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As graduates of Arts & Sciences are well aware, the effects of the activities and research within our Arts & Sciences community extend far beyond the Danforth Campus. Our work is vital to innovations of the future and the economics of our nation, but in order to look forward, we must also be aware of our place in a broader continuum of learning and discovery.

Earlier this year, university officials announced that Washington University will sponsor an innovative new charter school in St. Louis: the Hawthorn Leadership School for Girls. At Hawthorn, girls in grades 6 through 12 will have the opportunity to explore STEM fields – science, technology, engineering, and math – in a supportive and challenging environment. The school’s founder is Mary Danforth Stillman, former assistant dean at Washington University. Arts & Sciences alumna Ann Rubenstein Tisch founded the Young Women’s Leadership Network (YWLN), with which the school will be affiliated.

When I first heard of these plans, I knew that I wanted our school and faculty to be involved from the outset. Women continue to be underrepresented in important STEM fields. I believe that faculty across Arts & Sciences – including women faculty in my own department, biology – can be positive role models for this future generation of scientists and engineers.

This partnership is one example of the many ways in which the university sustains a strong focus on the connections between education and innovation. Although there may appear to be a world of difference between an elementary school classroom and a university research lab, both are essential to solving the pressing problems found across our nation and world.

In the feature “Tests That Teach” (p. 16), you can discover how research from our own psychology department helps teachers improve students’ learning outcomes. Years from now, these students may continue the excellent work of professors who are uncovering potential treatments for disease (“The New Science of Chronic Pain,” p. 20), challenging cultural presumptions about important concepts like privacy (“Private Lives,” p. 26), or developing technologies for new ways to share and experience news from around the globe (“The Future of Journalism,” p. 50).

I hope you enjoy this year’s issue of A&S Magazine and the glimpses it provides of our research community. As I have wrapped up my first year as Dean, I am continually impressed by the passion and dedication of our faculty, students, and alumni, and I have great expectations for the ideas and innovations that the scholars within Arts & Sciences will bring forth in the years to come.

Sincerely,

Barbara Schaal
Dean of the Faculty of Arts & Sciences
Mary-Dell Chilton Distinguished Professor

During a recent trip to Taiwan to meet with Washington University’s International Advisory Council for Asia, Dean Schaal visited a Gongliao rice terrace. For the past five years, Taiwan’s Forestry Bureau has worked with local governments and civic organizations to promote ecology conservation in Gongliao and other districts. The photo was taken by Kuo-Fang Chung, a former advisee of Schaal’s who earned his doctorate in evolution, ecology, and population biology in 2006.
“Suppose I could make this thing a star, a real presence in the intellectual and cultural realm?” – Gerald Early on creating a new interdisciplinary journal, p. 9
MAPPING THE BRAIN

In April 2013, President Obama announced a new initiative to get a better, more dynamic picture of how the living, working brain operates. As part of this Human Connectome Project, Deanna Barch, professor of psychology, and her colleagues are working to produce the first interactive wiring diagram of the human brain to better understand how the brain functions and the connectivity within its different parts. “What I do is look at how the different parts of the brain work together to produce behavior,” she told The New York Times in a January article about her research. For this project, Barch and her colleagues will send 1,200 volunteers through MRI machines in order to obtain cognitive, psychological, physical, and genetic assessments of the brain. These scans will then be used to build a baseline database for healthy brain structure and activity.

Above: a group average map of brain regions associated with language processing in human cerebral cortex. Participants are asked to listen attentively to either a story or an arithmetic calculation (e.g., “16 minus 5 plus 18 equals”) and answer a question about what they heard. Yellow and red regions are activated by listening to stories, whereas green and blue regions are more strongly activated by performing mathematical calculations.

SPECIAL DELIVERY

A large wooden crate was delivered to the Compton Hall loading dock in early December, direct from Paris. The crate contained a new instrument that Washington University in St. Louis scientists say will transform their ability to study everything from the long-term evolution of the Earth’s surface to high-performance ceramics. The instrument, called the Cameca SIMS ims7f-geo, is a state-of-the-art secondary ion mass spectrometer (SIMS), one of only three in the world. Great things are expected of the Cameca instrument in a variety of disciplines, especially in biogeochemistry, a relatively new discipline that explores exchanges of chemical elements between the sea, air, rock, and living creatures. The $3 million instrument, which was funded by a NSF Major Research Instrumentation grant awarded to a team of geo- and cosmochemists led by David Fike, assistant professor in earth and planetary sciences, will be used to study, among other things: the release of carcinogenic arsenic into groundwater; the release of neurotoxic lead from pipes in cities with old infrastructure; the viscous flow of mantle rocks that drives earthquakes and continental drift; and the emergence of life and an oxygen-containing atmosphere on our planet.

TRICK OR TWEET!

On October 31, ghosts and ghouls took over the Danforth Campus for a new social media event. Departments, centers, and programs showed off their Halloween spirit by decorating office spaces, and undergraduate students were invited to “tweet” self-portraits for chances at prizes. The event allowed students to explore the physical breadth of Arts & Sciences and connect with A&S social media channels. To see photos from the event and keep up with A&S news and events, search for Washington University in St. Louis Arts & Sciences on Facebook or follow @WUSTLArtSci on Twitter.
McMILLAN HALL GOES GREEN

Originally opened in 1907 as the first women’s dormitory on the Danforth Campus, McMillan Hall is one of the oldest and most revered buildings at Washington University. It has been home to the anthropology department since its formation in the late 1960s, however, the old infrastructure was ill-equipped to support the cutting-edge research and teaching needs of the highly regarded department and its growing number of undergraduate and graduate students. Fortunately, a 9,000-square-foot addition opened just in time for classes in August 2013. The addition features an environmentally friendly green roof, a 174-seat pooled classroom, and three new anthropology teaching labs, all with state-of-the-art audio-visual equipment.

AMERICAN IDENTITIES

What does it mean to be an American? In fall 2013, Hold That Thought, the weekly Arts & Sciences podcast, delved into this question with microphone in hand. In collaboration with the American culture studies program, the 10-part series “American Identities” offers a spectrum of unique stories and intertwined themes – from the history of the song “Ol’ Man River,” to the legal frameworks around American intimate relationships, to the untold histories of Atlantic slave ships. Iver Bernstein, professor of history and director of American culture studies, kicked off the series with “Stripes and Scars,” a discussion of the 19th century New York draft riots. Earlier this year, the Public Radio Exchange (PRX) recognized Hold That Thought in its annual Zeitfunk Awards. To hear the podcasts, visit holdthatthought.wustl.edu or search for Hold That Thought on iTunes, SoundCloud, Stitcher Radio, or PRX.org.

OXFORD BOUND

Courtesy of a prestigious Rhodes Scholarship, senior Joshua Aiken will soon be packing his bags and traveling to the University of Oxford to pursue a master’s degree in sociology. In November, Aiken became the 27th WUSTL student to be named a Rhodes Scholar. In recent years, Aiken has demonstrated his passion for human rights and civil liberties as a Humanity in Action American Fellow and a U.S.-U.K. Fulbright Commission Summer Institute participant. His activities on campus include co-chairing the Mosaic Project, the university’s new diversity initiative, and performing with WU-Slam, the award-winning spoken-word poetry team. Academically, Aiken’s interests span several areas of Arts & Sciences; he is a political science and American culture studies major, with a minor in psychology.
A 60-acre plot within WUSTL’s Tyson Research Center has been named a Forest Global Earth Observatory, or ForestGEO, by the Smithsonian Institute. The oak-hickory forest in the rolling foothills of the Ozarks joins a network of 51 long-term forest study sites around the world, including eight others in the United States. Together, the forests comprise the largest systematically studied network of forest-ecology plots in the world. These plots will be used as long-term monitoring sites and an early warning system for the effects of climate change on the biosphere.

**INTO THE WOODS**

4,500,000 TREES
8,500 SPECIES
51 SITES
23 NATIONS

**SOCIOLOGY REBORN**

In December, Dean Schaal convened a town-hall meeting with the faculty of Arts & Sciences to discuss the possibility of reestablishing sociology, a department that closed in 1991 after a difficult and complicated decision. Over the years, the discipline of sociology – the scientific study of social relationships, migration and immigration, demography, institutions, social justice, and inequality – has grown in scope and breadth. At the town-hall meeting, faculty and administration expressed that reinvesting in sociology would boost several important existing research areas within Arts & Sciences, provide students a richer array of course offerings, and create the opportunity for new collaborations with the School of Medicine and the top-ranked George Warren Brown School of Social Work. Planning is now underway to search for initial hires in 2014–15.

**NEW GRADUATE DEAN**

William Tate, the Edward Mallinckrodt Distinguished University Professor in Arts & Sciences and chair of the Department of Education, has been named the next dean of the Graduate School of Arts & Sciences and vice provost for graduate education. Tate will succeed Richard Smith, who steps down July 1 after six years as dean and will return to teaching in anthropology. Dean Schaal thanked Smith for his leadership and extraordinary service, and expressed confidence in Tate’s ability to lead the future course of graduate education at Washington University. “Bill Tate is one of the university’s most distinguished scholars,” she said. “In addition to his deep and diverse academic expertise, he brings vision and leadership to the position. His broad perspective of the academic enterprise will help guide graduate education as it becomes increasingly interdisciplinary.”
Jean Allmann, the Jack Hexter Professor in the Humanities, took up the helm at the Center for the Humanities in early 2014. The center, which evolved from the International Writers Center in 2003 under the leadership of longtime director Gerald Early, prides itself on its efforts to promote research and learning through events, seminars, workshops, library acquisitions, a one-semester Fellows Program, and academic grants. Allmann’s leadership and scholarly experience reflects the rich diversity of interdisciplinary study that the center encourages – in addition to chairing the history department, she has appointments in African and African-American studies and women, gender, and sexuality studies. In her studies of African history, Allmann has focused on nation and national identity, gender and colonialism, fashion and the politics of clothing, and the modernity and mobility of indigenous belief systems.

HUMANITIES CENTER LOOKS FORWARD

HOW HUMANS MADE CATS

Fiona Marshall, a professor of archaeology, co-authored the first evidence of the cat domestication process in the ancient Chinese farming village of Quanhucun. Her data suggest that cats were drawn to these villages about 5,300 years ago by the rodents that lived on the grain that the farmers grew, ate, and stored. Previously, little was known about how cats became domesticated. However, a team of Chinese archaeologists recently uncovered eight cat bones in Quanhucun, including bones from a much older cat, which gave evidence that cats ate grain-eaters. The bones of the older cat also suggest that cats were not only surviving, but thriving in the environment. Farmers may have seen the cats’ utility and encouraged them to stick around by offering food or a warm place to sleep. “The relationship between humans and cats was commensal, or advantageous for the cats,” Marshall said. “Even if these cats were not yet domesticated, our evidence confirms that they lived in close proximity to farmers, and that the relationship had mutual benefits.”
Though humans find plenty of ways to override our biological clocks (alarm clocks and double shots of espresso come to mind), human bodies are nonetheless remarkably accurate timekeepers. Erik Herzog, professor of biology, studies the brain region that controls biological clocks, and he and his colleagues recently discovered the wiring that sets its accuracy to within a few minutes out of the 1,440 minutes per day. This wiring uses a neurotransmitter, GABA, to connect the individual cells of the biological clock in a fast network that changes strength with time of day.

