

MORE OUTREACH TO
LOW-INCOME STUDENTS

TUITION AND FEES
SET FOR 2014-15

FOREVER YOUNG?
RESEARCH ON AGING

PRINCETON ALUMNI WEEKLY

A mosaic illustration of a lion behind a fence. The lion is depicted in shades of yellow, orange, and brown, with a detailed mane. It is looking towards the left. The fence is made of yellow and black tiles, with a wooden post and a chain on the right side. The background features green foliage and a blue sky.

SURVIVING RABIES

How Rodney Willoughby '77
sparked a raging debate over
the most lethal of viruses

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PRINCETON ALUMNI WEEKLY

PAW

An editorially independent magazine by alumni for alumni since 1900

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A decade ago, physician Rodney Willoughby '77 treated a teenager with rabies. Amazingly, she lived. But what saved her?
By Katherine Hobson '94

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Professor Coleen Murphy's research won't keep you young, but it could make the aging process a lot easier to bear.
By Anna Azvolinsky '09

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Princeton's Oscar
A look back at the 1973 documentary *Princeton: A Search for Answers* and its golden moment.



Movie Quiz
Test your knowledge of Tiger actors and filmmakers for a chance to win a prize.



Near Miss
After 25 years, Paul Hauge '80 still dreams of a different ending to the Princeton-Georgetown game.



Noise Petals
Listen to re-released tracks from an undergrad band that rocked Princeton parties in the late '80s.



Throwback Thursday
On the PAW blog, we explore images from the magazine archives and tell the stories behind them.

Top right: Peter Murphy; from left: Princeton: A Search for Answers; Wikipedia; Sports Illustrated/Getty Images; Jordana Toback '88; PAW Archives

On the cover: A mosaic by Auguste Guilbert-Martin evoking the rabies research of Louis Pasteur, who developed the first rabies vaccine. The work is at the Institut Pasteur in Paris, where Pasteur is interred. Photo by BSIP/ UIG via Getty Images.

At the White House, a Clarion Call for College Access

When I began my “listening tour” to learn what Princeton alumni thought about our alma mater, I never imagined it might include a stop at the White House. But on Jan. 16 I joined more than 80 college and university presidents who heard one of Princeton’s most famous graduates, First Lady Michelle Obama ’85, talk about what her undergraduate experience had meant to her.

The first lady and President Barack Obama convened the unprecedented gathering of academic leaders to highlight the importance of increasing college graduation rates for low-income students. The first lady has said that college access will be her signature issue during her remaining years in the White House.

Though the president also spoke eloquently at the meeting, the first lady’s inspiring speech was the show-stopping highlight. She reminded her audience that she and her brother, my classmate Craig Robinson ’83, were the first members of their family to attend college.



VIDEO STILL COURTESY OF THE WHITE HOUSE

First Lady Michelle Obama ’85 discussed her life-changing experiences at Princeton in advocating for greater college access for low-income students.

She said that she would never have considered Princeton if the University had not recruited Craig to play basketball. And she described how Princeton’s summer orientation program and its Third World Center — now the Fields Center for Equality and Cultural Understanding — were indispensable in helping her adjust to a place very different from the South Side Chicago neighborhood where she grew up.

The first lady used her own experience to underscore the life-changing benefits that a college education can provide to a young person from a low-income family. And the White House reinforced her message with a superb report, “Increasing College Opportunity for Low-Income Students: Promising Models and a Call to Action.” The report also stressed that low-income students still face significant barriers to college success. Among its findings:

- The value of a college education has never been higher than it is today.
- Only one in 10 people from low-income families earn a bachelor’s degree by age 25, as compared to five in 10 from high-income families.

- When low-income students do earn degrees, the effects are profound: For example, their chances of escaping the bottom income quartile increase by 50 percent.
- The benefits of a college education for low-income students increase when they attend institutions that are selective and well resourced.
- Demand for admission has grown faster than supply, especially at the most selective and best-resourced colleges and universities.

The remainder of the conference consisted of panels on best practices for increasing degree attainment by low-income students. Bridget Terry Long ’95, now a professor of education at Harvard University, presented research showing that even modest interventions — for example, helping high school students and their families to fill out financial aid forms — could have a dramatic impact on college access. Researchers affiliated with ideas42, an innovative behavioral economics nonprofit co-founded by Princeton Professor of Psychology and Public Affairs Eldar Shafir, are conducting ongoing work to help meet the need identified by Professor Long.

Institutions attending the White House summit were required to make new commitments to benefit low-income students. Princeton responded with three enthusiastic promises that were the culmination of planning efforts that had been ongoing for more than a year.

We are working to increase the scope of our partnership with the Leadership Enterprise for a Diverse America, a nonprofit organization that brings talented high school juniors from low-income backgrounds to the Princeton campus and prepares them for collegiate success. We are adding resources to our admissions office to reach more talented low-income applicants. And we are seeking to create a summer learning module to assist entering freshmen from disadvantaged backgrounds who are interested in the sciences, engineering, and mathematics.

The White House also gave us an opportunity to mention steps that we had already taken, such as our leading financial aid program. The White House’s report confirmed what Princetonians know already: To get the full benefit of a college education, students need a financial aid package that makes college really and truly affordable.

In addition, we described the expansion of our student body over the last decade. Given the extraordinary benefits that flow from an education at a highly selective college, one of the most impactful things that Princeton can do for students — from low-income and other backgrounds — is to make more places available.

Princeton has done a lot to increase access since the days when Michelle Obama and I were students here — but we can and should do more. I hope that all alumni who care about Princeton’s commitment to be “in the nation’s service” will rally around the first lady’s call to action. We should find ways to provide to other low-income students the kind of experiences that mattered so much in her life, and in all of ours.

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paul DAVIDS '69



Paul Davids '69 has 13 works of his collaborative art (with Russell Metzger) curated by the Ritz-Carlton of Laguna Niguel, on display until April 30th. Available for acquisition, along with Paul's many other artistic creations. Ritz-Carlton Director of Marketing Donna Bond says: "Paul's exhibit is one of the most unique showings that we have featured at the resort." Paul is noted for his many films distributed by NBC Universal, as well as 79 "Transformers" animated TV shows and 6 "Star Wars" novels from Lucasfilm.

He also has a beautiful vacation home in Santa Fe, New Mexico, available for short-term rentals to Princeton alumni. (see classified ad in this issue)

Visit www.pauldavids-artist.com
and contact Paul at starrynightmovie@aol.com

PRINCETON ALUMNI WEEKLY

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REPORTING ON SURVEILLANCE

With respect to your interview with Bart Gellman '82 on the Edward Snowden leaks (Q&A, Jan. 8), a couple of points:

First, Gellman seems to have had little concern about publishing information that is classified at the highest level. Why? He claims that he thought through “what the public interest is” Fair enough. But in our political system, the president, who is elected by the people, is charged with determining how and if government information is classified. Bart was not elected by anybody. Moreover, he has few, if any, qualifications for determining what the public interest is. His notional “public” well might conclude that keeping the nation safe is more important than revealing information that is certainly of great interest — to our enemies.

Second, Gellman claims to have “st[uck] to the letter and the spirit of the law” Puhleeze! By his own admission, Snowden committed a number of felonies. Under at least some theories of the law, Gellman was an aider and abettor.

Third, Gellman tries to turn Snowden into a folk hero because he “believed he was witnessing an out-of-control surveillance state.” Had Snowden really felt that way, there were numerous outlets, wholly legal, that would have given his views a full and sympathetic airing: the National Security Agency and Defense Department inspectors general, the Department of Justice, the Hill intel committees, and the U.S. attorney’s office. But they would not have afforded

him what he apparently desperately wants: the ego stroke that going public provides. It is worth at least asking the question whether an honorable person would violate an oath of office to keep secrets that have been entrusted to him.

Finally, to be sure, “transparency serves the public good” in many contexts. But transparency with respect to the conduct of intelligence may be incredibly costly. It might have been worthwhile for your interviewer to ask Gellman what price he is willing to pay for telling our adversaries the sources and methods we employ for obtaining intelligence.

Robert L. Deitz *72
National Security Agency general counsel, 1998–2006
Professor of public policy
George Mason University
Fairfax, Va.

Spreading sunshine in the black world of intelligence collection would do nothing more than give our adversaries the upper hand.

As a federal government employee with almost 20 years of service in both the law-enforcement and intelligence communities, I would note that within government, there are multiple mechanisms to report abuses of power, from each agency’s office of inspector general to reporting directly to the congressional oversight committees. Edward Snowden very easily could have

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CATCHING UP @ PAW ONLINE



Filming the Princeton University Band, which “basically doesn’t stop moving for nine hours on football days,” was a challenge for Angeline Jacques ’16, a student director in a fall-semester documentary-film course. Watch her team’s 10-minute film, “In the Plaid,” and read more about the class at paw.princeton.edu.

availed himself of these mechanisms, but made the choice to violate federal law and illegally disclose classified material.

All federal employees take an oath to protect the Constitution of the United States against all enemies, foreign and domestic. Post 9/11, this oath has become especially salient for those who have the job of protecting the United States from future attacks in the homeland and elsewhere. Analysts work around the clock using any and all tools to prevent this from happening. The analysts I know would never use the extensive intelligence-collection tools at their disposal for personal or political gain. Any organization occasionally will have individuals who violate the oath, and federal agencies must develop the safeguards to identify these individuals and take swift and immediate action when warranted.

The intelligence community, by its nature, must remain clandestine to effectively provide U.S. policy makers with the information they need to protect us. Our government was founded on checks and balances, and all three branches of government currently play an active part in intelligence oversight. Contrary to Professor Edward Felten’s prerogative that “we” should make choices about the appropriateness of government surveillance programs, I believe that spreading sunshine in the

Inbox

black world of intelligence collection would do nothing more than give our adversaries the upper hand in future terrorist operational planning.

Michael Mantyla '93
Salt Lake City, Utah

As I read the features on privacy in the Jan. 8 edition, all I could think about was my late roommate, Bob Capuano '73, working diligently on his junior paper for his fall Woodrow Wilson School conference on "The Boundaries of Privacy in American Society." Bob's paper, along with those of classmates Steve Glauber, Eric Vinson, Marilyn Green, Rich Nenno, Alex Hartnett, Betsy Freeman, Michael Theodore, Bob Wolf, and Mark Stevens, became the basis for the Alito Princeton Privacy Report.

This report was named after the senior, Sam Alito '72, who chaired the conference and later became a Supreme Court justice. I am very proud of my classmates for being way ahead of their time in analyzing issues such as "Federal Agencies Involved in Domestic Surveillance" and "Technology and the Control of Stored Data." Pretty heady work for a bunch of 20-year-olds in 1971.

Jim DiOrio '73
Morris Township, N.J.

VALUING VETERANS

When I returned to Princeton for my fifth reunion, I had been back from Vietnam for five months and was still on active duty. I left my uniform in New York City because I was afraid that if I wore it on campus, it would be defaced. Someone had arranged for a panel of graduating seniors to address our class on the evils of the war in Vietnam as part of our reunion.

Excoriating the troops has since become rare. I suspect part of the reason for the change was that such attacks proved to be politically counterproductive. Still, the "support the troops" replacement seems to be expressed more in terms of charity than respect.

Expressions of support for veterans, particularly combat veterans, often involve implicitly or expressly defining them as a disadvantaged group that, like other such groups, needs special

assistance from normal folks.

Changing the script, as suggested in "Tell Me Your Story" (On the Campus, Dec. 4), isn't terribly convincing. If you want to demonstrate that you value rather than pity veterans, become one.

William D. Watson '65
Denver, Colo.

ONLINE EDUCATION'S FUTURE

As someone who has worked in the field of online education in higher education and K-12 since 1998 — in an administrative capacity at Columbia University, as a policy adviser to the New York City Department of Education, and as a consultant to universities as well as faculty — I was surprised by the faculty committee's comments that questioned the future of online education in higher education (On the Campus, Jan. 8).

Although MOOCs are a recent phenomenon and generally not representative of the state of the art in online education, online education in higher education has existed for close to 20 years in the United States. In fact, in a 2012 College Board survey of 2,800 higher-education institutions, nearly 70 percent of chief academic officers polled identified online education as an

essential part of their long-term strategy. Peer institutions including Stanford, Harvard, Penn, and Columbia have offered credit-bearing programs online for many years, and the president of the United States is promoting 21st-century learning modalities, including online education, as critical to the education of our youth and future success of our country. What more evidence does the committee need?

If Princeton is to remain one of the leading academic institutions in the country and the world, it will have to look forward and beyond the gates, so as to clearly envision the future.

Jane Hatterer '83
New York, N.Y.

JAZZ BAND RECALLED

Do any other alumni of my vintage remember the Intensely Vigorous Jazz Band at football games in the late 1940s? The original IVJB was a Dixieland ensemble that used to march into Palmer Stadium to warm up the crowd ahead of the regular marching band. I seem to recall Tony Winchell '49 on clarinet, but I've lost the rest. Anyway, they were great fun.

Stu Hibben '48
Swarthmore, Pa.

YOUR COMMENTS ONLINE

Hobey Baker's Legacy Lives On



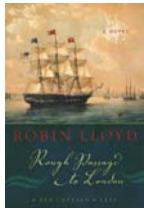
Gregg Lange '70's PAW Online column on Hobey Baker 1914 ("American Idol: Real Life and the Hobey Code," posted with the Nov. 13 issue) prompted comments from several PAW readers.

"The Hobey Code may not be much in evidence today, but it shines on as an aspirational beacon for all athletes as another fine example of Princeton in the nation's service," wrote **Gerald D. Skoning '64**, captain of the hockey team his senior year.

Phil Seib '70 noted that his 2003 biography of baseball star Christy Mathewson, *The Player*, included a section on Mathewson's "contemporary and fellow epitome of sportsmanship, Hobey Baker. It was a pleasure researching the life of such fine athletes and fine persons."

J.E. "Sandy" Murdock III '69 wrote that his grandfather, J. Edgar Murdock 1916, had "offered to shag the balls" when Baker practiced his drop-kicking. In the fall of 1965, football manager Sandy Murdock was assigned to make sure placekicker Charlie Gogolak '66 had his appropriate tee for field goals and kickoffs. Gogolak "set some records that day, decided that the freshman manager was a good-luck charm, and requested that I continue in this function. That decision made my grandfather's day. ... Some sort of historical symmetry?"

SEA CAPTAIN'S DESCENDANTS



The picture of the cover of Robin Lloyd '73's book, *Rough Passage to London: A Sea Captain's Tale*, caught my eye (Princetonians, Dec. 4). Just three days before,

I had unwrapped my own copy of that book on Christmas morning, a gift from my father, Edward Morgan III. Growing up, the dark and imposing oil portrait of Elisha Ely Morgan, or "Captain Morgan" to us, that hung over our mantel often drew questions from visitors. My father was always ready to tell of his ancestor, my great-great-grandfather, who was a well-respected captain whose frequent passengers included Charles Dickens.

My father had tracked down Mr. Lloyd—and his novel—in doing research for our family archives, and while he knew that Mr. Lloyd (a great-great-great-grandson of Captain Morgan, and therefore a cousin of mine) was part of our extended biological family, none of us realized that we shared a Princeton connection as well. Thank you for bringing this to light and for sharing Mr. Lloyd's tale with other PAW readers!

Meg Morgan '89
Kirkland, Wash.

FROM THE ARCHIVES

Karen Thomas-Alyea '96 was able to identify all five members of the Princeton Environmental Reform Committee (PERC) in the Dec. 4 From the Archives photo. They are, from left, Thomas-Alyea, Eckhart Richter '98, Virgene Zumbrunn '97 *01, Carolyn Bradner Jasik '97, and Amy Gladfelter '96. The committee conducted a campus environmental audit from 1994 to 1996.



Each story, letter, and memorial at paw.princeton.edu offers a chance to comment.



FROM THE EDITOR

'If I'm Wrong, You're Dead'

One night in August 2008, I was awakened in the night by a swoosh of air against my cheek. I sat up suddenly and turned on the light. Nothing. "You're dreaming!" my husband mumbled.

