/networks, along with links to social media pages to stay connected and current on all of the latest network news and events. Check back often — new networks are forming all the time!



Alumnae pose for a selfie at a Black Alumni Council (BAC) event held in conjunction with Reunion at Thurtene Carnival this past spring. Founded in 1993, the BAC supports the professional and personal development of African-American Washington University alumni and assists in the recruitment and retention of African-American students.

Sid Hastings



Alumni, parents and current students gathered for networking opportunities at a downtown Washington, D.C., event co-hosted by the WashU Government and Public Policy Network and the WashU Defense, Aerospace and National Security Network last summer. WashU parent Col. Eric Heist (right), MBA '92, hands his business card to undergraduate engineering students Alaina Fierro (left) and Eden Livingston.

Andres Alonso



Steve Lim, BS '89, MBA '87, chats with Kathy Steiner-Lang, assistant vice chancellor and director of the Office for International Students and Scholars, during the WashU Asian Alumni Network kick-off reception held in April. This new network advocates for issues important to the Asian and Asian-American WashU community.

Courtesy photo

THE MOMENTUM OF A COMMUNITY

Leading Together enters its final year.

My relationship with Washington University extends back many years. Among my most extraordinary experiences at this great institution has been to see our community unite in support of *Leading Together: The Campaign for Washington University*.

Alumni, parents, friends, faculty, staff and even students have participated by making gifts of all sizes to advance the programs that mean the most to them. Together, more than 148,000 donors contributed a total of \$2.76 billion as of Sept. 30, 2017. They committed \$505.4 million to scholarships and endowed the majority of our 135 new professorships and other leadership positions.

We are deeply grateful for this support. But the need is still great. In this final year of the campaign, I hope you will join your fellow community members in supporting Washington University. With your help, we will make even greater strides in serving society.

For more on all gifts to the campaign, please visit together.wustl.edu.

Andrew C. Taylor, Life Trustee
Executive Chair, Enterprise Holdings
Chair, *Leading Together*

\$40 MILLION FOR SCHOLARSHIPS

McDonnell Challenge reaches goal

In the spring of 2017, Life Trustee John S. McDonnell issued an unprecedented challenge to the Washington University community. For every new or increased gift to scholarships, he would match the amount dollar for dollar — up to \$20 million.

The McDonnell Scholarship Challenge met its goal, with approximately 7,000 donors contributing to both undergraduate and graduate scholarships and fellowships for the university and across all seven schools. Including McDonnell's challenge gift, support from the McDonnell Challenge totaled \$40 million.



"The success of this remarkable challenge means a great deal to Washington University," says Chancellor Mark S. Wrighton. "John's longtime support has made the difference for many students who otherwise would have been unable to attend. Both John and those who gave in response to this challenge are ensuring that we can

prepare students of all backgrounds to lead lives and careers of significance."

With the conclusion of the McDonnell Scholarship Challenge, the university has announced the Taylor Family \$10 Million Scholarship Challenge to further encourage gifts for scholarship support. See opposite page for details.



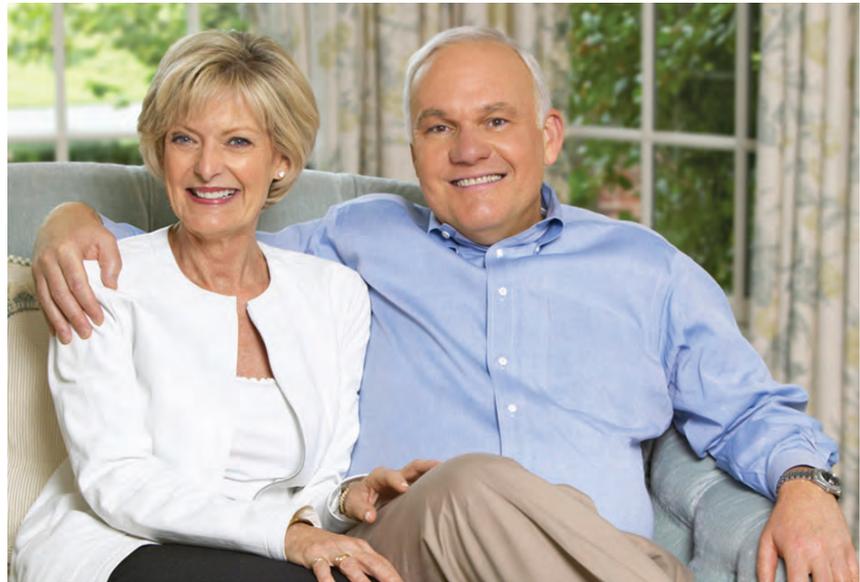
The Taylor Family \$10 Million Scholarship Challenge

Preparing the leaders of tomorrow

St. Louis philanthropists Andrew and Barbara Taylor have made a new \$10 million commitment to help Washington University secure undergraduate scholarship support during the *Leading Together* campaign. The Taylors' gift establishes a challenge that will match all new and increased gifts for undergraduate scholarships received by the conclusion of the campaign on June 30, 2018, as well as pledges to be paid by June 30, 2023.

Young people of extraordinary ability are drawn to Washington University, driven by a passion for excellence and inspired by the desire to use their education to serve others. For many, financial aid is a primary factor in their decision to accept an offer of admission. Washington University awards more than \$220 million in scholarship support to undergraduate and graduate students each year, but the need continues to grow. The Taylor Family Scholarship Challenge will help bridge the need gap.

"We're proud to invest in talented students who aspire to attend Washington University," Andy Taylor says. "The university makes extraordinary contributions to advance human health, inspire innovation and entrepreneurship, and enhance the quality of life — not only in St. Louis, but across our nation and around the world. By helping to prepare the leaders of tomorrow, the university benefits not only its students, but also everything they undertake throughout their lives."



Courtesy photo

Barbara and Andrew Taylor

"The Taylors' leadership and extraordinary generosity are an inspiration to everyone who desires to help exceptional young people from all walks of life turn their aspirations into achievements. Together, we can make this once-in-a-lifetime opportunity possible for all qualified students who aspire to a Washington University education." — Chancellor Mark S. Wrighton

Taylor Challenge criteria

- Gifts, pledges and commitments must be made by June 30, 2018, to qualify for the match. Multiyear pledges payable through June 30, 2023, are encouraged, and they will count toward the campaign total.
- Matching funds received from corporations or other entities will count toward a donor's contribution.
- If a donor elects to designate scholarship support to a specific school, Taylor Family Scholarship Challenge matching funds will be directed to Enterprise Holdings Scholarships in that school.*
- Individuals who prefer to make gifts through their donor-advised funds may contact the university for specific guidelines. Please call the Office of Planned Giving at **314-935-5373** or **800-835-3503** or email **plannedgiving@wustl.edu**.

**If Enterprise Holdings Scholarship funds in a donor's designated school exceed the approved Enterprise Scholars awards for that school, the Taylor Family Scholarship Challenge match will instead support university-wide Enterprise Holdings Scholarships.*

EAST END TRANSFORMATION BEGINS

Leadership gifts will advance mission of teaching, research and discovery.

Washington University is setting the course for its next era of academic excellence and service to society with the most extensive and multifaceted capital project in the history of the Danforth Campus. The university broke ground May 2017 on the east end transformation project, which includes three



Attending the east end transformation groundbreaking, May 5, 2017, were (from left) Life Trustee John F. McDonnell, MBA '14; Trustee Andrew E. Newman; Dotty Kemper; Life Trustee David W. Kemper; Elizabeth Fowler; Trustee Gary M. Summers, AB '75; Andrew Tisch; Trustee Ann R. Tisch, AB '76; Emeritus Trustee John D. Weil; Anabeth Weil; Chancellor Mark S. Wrighton; Trustee Donald A. Jubel, BS '73; Karen Jubel; Trustee James M. McKelvey Jr., AB '87, BS '87; Anna McKelvey; James M. McKelvey Sr., MS '47, PhD '50; Judith McKelvey; Board of Trustees Chair Craig D. Schnuck; Nancy Schnuck; Life Trustee Stephen Brauer; Shoshana M. Shanes, AB '17.

Joe Angillet

Craig and Nancy Schnuck Pavilion

Board of Trustees Chair Craig Schnuck has played a key role in planning the east end transformation. His engagement with that project led him and his wife, Nancy, to make a leadership commitment to support construction of the Craig and Nancy Schnuck Pavilion, a multiuse facility that will provide vital services and serve as headquarters to the university's sustainability initiatives. Schnuck Pavilion will house dining facilities, the Environmental Studies Program and the Office of Sustainability.

Gary M. Summers Welcome Center

Trustee Gary Summers, AB '75, made a \$7 million commitment for the Gary M. Summers Welcome Center. As the new home of the Office of Undergraduate Admissions and Student Financial Services — important destinations for students, prospective students and parents — the Summers Welcome Center will offer visitors sweeping views of Brookings Hall and Tisch Park. Indoor and outdoor spaces adjacent to Weil Hall, Hillman Hall and Tisch Park will provide gathering and meeting spaces for the university community.

Anabeth and John Weil Hall

A \$12.5 million lead gift from Anabeth Weil and Emeritus Trustee John D. Weil is making possible the construction of Anabeth and John Weil Hall, which will unite all Sam Fox School of Design & Visual Arts programs in one physical location for the first time. Weil Hall will provide contemporary facilities for graduate programs in art, architecture, landscape architecture and urban design. The Digital Fabrication Lab and Assembly Space will be both the physical heart and the conceptual heart of Weil Hall.



new academic buildings, two multiuse pavilions, an underground parking garage, an expansion of the Mildred Lane Kemper Art Museum, and a new park and surrounding landscape. Completion of the project is scheduled for 2019, with the exception of McKelvey Hall, which will open in 2020.



Ann and Andrew Tisch Park

Trustee Ann Tisch, AB '76, and her husband, Andrew Tisch, provided a lead gift for the Danforth Campus east end transformation project to support the creation of Ann and Andrew Tisch Park. Positioned at the heart of the reimagined east end, the green space will offer a lively, welcoming entrance to the Danforth Campus and a place for students, faculty, staff and visitors to gather and celebrate. Tisch Park will be home to 70 of the more than 300 trees to be planted on the east end and will offer pedestrian and bicycle access into and across the Danforth Campus.

Henry A. and Elvira H. Jubel Hall

Trustee Don Jubel, BS '73, and the Jubel family made a significant commitment through the Henry A. Jubel Foundation toward the construction of a new facility for the School of Engineering & Applied Science. Henry A. and Elvira H. Jubel Hall will be named after Don Jubel's mother and his father, who was a 1941 graduate of the engineering school. The facility will house the Department of Mechanical Engineering & Materials Science, as well as the Spartan Light Metal Products Maker Space.