THE COMMON READER

Under the leadership of Gerald Early, professor of English and Merle Kling Professor of Modern Letters, an innovative new publication is in the works. Inspired by respected journals such as the Virginia Quarterly Review and Wilson Quarterly, The Common Reader will be centered on a different theme every issue, with both print and online versions. The publication will gather articles and other work from leading writers and thinkers in ways Early hopes will bring new context and vigor to current issues and questions. The theme of the first online issue will be the future of language, and the premiere print issue will focus on the science of GMOs and the culture of food. About the process of inventing the interdisciplinary journal, Early wrote that “the invitation to start a journal was simply too seductive to resist. Suppose I could make this thing a star, a real presence in the intellectual and cultural realm?” Early himself was recognized last April with a brass star bearing his name on the St. Louis Walk of Fame. On the national scene, he was honored last August with a presidential nomination to the National Council on the Humanities, the 26-member advisory board to the National Endowment for the Humanities. He is also a consultant on Ken Burns’ documentary-in-progress on baseball pioneer Jackie Robinson.

POETRY PRIZE

Phillip B. Williams, a Master of Fine Arts candidate in creative writing, was one of five young poets awarded the prestigious 2013 Ruth Lilly Fellowship from the Poetry Foundation and Poetry magazine. The fellowship, which provides a $15,000 scholarship prize, aims to encourage and support aspiring poets in the further study and writing of poetry. Williams, a Chancellor’s Graduate Fellow, is the author of the chapbooks Bruised Gospels (Arts in Bloom Inc., 2011) and Burn (YesYes Books, 2013). He is also the poetry editor of the online journal Vinyl Poetry, and his work has appeared in Blackbird, Callaloo, Kenyon Review Online, Painted Bride Quarterly, The Southern Review, and West Branch, among others.

HUMAN CLOCKS

Though humans find plenty of ways to override our biological clocks (alarm clocks and double shots of espresso come to mind), human bodies are nonetheless remarkably accurate timekeepers. Erik Herzog, professor of biology, studies the brain region that controls biological clocks, and he and his colleagues recently discovered the wiring that sets its accuracy.
These days, a cellphone is no longer just a phone. Our smartphones become, among other things, GPS systems, calendars, cameras, mini-arcades, instant messengers, and Internet browsers, all with the swipe of a finger. Though it’s easy to take these capabilities for granted, the technology that goes into creating just the shell of such a versatile tool is astounding. Ken Kelton, the Arthur Holly Compton Professor of Physics and director of the new Institute of Materials Science and Engineering, explains how feats of materials science improve even the screens and cases of modern smartphones.

Metallic glasses are 2–3 times stronger than typical crystal metals.

The cases of some future smartphones may be made from a novel new material, a metallic glass that contains 5 or more elements.

Gorilla Glass screens are .5 millimeters thick.
Q&A MATERIALS SCIENCE 101

Ken Kelton on smartphones, metallic glass, and the science of making stronger, harder materials

WHEN TALKING ABOUT MATERIALS SCIENCE, WHERE DO WE START?

That’s a big question with a big answer. Our entire history as a civilization has been built on materials. We map the ages and our advancement as a society through materials: the Stone Age, the Bronze Age, the Iron Age. Advancements in materials lead to an advancement in technologies. Materials science is in our clothing, in our electronics, in the structures that hold buildings together. It’s everywhere.

SO IF WE TAKE SOMETHING LIKE, SAY A CELLPHONE, CAN YOU TELL US HOW MATERIALS SCIENCE HAS HELPED SHAPE IT?

Sure. I’m glad you asked about that one because there are a lot of materials there. So, the first thing you see is the screen. This is a type of glass called Gorilla Glass, which is made by Corning, the same people who invented Pyrex glassware and CorningWare. Gorilla Glass is designed to be very tough. There are videos on YouTube showing a car running over a cellphone with Gorilla Glass, and the glass doesn’t break. It’s also really thin – about the thickness of a piece of construction paper. An enormous amount of research has gone into just this piece of glass for the front of the cellphone.

Now, if we turn my iPhone 5 over, the back is made of metal. The cases of most cellphones have been made from molded plastic, but metals like aluminum are more resistant to cracking. However, the process of molding the metal into the right form can cause it to weaken and lose some of these mechanical advantages. But in 2010, Apple bought the rights to a new kind of metal. This new metal is unusual because it’s a glass. A metallic glass. Metallic glasses are extremely strong and hard, making them break- and scratch-resistant. My current research focuses on these glasses and the liquids from which they form.

WHAT IS METALLIC GLASS?

Metallic glass was discovered in 1960 at the California Institute of Technology (CalTech) by Professor Pol Duwez, who was studying liquid metals. Normally metals are crystalline in their structure, but when Duwez cooled these liquid metals at a very high rate – around a million degrees per second – he got something that looked like a regular metal, but when it was studied closer was found to have the structure of a glass. This had never been observed. Ever. There are a few naturally occurring glasses, like obsidian, but nowhere in nature do you find metallic glass. This was something totally new.

SO HOW DID THIS LEAD TO THE METALLIC GLASS IN OUR SMARTPHONES?

In the 1990s, again at CalTech, Professor William Johnson and his research group discovered new kinds of glasses that could be formed at much slower cooling rates. If you ever watch glass blowers cool a piece of glass, they just take the glass out of the furnace, and it cools slowly. If you do that with a typical metal, it crystalizes. But in this case, the researchers used complicated alloys with five or six components, and they found that those metals could cool slowly and form a glass. This means you can actually blow these liquid metals, like glass, or inject them into a mold, like plastic. Johnson founded a company called Liquidmetal Technologies to market these new glasses, and Apple signed an exclusive agreement with Liquidmetal in 2010. Apple hasn’t stated that they use Liquidmetal yet, but large companies often don’t share information about their technology. For example, Apple only recently admitted to using Gorilla Glass in their phones.

BESIDES CELLPHONES, HOW ARE METALLIC GLASSES USED – AND WHAT’S IN THE WORKS?

The first application of metallic glass was a golf club. You can find a demonstration online in which people drop three balls – one on a piece of stainless steel, one on a piece of titanium, and one on a piece of metallic glass. The ball on both the titanium and stainless steel bounces for maybe 10 seconds. Meanwhile, the ball on the metallic glass continues to bounce for three or four times as long. The reason for that is something called the coefficient of restitution, which is: if I impact a body and deform it, how much does it spring back? For metallic glasses, it’s a huge amount. They’re very elastic materials. When you use one of these clubs, a large amount of energy is imparted to the golf ball. My joke is, “Well, that’s great. I can just hit it farther out of the fairway,” but Tiger Woods could do really well with one.

Metallic glasses are also being studied for bio-implants and stints. Because the glasses can be molded like a plastic, you can get very intricate and tiny shapes. It’s a niche market for now, but I think it’s an expanding one, and obviously if these metallic glasses are moving into something like cellphone or computer cases, they’re going to become a major part of the objects we use every day.
Rethinking the Undergraduate Major  Richard Smith, dean of the Graduate School of Arts & Sciences, shares some advice with the class of 2017. Smith will complete his tenure as dean this July, after six years of service.
ISSUES IN HIGHER EDUCATION

After stepping up to the podium at last year’s freshman convocation, Richard Smith, the Ralph E. Morrow Distinguished University Professor of Anthropology, began his speech to the class of 2017 with some unexpected advice. “If you’re taking some satisfaction in having a well-thought-out, comprehensive plan,” he said, “if you know what your major will be, your second major, your minor, and which courses you will take to fill requirements – I urge you to reconsider.” A&S caught up with Smith to discuss why he advises students to slow down, explore options, and think beyond the major.

A UNIQUE AUDIENCE

It’s no secret that undergraduates in Arts & Sciences are as driven as they are intelligent. In an environment in which a large percentage of incoming freshmen already dream of graduate school success, Smith believes students’ ambition can – and should – be focused on more than a specific set of curricular requirements.

“Let’s assume that in this unusual, above-average population of young adults, their aspirations are not average either,” Smith said. “Many of our students have said, ‘I’m going to use my intellectual abilities to succeed in highly complex areas and become a true expert in something.’” For this specific group, Smith’s convocation address expressed a simple, but perhaps hard-to-hear truth: expertise takes more than four years to acquire.

“A bachelor’s degree in economics does not make someone an economist,” Smith said, “and anyone who needs an economist has their choice of many people who are earning master’s degrees and PhDs.”

The good news is that the opportunities available to students go far beyond learning facts related to one or two subjects. According to Smith, it’s possible to think of the major as just one component of the active intellectual life of an undergraduate.

A SPECIAL MOMENT IN TIME

Smith believes that the four years sandwiched between high school and a career or graduate study is a truly unique block of time, a rare moment in which students may broaden their focus and thinking. “High school is all about getting into college,” he said. “And after this, it’s all about discipline-specific expertise where the objective is to know more and more about less and less. This is the one place where the goal is to understand yourself, expand your horizons, be introspective, consider alternative points of view – it’s a very special moment in time.”

In order to take full advantage of this opportunity for exploration, Smith urges incoming students to take courses in disciplines that they would not have encountered in high school, even if they didn’t initially plan to pursue that subject in their professional lives. High schools don’t have departments in psychology, classics, art history, or a score of other subjects, he noted. “Students should find out what these things are, because the tools for success in life are much more than factual expertise. And I’m surprised, in fact, that our undergraduates are so driven by this idea of the importance of their undergraduate major. It’s really a disconnect from what’s going to be important later on.”

THE EDUCATED MIND

So what is important later on, if not only the subject-specific proficiency acquired along with a bachelor’s degree? According to Smith, a range of skills and knowledge will serve the class of 2017 as well as – or better than – factual knowledge alone. “A few of them may be brilliant enough that if they’re unpleasant and difficult to work with they will be tolerated eventually for their knowledge contributions, but most of us need to have judgment, perspective, a sense of balance, objectivity, a sense of right and wrong. We have to have priorities,” he explained. “Life and business interactions are complicated. Some of that comes naturally, but in fact some of it is learned.”