The next evening, as I sat in the bedroom watching Hillary Clinton address the Democratic convention, something brown and several inches long flew in front of me. Then it flew back. The swoosh had been no dream. For the next half hour, my husband and I chased a bat around the house with beach towels until we closed it off in the mudroom, opened the exterior door, and watched it fly away.

That was dumb.

With no bat, there was no way to determine whether I'd been exposed to rabies and required injections with the post-exposure vaccine, which prevents rabies before symptoms develop. The doctor thought the chance of infection was slim. Then he added: "If I'm wrong, you're dead." I got the shots.

It turns out that rabies can be survivable in some cases, though it remains the most lethal of infectious diseases. One of the most important figures in the story of how rabies is—or can be—treated is Rodney Willoughby Jr. '77. He is the doctor who, in 2004, treated a Wisconsin teenager infected with rabies. She became the first person with a documented case of the disease to survive.

About 60,000 people die each year from rabies; only a few of them are in the United States. Victims often are unaware of the life-saving injections or the immediate need for them, or lack access to them. In some parts of the world, rabies remains a problem among dogs, the most common carriers of the disease to humans.

Willoughby's protocol still is controversial, and he and his critics disagree sharply on how people with rabies should be treated. There's little disagreement that other advances—eradicating canine rabies and improving access to early post-exposure treatment—would be far more significant. PAW writer Katherine Hobson '94 writes about Willoughby, his work, and the debate surrounding the disease, beginning on page 22. —*Marilyn H. Marks '86*

Photos: Princeton University Archives; istockphoto.com

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News from the Alumni Association

The Alumni Association of Princeton University: over 80,000 served

Aluminaries

Kevin Yip '01
President
Princeton Alumni
Association of Canada,
Toronto Chapter



c. 2001

To learn the many ways to stay connected to Princeton, contact the Office of the Alumni Association at 609-258-1900 or www.alumni.princeton.edu

When Kevin Yip's big sister was venturing south from their Toronto home to look at colleges in the Northeast United States, Kevin tagged along. Still years from thinking about college, he was moved by the beauty of Princeton's campus. Although his sister did not ultimately go to Princeton, when it was his turn to go looking, he knew what he wanted: Princeton, with its world-class facilities, strong combination of engineering and liberal arts, and welcoming classes.

His memories and his research did not let him down. During his time as a student Princeton surpassed his expectations, and even held a few surprises. Looking back he marvels at how cosmopolitan the campus was. He made friends among undergraduates, graduate students and professors from across the United States and around the world.

Armed with a degree in Computer Science and certificates in Finance and in Engineering & Management Systems, following graduation Kevin headed to Chicago and a research position at a hedge fund. Then in 2003, he wrestled with a difficult, if also tantalizing, decision: Should he go back to Canada to pursue his childhood dream? "When I was younger, I wanted to either be a lawyer or make video games," he admits. Law school won, and he is now at a major law firm in Toronto.

While in Chicago and as a law student in Toronto, Kevin went to Reunions and to regional events. In 2006 and out of law school, Kevin answered the regional Toronto Alumni Association Chapter's call for volunteers. He got an assignment, then more assignments. Two years later he was the chapter president. "Just keep showing up and you're put in charge!" he laughs.

In addition to being president of the Toronto chapter, he also interviews Princeton applicants through the chapter's Alumni Schools Committee and is a member of the Alumni Council's Committee on Careers, serving as vice chair for this year's Global NetNight (GNN) sub-committee. When Kevin describes what he most enjoys about his volunteer roles, one theme quickly becomes apparent: connecting alumni as well as the broader Princeton community. "Global NetNight is a way to connect regional associations as well as young and older alums to talk about compelling life issues. And at our chapter events, I really enjoy bringing together alumni, parents, students, faculty, staff and friends as often as possible." Kevin pauses, then smiles again: "With a Princeton connection, you are instantly friends."

Your Alumni Trustee Candidates

The Committee to Nominate Alumni Trustees is pleased to announce the candidates for Alumni Trustee At-Large and Region III Trustee.

The election materials will be available to all alumni after April 1, 2014.

At-Large

Margaret M. Canella '73
New York, NY

Heather K. Gerken '91
New Haven, CT

Paul A. Maeder '75
Cambridge, MA

Region III

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Cincinnati, OH

Yvonne Gonzalez-Rogers '87
Piedmont, CA

David Huebner '82
Los Angeles, CA



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— Philip Seib '70 *Journeyed to Patagonia, ringing in the New Year with Princeton Journeys*

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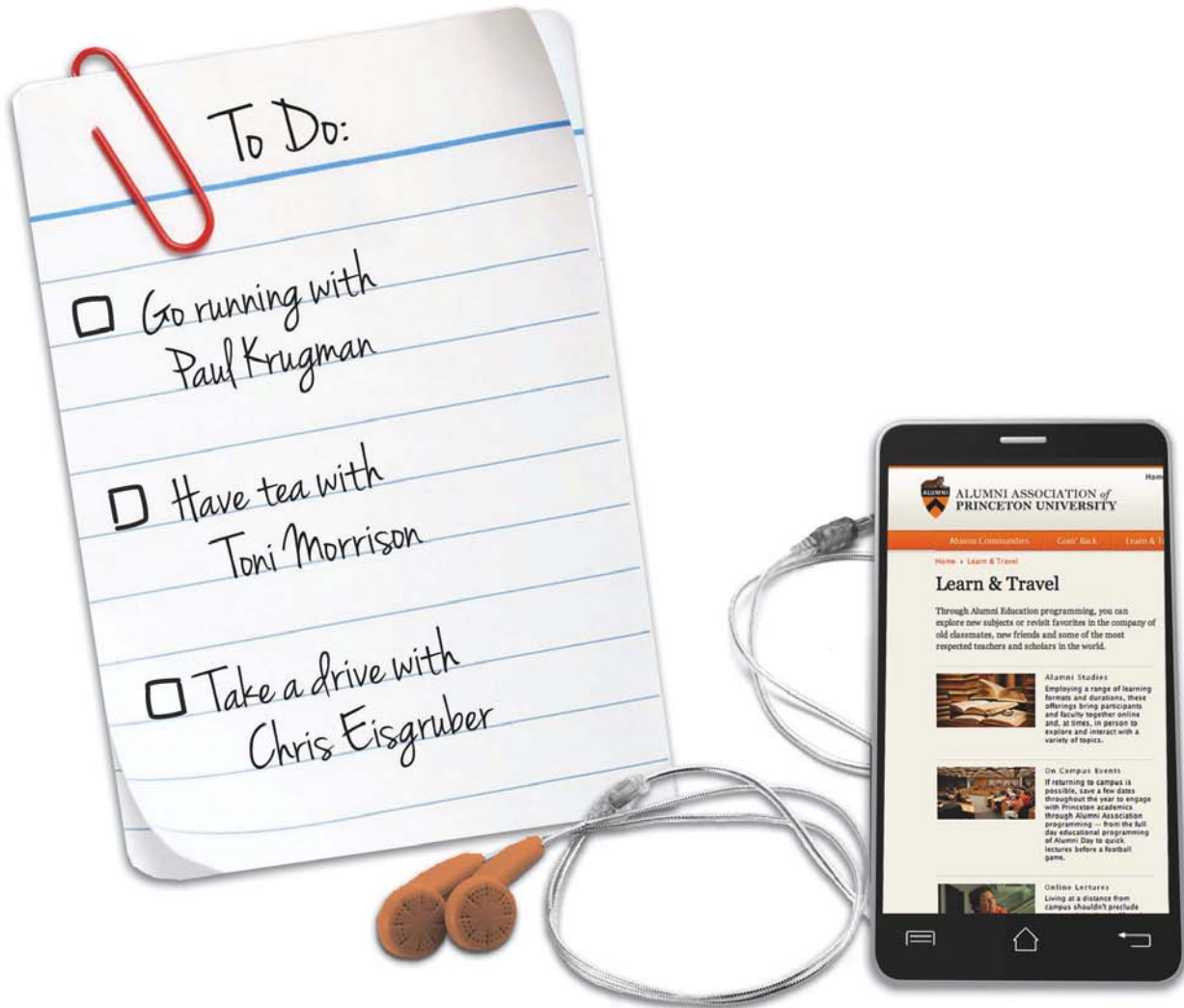
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On the Campus



Two sculptures by Alexander Calder, “Man” (left) and “The Kite That Never Flew,” contrast with a blanket of January snow in front of the University Art Museum. The works are on loan through June 15.
Photograph by Ricardo Barros



From left, Farrah Bui '14, Dallas C. Nan '16, and Lea Trusty '16 are leaders of the Princeton Quest Scholars Network, which connects and supports low-income students.

Powerful Benefits

Eisgruber: University expanding efforts to attract, support low-income students

President Eisgruber '83 was among more than 80 higher-education leaders who attended a White House conference Jan. 16 on socioeconomic diversity in higher education, pledging new initiatives to recruit and support high-achieving, low-income students.

The conference, hosted by President Barack Obama and first lady Michelle Obama '85, offered “compelling evidence that selective higher education has especially powerful benefits for students from low-income families,” Eisgruber said. Educating those students “enables the University to serve as an engine of social mobility,” he said.

Eisgruber said he found “very

persuasive” a conference theme that “students coming from low-income groups should be thought of as great talents who will succeed,” and not as students in need of special assistance.

The University cited these new initiatives:

- ◆ Hiring Princeton’s first associate dean for diversity outreach last spring.
- ◆ Working with the College Board to use newly available data to identify high school students from low-income backgrounds, along with test scores and grades.
- ◆ Expanding Princeton’s partnership with Leadership Enterprise for a Diverse America (LEDA), a New York-based nonprofit that seeks to develop the academic and leadership potential of

disadvantaged students and brings high school seniors to Princeton for summer courses and college counseling. The University has enrolled 60 LEDA alumni over the past 10 years, including 39 current students.

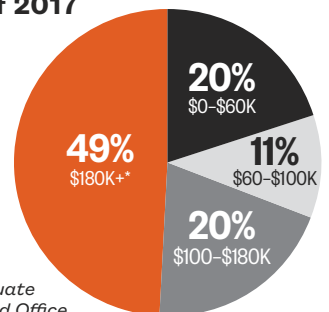
◆ Seeking foundation funding to expand the summer Freshman Scholars Institute for incoming students, to include courses in science, technology, engineering, and math (STEM) fields. Among those invited to attend the institute are first-generation college students and those who attended high schools where advanced courses were limited.

Michelle Obama, raised in a working-class family in Chicago, told the White House gathering that if her brother, Craig Robinson '83, had not been a basketball recruit at Princeton “and if I hadn’t seen that he could succeed on a campus like that, it never would have occurred to me to apply.” There are “so many kids out there just like me,” she said. She said she received valuable support in adjusting to Princeton from a summer orientation program and from the Third World Center, now called the Carl A. Fields Center.

Eisgruber said Obama’s personal story was an illustration to low-income students that they can succeed — “and to colleges that if they go out and make extra efforts to recruit students from low-income groups, they may identify and cultivate the next Michelle Obama or the next Sonia Sotomayor [’76].”

Princeton’s definition of “low-income” correlates to the top of the middle quintile of household income, based on Census Bureau figures, according to Robin Moscato, director of undergraduate financial aid. For the Class of 2017, it was \$60,000; for

FAMILY INCOME Class of 2017



*Top 5% of incomes nationally

Source: Undergraduate Financial Aid Office

This page: Frank Wojciechowski; Opposite page: Getty Images (Model T)

the Class of 2018, it is \$65,000.

The Class of 2001 — the last class admitted before Princeton adopted its pioneering no-loan financial-aid policy — enrolled 88 low-income students, one of every five aid students, Moscato said, while the Class of 2017 includes 254 low-income students, nearly one of every three receiving aid.

In recent years Princeton has ranked at or near the bottom of its peer institutions in the number of students receiving Pell Grants, another measure of socioeconomic diversity, though the number is growing. Moscato said that about 10.5 percent of current seniors are Pell recipients, and 14.5 percent of freshmen.

Princeton is “finding excellent students from every background, and if anything, we’re strengthening each class as they come in,” said Dean of Admission Janet Rapelye. Working to create a diverse student body is essential, she said: “Students need the relationships with each other to be able to move forward in this world.”

While the transition from high school to college can be tricky for all students, Rapelye said, “If you’re coming from a place where Princeton has not been a household name, and you’re the first person who’s going to be graduating from college, the navigation of this place takes a lot of effort.”

Farrah Bui ’14, the daughter of Vietnamese parents who settled in a small town in South Carolina, set out to help smooth that transition. Bui came to Princeton with assistance from QuestBridge, a nonprofit organization working to increase the number of low-income students at elite U.S. universities; Princeton has been enrolling more than 40 QuestBridge participants in each entering class.

Bui organized the Princeton Quest Scholars Network to support low-income students on a campus that offers “polar extremes” of financial status, as well as to mentor younger students. A committee formed by former president Shirley Tilghman a year ago to assess the campus experience of low-income students shows that the University is “being open and public about these issues,” Bui said. ♦ *By W.R.O.*

FINANCIAL AID UP 8.5%

Tuition, Room, Board To Rise 4.1%; Total Cost Estimated at \$58,940

Undergraduate tuition, room, and board will increase 4.1 percent for 2014–15 as part of a \$1.6 billion operating budget approved Jan. 25 by the trustees. The University said that even with the increases, Princeton’s costs of about \$58,940 will be about \$800 below the

fees currently charged by its peer schools.

Undergraduate costs: 2014–15

- \$ 41,820** Tuition
- \$ 7,570** Room
- \$ 6,050** Full meal plan
- \$ 3,500** Books, fees, misc.

- \$58,940** Total cost (estimated)

Financial aid is projected to increase 8.5 percent to \$131.6 million; currently about 60 percent of undergraduates receive aid. (The projected average aid package for next year’s freshmen is \$42,700.) Graduate tuition will

increase 4.1 percent to \$41,820, and housing fees for grad students will rise 3 to 4 percent. Grad-student stipends will increase 3.5 percent.

Unlike Yale University, which faces a significant deficit and anticipates layoffs, Princeton is projecting a modest operating deficit that it expects to fill from its reserves. “We continue to operate in a post-recession, ‘new-normal’ mode,” said Provost David S. Lee ’96 ’99. “We cannot expect the same rates of future growth that we enjoyed before 2008.”

The budget, which calls for a 3.6 percent increase in spending, includes \$600,000 in additional resources for priority initiatives such as student training regarding sexual misconduct, six free meals a semester for graduate students who do not live at the Graduate College, and enhancements in technology and social media.

The endowment is expected to contribute \$789 million to the budget, up 5.4 percent from this year. ♦ *By J.A.*

LEARNING VS. DRIVING: WHAT IT COST

A hundred years ago, Princeton’s tuition was \$160, while buying the country’s most popular car, the Model T, would set you back three times that. Today a top-selling car goes for two-thirds of a year’s tuition. ♦ *Compiled by Jennifer Shyue ’17*

Tuition			
1914–15	1964–65	1994–95	2013–14
\$160	\$1,770	\$19,900	\$40,170
Most Popular Car (U.S.)			
1915 FORD MODEL T	1965 CHEVY IMPALA	1995 FORD TAURUS	2014 TOYOTA CAMRY
\$490	\$2,539	\$21,360*	\$26,565*



*Midrange of various models



'A GENEROUS MENTOR'

Kulkarni Appointed Grad-School Dean

Sanjeev Kulkarni, an electrical engineer and a faculty member since 1991, will become dean of the graduate school March 31. He succeeds William Russel, who announced in September that he was stepping down after 12 years.

"Sanj has excelled in every aspect of

faculty endeavor," said Provost David Lee '96 '99, citing Kulkarni's teaching awards and his reputation as "a generous mentor and a collaborative leader."

"Graduate education nationally is at a crossroads and there are unique opportunities at Princeton at this time," Kulkarni said, adding that there is a chance for "significant impact at the graduate school and on the graduate-student experience." He said his priorities include academic excellence, campus life, diversity, and professional development.

"A number of graduate students will end up in academia, but not all," Kulkarni said. "But diving really deep into a subject is immensely valuable, broadening, and liberating, and provides a foundation to go into any new area with the confidence and abilities to succeed." Professional development could include internship opportunities and career-development workshops, he said.