James M. McKelvey, Sr. Hall

School of Engineering & Applied Science Dean Emeritus James McKelvey Sr., MS '47, PhD '50, is being honored by his son with a new building for the engineering school. A \$15 million commitment from Trustee Jim McKelvey Jr., AB '87, BS '87, will name James M. McKelvey, Sr. Hall, which will house the Department of Computer Science & Engineering and support the university's data science efforts. The building will expand collaborative opportunities among computer scientists and researchers in a variety of departments.

Mildred Lane Kemper Art Museum Expansion

The William T. Kemper Foundation made a \$5 million lead commitment to fund the upcoming renovation and expansion of the Mildred Lane Kemper Art Museum at the Sam Fox School. The foundation and members of the Kemper family, including Life Trustee David W. Kemper, are longtime supporters of Washington University. In 2004, they named the museum in memory of Mildred Lane Kemper to advance scholarship and the study and appreciation of art.

WORKING TO MAKE LIFE BETTER

Michael and Noémi Neidorff are two of St. Louis' most dedicated citizens. Their commitment and outreach make the city and the organizations they engage with better for all.

BY MARY LEE

When Michael Neidorff accepted a position as president and chief executive officer of Physicians Health Plan of Greater St. Louis in 1985, he and his wife, Noémi, faced a move to an unfamiliar city. Noémi, a classically trained pianist, was acquainted with the St. Louis Symphony. A neighbor in Elkhart, Indiana, where Michael was an executive with chemical and pharmaceutical company Bayer AG, mentioned the city had a terrific zoo.

Today, the Neidorffs, who grew up on the East Coast, are among St. Louis' greatest ambassadors. "We tell everyone that St. Louis has everything that New York or any big city has, but it's more affordable and accessible," Noémi Neidorff says. "Our city's many wonderful institutions are such great treasures."

Over the years, the Neidorffs have served as advocates and benefactors for dozens of these cultural and educational institutions, including Washington University. Their commitment reflects a passion for service and a belief in the importance of investing in people and communities.

"We can choose to stand on the sidelines and watch things happen, or we can work to help make things better," says Michael Neidorff, who has served as chairman and CEO of St. Louis-based Centene Corporation since 1996. "We think it is our obligation to make things better."

That philosophy aligns with the mission of Centene, a Fortune 500 company that specializes in providing health-care plans through Medicaid, Medicare and the federal health insurance marketplace. "Our strategy has been consistent for the



Michael and Noémi Neidorff

Courtesy photo

past 20 years," Michael says. "We have focused on improving the health of communities by providing the highest-quality care at the most reasonable cost."

Under his leadership, Centene has grown substantially, from 40,000 covered members when he took the helm to more than 12 million members in 28 states today. In March 2016, the company completed a \$6 billion acquisition of Health Net, which made it the country's largest Medicaid managed-care provider.

Dynamic duo

When it comes to their work in the community, the Neidorffs are a formidable team. During their early years in St. Louis, Noémi took the lead, putting Michael to work at events like the Gypsy Caravan, an annual flea market that benefits the St. Louis Symphony. "She would tell me what to do and where to go," he says. "He was a very good sport," Noémi says. "I made sure we both were involved."

The Neidorffs went on to serve on the St. Louis Symphony board of trustees. Michael is a life trustee, and Noémi is a vice chair of the board. She is particularly proud of two symphony educational programs she launched, Picture the Music, which encourages young children to interpret classical



music through painting and drawing, and Express the Music, which invites teens to write stories, essays and poems about a classical piece.

Noémi's interest in exposing children to music and the arts stems from her youth. Born in Budapest, Hungary, she grew up listening to opera and classical music, and her family lived around the corner from the Hungarian State Opera House. Michael shares a story from her childhood: "At age 4, she came home from a dance lesson, went to the piano and without any training or instruction, played the entire song from the lesson by ear," he says.

"I hated the dance lessons," Noémi adds. "At age 6, I began studying music at the Franz Liszt Academy of Music."

After escaping from Budapest during the Hungarian Revolution of 1956, Noémi's family settled in New Jersey. She went on to earn bachelor's and master's degrees from the Manhattan School of Music and currently serves on the school's executive committee. Among her other

the Brown School and Duke University. The center works to translate public health and behavioral economics research into programs that improve health-care delivery and health outcomes, particularly for vulnerable populations.

Enthusiastic partners

The Neidorffs' relationship with the university is bolstered by their deep admiration for the institution. "When you look at the faculty and the work they are doing, you realize that Washington University has tremendous impact in St. Louis and around the globe," Noémi says. "The university helps put St. Louis on the map."

In 2014, the couple established the Neidorff Family and Robert C. Packman Professorship at the School of Medicine, named in honor of Packman, AB '53, MD '56, senior vice president for medical affairs at Centene and a professor of clinical medicine at the university for more than 35 years. More recently, Michael and Noémi joined with the Centene Charitable Foundation to endow the

"Their energy and enthusiasm are infectious. We are fortunate to have them as partners in our efforts to improve the quality of life for people in our region and beyond." – Chancellor Mark S. Wrighton

leadership positions, she is chair of the board of Opera Theatre of Saint Louis and serves on the board of the Radio Arts Foundation-Saint Louis, where she has played a significant role in establishing a new classical radio station that promotes the arts and artists throughout the region.

Michael's résumé as a civic leader is as extensive as Noémi's. He has made important contributions to the development of St. Louis through his work with the boards of the St. Louis Regional Chamber, United Way of Greater St. Louis, Saint Louis Science Center and many other organizations. He also chairs the boards of the National Urban League and Trinity University in San Antonio, his alma mater.

At Washington University, Michael served as a member of the Brown School National Council for more than 10 years. In 2016, Centene became a partner in the Envolve Center for Health Behavior Change, an industry-academic collaboration with

Neidorff Family and Centene Corporation Deanship at the Brown School, held by Mary McKay.

"Noémi and Michael's generosity and leadership have strengthened Washington University and its connection to the St. Louis community," Chancellor Mark S. Wrighton says. "Their energy and enthusiasm are infectious. We are fortunate to have them as partners in our efforts to improve the quality of life for people in our region and beyond."

In recognition of their dedication and generosity, the university presented the Neidorffs with the Robert S. Brookings Award during Founders Day on October 28. They are honored to be acknowledged, yet they continue to focus on the work that remains to be done.

"We really don't spend time thinking about our legacy," Michael says. "We think about today and what we can do to give back to the community now." 

Mary Lee is director of development communications.

News of fellow alumni

We want to hear about recent promotions, honors, appointments, travels, marriages (please report marriages after the fact) and births, so we can keep your classmates informed about important changes in your lives.

Entries may take up to three issues after submission to appear in the magazine; they are published in the order in which they are received.

Please send news to:

Classnotes, *Washington* magazine, Washington University in St. Louis, Campus Box 1070, One Brookings Drive, St. Louis, MO 63130-4899

Email wustlmagclassnotes@wustl.edu

Washington magazine publishes Classnotes in print issues.

ALUMNI CODES

AR Architecture	HS House Staff
BU Business	LA Arts & Sciences
DE Dentistry	LW Law
EN Engineering	MD Medicine
FA Art	MT Manual Training
GA Graduate Architecture	NU Nursing
GB Graduate Business	OT Occupational Therapy
GD Graduate Dentistry	PT Physical Therapy
GF Graduate Art	SI Sever Institute
GL Graduate Law	SU Sever Institute Undergraduate
GM Graduate Medicine	SW Social Work
GN Graduate Nursing	TI Tech. & Info. Mgmt.
GR Graduate Arts & Sciences	UC University College
HA Health Care Admin.	

50s

Patricia (Cavner) Seyfried, FA50, age 87, writes that she remembers when returning veterans filled the seats in her freshman classes in 1946 and 1947. She “fully appreciates the doorways to living a full life” that her WashU experiences gave her.

Edward A. Jeude, EN52, still practices as a professional engineer in Missouri at age 90. During his lifelong career at McDonnell-Douglas, he worked on the Mercury and Gemini projects at Cape Canaveral and the Dragon Missile and F-15 projects in St. Louis.

Max Heeb, MD53, received the Distinguished Service award from the University of Missouri School of Medicine in April 2017.

Patricia (DuBose) Duncan, FA54, had her painting, *White Cloud Returning to Grass*, acquired by the Spencer Museum of Art at

the University of Kansas. Long an advocate for Tallgrass Prairie National Preserve, Duncan has captured the tallgrass in her photographs and writings. Many of her photographs were included in a Smithsonian Institution bicentennial exhibition, *The Tallgrass Prairie, an American Landscape*. The digital version of the exhibition is featured at the Marianna Kistler Beach Museum of Art at Kansas State University.

Sanford Goffstein, BU59, LW60, published his first book, *Tales of a Trial Attorney* (Lulu Publishing Services, October 2016), about eight of his most interesting cases during his 55 years of trial work.

Edward P. Ortleb, GR59, GR63, received the Robert H. Carleton Award, the highest honor bestowed by the National Science Teachers Association, in March 2017. Ortleb, who served as K-12 science supervisor for the St. Louis

Public Schools and as an adjunct professor of biology at WashU, is the co-author of more than 75 middle-school science textbooks.

60s

George M. Bohigian, LA61, HS69, received the St. Louis Ophthalmological Society's Presidential Award for his distinguished contributions and service to the local and worldwide ophthalmic communities. Bohigian is a professor of clinical ophthalmology at Washington University School of Medicine.

W. Thomas McLaughlin, BU62, and his wife, Jean, are enjoying life as retirees at The Villages in central Florida, where they play golf, sail and line-dance. Their grandson, Joel Krenz, attends Concordia University Chicago, and their granddaughter, Anna Krenz, is a freshman at Concordia University Irvine.

Reinhard “Bud” Wobus, LA62, was recognized for his contributions to the stimulation of interest in the earth sciences in 2016, when he received the Neil Miner Award, the highest honor bestowed by the National Association of Geoscience Teachers. Wobus has taught geoscience at Williams College for more than 50 years.

Kurt Studt, LA63, DE66, retired from active dental practice after more than 50 years. During his career, he taught dental subjects at WashU and at Southern Illinois University School of Dental Medicine. Today, Studt is an adjunct faculty member in the Dental Hygiene Department of St. Louis Community College at Forest Park.