Personally, Smith recalls how studying classic literature deeply affected his own sense of perspective, and he still thinks that great books help form thoughtful, mature adults. Overall, he believes that for this particular group of students, being open to new ideas and areas of study is a significant part of becoming an educated individual, rather than simply a person with a credential.

THE GRADUATE SCHOOL QUESTION

This line of thinking could especially benefit the large percentage of A&S undergraduates who plan to go to medical school. “Medical schools have absolutely no hesitation in telling students exactly what they want them to do,” Smith said. “They say, ‘We want these eight or ten courses.’ If they wanted you to major in biology or chemistry, they’d tell you! But they don’t.” By feeling pressure to major in specific disciplines, he fears that these future medical professionals miss opportunities for intellectual and personal growth – opportunities that could help them later in their careers. “Many of our [pre-med] students could major in philosophy, or classics, or English literature. It disappoints me greatly that there’s this self-reinforcing culture in which they feel they can’t do that.”

As dean of the Graduate School, Smith has had first-hand experience of the benefits that a multidisciplinary background brings to advanced graduate study.

“It is often the case that you’d be better not majoring in what you’re going to study for your PhD,” he said. “In my field, physical anthropology, if you’ve had enough of a background to know that’s what you want to do, what you should do as an undergraduate might be geology or statistics,” he said. “In our interdisciplinary world, it helps to bring knowledge to your studies that others don’t have.”
Team teaching  Rui Pan, from Fudan University in Shanghai, traveled to Washington University this spring to co-teach "Topics in East Asian Studies: Sino-American Relations since 1949" with Zhao Ma (see next page).

The course is supported by a grant from the Ford Foundation that aims to expand student interest in the areas of contemporary China, US foreign policy, international politics, and global conflict and cooperation.

Expanded internships  In spring 2013, the WU in Shanghai Center spearheaded a semester-long program geared toward students with an interest in public health, medical anthropology, and other health-related fields. The program includes field experiences in hospitals, clinics, and research centers.

Literary link  Poet, novelist, and Shanghai native Qiu Xiaolong (PhD '95) is likely best known for penning the popular "Inspector Chen" crime novels, set in 1990s Shanghai. Now a St. Louis resident, he is an advisory member of the Center for the Humanities and has taught classes in Chinese and comparative literature.

Arts & Sciences faculty, students, and alumni may be found just about anywhere in the world, and Shanghai, China, is no exception. Though more than 7,000 miles lay between Shanghai and St. Louis, innovative courses, study-abroad opportunities like the WU in Shanghai summer language institute, international research efforts, and literary accomplishments all provide intellectual and physical connections between land-locked St. Louis and this historic city on the East China Sea.

ON LOCATION SHANGHAI

Arts & Sciences faculty, students, and alumni may be found just about anywhere in the world, and Shanghai, China, is no exception. Though more than 7,000 miles lay between Shanghai and St. Louis, innovative courses, study-abroad opportunities like the WU in Shanghai summer language institute, international research efforts, and literary accomplishments all provide intellectual and physical connections between land-locked St. Louis and this historic city on the East China Sea.

WU in Shanghai summer language institute, international research efforts, and literary accomplishments all provide intellectual and physical connections between land-locked St. Louis and this historic city on the East China Sea.
1. The Bund
Lingchei Letty Chen, associate professor of East Asian languages and cultures, heads the Chinese section of the department. Her courses include “Topics in Chinese Literature and Culture: The Chinese City in the Global Context.”

My most vivid memory of Shanghai came from my first visit to the Bund. I was instantly mesmerized by the spectacular architectural grandeur on both sides of the Huangpu River. The extraordinary contrast between the long row of large 19th-century, European-style buildings on the west bank and the futuristic styles of 21st-century skyscrapers on the east bank reminds me of China’s tumultuous historical path of the last two centuries. The material and spiritual devastations resulting from imperialism, wars, and societal reforms, as well as the accomplishments of the Chinese people in their struggle to renew and rebuild – all have manifested in this incredible visual contrast of the country’s painful past and its promising future.

2. University Road
Rye Jones (LA’14, Chinese) studied in Shanghai for the 2012–13 academic year as part of the WU in Shanghai Overseas Program.

Located just a couple of blocks away from Shanghai’s Fudan University, University Road offers a glimpse of what fairly upscale real-estate developments look like in Shanghai. Many good restaurants and other stores litter the area. Among these, Togo Taco – owned and operated by a man who absorbed Cali-Mex style cuisine culture quite well while living in California – stands out for offering the best burritos I found in the city. The street’s proximity to the international dorms where study abroad students from Washington University live made it a frequent destination for me and other students, and the comforts of familiar Mexican food proved to be a great way to recall home while abroad.

3. Yuyuan Garden
Zhao Ma, assistant professor of East Asian languages and cultures and director of undergraduate studies, teaches “China’s Urban Experience: Shanghai and Beyond.” He also designed and led a study-abroad experience as part of the freshman program “China in the Global Context.”

Standing on the zigzag bridge at the heart of Yuyuan Garden in Shanghai, one is easily overwhelmed by the passing crowd speaking different languages and dialects, the labyrinth of alleyways winding in every direction, the sound of street hawkers and singing birds, and the smells coming from Starbucks coffee, burning incense, and fried, stinky tofu. But beneath the contemporary surface of chaos, there is the history of Yuyuan as the anchor of civic order in Shanghai for centuries before foreign colonial powers redrew the city’s political and social landscape. As home to dozens of the city’s powerful guilds in the 18th and 19th centuries, Yuyuan functioned as the administrative nerve center where social and commercial leaders worked together to provide a range of services, including firefighting, street cleaning, crime control, and poverty relief. Today’s Yuyuan embodies pervasive tourism and commercialism, but it also reminds us of a remarkable history of social activism, the spirit of public service, and community self-governance in early modern China.
"Test" has become a dirty word in education, but psychologists reveal how a specific type of testing improves learning and helps information stick.

For many, the word "test" conjures feelings of dread. If it’s not standardized testing, then it’s the futility of those midnight hours spent reading and rereading textbook passages only to forget it all by the next morning when faced with rows of multiple-choice answer bubbles and the yawning white space of essay questions. However, psychologists at Washington University in St. Louis now believe that the best way to prepare for tests is with, well, tests.

The key, of course, is how these tests are conducted and used. Traditionally, tests are only used as assessment tools for teachers to assign grades, but in their purest form, tests ask students to show and practice what they know. They require students to recall information and apply it—a vital but often overlooked part of learning.

“A lot of education you think of as trying to stuff the kid’s head with knowledge,” says Henry Roediger, the James S. McDonnell Distinguished University Professor of Psychology, “and that’s part of it, but the other part is being able to use knowledge when you need it. We normally don’t give kids practice at that.”

Frequent, low-stakes testing can actually help students learn information more thoroughly and remember it longer. “Students prefer to study things repeatedly, and that gets you so far,” Roediger says, “but if you try to retrieve information, whether you get it right or you get it wrong and someone corrects you, you remember things much better on a later test. This is called the retrieval practice effect, or the testing effect.”

THE ROAD TO RESEARCH

Roediger and his colleague Mark McDaniel, also a professor of psychology, first noticed the testing effect more than 20 years ago. At the time, they were studying the ways people encode information to improve memory. As part of their experimental design, one of the participant groups took a quiz after reading some information, while others were asked to restudy the material. Over and over again, the group who took an initial quiz did better on the final test.

“The initial quiz was just another measure,” McDaniel explains, “but we found out it had an effect on final memory. We started to believe that retrieval was one of the most potent ways to improve memory and retention.”

When McDaniel came to Washington University in 2004, he and Roediger wanted to take this research to the next level by
For one unit exam, students were broken into three learning conditions: one was quizzed on material, another restudied material, and a third did not get any special coverage outside of the normal lecture. See the average test scores below.

- Learning condition: Quizzed
  - Score: 55%

- Learning condition: Restudied
  - Score: 62%

- Learning condition: Not tested
  - Score: 81%
applying for grants to further test their new theories. They teamed with fellow psychology professor Kathleen McDermott and received their first grants from the James S. McDonnell Foundation in St. Louis and the Institute of Education Sciences in the U.S. Department of Education for their preliminary laboratory research on retrieval practice. Their results were interesting enough in the lab that the group wanted to see how they would fare in the classroom, but in order to do so, they needed a partner school and classrooms in which to test their ideas.

“It was actually really fortuitous,” McDaniel remarks. Upon arriving in St. Louis, McDaniel reconnected with an old friend. This friend’s wife, Patrice Bain, taught at Columbia Middle School in Columbia, Illinois, and when she heard about McDaniel’s research, she immediately offered her assistance.

“She was already using retrieval practice in her classroom by giving the children pre-quizzes before her lecture and then quizzing them again after her lecture,” McDaniel says. “She was convinced that this was helping her students on their final exams, but she didn’t have any data.”

Bain became an advocate for the research team’s work, helping them make their case before the principal, superintendent, and other teachers in the school, and hers was, ultimately, the first classroom in which they set up their experiment. With this school partnership, Roediger, McDaniel, and McDermott received their second grant from the Institute of Education Sciences. The collaboration has since spread to nearby Columbia High School.

IN THE CLASSROOM

“At the beginning, it was pretty clear that some of the school administrators were hesitant to participate because they thought outsiders were going to come in and tell them how to do their jobs,” McDaniel says. “But we work in a really collaborative manner with participating teachers. We used all the materials that the teachers were already using and tried to introduce studies into the classroom without disrupting it.

Setting up a well-controlled psychology experiment in functioning classrooms is no easy task. McDaniel explains, “We take all of the material the kids are responsible for and break it into different subsets. Some of the subsets get quizzed, and some get presented for restudy, and some are our control material that the teacher doesn’t mention outside of her usual emphasis. And this all has to be counter-balanced across different classrooms, students, and semesters.”

In addition, ongoing debates around high-stakes and standardized tests give the very idea of testing a negative reputation among many teachers. In fact, the knee-jerk reaction from educators was so strong that the researchers have considered renaming their effect.

“We were going to call the effect ‘Test-Enhanced Learning,’ but we now often call it ‘Retrieval-Enhanced Learning’ just to avoid the word ‘test,’” McDaniel says. “A lot of educators, they just hear that word and they flare up.”

Pooja Agarwal first joined the project as a research assistant in 2005, shortly after graduating from Washington University. Now a postdoctoral researcher, she manages and analyzes data and acts as a key liaison between the teachers and administrators in the Columbia school district and the leading researchers. As Agarwal explains, teachers quickly found that WUSTL-initiated retrieval practice bore little resemblance to high-stakes standardized tests. In fact, making quizzes low-stakes or no-stakes was an essential part of the experiment.