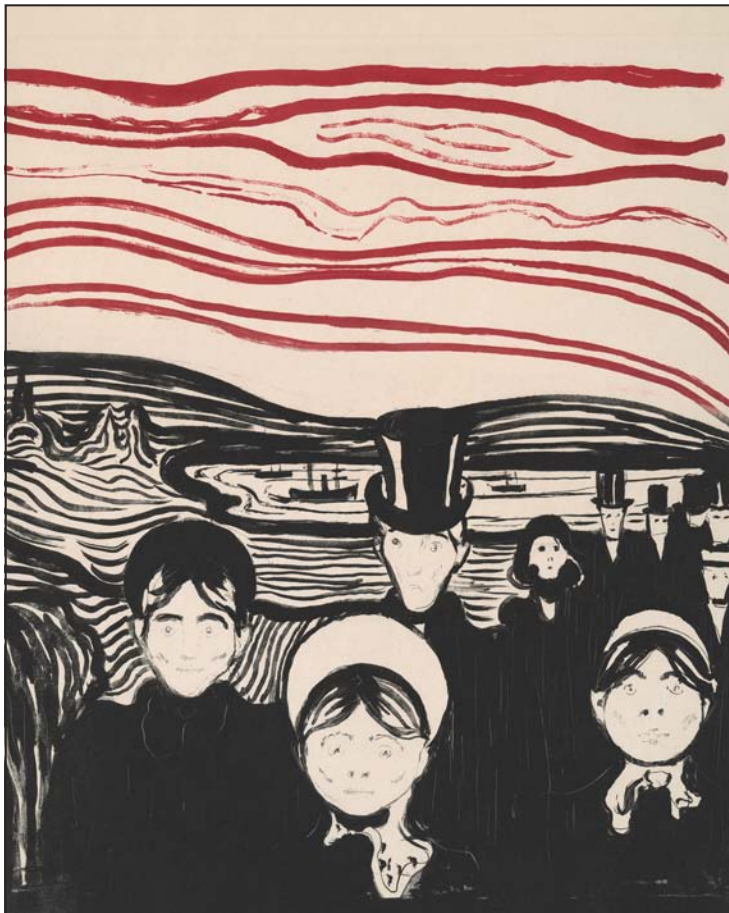
On diversity, he emphasized the importance of increasing the applicant

pool, examining the experiences of students from underrepresented groups "to be sure they're thriving and find the climate hospitable," and ensuring that rates of completion and job placement are high enough to attract promising undergraduates. "The dean's role is to provide leadership and bring the importance [of diversity] to the table for all departments," he said.

Kulkarni also stressed the need to create a sense of community for grad students, and he supported creating a grad-student lounge and campus pub.

Kulkarni has been director since 2011 of the Keller Center, whose mission is to educate leaders for a technology-driven society, and he previously served as master of Butler College and associate dean for academic affairs of the engineering school. His research interests include statistical pattern recognition, machine learning, information theory, wireless networks, signal/image/video processing, and econometrics and finance. ♦ By W.R.O.

Frank Wojciechowski



Edvard Munch Symbolism in Print

Masterworks from The Museum of Modern Art, New York

FEBRUARY 8 TO JUNE 8

Edvard Munch, *Anxiety* (detail), 1896. Lithograph. The Museum of Modern Art, New York. Abby Aldrich Rockefeller Fund (1656.1940) © 2013 The Munch Museum / The Munch-Ellingsen Group / Artists Rights Society (ARS), New York

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Welcoming J Street U

Student group resisted at other schools, but gets warmer reception at Princeton

A chapter of J Street U, a student group that has sparked controversy on other college campuses because some see it as too critical of Israel, has been formed at Princeton without friction. J Street U is the student-organizing arm of J Street, a left-of-center lobbying group that advocates a two-state solution to the Israeli-Palestine dilemma and was founded in 2008 by Jeremy Ben-Ami '84.

J Street U, which has more than 60 chapters on campuses nationwide, has met with resistance from Jewish groups at other colleges, including Columbia, the University of Pennsylvania, and the University of California, Berkeley. It has been criticized for hosting speakers who find fault with Israeli policies.

Most J Street U chapters are affiliated with Hillel, the world's largest Jewish student organization. But some Hillel chapters have declined to co-sponsor events with J Street U, said Aryeh Nussbaum Cohen '15, who started the Princeton chapter in late 2012 and serves on J Street U's national student board. Hillel does not sponsor speakers who it says seek to harm Israel.

Princeton's chapter hasn't sparked conflict because "people at Princeton are

not so confrontational," Cohen said.

J Street U is applying for affiliation with the Center for Jewish Life, Princeton's Hillel, "to open up the conversation within the Jewish community about Israel," Cohen said. CJL Executive Director Rabbi Julie Roth said, "We embrace J Street U," though the question of affiliation had not yet been decided by the CJL board.

On Nov. 19, Ben-Ami spoke at Princeton about reaching a two-state solution. More than 250 people attended.

With 25 active members — about half of whom are not Jewish — J Street U's Princeton chapter holds biweekly education programs and discussions and conducts advocacy campaigns. The Israeli-Palestinian conflict engenders fierce debate all over the world, but "we welcome these hard discussions," said Kyle Dhillon '16, a Sikh student who is the group's advocacy chairman.

"For decades, the establishment view was that to be pro-Israel was to support every single policy of the Israeli government," Cohen said. But critiquing some of Israel's actions and advocating for Palestinians is not anti-Israel, he maintained. "If I really care about Israel, I'm going to speak out." ♦ By J.A.

IN SHORT

Could **FACEBOOK** be heading for "a rapid decline"? That was the conclusion of a research paper posted online by two graduate students in mechanical and aerospace engineering. Their work — which predicted Facebook would lose 80 percent of its users by 2017 in a flameout that was compared to the spread of an infectious disease — drew national media attention. Facebook had a quick retort: It posted its own study, which it said used the same methodology to forecast that by 2021, Princeton would have no students.



DAVID DOBKIN will step down June 30 after 11 years as dean of the

faculty and return to teaching. Dobkin launched initiatives to increase faculty diversity, put in place family-friendly policies, and created an enhanced retirement plan to encourage faculty turnover.

Princeton received **26,607 APPLICATIONS FOR ADMISSION** to the Class of 2018, slightly more than last year and the third-largest total in the University's history. Princeton offered early-action admission to 714 students in December.

CAROLINE SHAW, a fourth-year Ph.D. student in music, won a Grammy Award Jan. 26 for best performance in chamber music/small ensemble as a member of the vocal ensemble Roomful of Teeth.



J Street U co-president Natasha Madorsky '17 with former president Aryeh Nussbaum Cohen '15, left, and advocacy chairman Kyle Dhillon '16.

From left: Frank Wojciechowski; Amaris Hardy/Office of Communications

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PRINCETON ALUMNI WEEKLY



On the Campus



STUDENT DISPATCH

A Community of Men Takes a Stand Against Personal Violence on Campus

Dana Bernstein '15



A new group of male students is working to show that power-based personal violence is more than a women's issue —

that “Princeton’s community of men does care.”

The group is called Men Against Violence Resources & Intervention Community (MAVRIC), a play on the term “maverick.” “It has this notion of men who are willing to stand up against hundreds, if not thousands, of years of social construction and messaging around what it means to be male and really challenge those things,” said Philip Hickey, prevention coordinator for the Sexual Harassment/Assault Advising, Resources & Education (SHARE) office.

Sam Lite '14 said that taking part in a masculinity-discussion group during freshman year led to his interest in MAVRIC. “There’s a lot of well-deserved and definitely very necessary discussion around femininity and feminism and what it means to be a woman, both at Princeton and in society more broadly,” Lite said. “But I didn’t feel like an analogous forum existed for men.”

The mission of MAVRIC, which includes undergraduate and graduate students, is twofold. The first is to prevent power-based personal violence,


which includes sexual assault, sexual harassment, stalking, and dating and domestic violence. The SHARE website estimates that each year, one in nine Princeton undergraduate men and women are victims of power-based personal violence. MAVRIC is still developing specific plans, but Hickey said initially it is working to raise awareness.

The second goal is to give male students an opportunity to discuss “what it means to be male — to discard those toxic notions of masculinity and embrace some really beautiful social-justice-focused ones,” Hickey said.

Brandon Holt '15, president of SHARE, said he feels personally connected to the project. “I have very close friends who have been victims of power-based personal violence,” he said.

The project has received support from the community. “I think it’s a great initiative, and I think many students will appreciate the work that they do,” said Shawon Jackson '15, Undergraduate Student Government president.

“As a woman, I want my community to be safe, not just for me, but for my friends,” said Jackie Cremos '14, a SHARE peer adviser. “It’s important to show that everyone is invested in making this a safer place.” ♦

 **VIDEO:** Students talk about the MAVRIC project at paw.princeton.edu

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Vacation planning?

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Illustration: Tomasz Walenta; Photo: Courtesy Dana Bernstein '15

WOMEN'S BASKETBALL

Balancing Two Sports

Dietrick '15 sets the pace on the court; at season's end, lacrosse is her game

The end of the women's basketball season will mean more free time for most players, but when standout guard Blake Dietrick '15 steps off the court for the last time, she'll be heading straight for the lacrosse field.

Dietrick, who at midseason was leading the Tigers in points and minutes played, is one of few student-athletes who play two sports. "She's someone who doesn't like to be bad at anything," said head basketball coach Courtney Banghart.

As Banghart was recruiting Dietrick in high school, Princeton head lacrosse coach Chris Sailer wondered why the student had not yet committed to a college lacrosse program.

"I was surprised she wasn't committed and I'm like, 'How did we miss you? I'd really love to be able to work with you at Princeton,'" Sailer said.

"And her answer to me on the phone was, 'Oh, I'm coming to Princeton!'"

As a freshman basketball player, Dietrick shot 46.7 percent in 23 games off the bench. But after going a full year without lacrosse, she realized something was missing.

"I've always been a two-sport athlete since I was a little kid," she said. "If I didn't at least try to play lacrosse, I'd always wonder, 'What if?'"

When Dietrick approached Banghart about taking up a second sport, the coach gave her the green light. Sailer, too, was on board, though it meant that Dietrick would miss most of the lacrosse team's fall scrimmages and preseason workouts. She also will miss the first five lacrosse games — more if the basketball squad reaches the postseason.

As a sophomore, Dietrick "made

her presence known," Sailer said. "She would show up at some of our fall practices and our fall games — whenever she could be around, she made it a point to be around."

Then came the hard part — competing at a collegiate level after not playing lacrosse for a year. "It took me a while to adjust to the college game, definitely — the pace of the game and how skilled everyone else is," Dietrick said. She made the adjustment look easy, however, netting her first career goal to help her team to a big win over Dartmouth.

Dietrick also has become a leader on the basketball court. "I think in a lot of ways, Blake has become our heart," Banghart said. "The nature of her position — she's our lead guard — is she sets the tone on both ends" of the court.

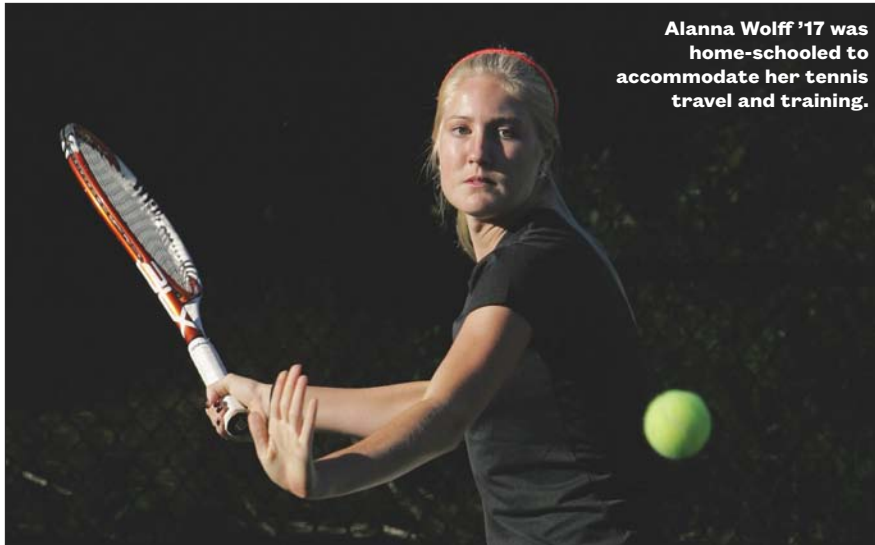
The early-season tone has been good, as Princeton beat Alabama Dec. 28 for the first victory over an SEC school in program history, then demolished Penn in its Ivy opener Jan. 11. But after falling to Harvard Jan. 31, the Tigers will have little room for error in their quest for a fifth-straight NCAA Tournament bid. ♦

By Stephen Wood '15



Guard Blake Dietrick '15 in action against Harvard.

Beverly Schaefer



Alanna Wolff '17 was home-schooled to accommodate her tennis travel and training.

EXTRA POINT

Freshman Tennis Star Takes a Southern Route to Princeton

Brett Tomlinson



In her early teens, Alanna Wolff '17 was a promising junior tennis player, eager to improve. Before entering eighth

grade, she and her parents made a bold decision: She would leave her home in Perth Amboy, N.J., and move with her mother to South Florida, where she could train four to six hours a day with top coaches. Wolff also decided to leave school, choosing instead a home-schooling routine guided by her mom and a private tutor.

Five years later, Wolff is back in New Jersey as a freshman on the women's tennis team. She's traded sun-drenched clay courts for the subterranean hard courts of Jadwin Gym, and her training has been trimmed to about three hours a day, including conditioning. But Wolff said she's still improving — and thrilled to be part of a team.

"There was always an underlying tension [in junior tennis] because you were fighting to get to that college you wanted or fighting to get to the pro tour," she said. "Here, you're all fighting for one goal: to win Ivies."

Wolff's path to Princeton may be atypical, but it is becoming more common in Ivy League women's tennis,

where at least half of the teams include players who were home-schooled or attended online high schools to accommodate the training and travel associated with their sport.

Laura Granville, Princeton's second-year head coach and a two-time NCAA singles champion at Stanford, said that elite junior players who value academic rigor are taking a close look at the Ivy schools. Her first recruiting class, headlined by Wolff, was ranked No. 7 in the nation by TennisRecruiting.net. Harvard, Dartmouth, and Yale also were included in the top 25.

On the court, Wolff has made a seamless transition to the college game, earning a No. 62 ranking among collegiate singles players and beginning the team season in Princeton's No. 2 spot, behind All-Ivy standout Lindsay Graff '15.

Wolff's return to a traditional classroom also has gone well, she said, thanks in part to the Freshman Scholars Institute, a seven-week summer program that provided early exposure to the University's curriculum. Admission officers might be wary of home schooling, she said, but the self-discipline she learned was good preparation for college. "Princeton gave me this opportunity," she said, "and I'm so happy that they did." ♦

SPORTS SHORTS

After beating Brown 9-0, **MEN'S SQUASH** lost a nail-biter 5-4 to Yale Feb. 2, nearly upsetting the No. 3 Bulldogs going into the last week of regular-season play. **WOMEN'S SQUASH** rebounded from a 6-3 loss to Penn to split the team's Feb. 2 matches, 9-0 over Stanford and a 5-4 defeat by Yale.

Recording back-to-back sacks at the Reese's Senior Bowl Jan. 25, Ivy-champion **FOOTBALL** co-captain Caraun Reid '14 has been named National Defensive Player of the Year for FCS (Division I-AA) by *College Sports Journal*.

Both **FENCING** teams are poised for strong seasons. The women, ranked 1st in NCAA preseason polls, swept their opening weekend 13-0 at the Northwestern Duals Feb. 1-2. The men, ranked 3rd preseason, were 8-3 for the weekend.

After slipping to Harvard 3-2, **WOMEN'S HOCKEY** clinched a 3-2 win over Dartmouth Feb. 1. Denna Laing '14, named ECAC Player of the Week Jan. 12 after her first career hat trick, notched a goal and an assist against the Big Green. ♦ *By Dorian Rolston '10*

PAW ONLINE

Paul Hauge '80's essay marking the 25th anniversary of Princeton's heart-pounding 50-49 loss to Georgetown



in the 1989 NCAA Basketball Tournament tells how he's "still dreaming of a perfect ending."