Fred Abrams, LA65, self-published two children's books with his wife, Jeri, in quick succession: *Rusty The Little Red Dog* (2017) and *Pogo The Puppy Mill Dog* (2017). Both books encourage young people to adopt a rescue dog rather than buy one. His first book,

on recovering from the death of a spouse, is titled *Thanks for the Dance* (WestBowPress, 2013).

Dave Hoehnen, LW65, is a proud member of the Cleveland, Ohio, Eliot Society Membership Committee, the WashU Loyalty Society and the Cleveland Regional Cabinet.

Karl Hogquist, UC66, is pursuing an online doctoral degree in project management. His avocational interests include automotive design and specialty automobile restoration and modification.

Harvey C. Gordon, LA68, published his fifth book, *SExciting PUNography: The Best Collection of Puns About Sex* (The Punster's Press, March 2017). For more about this practiced punster and his pun-filled publications, visit www.kingofpuns.com.

Lawrence Millman, LA68, published *At the End of the World: A True Story of Murder in the Arctic* (Thomas Dunne Books, 2017), which he describes as “the heartbreaking account of a series of obscure murders in the remote Belcher Islands and the ludicrous trial that followed.”

William Siedhoff, UC68, SW73, was named chair of the board of the City of St. Louis' Senior Services Fund, which is tasked with managing tax dollars earmarked to assist the city's seniors as a result of the passage of Proposition S in November 2016.

Marc Masor, LA69, is laboratory director of Green Lab Solutions and a professional speaker and consultant in Durango, Colo. He previously worked as a science teacher in Durango and, earlier, as a research scientist in pediatric nutrition at Abbott Laboratories in Columbus, Ohio.

William Neubauer, MD69, developed the website arsobo.org for ARSOBO, a US-Mexico cross-border nonprofit organization that trains individuals with disabilities

to construct medical equipment they need and use.

70s

Philip Lesser, LA70, GR72, GR80, retired as vice president of Bostrom, an association management firm. The Association Forum Foundation, which mentors promising association professionals, recently honored Lesser by creating the Philip Lesser, PhD, CAE, Education Fund Award. The award will support four recipients each year in attending foundation classes. Lesser was a 30-year member of the foundation before his retirement.

Mildred Hunter, SW71, was honored in 2016 with a Lifetime Achievement Award from the Chicago-based Health & Medicine Policy Research Group, which works to improve the health of all people in Illinois by promoting health equity.

Molly (Mary) Maginnis, FA73, has been a professional costume designer for theater, opera, film and television since 1976. For Amazon, Maginnis designed the *Patriot* and *Jack Ryan* series. She says Washington University inspired her to become a costume designer — even hiring a teacher just for her because she was the first student to express an interest in learning design.

Laura Freid, LA74, is president of Maine College of Art. From 2014-17, she was CEO and executive director of the Silk Road Project, a global cultural arts organization based at Harvard University. Freid was executive producer of a documentary film, *The Music of Strangers, Yo-Yo Ma and the Silk Road Ensemble*. Earlier, she was executive vice president for public affairs and university relations at Brown University and chief communications officer at Harvard. She recently reconnected

in Cambridge, Mass., with David Newell, LA73, who with his wife now lives in Cairns, Australia.

Barbara (Langsam) Shuman, LA74, was recently honored with the Ambassador Award from the Lupus Foundation of America, Heartland Chapter. Shuman also received the Distinguished Service Award from the St. Louis Press Club. She and her husband, **Michael**, LW82, live in Chesterfield, Mo. Their daughter **Amanda**, GR13, SW14, teaches fourth grade at North Side Community School in North St. Louis, an award-winning charter school.

Branch Morgan III, LA74, was celebrated as a dance leader by Motor House of Baltimore for dancing professionally for more than four decades. He also was a guest dancer with Chrystelle T. Bond's Chorégraphie Antique and performed in the historical Renaissance Dances Concert for the Medieval Festival held at the Walters Art Museum, in Baltimore.

Rick Welker, EN75, has been building Web and mobile apps for the health-care needs of customers at Dignity Health for more than five years.

Ken Cooper, LA77, was named senior editor at WGBH News, a public radio and TV station in Boston. A Pulitzer Prize-winning journalist, Cooper has worked for *The Boston Globe*, *The Washington Post*, Knight Ridder, the *St. Louis Post-Dispatch* and *The St. Louis American*.

Diane O'Rourke, GR77, GR87, retired gradually from teaching anthropology at Victoria University of Wellington in New Zealand from 2012-16. She has been helping the fledgling democracy in Somaliland in its push for global recognition since 2012. In 2017, she turned her focus to the drought and famine in the Horn of Africa.

Janet (Loft) Reinhardt, BU78, who took early retirement from Boeing, is enjoying living in San Diego and traveling to New York to visit her daughter. Her husband, Thomas, also retired early.

Amy (Nadel) Romanczuk, LA78, a retired clinical nurse specialist, spends her time optimizing her health, promoting literacy and following her artistic passion making Ukrainian Easter eggs (pysanky). Her coloring book, *Patterns of the Wheel* (Tor Books, 2016), combines pysanky-inspired designs with themes from Robert Jordan's *Wheel of Time* series.

Joan Saniuk, SI78, was named pastor of Sacred Journey Metropolitan Community Church, in Hendersonville, NC.

Steven Boggs, LA79, was appointed professor and vice chairman for clinical and research affairs at the University of

Tennessee in Memphis. Previously, he was at The Icahn School of Medicine at Mount Sinai and the James J. Peters VA Medical Center in New York.

Jill (Gardenswartz) Ebstein, LA79, is editor of the *At My Pace* series of books: *At My Pace: Lessons from Our Mothers* (SizedRight Marketing LLC, 2016) and *At My Pace: Ordinary Women Tell Their Extraordinary Stories* (2015). Her 2016 book is a collection of 38 stories from grown children with insights and introspective tales highlighting the love between parent and child.

80s

Frederick W. Jamison, TI80, published *The Rogue Intruder* (XLIBRIS, 2016), which depicts a world collapsing into one-government rule that controls the masses. A

In case you missed it ...



Trawling the waters

As a foreign correspondent, alumna Robin McDowell and a team of investigative reporters exposed the widespread use of slave labor in the fishing industry in Southeast Asia. Unbeknown to many, this seafood could end up in your local grocery store or favorite restaurant. Learn about McDowell and other alumni and university achievements on the Source.

THE SOURCE: source.wustl.edu/2017/08/trawling-the-waters/

decorated Vietnam vet and career civil engineer, Jamison is retired.

Jay Scherotter, SW80, completed his professional career and is taking on important civic and secular causes. Challenge Day, a nonprofit organization that helps people learn to connect through life-changing programs in schools, businesses and communities, is among his causes. He also enjoys travel, family, art and playing senior-level professional disc golf.

Keith E. Van Tassel, EN80, received the Center Director's Commendation Award from the NASA Johnson Space Center (JSC) for "exceptional technical expertise in the management of explosives safety and pressure systems and dedication to safety in addressing some of JSC's most hazardous pursuits." Van Tassel served as pyrotechnic subsystem manager for the Space Shuttle Program, explosives safety officer and pressure systems manager. He and **Ann Madison**, SI80, have been married 37 years.

R. Mark McCareins, LW81, a clinical professor of strategy at Northwestern University's Kellogg School of Management, received a Faculty Impact Award in fall 2016 for outstanding teaching. McCareins also serves as board chairman of Lawrence Hall Youth Services, a Chicago-based child welfare agency, which honored him with the Gene Meier Award for his outstanding contributions.

John Petrovich, LA81, is president at AOA Consulting LLC, a medical-legal analytics firm. Previously, he practiced general and vascular surgery.

Nathan Byers, EN82, is a mechanical engineer with a thriving consulting practice in Seattle. He and his wife of 26 years, Page, have two daughters. Hallie, 23, graduated from Scripps College and is a financial planner

in Los Angeles. Harper, 19, is a freshman at Colgate University.

David Cohen, LA82, an investigative analyst for the Texas Health and Human Services Commission, received praise from the inspector general for his work in recovering \$5 million in fraudulent Medicaid pharmacy payments. Cohen is studying abstract algebra at Texas State and plans to student-teach high-school math in 2018.

Aristotelis Tzakos, GF82, is a full professor at the Athens (Greece) School of Fine Arts, where he has taught since 1985. Tzakos also is chairman of the school's fine arts department and a member of the board of trustees. He also lives in Athens and writes that he'd like to hear from classmates.

Eric Wapnick, BU82, who is thrilled that his daughter is in WashU's Class of 2021, would like to hear from classmates who also have a legacy in attendance (wapnicks@gmail.com).

Jeanette Meyer, LA83, an associate at RE/MAX Alliance, ranked third among 115 Alliance real estate brokers in closed property sales for 2016 and 16th among 225 Alliance real estate brokers in northern Colorado. Meyer also received the Quality Service Certified Platinum Award for 100 percent client service satisfaction.

Perry Newman, LW83, is CEO of Boston-based Dorchester Bay Economic Development Corporation, a developer of commercial and residential properties, and owner of more than 900 affordable housing units. The corporation develops leadership and advocacy skills in youth and builds stronger neighborhoods through community organizing.

Leonard Chanin, LW84, joined Fifth Third Bank as senior vice president/deputy general counsel.

Carl Josehart, LA84, SW87, was honored as a Distinguished Alumnus by WashU's Brown School

in 2017. Josehart is CEO of TIRR Memorial Hermann Rehabilitation Network and system executive for rehabilitation services of Memorial Hermann Hospital System. Since his arrival in 2006, he and his leadership team have advanced the Houston hospital's *U.S. News & World Report* Best Hospitals ranking from fifth in the nation to second.

Kevin J. Luther, LW84, a partner at the law firm of Heyl Royster, was inducted as a fellow of The College of Workers' Compensation Lawyers in March 2017.

Mary Deza, UC86, is on the way to semiretirement after 25 years in travel and accounting. She is an office administrator for military contractor Battlespace Flight Services, which provides operational and maintenance support for MQ-9 military drones.

Jack Sharman, GR86, was named a Top Flight Attorney in Birmingham, Ala., by *B-Metro* magazine. A partner with Lightfoot, Franklin & White, LLC, Sharman leads the firm's white-collar criminal defense and corporate investigations practice.

Shayla (Moody) Kimbro, EN87, and **Kevin Sean Kimbro**, LA87, have been husband and wife since late 2016. The couple met and dated in their freshman year at WashU, reconnected as friends in 2009 and then began dating again in 2015. Shayla is an associate professor of biology at North Carolina Central University, and Kevin is a self-employed software consultant.