“Many of the teachers we work with say that they already give quizzes, but they always take them for a grade. So we’re trying to change that mindset into one that focuses on retrieving for the sake of learning— that is the most novel idea for many teachers,” she says. “When a quiz is used as learning strategy, there are fewer consequences and less stress. The quizzes help students figure out what they got right, what they got wrong, and what they need to continue studying. And the teachers themselves can figure out what concepts they might need to go over again.”

In addition to being low-stakes, McDaniel adds that frequency is an important aspect of this type of retrieval practice. “Usually they just test for a grade and cover a whole body of material,” he says. However, this research suggests that testing every day, at the end of each lesson, improves performance on later tests such as midterms, finals, and even comprehensive finals that cover all the material over the last year. In order to facilitate these quick, frequent, low-stakes quizzes, the researchers furnished teachers with electronic clickers for students to use.

POSITIVE EFFECTS

Some parents and teachers worried that more frequent testing would make students anxious, but actually the opposite has been true. Since 2006, the participating students have been surveyed to see if they thought retrieval practice helped them learn, how it made them feel, and whether or not they liked it. A whopping
school students. “By middle school, some kids start to think of themselves as not good learners, and as a consequence, they may be discouraged in the classroom and start to withdraw or act out,” McDaniel says. “But having them do retrieval practice, helping them do better on tests and quizzes can perhaps show them that they can learn. They can be successful.”

And apparently, the kids really liked the quizzes.

“It breaks up their classes,” Roediger explains. “Some days our experimental design wouldn’t call for them to be quizzed with the clickers, and the teachers told us that the kids would complain.”

Word is getting out about the testing effect. Kathleen McDermott has begun using the quizzing technique in her classroom with Washington University psychology students, and upon hearing about their colleagues’ research, Andrew Sobel, a professor of international and area studies, and Doug Larsen, an assistant professor of neurology in the Medical School, have begun regularly quizzing their students as well. Despite fears that their teacher ratings would plummet if they began giving frequent quizzes, McDermott says her students enjoy it, and that the technique also has many indirect benefits.

“I give a quiz to my students every day in class, so attendance is higher,” she says. “It makes people read the material before class and encourages them to pay attention or ask questions when they don’t understand something because they’re going to be quizzed on it at the end.”

AND BEYOND

Given their impressive results, the team has higher goals for their research. Roediger and McDaniel teamed up with writer Peter Brown to put out a book on the research titled Make It Stick: The Science of Successful Learning, which was released in March 2014. The book includes information about retrieval practice and other counterintuitive strategies for learning.

The researchers also have been hard at work on a self-contained guidebook that can be distributed to educators across the globe who are interested in integrating retrieval practice into their lesson plans. The guidebook, which will be available this summer, is an easy 10 pages long. “It’s short enough not to be overwhelming, but long enough to answer basic questions a teacher might have,” Roediger says.

Agarwal adds, “As opposed to a journal or article that reviews research and makes convincing arguments and shows powerful effects, the guidebook will be focused on implementation.”

Because retrieval practice as a learning strategy works across subject matters, the guidebook will be of use for a wide array of teachers and educational contexts. “Most education research is subject-specific,” Roediger says, “but retrieval practice is general purpose. We found it helped in social studies, every level of science, history, and vocabulary. The only areas that didn’t respond as well were English grammar and math, but math was our fault. They do problem sets all the time, so us giving one or two more didn’t really matter.”

In fact, Roediger thinks the technique could be valuable far beyond the formal classroom setting. “We want to reach as many teachers as possible with this research,” he says, “but we hope it will be used across many different avenues, including any training in business or the military — any field that is concerned with learning, which is just about everybody.”

Rebecca King is a writer and communications specialist for Arts & Sciences. She also produces podcasts for Hold That Thought, including the Retellings summer series.

92% of 6-12th grade students responded that retrieval practice helped them learn.

72% reported being less anxious or nervous about tests.

88% of students surveyed said they study the same amount of time or less compared to classes without retrieval practice.
The treatment of long-lasting pain may be on the verge of changing for the first time in decades.

More than two millennia ago, when a patient complained to Hippocrates – the ancient Greek physician – about a sore back or headache, he would suggest that they chew on strips of bark from a willow tree. But if the pain continued for months, Hippocrates didn’t have much else to offer the patient aside from his sympathy. Today, not a lot has changed about how doctors treat pain; the salicylic acid found in willow bark, in fact, is the active ingredient in aspirin. And when a patient has pain that lingers long past any sign of physical injury, modern doctors are, like Hippocrates, largely stumped as to how to treat the discomfort.

From an evolutionary perspective, such chronic pain “doesn’t make a lot of sense,” says Gary J. Patti, assistant professor in the Departments of Chemistry, Genetics, and Medicine. “If you put your hand on a hot stove, you experience acute pain, and that’s a good thing because it tells you to move your hand away from the stove, and that prevents tissue damage. But if you get in a biking accident and then your leg hurts for the rest of your life, we really don’t understand why that happens or what molecular mechanisms are mediating it.”

Patti’s lab at Washington University, which in addition to Patti has 14 members, is tackling chronic pain from a new perspective. Their unique approach has already led to the discovery of a chemical that’s produced by the spinal cord when injured nerves are healing. The work doesn’t just suggest a new target for the development of painkillers; it helps strengthen the very core of chronic-pain research.

“For a long time, people with chronic pain were deemed to be mentally ill and diagnosed with some kind of psychosomatic issue,” says Patti. “And so one of the exciting things about using the...
A NEW TOOLBOX

In the past, scientists trying to get at the roots of chronic pain have tried just about everything to reveal how a person with chronic pain is different from one without. Genetic screens, for example, have asked whether patients with lifelong pain carry unique gene mutations; brain scans have tested whether their neurons are arranged incorrectly or firing messages throughout the brain in unusual patterns; blood tests have probed whether differences in protein levels are to blame. Patti, though, had something different to try.

Patti completed a PhD in biological chemistry at Washington University in 2008, under the advisorship of Jacob Schaefer, the Charles Allen Thomas Professor of Chemistry, and then worked as a postdoctoral fellow at the Scripps Research Institute in California. There, he learned about a new way to gauge the activity of cells: measuring the amounts of small molecules called metabolites.

In any cell, genes hold the codes to make proteins, which fold into three-dimensional shapes to carry out the processes necessary for life. As they go about their business, though, proteins frequently interact with smaller molecules – metabolites. Metabolites, rather than being directly encoded by genes, are often the building blocks of larger molecules, or compounds that are taken into the body through digestion. Vitamins, antioxidants, cholesterol, and sugar molecules are all examples of metabolites. Patti, during his postdoctoral fellowship, learned that these minuscule metabolites could give an even more accurate “fingerprint” of biochemistry than could traditional tests of DNA and protein levels.

“Just looking at protein levels doesn’t tell you if the proteins are active; just looking at genes doesn’t tell you that those genes are doing anything,” says Patti. “But when we see a change in a metabolite level, it’s unambiguous that an associated pathway has altered activity.”

Returning to Washington University as an assistant professor, Patti launched his own lab to delve into the emerging field of “metabolomics,” the profiling of metabolites. But measuring the levels of metabolites in a cell or organ is no easy task. Researchers cataloguing metabolites have already added more than 200,000 molecules to one existing database.

To get a snapshot of metabolites in a biological sample like a vial of blood, Patti’s team runs the blood through a machine called a mass spectrometer. The machine is like a scale that you might use to weigh yourself, but it can measure the precise weights of tiny molecules. Then, since every chemical element has a different weight, researchers can work backwards and figure out the chemical makeup of every molecule detected by the mass spectrometer. Thousands of distinct metabolites can be listed out. In human blood alone, mass spectrometry identifies more than 40,000 metabolites – but researchers have only worked out what half or so of them are.

Within his metabolomics lab, Patti was eager to apply the new technique to medically relevant questions. “The really interesting thing about metabolomics is that you can use it to study almost any disease,” he says. “It’s hard to pick which conditions to go after.” Other labs had already begun to tackle cancer – asking whether tumors have unique profiles of metabolites – and brain diseases. He saw one big gap in the field that intrigued him: chronic pain.

PAIN’S MOLECULAR FOOTPRINT

The question that Patti’s lab set out to answer was whether the metabolite profile in the body...
of a rat with chronic pain was different than the composition of metabolites in a rat without chronic pain. If unique metabolites could be pinpointed, they could pave the way toward new treatments or tests for pain that lingers after a physical injury.

The researchers began observing rats that had injured one of their sciatic nerves – the nerve that runs from the lower back down each leg – which is often linked to chronic pain in humans. Three weeks after the injury, the nerve had healed, but the rats still showed signs of pain. At this point, Patti’s team collected samples from different spots around each rat’s body, as well as from rats unaffected by pain: cells from their leg, bloodstream, and spinal cord. Then, they used their metabolomics approach to compare the levels of metabolites in each area. 733 metabolites, they found, varied between the control rats and those in pain.

Patti says he expected the major metabolomic differences to be concentrated in the injured leg tissue where the original injury had occurred. But, surprisingly, the biggest difference was in the metabolites of the spinal cord. There, the scientists discovered one molecule in particular – N,N-dimethylsphingosine (DMS) – that was found at more than twice the levels in the spinal cords of rats with sciatic nerve pain. Since those findings, Patti’s group has delved further into the biology of DMS and has begun to work out how the molecule may be linked to chronic pain.

“When a nerve is damaged,” Patti explains, “what happens is that the nerve responds by degenerating and then rebuilding the damaged portion – this is well established.” But what Patti has observed is that damage to the sciatic nerve not only leads to degeneration at the site of injury, but also at the spine, where the nerve enters the spinal cord. DMS, Patti has found, is a byproduct of this degeneration and accumulates where the injured nerve meets the spinal cord.

Recently, Patti wondered whether blocking DMS would change the development of chronic pain, so his lab gave rats with sciatic nerve injuries a drug that inactivates the protein responsible for making DMS in the spinal cord. In the animals that received the drug, pain virtually disappeared once the nerve healed. “We’re pretty excited about this,” Patti says. “And we have collaborations with pharmaceutical companies that are pursuing this as something that could potentially be used in the clinic.”

Already, Patti’s team has confirmed that DMS is present in humans with chronic pain, not just mice and rats, making the work even more promising.

“But the challenge is that you have to give this inhibitor before DMS starts forming,” Patti points out. “It’s a relatively short window of time.” Patients would have to take the inhibitor within a week of getting an injury to prevent the accumulation of DMS. If they wait until months after an injury – when they begin to realize they have chronic pain – it will be too late, at least for this drug, to stop the pain.