Life of the Mind

SOCIOLOGY

The Most Fragile Families

A decades-long Princeton study gathers extensive data on unmarried parents

What does it mean for a child in America to be born to unwed parents? For a decade and a half, sociology professor Sara McLanahan has been searching for answers to that question. In the late 1990s, she began collecting data about the families of 5,000 children using periodic, in-depth interviews and vast amounts of demographic information to compile a detailed portrait of what she calls “fragile families.” Her research has increasing relevance to today’s society: While 5 percent of children were born to unmarried couples 50 years ago, 40 percent of children are born to them today.

Researchers for McLanahan’s Fragile Families and Child Well-Being Study have completed five rounds of interviews with their subjects, who live in 20 U.S. cities — conducted soon after the children are born and at ages 1, 3, 5, and 9. The study contains the most extensive existing data on unmarried partnerships with children, and receives funding from the National Science Foundation, the U.S. Department of Health and Human Services, and other organizations. The data are available to researchers across the country and have been used in more than 400 journal articles, 65 dissertations, and 42 books.

Early research in McLanahan’s study showed that more than 80 percent of unmarried parents were in a romantic relationship with each other when their child was born, but only a third remained together five years later. By the time their first child was 5, almost a quarter of unmarried mothers had

given birth to another child fathered by a different man. In addition, half of the fathers of children born into “fragile families” were in jail or previously were incarcerated, making it difficult for them to find employment and provide for their children. “There’s an enormous amount of instability and complexity in the lives of these families,” McLanahan says.

Unmarried parents in the United States often are poorer and less educated than married parents and less able to withstand economic shocks, leading their children to have higher rates of asthma and obesity, poorer school performance, and more aggression.

McLanahan completed her last

round of interviews between 2007 and 2010, during a historic economic decline. Among her findings: For every percentage point rise in the unemployment rate, fragile families had a 16 percent greater chance of suffering a financial hardship, such as having utilities cut off, as well as higher rates of smoking and drug use. The weakened economy also led to increases in domestic abuse and harsh parenting.

In the study’s next phase, which started in February as the children turned 15 years old, McLanahan wants to explore the teens’ romantic relationships, as well as how public policies might affect their involvement in the criminal-justice system. The two most important factors in improving the lives of these families, McLanahan says, are women’s delaying reproduction until they are at least 25 and an improved job market, so unmarried parents have a better shot at financial stability. ♦ *By Zachary Goldfarb ’05*



“There’s an enormous amount of instability and complexity in the lives” of families with unwed parents, Professor Sara McLanahan says.

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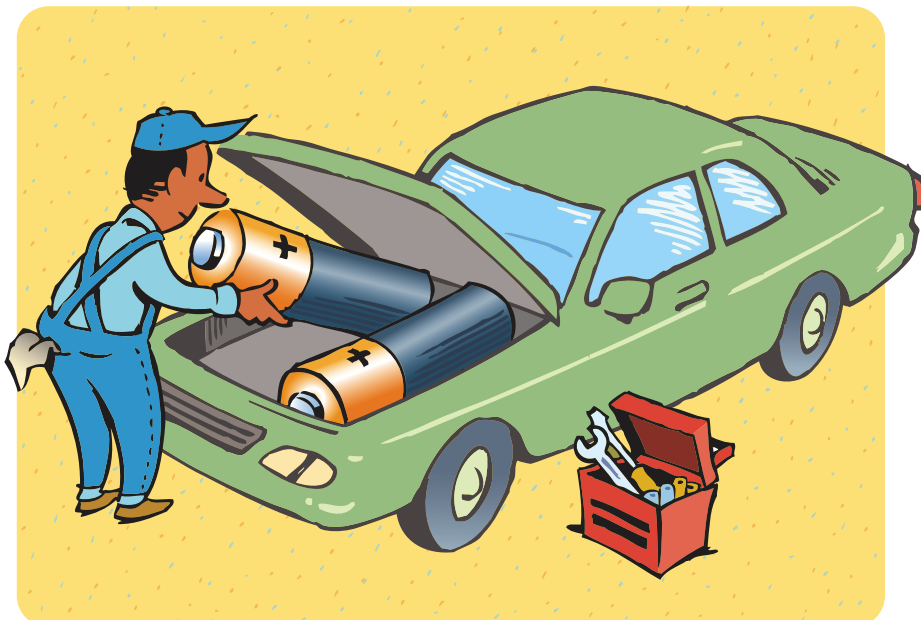
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Life of the Mind



ENGINEERING

A Cheaper Battery for Electric Cars

Lower cost, longer life Electric cars are good for the environment, but two factors — their high price and short battery life — have kept them from catching on. Dan Steingart, an assistant professor of mechanical and aerospace engineering, is working on a less expensive battery for electric cars. He and several colleagues are developing a new technology that



Dan Steingart

uses inexpensive and plentiful materials; their goal is to create a battery that has a longer life and can be recharged frequently. The target is 1,000 full recharge cycles, which would give a car that can travel 200 miles

on one battery charge a 10-year lifespan. The lithium-ion batteries used in cars today have a small but real risk of catching fire if the battery pack is damaged. Required safety precautions minimize the fire risk but add weight and decrease the battery's energy capacity. The battery Steingart is working on — funded by a one-year, \$1 million grant from the Department of Energy to accelerate electric-vehicle adoption — would be less volatile and less expensive than most current lithium-ion batteries. This type of battery also could be used

as a backup energy source in houses, instead of a generator.

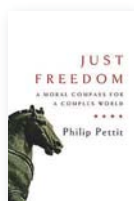
Proof of concept Steingart's battery uses alkaline instead of lithium-ion material. "The idea is to use a pretty old alkaline chemistry, similar to a Duracell-type or nickel-metal hydride rechargeable battery, but replace the nickel with manganese dioxide — a cheaper metal," he says. Steingart already has demonstrated that components of his battery work. Now he plans to demonstrate that the prototype can be recharged up to 1,000 times. In a year, the team will attempt to scale up the size so it will be suitable for a car. At that point, Steingart will begin working with an industrial partner, since university labs are not equipped to make large batteries, he says.

Beyond electric cars Steingart's lab also is working on batteries that can be built into clothing — to power built-in heart-rate monitors that light up to indicate stress levels in the wearer, for example. Fashion designers in New York have expressed interest in the product, Steingart says: "In the fashion industry, you can get away with high prices for a small battery — unlike in the electronics industry, where battery costs are a real sticking point." ♦ *By Anna Azvolinsky '09*

Illustration: Phillip Scheuer; photo: Luke Cheng '14

FACULTY BOOK: PHILIP PETTIT

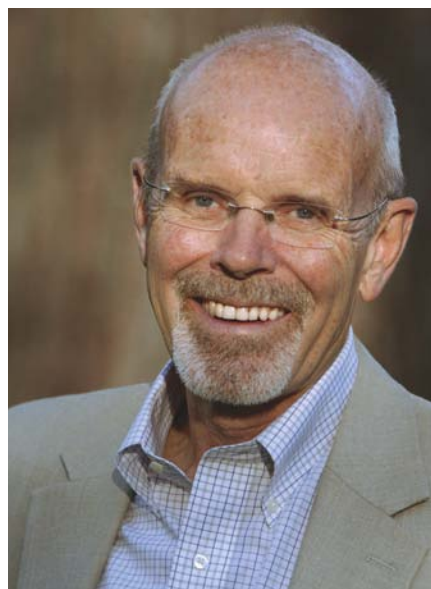
Falling Short When It Comes to Freedom



For Philip Pettit, the concept of freedom is more than just being “let alone” — that’s an impoverished idea of freedom, he argues, that doesn’t live up to the fuller sense put forward by Thomas Jefferson and other founders of American democracy. Countries that consider themselves free, including the United States, do not necessarily fulfill the idea of freedom Pettit espouses. To be truly free, he argues, individuals must be free of intimidation or control from outside forces and have access to a

social safety net to ensure that they will not be dependent on others.

In *Just Freedom: A Moral Compass for a Complex World* (W.W. Norton), Pettit, a professor of politics and human values, lays out the philosophical underpinnings of what he calls the “republican” ideal of freedom, and looks at what society might be like if it adhered to these principles. A “republican” concept of freedom mandates that governments ensure the individual rights of citizens.



Pettit proposes the “eyeball test” to determine if a citizen has achieved freedom: Can a person look another in the eye without fear of intimidation or rebuke? If not, then the person is not truly free.

it’s medical aid or legal assistance, people are “left exposed, to be blown about by others,” he says. And governments must work to make sure they are representative of the people’s will: Electoral districts should be drawn up by nonpartisan panels, and officials should combat the influence of money in politics. Given these requirements, Pettit argues, the United States does not meet a republican standard of freedom.

Pettit is critical of international organizations like the United Nations, which gives greater authority to nations that sit on the Security Council. That restricts the freedom of smaller nations, which must abide by the decisions of the council.

“An international world that conformed to republican requirements would be a very different world from ours,” he writes. ♦ *By Maurice Timothy Reidy ’97*

“If you hang on the good will of another, then you really don’t enjoy freedom in that original sense,” Pettit says.

Pettit uses early American history to explain his ideal of freedom. The American Colonies, for example, did not want to live under a political system in which the British crown could subject them to taxes without their consent. It did not matter that the crown did not always interfere with the colonies in this way; the fact that it *could* do so was reason enough for revolt, Pettit says.

In his book, Pettit looks at freedom on three levels: among people, between people and their governments, and among nations. He proposes the “eyeball test” to determine if a citizen has achieved his definition of freedom: Can a person look another in the eye without fear of intimidation or rebuke? If not, then the person is not truly free.

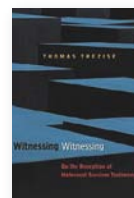
This ideal of freedom requires a social safety net, Pettit contends. Without some form of social insurance, whether

FACULTY BOOKS



Customers choose companies and brands based on their perceptions of the

organizations’ warmth and competence — the same criteria we use to judge other people, argue psychology and public affairs professor **Susan Fiske** and Chris Malone in *The Human Brand: How We Relate to People, Products, and Companies* (Jossey-Bass). Companies that put customers’ interests ahead of their own, they write, activate our automatic perceptions of their warmth and competence.



French professor **Thomas Trezise** writes about those who receive the testimony of Holocaust

survivors in *Witnessing: On the Reception of Holocaust Survivor Testimony* (Fordham University Press). The view that such trauma is unspeakable can inhibit victims from giving their testimony, he argues.

In *Redeeming The Prince: The Meaning of Machiavelli’s*



Masterpiece (Princeton University Press), **Maurizio Viroli**, a professor of politics

emeritus, offers a new understanding of *The Prince*. Rather than being a bible of unscrupulous politics, *The Prince*, Viroli suggests, is actually about political redemption.

BY KATHERINE HOBSON '94

SURVIVAL STORY

Ten years ago, Dr. Rodney Willoughby '77 treated a teenager who had rabies, long thought to be fatal in all cases. She lived. But Willoughby's methods remain under fire.

October, Giese fell ill.

First she was extremely tired — too tired to play in a key volleyball game, missing homecoming — and that progressed to double vision, vomiting, excess saliva, and a numb hand. When her pediatrician asked about her medical history,

It was October 2004, and only his second time on call at his new job in Wisconsin, when Rodney Willoughby Jr. '77 heard about the patient who would change his career.

A pediatric infectious-disease specialist at Children's Hospital of Wisconsin in Milwaukee, Willoughby was accustomed to treating young patients with dangerous bacterial and viral invaders attacking their blood, bones, and brains. But he never had treated someone with rabies, and that's what the physician on the phone said might be afflicting the gravely ill 15-year-old girl who was about to be transferred to Willoughby's care.

Willoughby had no idea during the subsequent weeks and months of caring for Jeanna Giese that a scientific controversy would erupt over his experimental treatment for her. Giese lived, becoming the first documented person to survive rabies without being immunized. Nonetheless, Willoughby's novel theory about how rabies kills and the treatment plan he came up with have been hotly contested, and almost a decade later, the debate is far from settled.

Giese lived in Fond de Lac, about 60 miles from Milwaukee. On Sept. 12, she'd gone to Mass with her mother. A bat flew into the church, interrupting the service, and after an usher knocked it to the floor, Giese walked to the back of the church with the intention of releasing it. When she picked it up by the wings, it sank a fang into her finger, where it hung until she pulled it off. At home, she cleaned the wound with peroxide, and the high school sophomore went on with her busy life, which included volleyball games and taking the PSAT. On the day she took the test, in mid-

he found out about the bat bite. Speaking to the doctor on the phone, Willoughby recommended the transport team wear protective gear, just in case, though there are no documented cases of human-to-human transmission of the virus — and it wasn't clear Giese had rabies at all. Giese arrived at Children's Hospital.

"I'd never seen a case of rabies," says Willoughby. Few physicians in the United States have. The disease kills about 60,000 people a year, mostly in Asia and Africa, according to the World Health Organization. Only one to three of those deaths are in the United States, because of the widespread vaccination of pets and availability of preventive measures. Most victims in other countries are bitten by unvaccinated dogs, but any mammal can get and transmit the disease, including foxes, raccoons, skunks, and bats.

The rabies virus enters the system through the animal's saliva and can take weeks or months to move from the nearby tissues and attack its target, the nervous system. Death is preventable if the patient quickly gets post-exposure prophylaxis — wound-cleaning and a multiple-injection rabies-vaccine series. More than 15 million people get that preventive treatment every year, including 40,000 in the United States. But if the patient isn't treated, the virus eventually makes its way into a peripheral nerve and moves toward the spinal cord and brain. There it wreaks havoc — provoking paralysis and loss of sensation — though no one understands quite how.

"We are no further along in the management of this disease than we were 40 years ago," says Charles Rupprecht, the director of research for the Global Alliance for Rabies Control and a professor at Ross University School of Veterinary Medicine in St. Kitts. In fact, death from rabies is so accepted,

Lucas Foglia



Rodney Willoughby '77, who developed the "Milwaukee protocol" for treatment of rabies.



“Maybe there is a way here: sedating the patient and buying time” to let the patient’s own immune system work.

Willoughby recalls that all he needed to know about the disease for his board exams was that it could not be treated. Given that Giese had not been vaccinated and was seemingly in the throes of a full-fledged neurological crisis, if the Centers for Disease Control and Prevention lab confirmed the disease from examining samples of her saliva, skin, blood, and spinal fluid, her prospects were dim.

Willoughby knew that if Giese did have rabies, the normal course of events would be to keep her comfortable until she died. But as his patient lay in the intensive-care unit, he searched

for possible treatments. He found little in medical literature about how to treat rabies, because no one had survived. He called a CDC rabies expert to see if any new research findings or treatments were in the pipeline — nothing. From looking at case reports on how rabies killed people, he did find some interesting information: that the brains of rabies victims don’t appear ravaged after their deaths, and that if victims receive life-prolonging assistance to breathe and maintain blood pressure before death, their bodies after death are virus-free.