Daniel Lally, GB87, is president and CEO of DevTech PET, Inc., a manufacturer of rigid plastic packaging based in Amherst, N.H. Dan and his wife, Laura, and their five children reside in St. Louis.

Bill Osbourn, BU87, is executive vice president and chief financial officer at Xerox Corporation. He and his wife, Enid (Rivera) Osbourn, BU87, live in Charlotte, N.C.

Kathryn Denton, EN88, SI15, started her second year with Omega ATC as a data security strategist. She conducts payment research in point-to-point encryption and mobile payment systems, and manages security standards and compliance projects for the company's clients.

Sterling Miller, LW88, had his second book, *Ten Things You Need to Know as In-House Counsel: Practical Advice and Successful Strategies*, published by The American Bar Association. Miller mentions WashU Professor David Becker in the book's acknowledgments. His first book is titled *The Evolution of Professional Football: An Almanac (1920 to 2015)* (Mill City Press, 2015).

90s

Donald Bingaman, TI91, retired from Boeing as director and chief engineer, Air Systems, Phantom Works, in 2016 after a career of more than 39 years. In January 2017, he launched VPE Aerospace Consulting, LLC, which provides engineering consulting services to the defense industry.

Sam Hananel, LA91, covers the U.S. Supreme Court as a reporter for the Associated Press. He and his wife, **Amy Ledoux**, LA91, LA91, recently celebrated their 27th wedding anniversary. Amy is an assistant vice president at CNA Insurance Co. They live in Bethesda, Md., with their three children.

Jeffrey Meltzer, LA91, was promoted to member of Sills Cummins & Gross P.C., a regional law firm based in New Jersey. Meltzer practices real estate law, including purchase and sale, financing and leasing transactions.

Jeff Barone, LA92, is principal and co-founder of Lennox Capital Partners, a private lodging investment and management firm.

PROFILE

Stephanie Beamer, AB '06

Crystal Ellis, AB '06

Hillary Petrie, AB '06

Collaborative by design

After more than a decade of making furniture together, Stephanie Beamer, AB '06; Crystal Ellis, AB '06; and Hillary Petrie, AB '06, have a knack for translating each other's sparks of inspiration into designs.

Beamer, Ellis and Petrie — all architecture majors — co-founded their contemporary furniture design company, Egg Collective, shortly after graduating from the College of Architecture in the Sam Fox School of Design & Visual Arts. The three friends, who met as freshmen and lived together from sophomore through senior years, have been honored in *Forbes'* 30 under 30 and featured in publications ranging from *Martha Stewart Living* to *Interior Design*. They've designed pieces for Lincoln Center in New York and for buildings and homes around the world.

After graduating from Washington University, though, they were designing mostly for themselves. They all stayed in St. Louis to work for local furniture makers or architecture firms. But they also had access to fabrication equipment, and they set aside Tuesday nights to work on their own pieces. "They'd be things we wanted for our own homes," Ellis says. "Sometimes we'd be like, 'I need a dresser.'"

Work soon took them to different cities: Petrie relocated to New Orleans when her firm took on recovery projects after Hurricane Katrina, and Ellis moved to New York.

But they still wanted to collaborate remotely, so they set up a "virtual studio." Before they were even concerned about selling things, they chose a name, set up a website and had a professional logo made. "We wanted it to feel legit, even though we didn't know what it was," Ellis says. They chose the name "Egg Collective" because the pure, simplistic form of an egg was also the perfect metaphor for the new enterprise they were undertaking.

The three focused on functional pieces, like a pill-shaped coffee table that doubled as giant bookends. By experimenting, they honed their skills and learned more about design.

They knew the next step would require living in the same city. So in 2011, they all met up in New York, a major furniture market. Ellis had just earned an MFA in sculpture at Rhode Island School of Design; Beamer was already in New York, working for a high-end furniture company and design-build architecture firm; and Petrie was in New Orleans, working in a millwork shop.

They rented space in a Brooklyn woodshop, where they made their first collection to debut at the 2012 International Contemporary Furniture Fair. They won Best New Designer, and the attention quickly gave their company legs to stand on.



Courtesy photo

From left: Stephanie Beamer, AB '06; Crystal Ellis, AB '06; and Hillary Petrie, AB '06, started collaborating on design projects at WashU. Now the trio runs Egg Collective, a furniture design company in New York.

Five years later, they've got a self-sustaining business working on its fourth collection. They try not to be "trendy" and to stick to what inspires them. All their furniture is custom-made, typically built with a combination of stone, metal, glass and wood. They source materials as locally as possible.

And they're constantly collaborating.

"It's gotten easier to work together as we've matured," Petrie says. "We communicate so well."

As they've found their own voice, they've also worked to support other women designers. In spring 2017, they used their showroom for the exhibit "Designing Women" that showcased the works of 18 women designers in furniture, lighting and housewares.

The marriage of unique, simple and thoughtful pieces was hailed as a must-see by *The New York Times* and *Vogue*, among other outlets. "The experience was far beyond what we anticipated," Beamer says. "It was super positive — the beauty of all the artwork, the press, the swell of support."

All their success, though, isn't shifting their focus away from the work that brought them to this point; it's affirming their dedication to the company they've built. They currently have six employees, a showroom in Soho and a workshop in Brooklyn.

And they plan to stay put; in 2015, they signed a seven-year lease on their workshop to continue their successful collaboration. "We round each other out," Beamer says. 🍷

— Michael Tabb, AB '14, is a video journalist.

Previously, he was with Maritz Wolff for 18 years. Barone serves on the boards of Explore St. Louis and Ronald McDonald House Charities of St. Louis. He resides in St. Louis with his wife, Diane, and their three children. Their daughter is a sophomore at the University of San Francisco. Their two sons, an 8th-grader and an 11th-grader, attend MICDS.

Gayle Brosnan-Watters, GR93, GR96, left her life as a retiree in Westdale, N.Y., during the 2016-17 academic year to take a one-year teaching position at West Point Military Academy. She writes that it was “an adventure” to teach cadets in her psychology and leadership course.

Arnor Bieltvedt, GF94, participated in a group exhibition, *Quadrivial*, at Los Angeles’ Gloria Delson Contemporary Arts Gallery that featured four of his abstract expressionistic paintings.

Barbara Krauthamer, GR94, was appointed dean of the graduate school at the University of Massachusetts Amherst. Previously, she’d been associate dean for student inclusion and engagement. Krauthamer is also an eminent historian of slavery and emancipation in the 19th-century American South and has taught history at UMass since 2008.

Michael Raney, MD94, a radiologist with West County Radiological Group, in St. Louis, was elected secretary-treasurer of the Missouri Radiological Society.

Esther Shin, LA94, LA94, SW98, is president of Urban Strategies, a not-for-profit organization specializing in human services development, planning and strategy implementation to support neighborhood revitalization. Shin was part of a team that recently won almost \$60 million to revitalize neighborhoods and transform

subsidized housing in St. Louis and Louisville, Ky.

Joy Chatterjee, SI95, works as a lead in Cisco Systems’ data center business unit, focusing on storage switching.

Hilary (Kohn) Cohen, LA95, and her husband, Jonathan, moved in summer 2016 to Dallas, where they were welcomed by **Shelley Weiss**, LA95, and **Simma Weiss**, EN95, and an “amazing community.” Cohen works remotely for the Chicago Rabbinical Council, completing the organization’s annual Passover guide for the 12th year in a row. She is eager to reconnect with other WashU alums.

Bryan Gibby, PT95, is a certified wound specialist at St. Luke’s Elks Wound Center in Boise, Idaho.

Bridget (Glynn) Manning, EN 96, and her husband, Matthew, joyfully welcomed Deirdre Anne, their first child, in February 2017. Bridget has worked at General Electric for 15 years. The family resides in La Grange, Ill.

Daniel Messeloff, LA96, is a partner at Tucker Ellis LLP, where he advises companies of all sizes on employment, labor and other legal issues.

Chris Miller, GR96, GB01, and **Allyn (Sutton) Miller**, BU03, welcomed a son, Andrew Phillip Miller, in October 2016. He joins Nina, who is 3. The family lives in Cincinnati, Ohio, where Chris continues working for Emerson Electric, and Allyn continues teaching in early childhood education.

Donald P. Shriver, LW96, was sworn in early this year as an associate judge of the 17th Judicial Circuit of Illinois. Previously, he worked at Shriver, O’Neill & Thompson, a firm established by his father, **Donald L. Shriver**, LW67. He lives in Rockford, Ill., with his wife, Jennifer, a high school math teacher, and their three children.

Amy (Block) Fields, LA97, SW05, is vice president and chief human

resources officer at HBM Holdings. Previously, she was chief human resources officer at Amerinet.

Hetal (Joshi) Gordon, BU97, joined the board of directors of Girl Talk Inc., which works through peer-to-peer mentoring to inspire girls to develop the confidence to lead. Gordon is director and global client lead for Google in Atlanta.

Dante Lauretta, GR97, who as a youth attended the Boys & Girls Clubs of Metro Phoenix, was inducted into the Boys & Girls Clubs of America 27th Annual Alumni Hall of Fame in May 2017. A mission chief on NASA’s OSIRIS-REx mission, Lauretta created Xtronaut, a STEM curriculum that reinforces concepts including math, science, vocabulary and cooperative learning. Lauretta is professor of planetary science and cosmochemistry at the University of Arizona’s Lunar and Planetary Laboratory.

Erin (Gleason) Leyba, LA97, SW98, an individual and marriage counselor specializing in helping parents of young children, published her first book: *Joy Fixes for Weary Parents: 101 Quick, Research-Based Ideas for Overcoming Stress and Building a Life You Love* (New World Library, 2017). In addition to writing a blog, Leyba speaks frequently to parenting and childcare groups.

TJ Silverman, LA97, recently launched The EquiLux Group, which provides seed capital to start-ups, particularly small businesses in the cannabis market. Previously, he was a partner and senior analyst at Auctus Private Equity for six years. His wife, **Marianna Kimiatek Silverman**, AR97, practices general medicine at Lahey Clinic. The couple lives in Winchester, Mass., with their two girls, ages 5 and 10.

Mitchell Wunsch, LA97, and his wife, Supriya, are thrilled to announce the birth of their second

child, Nathaniel Peter Wunsch, who joined them and big sister Aurelia in February 2017. The family is happy and well in San Francisco.