Next, Patti’s team wants to probe whether DMS – or other metabolites from their screens – are involved in chronic pain that is not associated with nerve damage.

### MAKING METABOLOMICS MAINSTREAM

The story of discovering DMS is just one example of the incredible power that metabolomics has in uncovering new insights about the biochemistry of the body. But to move forward and make metabolomics even more useful for labs across disciplines, Patti says, requires a standardization of techniques.

“Right now, every lab has their own sample method, their own equipment, their own analytical method,” says Nathaniel Mahieu, a graduate student in Patti’s group. “The challenge is that there is no metric to use to say one approach is better than another.” Mahieu is spearheading the Patti lab’s effort to change that, developing ways to compare and standardize metabolomics approaches.

“We’re a very young field,” Mahieu points out. In a more mature field like genomics, researchers can look up well-established experimental protocols or send their samples to facilities that process them. “In a situation like that, you can get relevant, repeatable, and publishable results without a lot of troubleshooting.” Metabolomics doesn’t yet have that level of reproducibility, and it’s holding back researchers who study medicine and biology from conducting metabolite screens on the conditions in which they are interested, Mahieu and Patti believe.

“If we can improve metabolomics to a point where it’s accessible and higher-throughput, then it’ll enable all of those other labs to start making the real biological advances that are applicable to human health,” Mahieu says.

Then, the success story of discovering a metabolite linked to chronic pain may become only one in a long list of findings that metabolomics will allow. For now, though, DMS is the poster child for why metabolomics holds so much power.

“We went in and found a compound that wasn’t even known to exist,” Patti says. “This wasn’t a targeted approach where we just looked for particular compounds we already knew something about. We weren’t confined to preconceived theories and ideas.”

By revealing completely new metabolites and then working out how they fit into known biological pathways, Patti says, researchers are rewriting biochemistry. And, he hopes, curing chronic pain for good.
MORE THAN A DREAMER

Retrospective
One of the greatest honors that Washington University has bestowed upon me is that I hold the Margaret Bush Wilson professorship. One of her exceptional life experiences included a longstanding friendship with Dr. Martin Luther King, Jr. On more than one occasion she exclaimed, “he was so much more than a dreamer; he was a man of profound action.” She routinely recounted occasions, including some when Dr. King was a guest in her home, when he formulated strategic acts of political engagement, all supporting his nonviolent quest to overcome racial discrimination born of slavery. It was Margaret Bush Wilson’s fervent hope that Americans from all walks of life would eventually come to recognize that Dr. King’s greatest legacy is based upon his exceptional deeds far more than the ethereal aspirations of the as-yet-unfulfilled dream that has become the iconic hallmark of his quest to eradicate racial injustice and social inequality.

“NSA Collecting Phone Records of Millions of Verizon Customers Daily.” With this straightforward headline from June 5, 2013, the Guardian newspaper ignited a media firestorm that grew in intensity as the summer wore on. National and international conversations swirled around the ethics of government surveillance, and Edward Snowden became a household name. Alongside the near daily headlines exposing the National Security Agency’s mass collection of Internet communications and personal data, a series of questions came into focus. Many of these questions centered on Snowden himself, who fled to Russia after leaking documents that had revealed the government’s activity. Was Snowden a traitor? A hero? Something in between? Other questions, however, concentrated on the violations of privacy that the leaked documents revealed. If privacy is a right that comes with being a US citizen, in what cases can or should the government violate that right?

Within the tumultuous news coverage, Joe Loewenstein, professor of English and director of the Interdisciplinary Project in the Humanities, saw a pertinent example of how work within the humanities confronts what’s vivid, and even dangerous, in modern life. “Everyone was running to cyber experts for commentary,” he said. “But the humanities owns privacy.”

Dean Schaal encouraged Loewenstein to bring the idea to the wider university community, and in October, the Interdisciplinary Project in the Humanities and Arts & Sciences co-hosted “Privacy and Surveillance: A Roundtable Discussion.” Loewenstein saw the discussion as an opportunity for scholars to present the idea of privacy as both multifaceted and malleable. As he stated ahead of the event, “I think it’s important that serious intellectual communities like ours should not treat a complex concept like privacy as simple or stable. We can’t assume that when I speak of privacy, what you hear is what I mean.”

Among the participants was Frank Lovett, associate professor of political science and director of legal studies. One of Lovett’s primary teaching areas is the history of political thought, and in his portion of the panel presentation, he reached back in time to provide context for beliefs about privacy that today may seem inarguable. In the age of Edward Snowden, privacy is widely considered an individual right. However, according to Lovett, this modern conception came about surprisingly recently. “A bunch of things had to coalesce in order for it to occur to anybody that there should be something called an individual right of privacy,” Lovett asserts. “And that particular constellation of things didn’t happen until the 19th century.”
DEFINING PRIVACY

To trace the history of privacy, first one has to roughly define it – a surprisingly difficult task. Alan Westin, a legal scholar whose 1967 book *Privacy and Freedom* helped bring about the field of privacy law, provided one commonly used definition: *Privacy is the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others.*

Though useful in many circumstances, Lovett points out that this statement has a major shortcoming in discussing the history of privacy. In essence, Westin’s definition describes the right to privacy, rather than privacy itself. The statement assumes that privacy has value for the individuals, groups, or institutions in question. Yet this underlying belief in privacy’s worth has hardly remained constant across time.

As David Konig, professor of history and law, explains, in earlier eras privacy was seen as little more than a shield for sinful behavior. Early American colonists, especially Puritans, had “an obligation to snoop,” according to Konig. “What we now think of as privacy was for a very long time contradictory to social morals,” he says. Because public scrutiny helped to maintain moral and social norms, privacy was considered a danger rather than a benefit.

Lovett agrees that there are surprisingly few roots to our modern thinking about individual privacy. “In terms of thinking about it as an individual good,” he says, “I’d be pretty hard pressed to find any major thinkers before John Stuart Mill who stated in a positive, affirmative way the value of people being allowed to live the kind of lives they want, free from scrutiny.”

THE ORIGIN OF PRIVACY

Even going back to antiquity, beliefs about privacy bear little resemblance to how the topic is now viewed. For example, Aristotle’s vision of the contemplative life – a life of reflection, as opposed to one of public service – has been regarded as a predecessor to current thinking about private life. However, Lovett believes these ideas are not as connected as they may first appear. Consider the contemplative lives of monks in later periods. “A life in a monastery is not a private life,” says Lovett. “Every aspect of your daily routine is strictly scheduled and supervised.”

These examples do not mean that prior to the 19th century, privacy was viewed as being entirely without value. Rather than being of benefit to individuals, however, Lovett theorizes that privacy was first and foremost seen as benefitting societies. Across time and cultures, certain types of activities (copulation, defecation, and menstruation are a few obvious and persisting examples) are typically deemed indecent and hidden from public view. Lovett believes that “the cultural articulation of this demand might be aesthetic, hygienic, spiritual, or some combination of these, but regardless, the keeping of such things private was principally regarded as something important to the community and not to the individual in question.”

So how did we begin to recognize individual privacy as something of value? Why was the 19th century, rather than any number of earlier eras, the turning point in our thinking about privacy? The answer, as indicated by the seminal 1890 article “The Right to Privacy,” is both cultural and technological. In this famous article from the *Harvard Law Review*, authors Samuel Warren and Louis Brandeis first proposed that “the right to be left alone” deserves legal protection. And as Konig explains, Warren and Brandeis’s
opinions about privacy notoriously came about from a very specific, and indeed personal, set of circumstances.

THE ROLE OF THE PENNY PRESS

In the earlier part of the 1800s, innovations in printing technology led to the birth of the “penny press,” inexpensive newspapers that depended on wide circulation to make a profit. As newspapers battled one another for readership, gossip columns describing the intimate lives of the rich and famous became commonplace. Samuel Warren, one of the authors of “The Right to Privacy,” experienced this gossip mongering firsthand. Warren’s wife, Mabel Bayard, came from a family of some prominence in New England, and the press documented aspects of her family life that in earlier eras would never have been considered fit for print. Everything from Mabel’s body in her bridal gown to her grief over the deaths of her mother and sister found its way into the papers.

“If Brandeis and Warren used the word ‘privacy’ over and over, it was only slightly more often than their use of the word ‘gossip,’” König notes. As stated in “The Right to Privacy,” “Even gossip apparently harmless, when widely and persistently circulated, is potent for evil.”

Interestingly, Warren and Brandeis described this violation of the private sphere as damaging for both the individual and for society at large. An individual with violated privacy is subject to “mental pain and distress far greater than could be inflicted by mere bodily injury,” according to the authors. Yet, in an argument that reads as strikingly modern in the days of social media and short-form news-aggregating websites, they also warned, “When personal gossip attains the dignity of print, and crowds the space available for matters of real interest to the community, what wonder that the ignorant and thoughtless mistake its relative importance.”

The demand for gossip, coupled with technological advances in both printing and photography, met a third cultural force in this era – Victorian morals. As König explains, “the Victorian era was the era of hypocrisy.” Prim and proper behavior in public, and the expectation of this type of behavior, did not align with prurient behind-the-scenes lives of Victorians. In a landscape of negative judgment, the technological ability to view and record seemingly shameful behavior was coupled with an industry determined to publicize that behavior. Suddenly, as such violations of privacy became more widespread, its individual value came into sparkling view.

This crucial intersection of technology and culture provided something of a blueprint for later approaches to thinking about privacy. Since the 19th century, a rapidly increasing number of technologies designed to observe and document our movements, actions, and thoughts have made their way into countless businesses, homes, and pockets. The legality and ethicality of these observations continue to be debated – depending on who is doing the observing, and why – yet by 2014, the innate value of privacy appears to be above question.

Looking back at “Privacy and Surveillance: A Roundtable Discussion,” Joe Loewenstein reflects on his own reactions to the presentations and discussion. “Each of these scholars shed light on privacy as a complex and evolving concept,” he says. “It certainly changed the way I respond to newspaper headlines today.” As Lovett’s portion of the roundtable made clear, those shifts in perspective include a surprising historical lesson: even the basic assumption of privacy’s worth has not been stable across time, and it should not be taken for granted.

In addition to her editorial role, Claire Navarro produces the A&S podcast series Hold That Thought.
THE FUTURE OF JOURNALISM

By Diane Toroian Keaggy
Hamman is among a group of recent A&S graduates who are shaping the newspapers of tomorrow – a future, they say, that promises more news, if less paper. At New York’s Newsday, Sam Guzik, who graduated with a degree in English in 2010, is finding new ways to use multimedia and social media to enhance the editorial and opinion pages. And at The Washington Post, Sarah Kliff, who graduated in 2007 with a philosophy-neuroscience-psychology degree, is telling stories in new ways and sharing them on new platforms.