As Willoughby later wrote in an article in *Scientific American*, “the rabies virus seems to induce the brain to sabotage the vital organs,” perhaps by overexciting the central nervous system. “I thought, ‘Maybe there is a way here: sedating the patient and

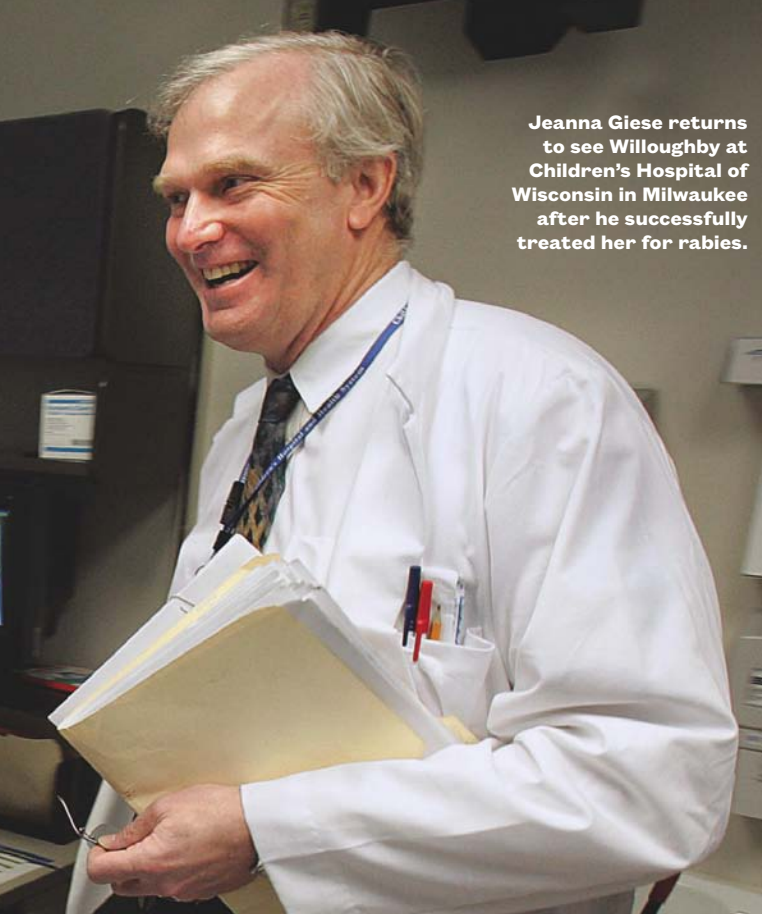
buying time” to let the patient’s own immune system work, says Willoughby. “It seems so obvious that you doubt yourself.”

Willoughby read more that night. The next day, Giese was worse. After Willoughby received a rabies confirmation from the CDC, he gathered a group of experts in neurology, critical care, and infectious disease, and proposed a plan: What if they used a cocktail of drugs to sedate Giese during that crucial period? They settled on the sedatives ketamine and midazolam and the antiviral and neuroprotectant amantadine. Rupprecht, then at the CDC, suggested they add the antiviral drug ribavirin as well. (They later added phenobarbital, in small doses, to induce a coma, though that wasn’t part of the original plan.)

Willoughby gave his colleagues a chance to veto his idea, but “no one had a really good reason not to do it,” he says. With his colleagues on board, Willoughby went to Giese’s parents and offered three options: hospice care at home, conventional medical care in the hospital, and what Willoughby calls “this improvised therapy,” which was “an idea but had zero data” behind it.

Willoughby knew that his third option was a risky proposition. The drugs had toxic side effects. Even if they worked, Giese might survive with severe neurological impairment. Her parents, he remembers, were “remarkable.” They opted for the experiment, saying that perhaps science — and future patients — would benefit, even if Giese didn’t survive. Despite his plan of attack, “I had the expectation that she would die,” says Willoughby.

While Giese was in an induced coma, the waiting was unbearable, recalls Willoughby. After about a week, it was time to taper off the sedation and return her to consciousness. “Those were the scariest days of my life,” Willoughby says. At first she was fully paralyzed, but she had electrical activity in



Jeanna Giese returns to see Willoughby at Children's Hospital of Wisconsin in Milwaukee after he successfully treated her for rabies.

the brain and pupils that reacted to stimulation. “I thought I’d done the worst thing and created someone who was locked in,” or conscious but almost totally paralyzed, says Willoughby. “I am pretty sure I cried.”

But over the days, as doctors withdrew the anesthesia, Giese’s reflexes slowly returned. Within two weeks she was sitting up and looking around, and she began a long, difficult recovery filled with rehabilitation to relearn, as she says on her personal website, “how to speak, walk, stand, pick things up, point, eat, drink, everything a baby learns.” She left the hospital in January 2005. A year after her diagnosis, she gave a speech at an international gathering of rabies researchers, and in 2011 she graduated from college, with Willoughby in attendance.

Still, because nothing was known about rabies recovery, and it was possible that Giese would relapse or suffer long-term complications, Willoughby says he didn’t breathe a sigh of relief until about two years after her treatment. “We didn’t know if there was a second train coming down the tracks,” he says.

And in the meantime, he had plenty of questions. Why did Giese survive? Had she been infected by a mild or unusual form of the bat-rabies virus? Or did the protocol save her? And if so, which elements were responsible? Would the approach work for other rabies victims?

Willoughby and his colleagues reported Giese’s case in the CDC’s *Morbidity and Mortality Weekly Report* and, in 2005, in the *New England Journal of Medicine*. The Medical College of Wisconsin set up a website with the detailed treatment regimen — which became known as the Milwaukee protocol — as well as a registry where clinicians could record the details of their experience using the protocol. Willoughby

expected that with tens of thousands of fatal cases of rabies a year, other physicians would start using it and “we’d have an answer within six months.”

That didn’t happen. “I’m puzzled by it, frankly,” says Willoughby. Many rabies researchers rejected the notion that the protocol is what saved Giese, saying the treatment was unethical and wouldn’t lead to any more survivors. And indeed, when it was tried in the first few years after Giese’s case, patients died. (Willoughby says the protocol wasn’t followed strictly in about half of the cases.) There have now been 51 known attempts, with seven survivors including Giese. Of them, five are still alive, though one is severely impaired and two have some impairments, says Willoughby.

Clearly the protocol doesn’t work for everyone. Its critics argue it doesn’t work for *anyone*, and harms patients who already are suffering greatly from the terrible symptoms of rabies. “‘Do no harm’ is the ancient dictum that physicians are expected to abide by,” says Henry Wilde, a doctor on the faculty of medicine at Chulalongkorn University in Bangkok, who unsuccessfully tried the protocol with his colleagues on a dog-bite victim. “What was largely done in the original Willoughby protocol may well have done some harm, yet that girl still recovered due to her vigorous defenses against the virus” and excellent intensive life support, he says, adding that all the patients who have survived showed evidence of a “very great natural-defense mechanism.” What Willoughby’s work highlighted, Wilde says, is that “rabies is not invariably fatal,” adding that survivors likely have gone undiagnosed over the years.

That is the heart of recent arguments against the Milwaukee protocol: The handful of survivors would have lived without it. There is evidence to support the idea that infection isn’t always fatal. Not all afflicted animals die from the disease, and research in remote areas of Peru where infected vampire bats are common has found that some people have antibodies against rabies despite never having been vaccinated — suggesting previous, non-fatal exposure. (Willoughby says that is most likely to happen in small indigenous populations where rabies is endemic.) And there is the case of the Texas “wild child,” a 17-year-old girl, believed to be a runaway, who was admitted to a hospital in 2009 with symptoms consistent with rabies and reported contact with bats. Certain aspects of her case and lab tests indicated rabies; she got one dose of the vaccine but no more, because of concerns that it would only exacerbate her illness. She never required intensive care and left the hospital, returning a few times because of headaches. But she didn’t return for more follow-up care, and public-health authorities don’t know where she is or how she’s faring.

Willoughby points to the numbers to argue that his approach merits further study. While a 14 percent survival rate is low, it’s better than the one possible survivor noted among 77 case reports describing other attempted treatments (using other methods, including ICU care) he’s seen reported in listservs and in medical literature. Willoughby says these reports aren’t perfect, but they are the closest to a control group that he has.

Willoughby says he is open to the possibility that certain elements of the protocol cause harm. He and his colleagues already have tweaked it several times, and he hopes to refine it further to improve efficiency and safety. It also might be possible



Willoughby attends Giese's college graduation in 2011, more than six years after they first met.

Willoughby and his critics do agree on one key idea: Treatment is not the best solution to the problem of rabies.

says the University of Manitoba's Alan Jackson in a 2013 review published in the journal *Antiviral Research*. Wilde says his local rabies consortium has opted to provide standard ICU care, including ventilation and blood-pressure support, to as many patients as possible who show an immune response, as measured by rabies antibody in the spinal fluid and a lack of rabies RNA in any body fluid. None have survived.

The conference at which Giese spoke on the anniversary of her diagnosis, the annual Rabies in the Americas meeting, has become a key place to hash this out in person. Willoughby expected more debate when he traveled to Toronto in October for the 2013 conference. Sergio Galvez, a physician from Chile, presented a recent case in which a 25-year-old man was bitten

to develop a stripped-down version for less severe cases in areas lacking ICU care. "A lot of people are almost surviving but for the fact that they didn't have an anesthesiologist" to sedate them and give the body more time to respond, he says. He also would like to conduct human trials comparing the protocol to more standard intensive care. (While animal studies would be ideal, he says, it's not possible to simulate intensive care for mice, and veterinary schools were not receptive to the idea of treating rabid animals such as dogs, he says.)

Critics don't think the protocol is worth studying or using at all. "Use of this protocol should ... be discontinued,"

by street dogs and given one dose of the rabies vaccine. Less than two weeks later, the young man showed symptoms of rabies. He survived after being treated in accordance with Willoughby's protocol and put on a ventilator.

But the latest presentation was met by only a few questions. "It's calmed down a lot," says Willoughby, settling into a hotel lobby chair on the first day of the conference. The lack of sparks also might have been due to the fact that Willoughby himself wasn't presenting the case. He came to the meeting to hear Galvez's presentation, and also because it's the one week each year when he can focus solely on rabies. His usual workflow includes his clinical practice, and he also sits on national committees that recommend vaccine policies. Before the Giese case shifted his course, he was doing research on whether cerebral palsy might be related to prenatal infections, but that has fallen by the wayside.

Willoughby seems unfazed by the rabies debate, which he describes as "anecdotal and personal" because of the small rabies-research community and by the limitations of the case reports that track the protocol's use. He is not used to giving up; if someone tells him he can't do something, he says, it often just stokes his will.

So the debate continues. The CDC's online information on rabies advises clinicians that they can "either offer supportive therapy or an aggressive treatment plan. There is no single effective treatment for rabies once clinical signs are evident." It provides two links: one providing information on Willoughby's Milwaukee protocol; the other, a 2002 article on case management suggesting that rabies is 100 percent fatal. Rupprecht thinks it's worth having a major symposium that brings together all the experts to "hash out a protocol and a new way to move forward," and to figure out "what's state-of-



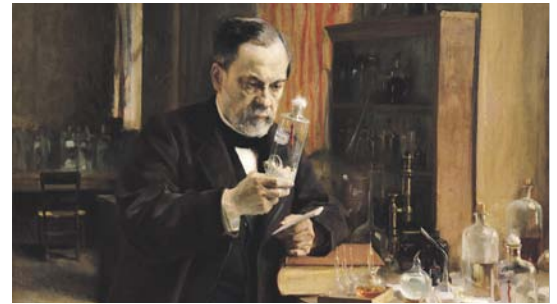
A RABIES PRIMER



Rabies was known in antiquity. It is believed to be referenced in the Mesopotamian Laws of Eshnunna, which were somewhat older than the Code of Hammurabi (about 1770 B.C.). Later, Aristotle wrote in his *History of Animals* that “dogs suffer from the madness.” Yet it was not until the 19th century that the disease could be diagnosed

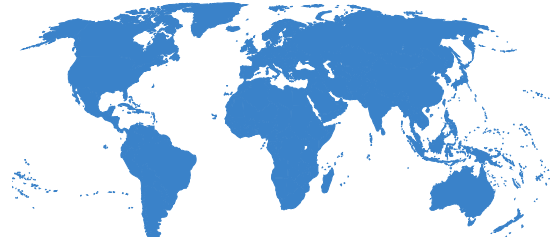
accurately or efforts were made to combat it through animal control.

The first rabies vaccine was developed by Louis Pasteur, who began researching rabies in 1880 and first used his vaccine successfully on dogs in 1885.



Each year, more than 15 million people worldwide are vaccinated after suspected exposure to rabies, which is believed to prevent hundreds of thousands of deaths.

About 60,000 people die each year from rabies, more than 95 percent of them in Asia and Africa. The virus is present on every continent except Antarctica.



Worldwide, dogs are the source of the vast majority of rabies deaths. In the United States people face exposure from wildlife: About 90 percent of reported animal cases are in wild animals.

Sources: www.historyofvaccines.org, World Health Organization, Centers for Disease Control and Prevention

the-art and what we’re prepared to do.” He says he’s “a firm believer that we can intervene.”

Willoughby and his critics do agree on one key idea: Treatment is not the best solution to the problem of rabies. As it stands now, it’s a last-ditch attempt, and an expensive one at that. The cost of providing care for one case in Bangkok was equivalent to the amount of money needed to give pre-exposure vaccination to 30,000 children in that city, Wilde says. Willoughby estimated the cost of Giese’s care in 2004 at \$800,000 or more. Prevention is far more efficient. In addition to consistently providing post-exposure prophylaxis to people bitten by wild animals, “if you could control dog rabies and the dog population, you’d not need this,” says Willoughby.

Researchers at Thomas Jefferson University in Philadelphia are researching a single-dose combination rabies vaccine and contraceptive shot for dogs, with funding from the Bill & Melinda Gates Foundation. The “One Health” approach to rabies and other zoonoses — diseases that spread from animals to humans, including West Nile virus, avian flu, and HIV/AIDS — is based on the notion that animal, human, and environmental health are linked, according to Laura Kahn ’02, a physician and research scholar at the Woodrow Wilson School. “You want to control the disease at its source, rather than waiting for the human to get accidentally exposed,” she says. “By targeting the health of animals, you include the health of humans.”

But even if better vaccines are developed, that doesn’t mean research on treatment — including his protocol — should end, says Willoughby. “You always need a plan B,” he says. ♦

Katherine Hobson ’94 is a freelance writer specializing in science and medicine.

TURNING BACK THE CLOCK CAN SOME OF THE DECLINES ASSOCIATED WITH AGING BE DELAYED OR EVEN PREVENTED? COLEEN MURPHY THINKS SO

BY ANNA AZVOLINSKY *09

C

oleen Murphy had her first child at 38, her second at 41. More than most people, Murphy, a molecular biologist, understood the risks of waiting until she was in her late 30s to build a family: It can be harder to conceive, and birth defects are more likely.

But she was dedicated to an all-consuming job as a rising young scientist. “I used to do experiments around the clock, every four hours for three days straight,” she says. “You can’t do that when you have kids.” So she waited: “It was my idea to postpone and gamble a little bit.”

For her, it turned out to be a good bet. As tenured faculty members, Murphy and her husband, molecular biologist Zemer Gitai, are able to manage their schedules, making it easier to balance scientific careers with raising their first-grade son and 3-year-old daughter. “There are times when you can put in a lot of effort to get your career going and other times when you have more flexibility,” Murphy says. The problem for a woman who hopes to have children is knowing how that schedule will fit with the workings of her own body.

Murphy is striving to lessen the risk of waiting to conceive. She believes that in the not-too-distant future — she can’t say exactly when — it will be possible to give a woman a blood test that could provide an individual biological clock, telling her the time frame in which she is most likely to conceive and with less risk. Perhaps a drug could be developed to slow the aging of a woman’s egg cells, a major cause of declining fertility. “A lot of women would be interested in that!” suggests Murphy, now 44, with enthusiasm. An even bolder prospect: Research might provide treatments to allow people to escape common diseases and conditions of old age, such as Alzheimer’s disease and loss of muscle tone, altogether.

An associate professor in molecular biology and Princeton’s

Lewis-Sigler Institute for Integrative Genomics, Murphy studies the processes of cognitive and reproductive aging. She and the members of her research team want to understand what is happening at the molecular and cellular level to govern how quickly we age, and why some cellular processes stop working earlier than others. Murphy’s work won’t let us live forever, but it could postpone or even prevent the deterioration in quality of life that most of us experience as we age.

“We used to think that aging was an unavoidable result of living, simply a matter of cells wearing out over time,” Murphy has written. But studies of different organisms — the roundworm *Caenorhabditis elegans* that she works with as well as yeast, flies, and mice — have found that a mutation in just one gene can dramatically increase life span, she says. This suggests that aging is not merely an issue of haphazard wear and tear, but that it follows a regulated process — and that the impairments associated with the aging process can be disrupted.

Although there is a genetic basis to aging, scientists don’t think that an individual’s life span is a *fait accompli*. Our environment, diet, and exercise trump genetics in most cases. Murphy and her research team are trying to understand just what role genetics *do* play. How does each part of the complex system that is the human body break down with age? How do the parts interact? What can be done to prevent breaks, or to repair them?