Edward Garon, MD99, joined LUNGevery’s scientific advisory board, a group of 19 world-renowned scientists and researchers who guide LUNGevery’s scientific strategy and research program. LUNGevery focuses on early detection of lung cancer.

Pamela Kesner, LA99, her husband, Gary Yellin, and their first daughter, Raya, welcomed Dena Brooke Yellin to their family in July 2016. Pam is a senior counsel at the U.S. Securities and Exchange Commission, where Gary is an IT project manager. The family resides in Alexandria, Va.

Matt Marinelli, LA99, and his wife, Susan, welcomed a second son, Alexander, in February 2017. He joins big brother Nathaniel. Marinelli works in the Environment and Natural Resources Division at the U.S. Department of Justice. The family lives in Bethesda, Md.

Yasuhiro Takada, GB99, was appointed president and CEO of THine Electronics, a global leader in high-speed serial interfaces and provider of mixed-signal LSI.

Jenny Tam, EN99, is an instructor in medicine at Massachusetts General Hospital, Harvard Medical School in Boston.

00s

Richard B. Emmons, GM00, joined Boston-based law firm Burns & Levinson as a partner in its life sciences and intellectual property group.

Angel Garcia, LA00, lives in Chicago with his wife and three boys. Before moving to Chicago, he lived in Mexico, New York, Pennsylvania and Iowa.

Scott Sample, LW00, joined Culhane Meadows PLLC as a partner in the Dallas office. Sample’s

practice is in the area of patent and trademark law in the chemical and biotechnological arts.

Peter Benoist, GB01, launched Oakland Capital Partners in St. Louis to provide growth capital and management support to small businesses. Previously, he was head of U.S. distressed trading at Barclays.

Douglas Harrison, GR01, GR05, is associate dean of the Graduate School at University of Maryland University College.

Beth (Burke) Richardson, LW01, special counsel at Sowell Gray Robinson, was honored with a 2017 Leadership in Law Award from *South Carolina Lawyers Weekly*. The award honors outstanding members of the legal community who work to better the profession through mentoring and involvement in their community.

Marie-Louise (Rodgers) Huth, BU02, was promoted to assistant general counsel for investment management and administrative law at the U.S. Securities and Exchange Commission.

Angela Janis, LA02, was promoted to co-director of mental health services at University Health Services at the University of Wisconsin–Madison.

Eli Herman, AR03, works at New Ecology, Inc., a community-based nonprofit organization that focuses on improving low-income multifamily housing.

Suzelle (Tempero) Knisley, LA03, and **Jonathan Knisley**, LA03, LW07, were married in Minnesota in July 2016, with some 40 WashU alumni in attendance.

Jessica Lipps, LA03, celebrated the first-year anniversary of her interview series, *Lipps On Life*. The interviews feature inspiring, extraordinary people who are living their dreams.

Deia Schlosberg, LA03, FA03, runs a documentary film company, Pale Blue Dot Media, in New York, and is directing and producing

several films on climate change, human rights and universal basic income, including *The Reluctant Radical*, *Bootstraps* and *The Story of Plastic*. Schlosberg lives in Harlem with her fiancé, Conrad Shaw.

Cory Simpson, LA03, is a clinical instructor in dermatology at the Perelman School of Medicine at the University of Pennsylvania, where he completed his dermatology residency in July 2016. Simpson received the American Skin Association's Carson Research Scholar Award to continue research on the role of autophagy in the pathogenesis of skin diseases such as psoriasis.

David G. Woodral, LW03, joined the GableGotwals law firm as a shareholder in the firm's Tulsa, Okla., office. His practice focuses on intellectual property law.

Betsy (Goldberg) Zangara, LA03, SW05, and **Jeremy Zangara**, LA03, LW06, are pleased to announce the birth of their third daughter. Eliana Joy joined twins Leora and Talia, 3, in February 2017. Jeremy is a shareholder at Greenberg Traurig, and Betsy is an audit senior manager at Deloitte.

Emily (Reinhart) Adeleke, BU04, and her husband, Anthony, welcomed a son, Adrian Akinwale, in August 2016.

Walker Deibel, GB04, recently acquired his fifth company in 24 months. With **Amy (Gaal) Zellers**, GB04, Deibel was a producer for *Bill Nye: Science Guy*, a documentary film that premiered at the March 2017 South by Southwest (SXSW) Film Festival.

Thomas Kim, GB05, is senior purchasing manager for Catholic Health Initiatives, in Seattle.

Lei Lei, LA05, who lives with her husband and two sons in Wauwatosa, Wis., practices medicine in the greater Milwaukee area.

Emily Shurilla, SW05, is director of clinical services at the Cleveland Rape Crisis Center. The center

provides advocacy, victim services and therapy for survivors of sexual violence in northeast Ohio as well as prevention programming.

Enelia (Valbuena) Faithful, FA06, and her husband, George, welcomed a son, Gustavo Xavier, in June 2016. He joined 3-year-old Penelope Winter. Faithful is a senior user-experience designer at Sophos. The family resides in Montclair, N.J.

Lauren (Miller) Hoye, SW06, was promoted to partner at Willig, Williams & Davidson. Hoye represents both unions and individuals in employment matters, including unemployment compensation and benefits. She was named to the 2017 Pennsylvania Super Lawyers list.

Matthew J. Weinstein, LA06, joined Bean, Kinney & Korman as an associate in the real estate, land use and zoning practice. Previously, Weinstein was chief of staff to Commonwealth of Virginia Delegate Richard Sullivan.

Lauren Kaplan, BU07, is chief operations officer at Nomad Financial, a full-service growth finance strategy and operations firm for early- to mid-stage companies that **Jonathan Gass**, BU04, founded in 2013.

James McGaw, FA07, is married with one son and lives in the outdoor paradise of Bend, Ore.

Mario Treto Jr., LA07, an assistant city attorney for Evanston, Ill., was named to the list of Best LGBT Lawyers Under 40–Class of 2017 by the National LGBT Bar Association.

Veronica L. Boyer, LW08, joined the law firm Mette, Evans & Woodside. Boyer focuses her practice in construction law and litigation as well as commercial, real estate and general civil litigation.

Eric Cesal, GB08, GA08, SI09, is special project director of the Curry Stone Design Prize as well as

co-host of *Social Design Insights*, a weekly podcast that interviews leaders within the social design movement from all over the globe.

Morgan Dugan, GB08, was promoted to vice president of supply chain at The Maschhoffs, a hog production network in Carlyle, Ill.

Saline Jiang, LA08, earned an MBA from the Amos Tuck School of Business Administration and moved to San Francisco to work in business operations for Stripe, a financial technology start-up. A fellow WashU alum referred Jiang for the spot.

Corinne (Pascale) Stroum, EN08, and her husband, Zach, welcomed a daughter, Miriam Katzin, in April 2017. Stroum is director of program management for healthcare analytics at Caradigm, in Bellevue, Wash., where she has worked five years.

Ian Weaver, GF08, was recognized by the *Chicago Tribune* for his art show, *Black Bottom*, which features pieces creating an imaginary Chicago neighborhood. The Black Bottom section of Chicago is a large, multiethnic neighborhood whose community and history were largely destroyed to construct an expressway and a university.

Along with **Ericka Beckman**, FA74, Weaver was selected by the Sam Fox School of Design & Visual Arts to receive the inaugural Stone & DeGuire Contemporary Art Award.

Catherine (Karayan) Wilbur, LA08, and her husband, Gregory, moved from Santa Barbara, Calif., to Los Angeles. Catherine is an associate in the tax and trusts & estates group at law firm Mitchell, Silberberg & Knupp — her dream job, she says, in a dream field.

Vir Singh, LA09, graduated from Rutgers Medical School in May 2017 and in June began training in emergency medicine in the inaugural class of the University of Central Florida–Hospital Corporation of America Emergency

Medicine Residency at Ocala (Fla.) Regional Medical Center.

Thom Wall, LA09, signed with Cirque du Soleil's "Totem" as the featured juggling act. When Wall was a student at WashU, he ran the juggling club and founded the St. Louis Juggling Festival, which enjoyed its 10th season on campus last year.

Becky (Stiger) Williams, SW09, and her husband, Kyle, relocated to Fort Worth, Texas, for his job with BNSF Railway. Becky is a consultant with EMIT Strategies & Solutions, LLC, an event management, marketing, public relations and training firm.

10s

Tara D. Benesch, LA10, graduated in April 2017 from the University of California, Berkeley with a master's degree in public health. She then started the medical doctorate program at University of California, San Francisco. Benesch was invited to speak at four of Mexico's medical schools about the findings of her thesis on the impact of sugar on children's dental and physical health. She also set a new world record for kettlebell weightlifting in her first-ever competition.

Jessica Lewis, LA10, earned a medical doctor degree from New York University School of Medicine in May 2017 and is a pediatric resident at New York Presbyterian Hospital.

William A. Ciszewski III, LW11, was promoted to senior associate in the insurance coverage practice at Hodgson Russ LLP.

Arif Soto, GR11, is an EB-5 consultant with Related Companies, in New York, where he is responsible for reviewing the lawful source of funds documentation in compliance with EB-5 rules. Previously, Soto was employed as an EB-5 paralegal in a boutique law firm in New York.

Allison Brand, LA12, graduated from the University of Pennsylvania with a doctor of dental medicine degree in May 2017 and started a Children's Hospital of Philadelphia pediatric dental residency joint program.

Marcus Jecklin, LA12, is co-founder and chief operating officer of World Fair USA, the first start-up to handle the production of a world's fair. The organization is also producing smaller events, including World's Fair Nano.

Joshua Kallman, LA12, is in the pediatric residency training program at Emory University. His interests are primary care, pediatric hospitalist medicine, developmental and behavioral pediatrics, and adolescent medicine.

Promita Majumdar, SW12, is director of health programs at Sapna, in New York, working with South Asian immigrants. She writes that the Brown School prepared her for interesting and challenging work.

Amanda Shuman, GR13, SW14, teaches fourth grade at North Side Community School in North St. Louis, an award-winning charter school.

Alainna Brown, LA14, is an MD/PhD student at the University of Washington with a research focus in computational neuroscience.

Megan Cook, PT14, who was married to Aaron Shoppa in September 2016, continues to work as a physical therapist at Advocate Children's Hospital in Oak Lawn, Ill.

Andrew M. Gaggin, LW14, GB15, is an associate in the Detroit office of Gallagher Sharp LLP, where he handles labor and employment issues. At Washington University School of Law, he served as associate managing editor of *Washington Jurisprudence Review* in 2014.