“A lot of people are focused on the challenges facing the industry, and it’s true that there may be fewer newspapers and competitive markets in the future. But it’s also an exciting time because there also are new ways to engage readers that weren’t available before,” says Guzik. “The winners will be the ones who find the right tool at the right time.”

NEW PRODUCTS FOR A NEW TIME

The troubles of the newspaper are many and well documented. According to Pew Research Center’s annual report on the state of media, the newspaper industry continues to hemorrhage jobs. Newspapers employ only 38,000 full-time journalists, a 30 percent decline since 2000. Despite a rebounding economy, print advertising fell for a sixth straight year in 2012. And digital advertising, while climbing, can’t compensate for the losses. Meanwhile, upstart competitors like Buzzfeed, Digg, and other news aggregators are making money off the original content generated by newspapers.

Still, not all the news about the newspaper business is bad. According to Pew, some 450 of the nation’s 1,380 daily newspapers have successfully adopted paywalls, making content available only to paid subscribers. And many are expanding their reach by drawing a new generation of readers to their digital editions. This is where opportunity lies for newspapers, says Hamman. The trick, he says, is to be a tool, not just a publication.

“News organizations tend to have a one-way thought process,” explains Hamman. “It’s all about the article. The reporter reports the story. Then someone else figures out photography. And then someone else takes the story and photo and puts it together. You are thinking about filling boxes. That’s very different from product development. When Kayak makes a travel search or Foursquare makes a mobile app they are starting with the question, ‘What is the user trying to accomplish?’ In the case of newspapers, the answer for some readers is information, not necessarily the article.”

That’s what aggregating sites do so well – they slice and dice both hard news and entertainment into nuggets that are easy to read and easy to find.

Like some 125 editors-in-chief before him, Brian Hamman learned to report stories, write headlines, and lay out pages in the offices of Student Life, Washington University’s student newspaper. His tools – Apple computer, digital recorder – were different from the typewriters and flashbulbs used by his predecessors. But the final product – words and pictures printed on newsprint – remained largely the same.

That was 2000. Today, Hamman is director of development for new digital products at The New York Times, a job he could not imagine when he graduated in 2002 with degrees in American culture studies and English. His day-to-day task is to develop mobile apps. But his real role is to think about newspapers in the digital age – who reads them and what those readers want from them.

“To say newspapers are dead is just not true,” says Hamman. “But in a very short period of time, things have changed dramatically. Readers are not sitting down with a newspaper, a cup of coffee, and 45 minutes. They are in line at Chipotle, and they have seven minutes. Or they are in the elevator. They have small bits of time, and the article does not fit into that small bit of time. So the question is, ‘How do you give the full story in a way that fits in with that reality?’”
Hamman and The Times are responding to the aggregators with mobile news apps that are more scannable, engaging, and up-to-the-minute. It also is launching specialty apps that combine great journalism with helpful tools. The real-estate app, for instance, includes both articles and a function that enables users to search for nearby open houses. He sees a future in which newspapers can create custom feeds for readers.

“We are reading our news on devices that know a lot about us,” says Hamman. “I think it’s possible where one day we can crunch all of that data and provide you with a more personalized experience based on your interests, your friends, and where you are.”

NEW TECHNOLOGY, OLD VALUES

Newspapers across the nation have created dynamic sites and apps for their sports and news coverage, but few have devoted the resources to develop engaging multimedia content for their editorial page. That’s a mistake, says Guzik. Because, beyond deep reporting staffs, newspapers boast another important advantage over the competition – community values.

“An aggregator does not have a sense of tradition,” says Guzik. “So as newspapers adapt to a changing landscape, it’s important to go back to those foundations – that strong editorial voice that is aligned with the values that founded the newspaper in the first place.”

Guzik is a multimedia producer at Newsday, a daily newspaper serving Long Island and New York City. In December, he posted “Police, power, politics,” an editorial package about a Nassau County corruption scandal that included video, a timeline, and profiles of key players. It was an engaging way to tell a complicated story.

“We have been experimenting with new ways of making our point,” says Guzik. “We’ve been thinking a lot about what it means to have an editorial page when there is no longer an actual page. How can you best make your point in a different medium?”

Guzik first started asking himself those questions at Student Life. He was editor-in-chief his junior year, but it was his next job – director of new media – that set him on his current path. He started Student Life’s Facebook page and Twitter feed, built slide shows, and helped redesign the newspaper’s website. Those early experiences prompted him to study digital journalism at Columbia University, where he discovered a passion for video.

“There are times when I feel it is easier for me to tell a story using crossfades and transitions in Final Cut than it is using periods and commas,” says Guzik.

Today he videotapes every editorial board meeting. That footage made for an especially compelling local election package, which featured interview clips of every endorsed candidate. Guzik also has launched a new moderated forum called “Take the Podium,” which invites the community to respond to hot-button topics.

“Comments can get pretty nasty in unmoderated forums, so we wanted to find a way to structure the conversation better,” says Guzik. “There is a lot of value to a letters page. So how do you take the best things – its structure and gravity – and cross-pollinate that with the flexibility of the Internet. It’s all about trying to leverage the Internet better to create an engaged audience – not just one that is bouncing in and bouncing out.”

THE 24-HOUR BEAT

Sarah Kliff’s first big-time journalism gig was at Newsweek, the venerable magazine that ceased publishing a print edition in 2012 (and brought it back in early 2014). Some of her long-form stories took days, sometimes weeks, to report.

Today, as The Washington Post’s healthcare reporter, Kliff will post four, five, even six stories a day to Wonkblog, the Post’s immensely
popular blog covering healthcare, technology, energy, and immigration. She also constantly posts to her personal Twitter feed. Some tweets link to infographics, reports, or government documents; others are photographs or quotes from the press conferences she covers. Some tweets are direct questions or answers to individual readers. She has some 27,000 followers, and it’s a safe bet that only a fraction of them have ever seen her byline in the Post’s print edition.

“There is no more 5 p.m. deadline,” says Kliff, who also served as Student Life editor-in-chief. “That is the great and the horrible thing about the Internet – you can write as much as you want. It takes a lot of nimbleness.”

But the digital era is changing more than how much Kliff writes. It’s changing how she writes, as well. During the rollout of the Affordable Care Act, she asked Twitter followers to share their enrollment experiences. She also uses social media to identify common trends and concerns about healthcare.

“Twitter is a big part of how I do my job,” says Kliff. “It gives me a stronger sense of what really matters to people.”

One thing that matters to many readers is context. For instance, one of the most popular stories of the past year was the Post’s “9 questions about Syria you were too embarrassed to ask.” The primer, which answered questions like “How did it all go so wrong in Syria? And, please, just give me the short version” and “I hear a lot about how Russia still loves Syria, though. And Iran, too. What’s their deal?” was reposted on countless websites, Facebook pages, and Twitter feeds.

“Usually the newspaper is where we put the news of the day, but we’ve found there is a real interest in explanatory journalism,” says Kliff. “People really want to ground themselves, and that is a great way to accomplish that. That’s not something we do a lot in the print edition.”

Kliff also uses her blog and Twitter feed to promote the work of her rivals – another practice that’s rare in newspapers. But she believes, like Hamman, that The Post is a tool, not just a publication.

“The people who are following me are largely interested in following the healthcare law,” says Kliff. “So I feel like I’m a curator for them. I will promote, of course, what I am writing, but I also will link to a Wall Street Journal or a New York Times piece. I see my job as providing a service and giving them a guide to a very complicated topic.”

In this way Kliff is more humble than some of her peers. But she says this is a humbling time for everyone in the newspaper industry.

“We are all learning and changing. We have to,” says Kliff. “What I’ve learned is that you’ve got to be open to new ways of getting information, new ways of telling stories, and new ways of sharing them.”

Diane Toroian Keaggy (LA’90, former news editor of Student Life) worked at the St. Louis Post Dispatch for 18 years and is currently director of campus life news at Washington University.

Note: Sarah Kliff is now a senior editor at Vox.com.
ALUMNI VOICE DISPATCHES FROM THE FRONT LINES
“When the King enters, you stand,” our guide says. “He will nod, and you will state your mission to the translator, but do not look up. Then you offer the translator your tribute [a bottle of Hennessey purchased from a well-placed liquor store across the street from the palace] and sit down. If the King approves, he will tell the translator, and the translator will tell you. You will stand up and address him, and he will decide if he would like to speak with you.”

Right. Got it. The aide turns on his heels and clicks down the hallway.

I am in the Ghanaian jungle to interview the King of the Akyeam tribe about the natural resources within his domain. After all, Ghana has just discovered oil, and the national debate that will ensue over the next year will largely determine whether the country goes the way of its resource-cursed neighbors (see: Nigeria) or continues its upward economic journey.

It’s a fascinating story at the intersection of geopolitics and environmentalism, tinged with a bitter historical legacy – a far cry from the sterile lab benches where I spend most of my time as a graduate student geobiologist at the California Institute of Technology.

Suddenly the King enters, wearing a thick white robe covered with geometrical splotches of orange and red draped over one arm. The other arm is bare except for a golden armband the size of a dinner plate. I struggle through the protocol – successfully, apparently – and tap “record” on my tape recorder.

My moonlighting as a writer began while on a scientific expedition to Antarctica. Scientists often have access to some of the most remote, unexplored regions of the world, and I was eager to share the experience with a broader audience – after all, exploration is a fundamentally human endeavor.

I soon found, to my surprise, that there was an audience for these dispatches from the front lines, and for my colloquial, people-centered treatment of scientific issues. (Insider tip: readers often love to learn about science, but in the end, people want to read about people.) When well-respected news organizations began supporting my journalistic endeavors, I expanded my repertoire.

Olympic skiers, Chinese artists, a headphone opera, and Dubai’s energy market may not seem particularly connected, but there’s always a scientific angle. The range of topics I’ve covered provides a continual reminder that science pervades every aspect of modern life. And as a practicing researcher, my inquisitiveness, need for evidence, and critical thinking were helpful journalistic traits.

Scientific research is a slow and deliberate process, and while nothing matches the thrill of discovering new things about the world, it’s occasionally nice to shorten that timeline by investigating a topic, synthesizing findings, and communicating them to a mass audience in days or weeks, instead of years. Journalism provides an ideal outlet in this sense, with the added bonus of helping researchers communicate their results to the world. Research and science journalism are synergistic endeavors, and it’s an honor to contribute on both fronts.

Jeff Marlow (LA’07, earth and planetary sciences) splits his time between graduate studies at the California Institute of Technology and writing stories for such notable outlets as The New York Times, Wired, and NASA.