The molecular biology of aging is a relatively new field, pioneered 20 years ago by Cynthia Kenyon, a professor at the University of California, San Francisco, who was studying development in *C. elegans*. Kenyon was working with worms that had a gene mutation that caused them to have few progeny, rather than the hundreds that worms typically bear. Kenyon usually studied the worms during their first week of life and then discarded them. By chance, she left a dish of the worms in an incubator for about a month. And when she returned to it, she found that the worms had a characteristic feature of old age — their movements were stiffer and slower than those of their

Peter Murphy



Coleen Murphy in the atrium of Icahn Laboratory, home of Princeton's Lewis-Sigler Institute for Integrative Genomics.

younger counterparts. “My breath was taken away,” she says. “The fact that worms get old just like people stuck with me and made me want to study aging.”

In those days, most scientists believed that aging was the unstoppable and random process of accumulating damage and wear and tear to our tissues. But Kenyon reasoned that aging, like development, was a regulated process, meaning that there was “some kind of dial that you could turn to make aging go faster or slower that had to do with our the genes and was something more than just random damage.” That thought was almost heresy in scientific circles, Kenyon recalls.

Then, in 1993, Kenyon shattered the prevailing view. Her laboratory presented evidence that a single mutated gene can double the life span of *C. elegans* while leaving the worm fertile and healthy. The worms’ mutation was in the *daf-2* gene, the gene for the insulin receptor. And the cause of the worms’ longevity, Kenyon’s team determined, was a protein regulated by the *daf-2* gene.

Murphy was finishing her graduate work at Stanford, studying a protein that is responsible for the contraction of muscle cells, when she heard Kenyon lecture on her research on insulin signaling and aging. Murphy was intrigued, and in 1999, she joined Kenyon’s lab. Using a then-new technology called DNA microarrays that enables the study of large numbers of genes simultaneously, Murphy analyzed all 20,000 *C. elegans* genes during her time there — a critical achievement that identified differences in gene-expression patterns between normal and long-lived worms.

Could the same processes uncovered in 1-millimeter-long nematodes barely visible to the naked eye also take place in humans? The *daf-2* gene counterpart in humans is the insulin receptor that regulates metabolism, growth, and stress. Since Kenyon’s pioneering work began, other studies have shown that mutations in the *daf-2* genes of mice, dogs, and other mammals also extend life span. Mutations in these genes have been linked to people who live more than 90 years.

Murphy has been building on those findings since arriving at Princeton in 2005. Like Kenyon, she used the unassuming roundworm in her research. A general premise in science is to start simply to gain understanding and then scale up. *C. elegans*, originally chosen for the study of neurology and development — the worm is transparent, so its cells are easily observed and tracked — has been a boon for aging studies. The roundworm has a life span of three to four weeks, making it feasible to do aging studies relatively quickly, and is one of the simplest organisms to have a nervous system. With exactly 959 cells in the adult body (the human body is thought to have at least a trillion cells), *C. elegans* is a simple-enough system to be understood entirely. The genes identified then can be tested in human studies.

“We share a large fraction of our genome and proteins with worms, so often what we find in worms ... ends up having correlates in humans,” Murphy explains. “That has been true of almost everything else that the *C. elegans* field in general has found, which is why it’s a great model system.”

She found backing for her research from the W.M. Keck Foundation and, more recently, from Paul F. Glenn ’52, who has been interested in the biology of aging since he was a Princeton undergraduate. In 1965, he established the Glenn Foundation for Medical Research to fund studies on aging, with the goal

of extending the “healthy and productive” human life span. While most foundations, he says, focused on specific diseases related to aging, he was more interested in the aging process itself. Today, his foundation supports aging research at eight institutions, including Harvard, Stanford, the Mayo Clinic, and Princeton, where a \$3 million grant allows Murphy and her team to study the networks of genes that are essential for higher neural activities, including memory and cognition.

Her work has implications for understanding and preventing Alzheimer’s disease and related conditions, but her approach makes her a maverick. Most research on Alzheimer’s, which affects more than 5 million people in the United States, is focused on the buildup of a protein called amyloid-beta in the brain that is thought to lead to cognitive decline. But Murphy thinks amyloid-beta may be a consequence of a genetic cause of the disease — not the cause itself — and that eliminating the buildup of so-called amyloid plaques won’t solve the problem. “I think we need to get back to genetics studies and ask how memory actually works,” she says.

“Aging is such an interesting and philosophical question,” Murphy says, as she sits in her office in the Icahn Laboratory. “It’s still one of the big questions in biology.” In the lab next door to her office, where postdocs, graduate students, and undergrads are at work, shelves hold reagents in glass bottles, plastic bottles with bright blue and Princeton-orange tops, micropipettes, and stacked Petri dishes. Those dishes are the laboratory habitats of the tiny *C. elegans* worms.

Murphy describes her experiments with the zeal of a graduate student who has just tasted the thrill of finding something new about the world; one of the first graduate students to join Murphy’s lab at Princeton, Amanda Kauffman ’10, says she was attracted to the lab not just for the chance to do groundbreaking science but by Murphy’s excitement about it. “Coleen really instilled a need to be fearless, to not be bound by your own field, but to learn something new,” Kauffman says.

At first, Murphy, Kauffman, and others in her lab were looking only at questions of the life span of the worms. But scientific curiosity leads to unexpected paths, and soon they were studying issues related to quality of life. Roundworms reach young adulthood by the third day of their three-week life. The worms, once fast and nimble, begin to show visible signs of aging by Day 10, similar to the signs we associate with old age in people. The worms become slower and less mobile; ultimately, they cannot move beyond wiggling their heads. It seemed clear, then, that their muscles were deteriorating. But how about their nervous systems, and the effect of aging on cognition? How could researchers even measure cognitive decline in a worm?

Kauffman came up with short- and long-term memory tests for the worms. Previous memory tests for *C. elegans* had been based on *negative* learning: The worms would learn to avoid certain chemicals placed in their environment because of their odor. But Kauffman and Murphy wanted to understand whether the worms were capable of making *positive* associations and developing and retaining long-term memory — something no one had shown before. Kauffman worked with three kinds of worms: those with the regular *daf-2* gene, those with the mutant gene, and those that were put on a calorie-restricted

diet. (Worms on the diet were known to live longer than regular worms.) She hoped to train the worms to associate a neutral odor with food, respond by moving toward the food source, and remember the association hours or days later.

First, Kauffman fed the worms in the presence of butanone, a chemical that neither repelled nor attracted them. To prompt the worms to form long-term memories, she provided seven “training sessions.” At different points, she would test whether worms of different ages would move toward the chemical — whether they would remember that butanone meant food was present.

Indeed, all the worms were capable of learning new tricks — but there were differences. After one 30-minute training session, the worms without the gene mutation associated the odor with food for about two hours. After seven sessions, the association generally lasted 16 to 24 hours, which is equivalent to a few years in the life of a human. By Day 4, that long-term memory was gone. By Day 9, the worms had lost their ability to form new short-term memories.

The worms with the mutant *daf-2* gene, who lived longer, did better. The short-term memory of these worms lasted about three times longer than those without the mutation, and their long-term memory was better, too. The worms with calorie restrictions were especially intriguing: They developed long-term memory more slowly than the others (requiring more training sessions than the normal worms), but the long-term memory that they did create remained with them longer: By Day 4, when long-term memory was gone for all the regular worms, worms on the diet showed they still had some.

The findings provided a clue about the genes involved in memory function. Comparing the activities of genes of the different worms, Murphy and Kauffman narrowed in on a gene called CREB, which is known to be necessary for long-term memory in many organisms, including humans. Levels of the protein produced by CREB decline with age.

Among the worms, the calorie-restricted worms had started with lower levels of CREB, but maintained their levels of the protein into adulthood — just as they retained long-term memory longer. “We don’t fully understand the role of CREB yet, but there is a molecular reason why these worms behaved differently,” says Murphy. She also is working to connect the memory-related behavior Kauffman observed with neuron activity and the rate at which the

neurons degrade with age: “We think that different neurons degrade at different rates, which is also true in us,” she says.

Working with *C. elegans*, Murphy also has made strides in understanding reproductive aging and how a woman’s reproductive window — the oft-dreaded biological clock that ticks away the time available for conceiving a child — may be extended. Unlike men, who produce sperm continuously throughout their lives, women are born with all the eggs — called oocytes — that they will ever have. As women age, the quality and quantity of those oocytes decline, making it more difficult to become pregnant.

Murphy and graduate student Shijing Luo have shown that oocyte quality in the roundworm is regulated by hormone pathways, including the insulin pathway, and that the same pathways are responsible for the processes in humans. Mutations in these pathways can as much as double the reproductive period of a worm’s life by maintaining healthy oocytes, Murphy says. Now, she is testing which genes decline with age in worms — information that eventually could be used to prevent fertility decline in women.

“Such information would empower couples in making decisions about the timing of major life changes, all of which are today made in the context of profound uncertainty about future reproductive options,” says Steve McCarroll, a professor of genetics at Harvard who collaborates with Murphy on aging and reproduction research. “She has put a finger on an important question. Coleen is a leader in studying

the reproductive life-span question, which is not only important but also scientifically tractable,” he says.


What’s next in her lab?

The day before her interview, Murphy participated in a triathlon, and as she considers the question, she glances at her legs, where the partly rubbed-off numbers from that event still are visible.

“Now I want to focus on knees!” she says. She laughs, but she’s serious: She wants to understand why the structures of the physical body break down in normal worms but not in the *daf-2*-mutant worms.

Then she adds: “There is a little part of me as I am getting older that is not sure it wants to be so close to the problem.” ♦

Anna Azvolinsky '09 is a freelance science writer and frequent PAW contributor.



SEX KILLS

The latest finding from Murphy’s lab — which graduate student Cheng Shi stumbled upon while conducting work on reproductive aging — may strike people as disconcerting: For females, sex kills (in worms, that is). In a paper published in the Dec. 19 issue of the journal *Science*, Murphy and Shi report that male sperm and seminal fluid interfere with the mother’s stress-response system, making her dehydrate, shrink, prematurely age, and die seven days after mating.

The vast majority of *C. elegans* are hermaphrodites; because their bodies contain both egg and sperm cells, mating does not require a male. The hermaphroditic worms try to avoid the males, but the males need the hermaphrodites to pass on their genes to future generations. Killing the mother means she would be unavailable to mate with another male, giving a genetic advantage to the father. The same occurs in roundworm species in which there are separate male and female worms and no hermaphrodites, and Murphy suggests that it may be a way to maximize a male’s reproductive success. *By A.A.*

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— RACHEL KAGANOFF STERN '86



Photo: Andrea Kane

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A N N U A L
G I V I N G

PRINCETONIANS



Architect Doris Kim Sung '86 experiments with thermo-bimetals to create self-ventilating buildings.

why buildings were so “static.” To “animate the inanimate,” she began experimenting with materials that move independently in response to the environment, consuming zero energy and requiring no controls. One possibility is using thermo-bimetals to create responsive skins that self-regulate building temperature. Bimetals are created by laminating two thin sheets of metals that expand at different temperatures, causing the metal to curl when heated.

Bimetals are not a new invention — the tight coils used inside most household thermostats for the past century are bimetals. Sung is finding new uses for the material, creating tessellated skins — small geometrically fitted tiles — that react to the sun, curling or unfolding in response to temperature fluctuation. She hopes these building skins can significantly decrease the need for air-conditioning.

In action, bimetal skins appear plant-like. Sung’s recent installation *Bloom*, displayed in 2011–12 outside a Los Angeles gallery, is a bimetal structure resembling a gigantic orchid and comprised of 14,000 tiles. Sung hopes to use the design of *Bloom*’s bimetal skin to create energy-efficient buildings that can regulate their own interior temperature. Each tile in *Bloom* is slightly different, and the varying sizes, shapes, and positions allow the

continues on page 34

DORIS KIM SUNG '86

BREATHABLE BUILDINGS

Designing surface materials that respond like human skin

Can building walls regulate their temperature like human skin? Architect Doris Kim Sung '86, an assistant professor at the University of Southern California, is intrigued by the possibility of buildings

that can breathe. Self-ventilating buildings, Sung believes, have major potential for sustainable architecture.

As an architecture graduate student at Columbia, Sung began questioning

STARTING OUT

KAITLIN HENDERSON '12
Research assistant at the brain-imaging lab of the New York State Psychiatric Institute and Columbia University.

DUTIES: Processes the raw data from brain scans for researchers conducting studies on depression, autism, and chronic pain.

LURE: “I’ve been interested in a career in research,” she says. “I wanted to try it out and see how things really work.”

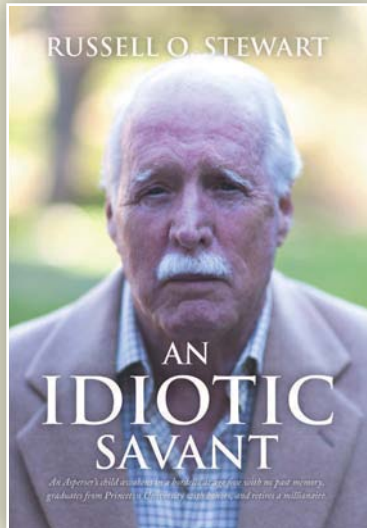
TEAMWORK: Her lab involves researchers from different specialties. “The way people work together is really interesting.”



Photos, from top: Inki Cho/famkoream.com; Courtesy Kaitlin Henderson '12

THE IDIOTIC SAVANT

RUSS STEWART '57
russellostewart.com



Russ was born in a bordello due to his family's financial situation and yet became a multimillionaire. His lack of memory prevents him from remembering a string of more than 10 words, yet Russ graduated with honors from Princeton University. Russ has explored first hand the sexual mores among more than twelve different cultures. His Asperger's syndrome both hindered and made possible his many successes. Read about this interesting and amazing man and his life.

The Idiotic Savant is available at amazon.com

PRINCETONIANS

continued from page 33

tiles to respond optimally to temperature fluctuations. "A brick wall is the same shape over and over again," Sung says, "but if you look at a fish, each scale is a unique size and conforms to its specific location." She envisions the same kind of differentiation used in *Bloom* being applied in actual buildings: building skins designed differently for the top and bottom of a structure, for a shaded north-facing wall and a sunny southern exposure.

"A brick wall is the same shape over and over again. But if you look at a fish, each scale is a unique size and conforms to its specific location."

Sung draws inspiration from the natural world: human skin, fish scales, a grasshopper's breathing system. That is not surprising: At Princeton, Sung began as a biology student before switching to architecture. "I'm fundamentally a science person," she says.

In addition to the bimetal skins, Sung is developing window systems that sandwich bimetal patterning between double-glazed panels, which would allow windows to regulate the quantity of sunlight and heat entering the building. Both the window systems and the skins still are in a prototype phase, and Sung is unsure of the cost to produce them or the amount of energy that would be saved. She hopes that both will be on the market in the next few years.

Meanwhile, Sung continues to experiment with materials that respond to the environment to create sustainable architecture. She is experimenting with making plastics perform like bimetals, and designing bimetals that mimic the rapid curling of touch-me-not ferns. Thinking ahead, she wonders if organic materials can be incorporated into responsive building materials. As she says, "The field is so wide open! It's an exciting future." ♦

By Jessica Lander '10

 **WATCH:** A video of Doris Kim Sung '86 at paw.princeton.edu



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Elizabeth Dabney Hochman '85 (pictured in 2012) with a former *KidSpirit* intern and a member of the editorial board.

PROFILE: ELIZABETH DABNEY HOCHMAN '85

A YOUTH MAGAZINE THAT WRESTLES WITH DEEP ISSUES

Life's big questions Elizabeth Dabney Hochman '85 is an opera singer with 20 years' experience. But she spends most of her time working with kids. About 10 years ago, the mother of two noticed that there weren't many media outlets for middle-school students to explore what she calls "life's big questions." So she set out to create a space in which they could "start to feel a better sense of who they are and what matters to them." She formed a nonprofit foundation with a board of directors; among its members are her husband, Jonathan Hochman '84, and several other Princeton alumni. In 2008, Hochman published the first issue of *KidSpirit*, a magazine for kids created by kids.