Juliana Gonzales, SW14, is a forensic interviewer at Mercy

Hospital Behavioral Health Department.

Max Schoenfeld, LA14, and **Jacob Goodman**, BU15, were featured in the *Huffington Post's* 5 Entrepreneurs Under 25 Who Are Succeeding with Traditional Companies. They met through the WashU Student Entrepreneurial Program and ran the student-run business, UTrucking. Schoenfeld went on to found College Truckers, a moving and storage company, and Goodman launched Fresh Prints, a custom campus apparel company.

Mark Sutherland, UC14, was named Her Majesty's Honorary Consul for the State of Missouri by the British government, charged with furthering cultural, political and economic connections between Missouri and the United Kingdom. Sutherland is vice president of market strategies at Missouri Partnership.

Quinn Robert Kern Allely, EN15, is studying medicine at the University of Tehran.

Anne Dobbels, GL15, is an international tax lawyer at PwC Luxembourg.

Lauren Gaffaney, LA15, is attending medical school.

Antony Santiago, BU15, GB16, is an assurance associate at PwC. He passed the CPA exam and is working to obtain a CPA license in Washington state.

Aakash Gandhi, LA16, is an MD/PhD candidate at the University of Texas Southwestern Medical Center, in Dallas. He hopes to put his training in patient care, biochemistry and pharmacology to use in science education as a means of community engagement. Gandhi serves as a district science fair judge and a curriculum representative for his medical school class.

Stephen Lehman, LA16, is working on a doctoral degree

in linguistics at the University of California, Los Angeles.

Kate Shin, LA16, is a paralegal in New York.

Rebecca Siow, EN17, is a software engineer at Blue Apron in New York.

In Memoriam

1930s

Venus (Frederiksen) Schattyn, LA 33; June '17 • **Viola (Timmerhoff) Cunningham**, BU 37; April '17 • **Elva (Lenz) Osborne**, LA 37; March '17 • **Grant E. Russell**, EN 38, SI 50; May '17 • **Alice F. Clark**, LA 39; May '17 • **Samuel T. Cohen**, UC 39; March '17 • **Don M. Savage**, EN 39; April '17

1940s

Richard J. Wolfheim, LW 41, LW 42; March '17 • **Stella (Sudika) Farley**, LA 42, GR 43; April '17 • **Mary (Atkinson) Hughes**, UC 42; March '17 • **Lee A. Brandenburger**, BU 43; May '17 • **Earle G. Hamilton**, AR 43; May '17 • **Stanley S. Kahn**, MD 43; May '17 • **Sorelle (Simon) Parker**, LA 43; May '17 • **Sanford A. Silverstein**, EN 43; June '17 • **Harriet (Traub) Wise**, UC 44; June '17 • **Ralph Berg**, MD 45; June '17 • **Robert H. Hall**, MD 45; March '17 • **Thomas E. Prosser**, DE 45; April '17 • **Mary (Riordan) Elsner**, FA 46; March '17 • **Mary (Zuccherro) Garvey**, LA 46, LA 47; March '17 • **J. Bernard Kolker**, BU 46; June '17 • **Elizabeth (Miller) Roche**, LA 46; April '17 • **Anne R. Dick**, LA 47; April '17 • **Betty (Klingelhoef) Krupp**, LA 47; March '17 • **Charlotte (Thuenen) Raith**, AR 47; March '17 • **Chester G. Schmidt**, BU 47; April '17 • **Virginia (Hiser) Dixon**, LA 48; April '17 • **Robert W. Krueger**, EN 48; March '17 •

The game of life

Sam Coster was 23 when he was first visited by the blood dragon, a hallucination that would burst out of his chest or appear in rooms as he entered them. It was the fall of 2013, and Coster, who had graduated with a psychology degree in 2012, shrugged off the visions because he was so busy. Seven months earlier, Coster and his brother Seth had launched their own game-development studio, Butterscotch Shenanigans.

The two-man team produced mobile games at a rapid rate, usually in just 48 work days. Seth did the programming, and Sam created the art. But after producing two popular games, *Quadropus Rampage* and *Towelfight 2*, Sam developed a recurring fever, extreme lethargy and lumps on his chest. The vision of the blood dragon began to appear daily. Sensing something was deeply wrong, he decided to see a doctor.

The news was devastating: Coster had a rare, aggressive form of non-Hodgkin's lymphoma, and it was already in its final stage. He didn't know it at the time, but his chance of survival was a mere 7 percent. Coster started treatment immediately.

He also started to think about his work. The brothers had been creating a small, unambitious endless runner for mobile. Like Butterscotch's other releases, it was purposefully silly and irreverent — and now held no interest for Coster.

"This is not the last game I want to make before I die," he remembers telling his brother. Instead, he wanted to draw players into an imaginative universe and keep them spellbound for hours — to create a game so great that "we'd keep ourselves alive just to build it." Seth agreed, and the two started working on a game tentatively titled *F—k Cancer*.

As Coster underwent aggressive chemotherapy, he began to look at the rest of his life the way he looked at game development, removing the unimportant to focus on work, family, his then-girlfriend (now wife) and close friends.

By December 2014, Coster had completed his cancer treatment and spent several months recuperating. The game — now called *Crashlands* — was moving along when Coster found a new lump. The cancer was back.

Coster entered "salvage" chemotherapy in early 2015, and he and *Crashlands* entered their darkest phases. Around this time, Coster's oldest brother, Adam, joined Butterscotch Shenanigans. Despite Adam's fresh perspective, *Crashlands* still didn't differentiate itself from other popular crafting games such as *Minecraft*.

Plus, Coster had to undergo BEAM chemotherapy to "nuke" his immune system. Once Coster could no longer make blood on his own, he would get two stem-cell transplants, effectively giving him a new immune system that would defeat the cancer for good.



Joe Angeles

After being diagnosed with stage 4 cancer, Sam Coster, AB '12, and his brother Seth decided to create the award-winning and popular game, *Crashlands*.

"I truly feel that I was pushed through the veil of life to the other side," Coster says. "And my doctor held on to just my pinkie toe, and then dragged me back across."

As Coster emerged from his treatment, *Crashlands* started to look up, too. The brothers figured that adding a story to their game would make it stand out. So in just a few weeks, Coster wrote the story of Flux, an interplanetary-delivery driver who crash lands on a strange planet, where she has to build shelter, craft weapons and tame strange creatures to survive.

By the end of 2015, the brothers were beta-testing *Crashlands* and preparing for a January 2016 launch. Coster went in for his post-transplant scan and got his first cancer-free verdict.

When *Crashlands* launched, Coster's story attracted a lot of press, and the game received phenomenal reviews. In 10 days, *Crashlands* sold 131,000 units. It went on to be named a top game of 2016 by *Time* magazine and game of the year by Touch Arcade. It was even nominated for Best Mobile Game of 2016 at the DICE awards, the game industry's equivalent to the Oscars.

With the success of *Crashlands*, the brothers were able to expand their studio and hire four more people. They are now working on their next game, *ScuffleBuddies*.

For Coster, the ordeal taught him one of life's most important lessons, he says, "When you experience setback after setback, keep in mind this basic fact: If you're not dead, you're not done." 🏆

— Rosalind Early, AB '03, is associate editor of this magazine.

Theodore M. Meiners, MD 48; March '17 • Jack H. Mooney, GR 48; May '17 • Irene (Caras) Restad, OT 48; June '17 • Wayne L. Roscoe, LA 48; June '17 • Florence (Molien) Sable, SW 48; April '17 • Thomas E. Sawhill, BU 48; April '17 • Loraine (Meier) Tracy, GR 48; April '17 • Jean (Zillman) Williams, LA 48; April '17 • Kenneth J. Boettcher, BU 49; June '17 • Charles W. Hanke, LA 49; April '17 • William J. O'Herin, LW 49; June '17 • Paul H. Owen, LA 49, GR 51; July '17 • Bruce A. Raymond, MD 49; May '17 • Paul T. Richter, EN 49; March '17 • Jack Sorkin, AR 49; March '17 • James W. Stewart, EN 49; April '17 • Lois (Meyer) Sullivan, UC 49; March '17

1950s

David F. Engelking, MD 50; May '17 • Ralph E. Greene, BU 50; March '17 • Wayne W. Hudgins, BU 50; April '17 • Donald R. Hunstein, LA 50; March '17 • Marc R. Mangus, UC 50; March '17 • William B. Muchmore, GR 50; May '17 • Shirley S. Payne, LA 50; April '17 • Earl H. Samel, UC 50, GR 53; April '17 • John T. Stewart, LA 50, GR 51; June '17 • Wilson R. Zunz, BU 50; March '17 • Annabelle (Tiffin) Alks, FA 51; March '17 • Jeana (Dale) Bearce, FA 51; April '17 • Clifford L. Duckworth, EN 51; March '17 • Richard J. Fadern, EN 51; April '17 • Russell G. Glueck, AR 51; April '17 • Julia (Donovan) Hiemenz, LA 51; April '17 • Martin Israel, EN 51; April '17 • William A. Penn, EN 51; April '17 • William H. Sanders, UC 51; March '17 • Leonard Zellinger, LA 51; March '17 • John J. Carusa, UC 52; April '17 • Ting L. Chu, GR 52; April '17 • Robert C. Drews, LA 52, MD 55; May '17 • Noel R. Essman, BU 52; April '17 • Richard L. Hedden, EN 52; April '17 • Joanne Lassen, LA 52; May '17 • Ralph Z. Miller, BU 52; March '17 • Henry W. Pieper, GB 52; March '17 • Mary (Palmer) Schnitzius, LA 52; March '17 • Helen C. Kalbfleisch, FA 53; April '17 • Alvin M. Levin, LA 53, LW 58; April '17 • Thomas C. Parsons, LA 53, LW 54; May '17 • Dorothy (Boyle) Schmidt, LA 53; May '17 • Norman J. Shapiro, EN 53; June '17 • Jerold J. Fadern, LA 54; May '17 • Davie L. Heuerman, LA 54, GR 57; March '17 • Dale A. Jacobs, EN 54; June '17 • Ralph B. Montgomery, DE 54; March '17 • Lawrence W. Reisch, LW 54; March '17 • Paul H. Vanderwal, EN 54; March '17 • Robert E. Ward, AR 54; March '17 • Raymond D. Whitmore, LA 54; May '17 • James L. Burst, EN 55; March '17 • Floyd E. Crowder, LA 55, LW 57; May '17 • Peter D. Haikalis, LA 55; March '17 • James A. Myers, LA 55; March '17 • Jack B. Rosen, LA 55, DE 58; March '17 • Raymond G. Schultze, LA 55, MD 59, HS 63; April '17 • Charles J. Witcher, FA 55; May '17 • Nancy (Schumacker) Ferreira, OT 56; March '17 • Richard L. Laboyteaux, BU 56; April '17 • Patricia (Kratky) Levine, LA 56; April '17 • Havner H. Parish, MD 56; June '17 • Kenneth D. Sennert, EN 56; April '17 • Peter R. Summers, LA 56, GR 58; May '17 • Jane (Nooter) Elswick, LA 57; March '17 • Bertram W. Justus, MD 57; May '17 • Marian (Piper) Paxhia, NU 57; March '17 • Frederick D. Peterson, MD 57; March '17 • Rudyard K. Rapp, EN 57; May '17 • Arthur J. Schneider, LA 57, MD 61; May '17 • Leland B. Boettcher, BU 58; April '17 • Robert P. Buhr, EN 58; May '17 • Donald E. Callaghan, HA 58; May '17 • Thomas R. Green, LW 58; March '17 • Daniel R. Fineberg, BU 59; March '17 • Alois