DISPATCH LOCATIONS

1. Hydrate Ridge, Oregon

2. Port-Au-Prince, Haiti
Music schools provide a sense of optimism following the 2010 earthquake. Christian Science Monitor.

3. Juba, South Sudan
Political leaders consider a drastic plan that would reconfigure the nation’s political geography. Geographical.

4. Park City, Utah
Steven Nyman and the US Ski Team embrace the role of science in creating faster racers. Wired.

5. Beijing, China
A tour of renegade artist Ai Weiwei’s studio provides a glimpse of the growing role of technology in Marlow’s work. Wired.

6. Koraro, Ethiopia
A site visit to an environmentally challenged Millennium Village with development guru Jeffrey Sachs offers signs of hope and enormous obstacles. The New York Times.
Volunteering

Washington University students are generous with their time and talent. According to the university-wide Gephardt Institute for Public Service, approximately 70% of all undergraduates report performing community service. Some students choose to serve the university community. Some go beyond campus to serve St. Louis neighborhoods and institutions. Some travel far beyond the borders of the US in order to volunteer. And some, like Rori Bridge (LA'15), do all three.

On campus, Bridge was a founding member of the Student Group on Race Relations, which seeks to improve campus dialogue about race and diversity.

In the community, she volunteers for the St. Louis Crisis Nursery and fundraises for City Faces, a local non-profit organization.

Around the globe, she is driven by a mission to ensure a baseline of health for every human. Last summer, Bridge traveled to Iganga, Uganda to serve as a GlobeMed Grow Intern in cooperation with Uganda Development and Health Associates. As part of the Gephardt Institute Civic Scholars Program, she hopes to return to Uganda this coming summer to carry out a community-based project to develop health and nutrition resources for vulnerable populations.

Rori Bridge (fourth from the left), Rachel Hoffman (far right), and Alex Rosenthal (second from right), with partners from Uganda Development and Health Associates (UDHA) in Naigobya, Uganda. The three students, all anthropology majors in the global health and environment track, are members of WUSTL’s chapter of GlobeMed, a national student-run organization. To see Bridge speak about the group’s collaborative work with UDHA, visit magazine.artsci.wustl.edu.
Beneath the ancient Maya city of El Peru-Waka’ in northern Guatemala, a team led by David Freidel, professor of archaeology, discovered a stone monument that detailed a bloody struggle between two powerful royal dynasties. Guatemalan cultural officials announced the discovery, which offers new information about a “dark period” in Maya history, in July 2013.
In Remembrance: Harold Ramis  “My characters aren’t losers. They’re rebels. They win by their refusal to play by everyone else’s rules.”

Harold Ramis (1944–2014) earned a bachelor’s degree in English Literature in Arts & Sciences in 1966. A celebrated writer, actor, and director, best known for his work on movies like “Ghostbusters” and “Groundhog Day,” he was also an active member of the WUSTL alumni community. He served two terms on the Board of Trustees from 1997–2005, and he received a Distinguished Alumni Award in 1988 and an honorary doctorate of arts in 1993.
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<th>Field</th>
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<tr>
<td>Anthropology</td>
<td>John Bowen, co-editor, European States and Their Muslim Citizens: The Impact of Institutions on Perceptions and Boundaries</td>
<td>[Cambridge University Press, 2013]</td>
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<td></td>
<td>David Browman, Cultural Negotiations: The Role of Women in the Founding of Americanist Archaeology</td>
<td>(University of Nebraska Press, 2013)</td>
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<td>Classics</td>
<td>Timothy Moore, co-editor, Form and Meaning in Latin Drama</td>
<td>Wissenschaftlicher Verlag, 2013</td>
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<td>East Asian Languages and Cultures</td>
<td>Rebecca Copeland, translator, The Goddess Chronicle</td>
<td>(Canongate U.S., 2013)</td>
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<td>Education</td>
<td>Korina Jocson, editor, Cultural Transformations: Youth and Pedagogies of Possibility</td>
<td>(Harvard Education Press, 2013)</td>
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<td></td>
<td>Carol Camp Yeakey, co-editor, Urban IIs: Twenty First Century Complexities of Urban Living in Global Contexts</td>
<td>(Lexington Books, 2013)</td>
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<td>English</td>
<td>Kathryn Davis, Duplex</td>
<td>(Graywolf Press, 2013)</td>
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<td>Film and Media Studies</td>
<td>Philip Sewell, Television in the Age of Radio: Modernity, Imagination and the Making of a Medium</td>
<td>(Rutgers University Press, 2014)</td>
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<td>Germanic Languages and Literatures</td>
<td>Paul Michael Lützeler, Transatlantische Germanistik</td>
<td>[De Gruyter, 2013]</td>
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On October 16, 1957, Albert Camus was having lunch at Chez Marius in Paris’s Latin Quarter when a young man approached the table and informed him that he had won the Nobel Prize for Literature.

The new laureate-to-be could not hide his anguish.

Sure, the Algerian-born French writer had been an international figure for more than a decade. He had earned great public admiration for his moral stands as well as for his novels, plays, and essays. But not yet forty-four years old, Camus was only the second youngest writer ever to receive the Nobel. He thought that the prize should honor a complete body of work, and he hoped that his was still unfinished.

After the demand for interviews subsided, he paused to reply to a few well wishers. One handwritten letter was to an old friend in Paris.

My dear Monod,

I have put aside for a while the white noise of these recent times in order to thank you from the bottom of my heart for your warm letter. The unexpected prize has left me with more doubt than certainty. At least I have friendship to help me face it. I, who feel solidarity with many men, feel friendship with only a few. You are one of these, my dear Monod, with a constancy and sincerity that I must tell you at least once. Our work, our busy lives separate us, but we are reunited again, in one same adventure. That does not prevent us to reunite, from time to time, at least for a drink of friendship! See you soon and fraternally yours.

Albert Camus

Camus knew well many of the literary and artistic luminaries of his time, such as Jean-Paul Sartre, George Orwell, Andre Malraux, and Pablo Picasso. But the recipient of Camus’s heartfelt letter was not an artist. This one of his few constant and sincere friends was Jaques Monod, a biologist. And unlike so many other of Camus’s associates, he was not famous, at least not yet. However, despite his pantheon of numerous, more illustrious colleagues, Camus claimed, “I have known only one true genius: Jaques Monod.”


Sean B. Carroll (LA’79), an award-winning scientist, author, and educator, writes of an unlikely friendship that blossomed in Nazi-occupied Paris during WWII. Writer Albert Camus and biologist Jaques Monod fought together in the underground French Resistance before going on to win the Nobel Prize in their respective fields.
**Mathematics**


**Performing Arts**


**Jeffrey Q. McCune, Jr.**, *Sexual Discretion: Black Masculinity and the Politics of Passing* (University of Chicago Press, 2014)

**Philosophy**

**Carl Craver**, *In Search of Mechanisms: Discoveries across the Life Sciences* (University of Chicago Press, 2013) (with Lindley Darden)


**Psychology**


**Political Science**


**Steven Smith**, *The American Congress* (Cambridge University Press, 2013) (with Jason Roberts and Ryan Vander Wielen)

**Romance Languages and Literatures**

**Mabel Moraña**, *Arguedas/ Vargas Llosa. Dilemas y ensamblajes* (Iberoamerican/Vervuert, 2013)


**Psychology**


Professor Weidenbaum passed away on Thursday, March 20, 2014, shortly before the Distinguished Alumni Awards ceremony. He is missed by the entire Arts & Sciences community.
SELECTED EXTERNAL GRANTS & FELLOWSHIPS

African and African-American Studies

Jonathan Fenderson was awarded a leadership fellowship from the National Council for Black Studies for “Liberation Communiversity in St. Louis”

Anthropology

David Freidel, $175,000 from the Department of the Interior and the Foundation for the Cultural and Natural Patrimony of Guatemala for research at El Peru-Waka’

Gayle Fritz (with graduate student Natalie Mueller), $19,076 from NSF for a case study on agricultural practice and domestication

J. W. Chou, $121,909 from NSF for “Ethoinformatics: Developing Data Services and a Standard ‘Etho-Grammar’ for Behavioral Research”

E.A. Quinn and Geoff Childs received a grant from the Wenner-Gren Foundation for Anthropological Research for “Milk with altitude: Investigations of milk composition in ethnic Tibetans living at high altitude.”

Carolyn Sargent and Peter Benson, $150,000 from NSF for research on the transnational coproduction of meanings and strategies about cancer among Senegal River Valley immigrants in France

L. Lewis Wall received a Fulbright award for work at the College of Health Sciences at Mekelle University in northern Ethiopia.

Bruce Carlson, $217,000 from NSF for “Brain Evolution, Communication, and the Diversification of Behavior”

Susanne DiSalvo, $52,190 from NSF for “Pathogenesis to Cooperation in the Microbiome of a Soil Amoeba”

Ian Duncan, $500,000 from NSF for “Control of Adult Patterning During Metamorphosis”

Sarah Elgin, $240,000 from NSF for “The Drosophila Fourth Chromosome: Gene expression in the context of repetitive DNA”

Petra Levin, $360,594 from NIH for “Temporal and Spatial Control of Bacterial Cytokinesis”

Scott A. Mangan, $374,312 from NSF for “Pathogen-mediated Negative Feedbacks Determine Tropical Tree Species Abundance”

Kathryn Miller, $299,412 from NSF for “Maintaining the PULSE: Sustaining Efforts of the Vision and Change Leadership Fellows to Transform Life Sciences Education”

Jonathan Myers, $77,938 from NSF for “Disturbance and Productivity as Drivers of Plant-pollinator Diversity and Function Across Scales”

Art History and Archaeology

Marisa Anne Bass received a summer fellowship from the Scaliger Institute for her book project on Netherlandish artist Joris Hoefnagel.

Biology

Robert Blankenship, $79,180 from DOE for “DOE (NREL) SERIIUS - Solar Energy Research Institute for India and the United States”

Yehuda Ben-Shahar, $470,000 from NSF for “ICOB: miRNAs and the social regulation of behavioral plasticity”

Bruce Carlson, $217,000 from NSF for “Brain Evolution, Communication, and the Diversification of Behavior”

Susanne DiSalvo, $52,190 from NSF for “Pathogenesis to Cooperation in the Microbiome of a Soil Amoeba”

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Alumni Bookshelf

Sean B. Carroll, Wayne B. Drash

Brave Genius: A Scientist, a Philosopher, and Their Daring Adventures from the French Resistance to the Nobel Prize
by Sean B. Carroll, LA Biology 1979

When Paris fell to the Nazis in 1940, then-unknown writer Albert Camus and budding scientist Jacques Monod joined their countrymen in the French Resistance. Neither could guess that, years later, the two friends would eventually win the Nobel Prize in their respective fields. Drawing upon a wealth of previously undiscovered material, Brave Genius offers a fascinating look at how war, resistance, and friendship can catalyze genius.