RÉSUMÉ Founding editor of *KidSpirit*. Opera singer. Master's in music from the Mannes College of Music. Majored in art history.

For teens by teens Hochman wanted the magazine to be an interactive environment for adolescents to discuss issues such as ethics, morality, and spirituality. Once a month in New York City she meets with an editorial board of about 20 boys and girls of different backgrounds, ages 11

to 17. As founding editor and publisher, Hochman facilitates a discussion to choose a theme for each issue. Recent issues have focused on money, God, beauty, and gender. Young people from around the world create the content, which has included essays on the portrayal of men on television, poems about what happens to us after death, and paintings of nature's beauty.

A catalyst for growth *KidSpirit* has evolved into an online publication and website with one compilation issue printed each year. (*KidSpirit* does not disclose the number of unique visitors to the website.) There are now six satellite editorial boards — all composed of students — and two more forming. "It's very cool to be able to provide something that can be a catalyst for huge growth for people discovering who they are," says Hochman. ♦ *By AJ Smith '03*

Elizabeth Stuart/Deseret News

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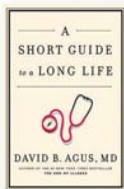
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READING ROOM: DAVID AGUS '87

DOCTOR'S ORDER: TAKE CHARGE OF YOUR HEALTH



Cancer specialist, researcher, and wellness advocate David Agus '87's health advice sounds simple enough: "Every day your body is talking to you. You have to listen." His second book, *A Short Guide to a Long Life* (Simon & Schuster), prescribes 65 rules that combine common wisdom with the latest scientific thinking.

You've heard much of it before: Maintain a healthy weight (Rule 13); pursue your passions (Rule 30); avoid sunburn (Rule 57). But Agus throws in some surprises: Automate your life with a consistent routine for eating, sleeping, and exercise to reduce stress (Rule 3); consider DNA testing to learn your risk for certain illnesses (Rule 20); and ditch vitamins and supplements in favor of food for the best nutrition (Rule 62).



What he's reading: *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants* by Malcolm Gladwell. "Malcolm makes important observations on education throughout the book."

to understand what's best for his or her body.

He does his best to follow his own rules, riding horses with his daughter and playing tennis with his son to mix up his exercise routine. They all wear fitness trackers and compare their metrics at the end of the day.

Agus advocates employing technology wherever possible. He co-founded the companies Navigenics (recently sold), which sequences a person's genome, and Applied Proteomics, which gives a readout of all the proteins in the blood, the better to assess if advanced testing, such as a colonoscopy, is needed. And he has organized his medical records in a digital file that he carries on his smartphone so that it's available at a moment's notice.

Sometimes he reminds patients that there is no miraculous cure-all. "The path to improvement is not finding the one thing you are lacking — it's following a collection of rules," Agus writes. "By sticking to as many as possible, your chance of a long, fulfilling life goes up." ♦ *By Maria LoBiondo*

A professor of medicine and engineering at the University of Southern California's Keck School of Medicine and Viterbi School of Engineering, Agus wrote *A Short Guide* as a SparkNotes version of his first book, *The End of Illness*, which delves deeper into scientific data. He knows that not everyone will agree with him on every rule (Agus and television personality Dr. Mehmet Oz have skirmished over Agus' suggestion that people over 40 should consider taking statins to control cholesterol for heart health and to reduce chronic inflammation, which researchers have linked to diseases such as cancer and diabetes), but Agus counters, "I want people to argue. From discourse comes understanding."

He continues to see patients at USC's Norris Westside Cancer Center, and he has appeared regularly as a CBS contributor since May 2013.

His mission, he says, began from frustration. "I know I can't cure advanced disease," he says. Agus began to think about how to stop cancer cells from growing in the first place, which led to more interdisciplinary approaches to tackle disease and his current mantra: Prevention is the best medicine, and every individual needs

NEW RELEASES



In the collection of essays *The Accidental Universe: The World You Thought You*

Knew (Pantheon Books), physicist and novelist **Alan Lightman '70** explores, among other topics, the possibility that there are multiple universes; our longing for permanence despite "the fleeting nature of things"; and how technology can separate us from nature and other people.



Gabriel Finkelstein '96 calls Emil du Bois-Reymond (1818-1896) "the most important

forgotten intellectual of the 19th century." In the biography *Emil du Bois-Reymond: Neuroscience, Self, and Society in Nineteenth-Century Germany* (The MIT Press), Finkelstein brings attention to this pioneering German scientist, who gained recognition for his research in neuroscience and his public lectures on science and culture.

Noise Petals was a 1980s rock band that performed at Princeton. The group —



James Trigg '88, Jeremy Toback '88, Tom Stegeman '89, and

Hearn Cho '88 — which disbanded, has released a digital album of its 1988 vinyl LP through CollegeBand.

 **LISTEN:** Noise Petals at paw.princeton.edu

CLASS NOTES

Online Class Notes are password protected. To access, alumni must use their TigerNet ID and password. [Click here to log in: http://paw.princeton.edu/issues/2014/03/05/sections/class-notes/](http://paw.princeton.edu/issues/2014/03/05/sections/class-notes/)

MEMORIALS

PAW posts a list of recent alumni deaths at paw.princeton.edu. Go to "Web Exclusives" on PAW's home page and click on the link "Recent alumni deaths." The list is updated with each new issue.

THE CLASS OF 1936



Carl Wilkening '36

Carl was a resident of Chatsworth, Calif., at the time of his death May 7, 2013.

Carl was born in Sharon Hill, Pa., and spent part of his early life in Lansdowne, Pa. Before Princeton, he attended Lansdowne High School, Swarthmore Preparatory, and Penn Charter School.

At Princeton, Carl planned to major in physics, but changed to mathematics his senior year. He was a member of the Pistol and Court clubs. He served as class chair as an alumnus. After his retirement, Carl volunteered as a docent and tutor.

He is survived by his wife of many years, Ruth Wilkening. He had four children, a son and three daughters. The class sends its deepest condolences to his family.

THE CLASS OF 1939



Carl E. Touhey '39

Carl died Aug. 25, 2013, in his hometown of Albany, N.Y. (where he was almost elected mayor in 1973), a few months short of his 96th birthday.

After graduation he worked for Wendell Willkie, then for the Minneapolis *Star-Journal*. During World War II he was a pilot in the Army Air Force, retiring as a captain.

Back in Albany, he began his business career in the company his father had founded, Orange Motor, and then branched out to bottling plants (Canada Dry and 7UP).

At our 25th reunion he wrote, "The climb to financial security and opulence was fun and rewarding. But now what?" His answer was to help big and small organizations, such as the Albany Medical Center, the College of St. Rose, the Albany Symphony, and the Touhey Homeownership Foundation, among others.

At our 50th reunion he wrote, "I love Princeton and all it stands for — including its broadening for race, religion, and color since 1939 (when things were a little narrow)."

At the end he said, "It all comes down to family." He was the father of four (including

Charles '68); stepfather of seven; surrogate father to 14 nieces and nephews; and grandfather and great-grandfather for too many to number. To them all, the class extends its love and sympathy.

THE CLASS OF 1942



Robert M. Davis '42

Twink Davis died Sept. 1, 2013, at Pennwood Village in Newtown, Pa.

He grew up in Lawrenceville, N.J., where he attended the Lawrenceville School. At Princeton, Twink majored in geology and joined Cap and Gown.

Ten days after graduation from Princeton, Twink reported to Fort Bragg for basic training. Once this was completed, he was assigned first as an artillery officer with the 13th Armored Division and then as a forward artillery observer with Gen. Patton's Third Army. In September 1944 he was wounded and spent six weeks in the hospital. In December 1944 he was back with his unit and stationed near St. Vith, Belgium, where the American Army experienced the fury of the German attack in the Battle of the Bulge. Twink participated in the successful repulse of the Germans and in the postwar occupation of Germany.

After the war, Twink married D.D. Nightingale and bought a dairy farm in Allentown, N.J. He also bought Newtown (Pa.) Hardware. In his hardware store, Twink purveyed the hunting and fishing equipment that supported the sports that he loved.

D.D. predeceased Twink. He is survived by his daughter, Mary Newcomb; his son, Robert Jr.; and two grandchildren. To them, the class sends sympathy.



Edward J. O'Brien III '42

E.J. O'Brien, for many years prominent in the leaf-tobacco business, died Sept. 2, 2013, in Louisville, Ky.

E.J. was raised in Louisville and prepared for college at the Newman School in Lakewood, N.J. At Princeton he joined Ivy

Club, majored in French, and was in ROTC. After graduation he was ordered to report for basic training in field artillery. After completion of this exercise, he was selected by the general commanding the 8th Armored Division to describe a role for tanks to be used as artillery in support of fire preparations. Accordingly, E.J. and other officers developed strategies and training manuals for this purpose.

Back in Louisville after the war, E.J. joined the family tobacco business. Much of this work required travel overseas, and it wasn't until 1960 that he was able to accept the suggestion of Lucy Scott of Winston-Salem, N.C., that they marry.

In addition to serving as president of the Edward J. O'Brien Tobacco Co., E.J. was active in charitable organizations, especially the American Red Cross.

His wife predeceased him. He is survived by his children, Edward IV and Mary Scott Herrington, and three grandchildren. To them all, the class sends sympathy.

THE CLASS OF 1944



David P. McCallie '44

Dave died Oct. 7, 2013, in Chattanooga, Tenn.

A lifelong resident of Chattanooga, Dave came to Princeton from the McCallie School, which was founded in part by his father. An honors student in chemistry at Princeton, he left in March 1943 to attend the University of Pennsylvania Medical School and then spent two years in the Navy.

Dave and his wife, Maddin Lupton, had four sons, one of whom died at age 26. Dave had a notable medical career in Chattanooga, where he served on many medical boards. He was honored numerous times as a distinguished citizen, Outstanding Physician of the Year, and for his service to the delivery of quality health care. He also was chairman of the McCallie School and president of the county medical society.

Dave was a dedicated Christian and was an elder in the local Presbyterian church. Family ties were constantly strengthened through camping trips. A lengthy memorial in the Chattanooga papers noted he was an exceptional doctor, a leader in his profession, and a man of great service to his community and state.

Predeceased by Maddin, his wife of 59 years, he is survived by three sons, David, Allen, and Jack; and five grandchildren.

THE CLASS OF 1945

Douglas T. McClure '45

Doug McClure died Dec. 17, 2012.

Doug entered Princeton from The Hill School and joined Cap and Gown. His Princeton studies were interrupted for service





with the OSS in Italy and Austria. Returning to Princeton, he earned a bachelor's degree in economics *cum laude* in 1947.

Doug joined Ford Motor Co. in Detroit, where he spent his entire career, retiring in 1989 as executive director of marketing. Following his retirement, he was appointed chairman of the board of trustees of the Henry Ford Health System, serving from 1989 to 1995, when he was named an honorary trustee.

Doug served on a number of professional and community boards, including The Hill School, the University Liggett School, the Michigan Cancer Foundation, the Association of National Advertisers, and the Ad Council and Adcraft Club of Detroit.

In 1951 Doug married Marjorie Oberteuffer, who survives him along with sons Douglas Jr. and Peter '87; daughter Julie Chandler; and seven grandchildren. The class expresses its sympathy to the family.

THE CLASS OF 1946



Marion Grant Bingham '46

Not every Princeton-educated petroleum engineer gets to advise on how to drill a hole 601 feet into the seafloor, under 11,700 feet of water, in an attempt to retrieve material from the earth's mantle. But Grant Bingham advised for eight years while the American Miscellaneous Society's Project Mohole, seeking information on the earth's age, makeup, and internal processes, explored its intraterrestrial frontier.

Except for assignments in Canada, Central and South America, Africa, Europe, and the Middle East, Grant's career concentrated on oil and Texas, with work in both research and practical operations. As a result, by his retirement in 1983 he had published more than three dozen books and papers, including such titles as *A New Approach to Interpreting Rock Drillability* and *Mud Equipment Manual*.

In September 1947, Grant married Margery Reynolds, daughter of S.C. Reynolds 1916. She died in 1982. His death May 23, 2011, left a son, a daughter, seven grandchildren, and his brother, A.A. Bingham '44, all of whom had enjoyed boating with him off the shores of Table Rock Lake in southwest Missouri, where he spent busy retirement years building furniture for them. To them all, '46 sends thankfulness for a long life well lived.

THE CLASS OF 1947

John J. Cote '47

John died Nov. 19, 2012, at a senior-care facility in Mission Viejo, Calif. Since 2008 his health had been an ongoing problem.

Before entering Princeton in the fall of 1946, John served 33 months of active duty in the

Navy. He earned his degree from Princeton in 1950.

After graduation he joined Rike-Kumler, Dayton's leading department store. John eventually became a buyer of men's sportswear, which required extensive travel to Europe, California, and New York. While in Dayton he was president of the Princeton Alumni Club and was involved in real-estate developments.

In the 1960s, John got into the convenience-store business, initially in Arizona and then in Southern California, where he had a hand in 107 Tic Toc Markets. After most of them were sold to the U Totem chain, he owned and operated several Minute King Markets. During this time John owned a restaurant (Winner's Circle) in Parker Dam, Ariz., but eventually, finding the commute each weekend to Newport Beach, Calif., too arduous, he sold it. While living in Newport Beach and Laguna Niguel, John participated in a series of Princeton Alumni Association activities. He retired from his business responsibilities in 1995.

John is survived by four sons and three grandchildren.



Joseph H. Lackey '47

Joe died Aug. 9, 2013.

Joe graduated from Princeton with honors in economics in 1947, received a law degree from the University of Michigan Law School in 1950, and earned a Chartered Life Underwriter designation from the American College of Underwriters in 1953.

Joe specialized in design and administration of employee-benefit plans. He served as president and chairman of New England Compensation Planning, president of New England Consulting Group Inc., and president of Physicians Insurance Plans Agency Inc.

After his retirement, Joe had three goals: ski the high mountains of the West, go to China, and buy a sport boat. He accomplished all three. Joe and his second wife, Pauline, continued to travel and produced a slide presentation of their travels around the world. He had a vacation home at a club in Harbor Springs, Mich., where he could use his new sport boat.

Joe is survived by Pauline, three daughters, two sons, and six grandchildren. The class extends its sympathy to the family.

THE CLASS OF 1949



Frederick Lee Hawes '49

Frederick Lee Hawes, known as "Lee," died Sept. 10, 2012.

Lee was born June 27, 1927, in St. Louis. After St. Louis Country Day School and Navy service from 1944 to 1945, he came to Princeton. He majored in economics, was on the business staff of *The Daily Princetonian*, and

joined the Catholic Club and Colonial Club.

Lee's business career began in the plastics industry, and in 1965 he founded Tetra Plastics, a plastics-extrusion company. This very successful enterprise, which served industries as diverse as skiing, beverage distribution, nuclear energy, and athletic footwear, was sold to Nike in 1995. Thereafter he worked in fundraising for good causes, helped a monastic community in Great Britain adopt modern business practices, bicycled, hiked, played tennis and golf, climbed mountains, and photographed the world.

Lee's wife of 61 years, Florence "Sissy" Weld Hawes; his children, Elizabeth Brown, Marion Hawes, Noel Mangano, and Frederick Hawes Jr.; and 10 grandchildren survive him. The class extends its sympathy to them all.



Boris Sokoloff Jr. '49

Boris Sokoloff died Dec. 8, 2012.

Boris was born in Nice, France, July 20, 1924, the son of a prominent cancer researcher and author.

He prepared at the Lycée de Nice and IX Gymnasium in Belgrade, Yugoslavia. He came to Princeton in 1946, speaking no English, but adapted so quickly that he became active in a bevy of undergraduate organizations. He played JV soccer, worked several different jobs on campus, and joined Key and Seal Club. He graduated with honors in SPIA.

Boris did graduate work at Columbia University and then went to work for Union Carbide. He and Joan, his wife of 62 years, lived variously in Greece, Switzerland, Morocco, and finally in Greenwich, Conn. He retired in 1984 after becoming chairman of Union Carbide Middle East and Africa.

After his retirement he started his own export company. Boris loved to ski, sail, swim, and travel; he was always busy.