J. Koller, EN 59; April '17 • Boris Prstojevich, LA 59; April '17 • Julius A. Seidel, BU 59; May '17 • Frederic W. Wulfing, GB 59; March '17

1960s

Ronald J. Bauer, EN 60; April '17 • Jeremiah D. Finnegan, LA 60; March '17 • Stanley H. Gellman, FA 60; March '17 • Gerald L. Howell, DE 60; May '17 • Erwin Johannngmeier, LA 60, GR 64; April '17 • Walter A. Learmont, UC 60; April '17 • George A. Morrison, LW 60; March '17 • Robert O. Piening, LA 60, BU 60, GB 61; March '17 • Gaylord E. Richardson, AR 60, GA 78; March '17 • Eli R. Shuter, MD 60; April '17 • Larry L. Zahnd, LW 60; March '17 • Terry L. Eppler, EN 61; May '17 • John N. Komos, EN 61; March '17 • Cedric S. Reynolds, LA 61, GR 64; March '17 • Richard T. Richmond, LA 61; April '17 • Harold B. Shapiro, BU 61, GB 62; March '17 • Symuel H. Smith, UC 61, HA 65; June '17 • Paul A. Beyreuther, LA 62, GB 64; March '17 • Louree P. Clem, UC 62; May '17 • G. Dwight Dieckman, EN 62; March '17 • Raymond J. Kersting, UC 62, UC 72; March '17 • Betty (Jaeger) Portmann, FA 62; March '17 • Marlene (Schenberg) Seifer, LA 62; March '17 • William R. Andler, UC 63; April '17 • Marjorie (Smith) Cope, UC 63; April '17 • John B. Dal Pozzo, UC 63; March '17 • Henry E. Dupree, DE 63; April '17 • Nancy (Whiffen) Griffiths, FA 63; March '17 • William H. Hecht, GR 63; June '17 • Robert D. Hutton, MD 63; May '17 • Howard E. Lovely, GB 63; March '17 • Robert T. Miller, MD 63; March '17 • Ralph R. Smith, GR 63; April '17 • Nathan F. Williams, EN 63; April '17 • Joel R. Dickson, UC 64; June '17 • Sophia (Goode) Goodman, UC 64; May '17 • Martha A. Coleman, GN 65; April '17 • George E. Drabb, UC 65; April '17 • Mary (Brandau) Maledon, UC 65; May '17 • Thomas M. O'Connor, GR 65; March '17 • Gerald D. Rapp, GR 65; March '17 • Robert J. Reilly, UC 65; March '17 • Hazel (Zink) Sprandel, GR 65, GR 69; June '17 • Jay A. Weinstein, GR 65; March '17 • C. Fred Blake, GR 66; April '17 • Carl H. Hoffman, LW 66; May '17 • Paul R. Kucera, UC 66; June '17 • Michael H. Maguire, UC 66, GR 67, GR 71; June '17 • Louis A. Noel, BU 66; May '17 • Merle (Moss) Olderman, LA 66; April '17 • Nancy (Fowler) Pope, NU 66; March '17 • George J. Simcik, UC 66; May '17 • C. David Stringfield, HA 66; March '17 • Margie (Bernstein) Summers, LA 66; April '17 • Jedonna (Prince) Wagner, UC 66; March '17 • John Faszholtz, GR 67; March '17 • Allen D. Patrick, UC 67, UC 74; May '17 • Terry A. Ryan, UC 67; March '17 • Nancy (Adler) Sachar, GR 67; June '17 • Helen A. Abbott, LA 69; June '17 • Thomas W. Leichenauer, UC 69; April '17 • Joseph K. Markovitz, UC 69, UC 72; May '17 • John H. Turner, GR 69; May '17 • Kraig R. Vogt, SW 69; March '17

1970s

Ron L. Thompson, EN 70; April '17 • Stanley P. Vroman, UC 70; April '17 • Angelo M. Colombo, UC 71; March '17 • Larry Cooper, SI 71; June '17 • Judith (Lurtz) Lewin, UC 71; March '17 • Willard E. Misfeldt, GR 71; April '17 • Anthony J. Weisenberger, MD 71; March '17 • Jerry M. Cottrell, UC 72; April '17 • Robert L. Mantle, TI 72; June '17 • Robert C. Postill, TI 72; March '17 • John W. Geppert, BU 73; March '17 • Dennis Richmond, MD 73; May '17 • Ernest P. Sutton, DE 73;

The courage to heal

Katie Rhoades entered the Brown School with a clear mission — to help women who had been involved in the commercial sex industry. She'd been on this mission ever since she escaped three years of sexual trafficking at age 21. From that, she learned about the dearth of institutions devoted to helping women get out of the commercial sex industry and decided to help.

First, Rhoades studied social work at Metropolitan State University in the Twin Cities. Her professors encouraged her to apply to graduate school, and she matriculated at Brown in 2010. With support from her Brown School professors, Rhoades decided that, after she graduated, she would launch her own agency to help survivors of sex trafficking.

"I had a board of directors, and we were going to start the agency within six months," Rhoades says with a laugh. "I was 30 when I graduated, and I thought that I was immune from that grad school gusto — not so much."

While she worked to launch the agency, she found a job at Easter Seals Midwest, helping adults with mental disabilities and managing a staff of 20. The job easily took 60 hours or more a week.

In her free time, Rhoades educated people about sex trafficking and how to help victims. She developed trauma-informed therapeutic services and provided them to survivors at residential shelters and in mental health programs. She also taught hotel staff how to identify commercial sex in their hotels.

Jason Kander, then Missouri's attorney general, tapped Rhoades to advocate for a change to Missouri's Safe at Home Bill, which provides P.O. boxes free of charge to victims of domestic abuse. He wanted to add sex trafficking victims to those eligible.

"There was a lot of politics around it," Rhoades grumbles. "That's an area where I get really frustrated because we're putting politics over the welfare of individuals. I did call it out," she says with a laugh. "We had a human trafficking awareness day [in Jefferson City], and I was the speaker. I just said, 'It really irritates me that politics is getting in the way. We need to serve women.'"

The changes to Safe at Home did pass, and Rhoades has since joined a new Statewide Anti-Trafficking Task Force formed by Josh Hawley, current Missouri attorney general. "I'm not a big fan of coalitions because a lot of times they're pretty ineffective," Rhoades says. "But this one's moving and it's moving quickly, and I like that. I'm a get-stuff-done person."

So Rhoades' struggles to fund her agency right away were frustrating her. By 2015, she decided, "It's either going to happen or it's not. And if it's not, I need to move on." She was even planning a move back to Minnesota when a 3-year grant from



Joe Angillet

Katie Rhoades, MSW '11, founded Healing Action, a nonprofit organization that helps women recover from sex trafficking.

the National Foundation, one that she had been working on for a year, came through.

Rhoades opened Healing Action in November 2015. Unlike many other organizations, it is open to any woman trying to escape any kind of commercial sex.

"We openly say that how you got in isn't a concern for us because the trauma and exploitation happen regardless," Rhoades says. "Women already have that self-blame and self-hatred because of the 'choices' they've had to make, so we don't want to contribute to that."

As Healing Action's executive director, Rhoades built a therapeutic program on the relational-cultural therapy model, which says that trauma happens in the context of relationships and most trauma is interpersonal. The best way to recover is through healthy relationships. Healing Action promotes "growth-fostering relationships" through trauma therapy, peer coaching, therapeutic book study and peer support groups. Plus, all of the peer support specialists, who do one-on-one coaching and group facilitation, are survivors themselves.

Rhoades says that seeing her agency come to fruition has had a huge impact on her own healing from trauma and has been deeply satisfying. "It sounds corny to me, but I really do love my job," she says. "It's challenging, and I've learned a lot about myself in the process. I like coming to work every day." 🧘

— Rosalind Early, AB '03, is associate editor of this magazine.

April '17 • **Heimtraut Taylor**, GR 73; March '17 • **Fred W. Fischer**, GR 74; April '17 • **Robert D. Rounds**, DE 74; March '17 • **Marvin H. Barnett**, TI 75; April '17 • **Robert A. Chappell**, LW 75; May '17 • **Yasuko Yokota**, SW 75; April '17 • **Richard L. Baron**, MD 76; May '17 • **Wendolyn (Wade) Darden**, LA 76; March '17 • **Elizabeth L. Wright**, GR 76; June '17 • **Cleveland J. Guillot**, BU 77; April '17 • **Lawrence P. Travers**, UC 77, GR 85; May '17 • **John A. Conner**, EN 78; April '17 • **Richard H. Franklin**, BU 78; April '17 • **Larry J. Spivey**, FA 79; March '17 • **Albert E. Weber**, SW 79; April '17

1980s

Nona L. Bonheimer, PMBA 80; April '17 • **Jeanne D. Lewis**, MD 82; May '17 • **Franklin A. Mushkin**, EN 82; Nov. '16 • **Virginia M. Paget**, GR 82; April '17 • **Holly G. Simons**, LW 82; April '17 • **Keith R. Chastain**, GB 83; March '17 • **Thomas P. Reck**, GR 83; April '17 • **David Seabaugh**, TI 83; March '17 • **Walter F. Goodman**, LA 84; May '17 • **Earl W. Jyung**, BU 86; May '17 • **Cynthia M. Wolf**, GR 86, GR 95; April '17 • **Hal E. Bundy**, GF 88; April '17 • **James O. Rice**, EMBA 88; March '17 • **David A. Schwab**, GL 88; April '17 • **Aminata F. Ipyana**, LW 89; March '17 • **G. Kevin Miller**, EN 89; March '17 • **David J. Tseng**, GL 89; April '17

1990s

Dianna M. Georgina, UC 90, GR 92; May '17 • **Albert E. Combs**, GR 92, GR 95; March '17 • **Dmitry A. Altshuller**, SI 95; May '17 • **Beth J. Calabotta**, PMBA 96; March '17 • **Stanley J. Crone**, EN 97; March '17 • **Thomas J. Mueller**, PMBA 98; June '17

2000s

Aaron Rogat, GM 02; April '17 •

Douglas A. Rawls, EMBA 03; June '17 • **C. Truth A. Griffeth**, SW 04; March '17 • **Branden N. Klayko**, AR 07; June '17

2010s

Brian P. Schlitt, LW 19; April '17 • **Donald E. Stahl**, GR 19, UC 19, UC 19; March '17

2020s

Travis C. Mazer, GM 20; April '17

In Remembrance

David August Bensinger

David August Bensinger, AB '44, DDS '44, former professor and dean of the School of Dental Medicine, died July 22, 2017. He was 91.