On These Courts
by Wayne B. Drash, LA English Literature 1994
Touchstone, 2013

After NBA star Anfernee Penny retired from basketball, he thought he was done with the sport forever. But when his oldest friend asks him to help manage a struggling middle-school basketball team in the dangerous Memphis neighborhoods where Anfernee himself grew up, he can hardly say no. A true story of hope and inspiration, struggle and triumph, On These Courts reveals the importance and power of taking a stand in a community and learning what it truly means to give back.
SELECTED EXTERNAL GRANTS & FELLOWSHIPS

Himadri Pakrasi, $567,622 from NSF for “Designing Nitrogen Fixing Ability in Oxynogenic Photosynthetic Cells” and allocation from ICARES

David Queller and Joan Strassmann, $1,575,050 from the Templeton Foundation for “Cooperation, Purpose, and the Organism”

Kevin Smith, $350,003 from NSF for “Outdoor Research Console and Cold Probe”

Joan Strassmann, $854,000 from NSF for “Kin Structure, Kin Recognition, and Cooperation in a Model System”

Chemistry

D. André d’Avignon and Joseph J.H. Ackerman, $436,700 from NIH to purchase a 600-MHz NMR spectrometer replacement console and cold probe

William Buhro, $450,000 from NSF for “Semiconductor Belts, Sheets and Wires Having Idealized Optical and Transport Properties”

Regina Frey, $250,000 from the Association of American Universities for “Using Multiple-Strategies Approach to Increase the Use of Active-learning Techniques across Multiple Disciplines” (with Mark McDaniel in Psychology, Kathryn Miller in Biology, and Kurt Thoroughman in Biomedical Engineering)

Liviu Mirica, $550,000 from NSF for “Oxidative Reactivity of Pd and Ni Complexes Employing Paramagnetic Oxidation States”

Kevin Moeller, $320,000 from NSF for “The Development of Microelectrode Arrays as Bioanalytical Tools”

Gary Patti was awarded a Sloan Research Fellowship by the Arthur P. Sloan Foundation.

Jay Ponder, $1.49 million from NIH for “Development of a Next-generation Nucleic Acid Force Field”

Earth and Planetary Sciences

Alexander S. Bradley, $100,000 from the American Chemical Society for “Deconvolution of Sources of Isotopic Variability in Higher Plant Biomarkers”

Jeffrey Catalano, $521,043 from NSF for “MRI: Acquisition of an X-ray/Ultraviolet Photoelectron Spectrometer (XPS/UPS)” (with John Fortner and Parag Banerjee in Engineering)

Robert Criss, $13,560 from the Missouri Botanical Garden for “Missouri Botanical Garden Deer Creek Watershed Initiative (Phase III).”

Bruce Fegley, $117,402 from NASA/EPSCoR/MSU for “Understanding the Atmospheres of Hot Earths and the Impact on Solar System Formation”

David Fike, $333,229 from the Moore Foundation for “Cracking the Surface Cycle with Novel Cell- and Metabolite-Specific Stable Isotope Approaches”

Anne M. Hofmeister, $242,891 from NSF for “Measurements of Thermal Transport Properties of Melts vs. Temperature and Composition: Theoretical Implications”

Bradley Jolliff, $60,000 from NASA for “Determining Ages of Young Cratering and Volcanic Events on the Moon”

Physics

W. Robert Binns, $162,500 from NASA for “SUPERTIGER 2: A Very-Large-Area, High-Resolution Trans-Iron Cosmic Ray Investigation”

Matthew Kerr, $28,000 from NSF for “Recent Advances in Hodge Theory: Period Domains, Algebraic Cycles and Arithmetic”

John E. McCarthy, $300,000 from NSF for “Multivariable Operator Theory and Applications”

Ari Stern, $35,000 from the Simons Foundation for “Collaborative Research in Geometric Numerical Analysis”

Statistics

Xiang Tang, $39,983 from NSF for “Noncommutative Geometry of Orbifolds”

History

Jean Allman was awarded an ACLS Fellowship for an Intimate History of the African Revolution: Kwame Nkrumah and the Women in Question.

Margaret Garb won the 2014 Grimm Travel Award for “Daniel Burnham in the Philippines: the Birth of American Urban Planning and American Imperialism”

Sowande’ Mustakeem was awarded a 2013 Joel Williamson Visiting Scholar Grant by the Southern Historical Collection at the University of North Carolina at Chapel Hill.

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Physics

W. Robert Binns, $162,500 from NASA for “SUPERTIGER 2: A Very-Large-Area, High-Resolution Trans-Iron Cosmic Ray Investigation”
Matthias Beilicke, $491,026 from NASA for “Development of Small-Pixel CZT Detectors for Future High-Resolution Hard X-Ray Missions”

Thomas Bernatowicz, $270,000 from NASA for “Coordinated Microanalytical Investigations of Carbonaceous Stardust”

James Buckley, $47,812 from the Smithsonian Institute/DOE for “VERITAS Project”

Mark Conradi, $12,920 from NIH for “Evaluation of Endobronchial Interventions for COPD via CT and 3HE MRI”

Willem H. Dickhoff, $375,000 from NSF for “Green’s Functions and the Nuclear Many-Body Problem”

Christine Floss, $425,000 from NASA for “Meteoritic Nanodiamond Analysis by Atom- Probe Tomography”

Ralf Wessel, $363,388 from NSF for “CRCNS: The role of inhibition and correlated dynamics in cortical visual processing”

Lori Markson, $40,000 from the McDonnell Center for Systems Neuroscience for “Infants’ Understanding of Social Dynamics: Implications for Autism”

Henry Roediger, $250,000 from Dart Neuroscience, LLC for “Identifying Individuals with Superior Memory Consolidation”

Mitchell Sommers, $32,000 from the Harvey A. Friedman Center for Aging for “Bilingualism and Protection from Age-Related Cognitive Decline: Using eye-movements to track online speech perception”

Jeffrey Zacks, $149,996 from DARPA for “Everyday Event Perception and Memory in PTSD”

Psychology

Deanna Barch, $30,000 from the McDonnell Center for Systems Neuroscience for “IPNG Supplemental Funding”

Joshua Jackson, $25,000 from University Research Strategic Alliance for “Reason, Emotion, and the Good Life”

Randall Larsen, $199,044 from NIH for “Emotional Aging: Control Processes and Emotion Regulation in Everyday Life”

Romance Languages and Literatures

William Acree was awarded a fellowship for university teachers by NEH.

The Wives of Los Alamos by TaraShea Nesbit, MFA Creative Writing 2006 Bloomsbury USA, 2014

Their average age was twenty-five. They came from Berkeley, Cambridge, Paris, and London. They arrived in New Mexico ready for adventure, but they were forced to adapt to a rugged military town where everything was a secret. The Wives of Los Alamos explores one of the strangest and most monumental research projects in modern history. It’s a testament to a remarkable group of women who carved out a life for themselves in spite of the chaos of war and the shroud of secrecy.

The End of the Point by Elizabeth Graver, MFA Creative Writing 1990 Harper Collins, 2013

Long-listed for the 2013 National Book Award, The End of the Point charts the dramatic changes in the lives of three generations of one remarkable family, and the summer place that both shelters and isolates them. Set in the second half of the 20th century, Graver artfully probes the hairline fractures hidden beneath the surface of our lives and traces the fragile and enduring bonds that connect us.
High-impact innovation requires an entrepreneurial mindset that views big problems as big opportunities. The entrepreneur is ready to embark on a journey without knowing the exact destination and is ready to fail in reaching for success. When entrepreneurs and entrepreneurial thinking are injected into the mix, remarkable things happen at our great universities. Many universities were founded as a result of a partnership between an academic, often a humanist, and an entrepreneur. Throughout the book, we point to great achievements growing out of an entrepreneurial mindset or from deep involvement of entrepreneurs in the university community; but these achievements are still too rare, and academics still too often equate entrepreneurship with opportunism or commercialization in a pejorative way.

So let us be clear. We see entrepreneurship as fully consonant with the aims of the modern university, in all its many and varied parts. “Entrepreneurs innovate.” These two words by Peter Drucker summarize both his thinking on the meaning of entrepreneurship and literally hundreds of books on the subject. The elegance of the definition makes it easy to miss its profound implications. Notice there is no mention of business. Entrepreneurs are not necessarily business people. Nor do the words “management” or “commercialization” or “finance” or even “money” appear in the definition. Instead, Drucker’s definition provides a metaphorical big tent – an intellectual framework – with room for social, scientific, artistic, and, yes, even academic entrepreneurs. This “big tent” actually hosts a conversation, a way of thinking about opportunity, using a set of tools that are available to all no matter what their agenda or their values. Once these ground rules are established, we believe it is appropriate and even imperative that entrepreneurship enter the dialog that takes place at America’s great research universities. The result will be the kind of innovation that will reenergize all of our great institutions in the twenty-first century, as it has in the past.

From Engines of Innovation: The Entrepreneurial University in the Twenty-First Century. Copyright © 2013 by Holden Thorp and Buck Goldstein. Used by permission of the University of North Carolina Press. Buck Goldstein is the University Entrepreneur in Residence and a professor of the practice in economics at the University of North Carolina, Chapel Hill.

In fall 2013, Holden Thorp became provost and executive vice chancellor for academic affairs at Washington University, where he also holds an endowed chair in chemistry and medicine. Thorp joined Washington University after spending three decades at the University of North Carolina at Chapel Hill. He served as the chancellor of UNC from 2008 through 2013.

Thorp earned a doctorate in chemistry in 1989 at the California Institute of Technology and completed postdoctoral work at Yale University. In his research career, he developed technology for electronic DNA chips and most recently cofounded Viamet Pharmaceuticals, which is commercializing new drugs for antifungal and prostate cancer indications.
New Spaces for New Science  As shown in this preliminary rendering, plans are under way to renovate and expand the science buildings along the north edge of the Danforth Campus. The goal for this decade-long initiative will be to make sure that our facilities continue to support the latest innovations in teaching and research. Stay tuned for more in fall 2014.
On a chilly morning last June, Cole Bishop began the 1,100-meter ascent up to Avalanche Peak in New Zealand – an experience he describes as “absolutely surreal.” Bishop, a senior in earth and planetary sciences, studied in Christchurch for the second semester of his junior year.

An avid photographer, Bishop shoots for the First Year Center, the Career Center, and student groups on campus. This photo won special mention in the fourth annual Arts & Sciences senior photo competition.