Bensinger grew up in St. Louis and earned his bachelor's and Doctor of Dental Surgery degrees from Washington University.

Bensinger was also president of the Missouri Dental Association and of the Midwest Society of Periodontists. Further, he was editor of Greater St. Louis Dental Society publications.

He was named a Fellow of both the American College of Dentists and the International College of Dentists, and he won a distinguished alumni award from the university in 1968 and a service award from the Greater St. Louis Dental Society in 1971.

Robert C. Drews

Robert C. Drews, AB '52, MD '55, a professor emeritus of clinical ophthalmology at the School of Medicine, died May 9, 2017, following a stroke. He was 86.

Drews had a long history with the university. He earned a bachelor's degree here in 1951 and a medical degree in 1955. He went on to complete his residency in ophthalmology at the School of Medicine, where he served as chief resident. Following two years in the U.S. Navy, he opened a private

Charles F. Knight

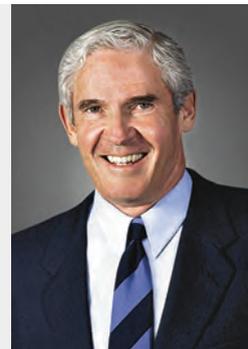
Emerson Chairman Emeritus Charles F. Knight, a major benefactor of Washington University and longtime member of its Board of Trustees, died Sept. 12, 2017, of complications from Alzheimer's disease. He was 81.

Knight, who was chief executive officer at Emerson Electric Co. for 27 years, helped shape the present-day Washington University, according to Chancellor Mark S. Wrighton.

"Chuck Knight was a loyal and dedicated friend of Washington University for more than 40 years. His extraordinary generosity, support and vision can be felt and seen throughout our campuses," Wrighton says.

"He, along with his wife, Joanne, showed an unwavering commitment to advancing the university: helping establish Olin Business School as one of the premier institutions of business education and research in the world; helping build the Alvin J. Siteman Cancer Center into the country's third-largest cancer center; and strengthening our research programs related to Alzheimer's disease.

"Sadly, near the end of his life, he suffered himself from Alzheimer's disease. He was a great business leader, an outstanding trustee of the university and a personal friend. His leadership in our community is deeply missed," Wrighton says.



practice in St. Louis and taught in the ophthalmology department.

During his career, Drews invented many instruments for the eye; authored more than 500 journal articles, book chapters and books; served on editorial boards for leading ophthalmology journals; and received many awards.

Robert F. Ford

Robert F. "Dick" Ford, emeritus trustee of the university, died July 8, 2017, after a 20-year battle with cancer. He was 81.

Ford was involved in finance throughout his life, working for Merrill Lynch and 1st National Bank of St. Louis and eventually becoming president and CEO of Centerre Bank, formerly 1st National.

He joined the university's Board of Trustees in 1981 and became an emeritus trustee in 2007. While on the board, he served

on nearly every committee and worked on several of the university's national councils.

In addition to founding Gateway Mid-America Partners, a venture capital partnership, Ford served on many boards, was active with Edgewood Children's Center and was president of a Michigan country club.

John M. Fredrickson

John M. Fredrickson, MD, former head of the Department of Otolaryngology and a professor emeritus of otolaryngology at the School of Medicine, died April 5, 2017. He was 86.

Fredrickson came to Washington University in 1982 as the Lindburg Professor and head of the Department of Otolaryngology, a position he held until 1998.

In addition to helping the otolaryngology department grow

in both research and clinical activities, Fredrickson was a distinguished otolaryngologist in his own right. He made major contributions in the field of vestibular neurophysiology, middle-ear implants and micro-vascular reconstructive surgery of the head and neck. He also served as president of the American Laryngological Association and editor of the *American Journal of Otolaryngology*.

He became an emeritus professor in 2002 and moved back to his native Vancouver, Canada, where he helped develop an implantable transducer for severe hearing loss.

Travis C. Mazer

Travis Conrad Mazer, a doctoral candidate studying molecular genetics and genomics, died unexpectedly on April 24, 2017. He was 25.

Mazer first came to the university as a research technician before entering the School of Medicine's PhD program in August 2016. He worked in the lab of Abhinav Diwan, MD, associate professor of medicine, and will be listed as an author on an upcoming research paper from Diwan's lab.

Stanley A. Sawyer

Stanley Arthur Sawyer, professor emeritus of mathematics in Arts & Sciences, died August 2, 2017. He was 77.

Sawyer was a distinguished mathematician and statistician. In addition to working in the mathematics department, he was a professor of genetics and biostatistics at the School of Medicine. During his career, Sawyer authored 80 scholarly articles and a book. He designed the computer program GENECONV, which analyzes DNA and gene conversions.

Sawyer started at the university in 1984 and taught for about 30 years before becoming professor emeritus in 2013.

Brian Schlitt

Brian Schlitt, a first-year student in the School of Law, died April 12, 2017, after a brief illness. He was 38.

Schlitt earned a bachelor's degree in English and philosophy from Southern Illinois University in Carbondale in 2004.

Before enrolling at the School of Law, Schlitt ran his own computer graphics company.

Peter G. Sortino

Peter G. Sortino, assistant vice chancellor at Washington University and a longtime St. Louis civic leader, died March 24, 2017, of pancreatic cancer. He was 62.

Sortino joined the administration in 2011 to help the university become an even stronger contributor to the well-being of the region.

He had been president of the Danforth Foundation from 2005 to 2011, during which time he oversaw the administration of all grants and related activities.

For his leadership in securing voter approval of a sales tax increase to fund the parks, Sortino was inducted into the Missouri Recreation and Parks Hall of Fame. He also worked on other important civic projects: the CityArchRiver project, transforming the Gateway Arch grounds; the renovation of Forest Park; and the development of Washington Avenue.

In November 2016, Sortino was named St. Louis' 2016 Citizen of the Year.

Donald Stahl

Donald Stahl, a master's degree student in University College in Arts & Sciences, died March 22, 2017, after suffering a heart attack on campus. He was 73.

Stahl came to Washington University after retiring from a career in social work. He had been enrolled at University College since spring 2015. University College Dean Mark Rollins says Stahl will be awarded an advanced

Joseph Smith

Air Force Capt. Joe Smith, MBA '69, had been deemed missing in action since April 4, 1971, when his F-100 Super Sabre jet was shot down during the Vietnam War.

Growing up in Assumption, Illinois, Smith was by all accounts popular and handsome and was elected his high school's class president. He went on to earn a bachelor's degree from Notre Dame, where he was a member of the ROTC. While earning his master's degree in business from Washington University, Smith met his wife, Elaine, a student at Fontbonne College.

Smith enlisted in 1970, and less than a year later, his plane was shot down. Although his remains were not recovered, his family held a memorial service. The church overflowed with mourners, and the U.S. Air Force performed a Missing Man Formation Flyover; without remains, though, Smith was still considered MIA.

In 2016, the Defense POW/MIA Accounting Agency, which searches the world for missing U.S. vets, found Smith's remains still with his plane in Kampong Thum Province in Cambodia. Due to the remote location of the crash, it took multiple visits to identify and excavate the remains, which were sent to Smith's hometown. There, he was given a full military funeral in July 2017.

"He was a wonderful man," says his widow, Elaine Mills, "and lived a short, but good, life."



certificate in international affairs posthumously.

Denise Thomas

Denise Thomas, a medical assistant for 28 years in the School of Medicine, died July 4, 2017, after a stroke. She was 52.

In addition to working as a medical assistant in the Division of Hematology, Thomas was working toward a bachelor's degree in health-care management at University College. Thomas had been inducted into Alpha Sigma Lambda honor society, which celebrates the scholarship and leadership of adult students in higher education. University College Dean Mark Rollins says the college will award Thomas' degree posthumously.

Jean Holowach Thurston

Jean Holowach Thurston, MD, a pediatric neurologist at the

School of Medicine and a pioneer in the field of pediatric neurology, died April 29, 2017, of natural causes. She was 99.

Thurston's groundbreaking research helped advance the treatment of childhood seizure disorders. She studied epilepsy and in 1972 published a study that identified seizure recurrence risks in *The New England Journal of Medicine*. The findings remain relevant.

Thurston's studies into brain metabolism and neurochemistry proved foundational material for further research on childhood metabolic disorders. Plus, Thurston was the first to document the association between breath holding and anemia in children.

Thurston won many awards including the first lifetime achievement award from the Child Neurology Society. She was also a consultant for the National Institutes of Health.

High art

In spring 2017, eight students from the Graduate School of Architecture & Urban Design — part of the Sam Fox School of Design & Visual Arts — designed and began building prototype sections for *Spectroplexus*, a large public sculpture commissioned by the Art and Culture Program at St. Louis Lambert International Airport. Over the summer, students and more than a dozen volunteers spent weeks fabricating and installing the final piece in the airport's Terminal 2. The finished artwork, which runs nearly 100 feet long, demonstrates how simple organic processes can inspire built systems of great intricacy and complexity. At right, graduate student Marija Draskic makes final adjustments to the installation. Also pictured is lift operator Barry Bushong. (Photo: James Byard)





A TIME TO REMEMBER On the first day of the 2017-18 academic year — Monday, Aug. 21, 2017 — university photographer James Byard captured a view of the total solar eclipse from the Danforth Campus.