Joan and Boris' children, Katherine '77 and Alexander; grandchildren Ana, Nick, and Alex; and great-grandchildren Sasha and Aiden have lost a talented, gracious, and energetic man. We all mourn his passing.



Charles H. Ware '49

Charles Ware, who bravely stepped in to serve as our class secretary after the death of Sam Englehart, died Feb. 20, 2012.

Charlie was born in the Bronx July 8, 1927, and graduated from Tenafly (N.J.) High School. At Princeton he majored in chemical engineering, played intramural sports, and worked in the dining halls. After graduation he served in the Counter Intelligence Corps in Japan and earned a Ph.D. in chemical engineering from the University of Pennsylvania.

Charlie taught, lectured, and invented. He

was awarded nine patents for improvements in the petroleum industry.

Charlie said that his principal interests were spirituality and metaphysics, including self-healing. The result was Charlie's Law: "Everything turns out right when you let it." His book, *Murphy's Law Repealed!*, was published in 2004.

Charlie was divorced from his first wife, the late Elizabeth B. Ware. In 1985 he married Sharon Mayes, who survives him and who served as our class secretary for a time after Charlie's passing. To Sharon and his children, Ellen E. Ware and Laura W. Pennington, and grandchildren Allen C. and Anna E. Pennington, the class extends its condolences on their loss of this most interesting man.

THE CLASS OF 1950



Samuel G. Armistead '50
*55 Sam, one of the world's leading scholars of Spanish literature and language, died Aug. 7, 2013, at his California home.

He grew up in the Philadelphia area and attended Penn Charter. At Princeton he belonged to Tiger Inn and graduated as a member of Phi Beta Kappa with highest honors in modern languages. He subsequently earned a master's degree and a Ph.D. from Princeton.

His fascination with Hispanic culture was fueled at Princeton by the renowned Spanish historian Américo Castro. Sam's studies included Spanish ballads, improvised poetry of the Canary Islands, and the dying language of Louisiana's Isleños. He authored some 30 books and more than 500 articles.

After teaching at Princeton, UCLA, Purdue, and Penn, he settled in at UC, Davis as a Distinguished Professor of Spanish and Classics from 1982 until retiring in 2010. He was recognized in Spain with several prestigious academic honors.

Sam had a great sense of humor, a prodigious memory, and sincere interest in his colleagues' work. His students will remember him for singing medieval Spanish ballads in class and reciting poetry in one of the many languages he mastered.

Sam was a devoted husband and loved animals, especially his cats. To his wife of 30 years, Annie Laurie; his brother, Harry; and the extended family, we offer condolences.



John S. Hager '50
John died July 18, 2013, in his native Owensboro, Ky., after a long battle with Parkinson's disease.

John was respected as an attorney, journalist, philanthropist, and public-reform advocate. He and his brother were third-generation publishers of the *Owensboro*

Messenger-Inquirer, once named as one of the top five small-city newspapers in the country.

An Exeter graduate, he served in the Navy from 1945 to 1946. John majored in history at Princeton and belonged to Cannon Club. He graduated from the University of Michigan Law School in 1953 and practiced law in Owensboro until 1973, when he became co-editor of the *Messenger-Inquirer*. He also was president of the Owensboro Broadcasting Co.

After the sale of the newspaper in 1996, John and his wife, Marjorie, established the Community Life Foundation, which seeks to engage citizens in a dialogue on challenging community and world issues.

He was involved in Junior Achievement and Rotary and was instrumental in starting Owensboro Community College. His contributions were summed up by the Louisville *Courier-Journal* headline: "Owensboro's John Hager made the state a better place."

We extend our sympathy to Marjorie, his wife of 60 years; children Bruce, Sally, Stewart, and Susie; eight grandchildren; and his brother, Larry.

THE CLASS OF 1953



Webster Griffith '53

"Wick" died Aug. 23, 2013. He was 82 and lived with his wife, Patsy, in Reston, Va.

A career Naval officer who served in the Vietnam War, Wick was awarded the Bronze Star with valor, among many other commendations.

If Director of Admission Radcliffe Heermance wanted diversity in a dormitory suite, he could have found it in 231 Walker Hall, the Rockefeller Suite. There, Wick, an architecture major, *Tiger* staffer, and freshman crew member, resided with six rambunctious roommates. John Stone, 50- and 100-yard freestyle swim champion, remembered Wick as "kind, studious, considerate, and quiet." Wick had a steady girl, Patsy Wheeler, whom he married in 1957.

Other roommates were Les Wilson, varsity footballer and wrestling captain; Ernie Reese, a biology major; and Ed Craig, the *Tiger* mascot and swimming captain. Also, there were two transfer students, USC's "Yogi" Galesi and Willy Johansen of Denmark.

Wick's family said he "put his Naval experience to work" after retiring as a commander, with significant civilian pursuits. He is survived by his wife; daughter Patsy Van Etten; brother George W. '48; and two grandsons. We miss Wick, and that goes double for his Rockefeller suitemates.

THE CLASS OF 1962

Barton P. Ferris '62

Barton Ferris died Oct. 17, 2013, in Twilight Park, N.Y., after a long illness due to



complications from ataxia.

Bart came from Northfield Mount Hermon School, where he roomed with Peter Heydon. While at Princeton he majored in mathematics, was a member of Tiger Inn, and captained the wrestling team. He roomed with David Barry, Rich Dallow, Ed Bailey, Chick Finch, Mark Eubanks, and Bob Chamberlain.

Bart received an MBA in finance from Columbia University and worked for Morgan Stanley, E.F. Hutton, and Advest Inc. He lived for many years in New York City and served on several boards of directors, including Ronson Corp., DSLT Inc., and Graham Magnetics.

His memberships included the Manhattan Rugby Club, Twilight Park Association, and the Union Club. Bart was deeply involved in fundraising for Northfield Mount Hermon. One of Bart's most memorable trips was to Mount Hermon, whose summit straddles the border of Syria and Lebanon.

Bart was a devoted family man. The class extends its sincerest condolences to his wife, Susie; daughter Juliana; sons Jeffrey and Nathan; daughters-in-law Laurie and Patricia; granddaughters Sally and Annabelle; and brother Warren. A memorial service is planned in Twilight Park in June.



George H. Irvin III '62

George Irvin died of colon cancer June 26, 2013, in Anchorage, Alaska.

George prepped at the University School in Shaker Heights, Ohio. At Princeton he was involved with WPRB, the Undergraduate Schools Committee, and Whig-Clio. A politics major, his thesis was on the "Evolving Ideology of the Cuban Revolution."

After graduation, George was a Peace Corps volunteer in Peru, and then did graduate work at Cornell. Joining the "War on Poverty," he became a field representative for the Office of Economic Opportunity in Alaska. Over the next 45 years he worked with native Alaskans through the Rural Alaska Community Action Program and the Alaska Federation of Natives. An office representative mentioned both his strong managerial capabilities and his dedication to helping local people. George said, "The Alaska native people accepted me. They took me in."

Although George was not in touch with Princeton or the class after graduation, it is obvious that he dedicated his life to helping other people — a noble cause.

The class extends its sympathy to his wife, Ursula Susan Paniyak Irvin; his sons, Michael and Christopher; his daughter, Michaelene; stepson Robert Paniyak; and his granddaughter, Jaderiane Paniyak.

THE CLASS OF 1968



Al S. Dunning '68

Al died Oct. 15, 2013, in New York City of pancreatic cancer.

Al came to Princeton from Westfield (N.J.) High School and majored in history. He

earned a law degree from Yale.

In 1971, Al joined the firm of Cleary Gottlieb Steen & Hamilton, where he was a partner for 28 years until his retirement in 2008. An international corporate-finance specialist, he began his career in New York but spent 17 years in the firm's overseas offices.

In the 1980s and 1990s, Al was active in the Summit, N.J., public schools and served on the board of education for six years, including a year as president. While living in Frankfurt, Al was the Princeton Alumni Schools Committee chair. For several years, he served on the board of the International Institute of Rural Reconstruction, working to end poverty in Africa and Asia.

Family, friends, and travel were Al's passions, as was Princeton. Al's father was in the Class of '24 and his grandfather was 1899. He was predeceased by his brother, Bruce '62.

In retirement, Al enjoyed spending time with his grandchildren and exploring New York City.

Al is survived by his beloved wife of 43 years, Anne; children John '95, Catherine '95, Mary Kay '99, and Ashley '11; and grandchildren Griffin, Colette, and Walker. The class extends profound sympathy to them all.

THE CLASS OF 1983



David Bederman '83

David died Dec. 4, 2011, of complications from appendix cancer.

At Princeton, David was a member of Quadrangle Club, president of Whig-Clio, and secretary general of the Model UN Conference. He also was on the men's fencing team, fencing foil under coach Stan Sieja. After graduation, David received a master's degree from the London School of Economics, a law degree from the University of Virginia, a diploma from The Hague Academy of International Law, and a Ph.D. at the University of London.

David worked at the firm of Covington & Burling in Washington, D.C., and as a legal adviser at the Iran-United States Claims Tribunal at The Hague, eventually becoming the K.H. Gyr Professor in Private International Law at Emory University. He published many articles and books.

David argued four cases before the U.S. Supreme Court and held distinguished visiting professorships at NYU, the University of Toronto, and the University of Virginia. He was one of the world's few experts on the laws surrounding shipwrecks. His contributions as a

scholar, teacher, and guide are commemorated at the annual David Bederman lecture at Emory Law School.

Sympathy from the class goes to his wife, Lorre Cuzze; daughter Annelise; and his parents, Dr. Sanford and Jolayne Bederman.

GRADUATE ALUMNI

Philip McL. Stehle *44

Philip Stehle, professor of physics emeritus at the University of Pittsburgh, died of pneumonia April 29, 2013. He was 94.

Stehle earned a bachelor's degree from Michigan in 1940. In 1944 he was awarded a Ph.D. in physics from Princeton. During World War II he served in the Army as a specialist working on the Manhattan Project. After his discharge, Stehle taught for a year at Harvard before going to the University of Pittsburgh.

He joined Pittsburgh's department of physics and astronomy in 1947, and twice served as its chair. He retired in 1989. On three separate occasions he was awarded a Fulbright fellowship to the University of Innsbruck in Austria. Innsbruck later awarded him an honorary degree.

Stehle wrote three books on physics and one on the history of physics in the early 20th century. As a furniture maker, he produced attractive pieces for family and friends. Among his colleagues, he was known for his athleticism as a skier and squash player.

He was predeceased in 2012 by his wife, Evelyn, whom he married in 1942. He is survived by their three children and two granddaughters.

John E. Booty *60

John Booty, former dean of the School of Theology and professor emeritus at the University of the South in Sewanee, Tenn., died April 17, 2013. He was 87.

Booty received a bachelor's degree from Wayne State University in 1952 and a bachelor's degree in divinity from Virginia Theological Seminary in 1953. He was then ordained in the Episcopal Church.

In 1957 he received a master's degree in religion from Princeton, and in 1958 began teaching at the Virginia Theological Seminary. He completed his Princeton Ph.D. in 1960 and was promoted to associate professor in 1964.

From 1967 to 1982, he was a professor of church history at the Episcopal Theological School in Cambridge, Mass. From 1982 to 1985, he was dean of the School of Theology at the University of the South, and from 1984 to 1990 he was professor of Anglican studies, becoming emeritus in 1990.

He was a Fulbright scholar and fellow of the Folger Shakespeare Library and the NEH. Booty contributed to the Graduate School's Annual Giving campaign for 52 years.

He is survived by Catherine Louise, his wife

of 62 years; three children; nine grandchildren; and four great-grandchildren. A son died in 2010.

Alfred F. Hurley Sr. *61

Alfred Hurley, retired Air Force brigadier general and chancellor emeritus of the University of North Texas System, died June 8, 2013. He was 84.

Hurley graduated *summa cum laude* in 1950 from New York's St. John's University. While serving in the Air Force, he earned a Ph.D. in history from Princeton in 1961.

Enlisting as an airman in 1950, he retired as a brigadier general in 1980. From 1966 to 1980, he was a professor and history department head at the Air Force Academy. From 1977 to 1980, he was on the academy's executive board and chaired the humanities division.

While Hurley headed the UNT system from 1982 to 2002, enrollment rose from under 19,000 to more than 27,000, and its endowment grew from \$850,000 to \$45 million. Almost \$200 million was raised in two capital campaigns. UNTS named one of its buildings for the Hurleys. For Princeton, he was a member of APGA's board from 1976 to 1979.

He is survived by Johanna, his wife of 60 years; five children (including Alfred Jr. '76, Claire Hertton '82, and John '86); and 14 grandchildren.

Barbara A. Brenner *77

Barbara Brenner, who combatively headed the Breast Cancer Action organization, died of ALS May 10, 2013. She was 61.

Brenner graduated from Smith in 1973. After attending but not graduating from Georgetown University Law Center and Princeton's Woodrow Wilson School, she worked for the ACLU in Los Angeles. Later seeing how the law could be used beneficially, she graduated from UC, Berkeley School of Law in 1981. She was a partner in two public-interest law firms.

In 1995, Brenner became Breast Cancer Action's first executive director, two years after undergoing treatment for the disease. She held this position until 2010, when ALS forced her to retire. Under her leadership, Breast Cancer Action's membership increased from 3,500 to 50,000 and it focused its demands on research into the causes of breast cancer, especially its link to environmental pollutants. The organization and Brenner earned respect for refusing donations from profit-making entities as well as chemical, drug, oil, and tobacco companies whose activities might cause cancer.

Brenner is survived by her partner of 38 years, Suzanne Lampert '75, and five siblings.

Graduate memorials are prepared by the APGA.

*This issue has an undergraduate memorial for Samuel G. Armistead '50 *55.*

Classifieds

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United States Northeast

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Wellfleet: 4 bedroom beachfront cottage with spectacular views overlooking Cape Cod National Seashore. 609-921-0809 or warrenst@aol.com

Stone Harbor, NJ: On beach, upscale. 570-287-7191. Email: radams150@aol.com

Sugarbush/Warren, Vt: 3 BR/2.5 BA condo minutes from ski area. Sleeps 8. Free shuttle service or short walk to ski-on access. 212-496-6528 or suzannezywicki@hotmail.com

Monhegan Island, Maine: 4 bedrooms, 2 baths. Panoramic island, ocean view, Wi-Fi. Available June-September \$1,900/week. Two week minimum. Bill Walker '64. 610-687-3271, mwalks512@verizon.net

Chester, VT: Historic farmhouse; period antiques; picturesque; hot tub. 5BR, 3BA, fireplaces; large kitchen; near Killington, Okemo, Stratton — great year-round! MWyatt@FoleyHoag.com

Nantucket Oceanfront: Charming, antique-filled cottage on five acre oceanfront estate. Sleeps six comfortably. \$3,500-\$6,700 weekly, May-October. Discount for multi weeks. phoe63@comcast.net for details/pictures. '63.

Nantucket: Dionis. 3BR, 2BA, decks, views, walk to beach. 530-574-7731. doctorpaula@comcast.net, '66, p'86.

Classifieds

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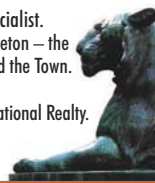
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Police investigate the kidnapping of Charles Lindbergh's son at the family home near Princeton.



Kidnapped!

W. Barksdale Maynard '88

“The Crime of the Century” took place just eight miles from campus, when someone snatched the Lindbergh baby from his crib on the cold, windy evening of March 1, 1932. Princeton students marched through the woods of Hopewell, looking for clues.

It had been five years since Charles Lindbergh’s sensational flight across the Atlantic. Stunned by the sudden fame, he had hired lawyer Henry Breckinridge 1907 as his personal adviser. Breckinridge introduced him to University president John Grier Hibben 1882, who offered the aviator-scientist access to campus laboratories where he could undertake biomedical research — he collaborated with a French surgeon on a glass heart pump.

Lindbergh married into a wealthy New Jersey family and built an estate near Hopewell, 19 minutes away by car from Princeton. When he found the toddler missing, Lindbergh instantly called Breckinridge, who raced down from New York and after midnight knocked frantically on the dorm-room door of his stepson, Oren Root '33: Could he remember the twisting route to Hopewell?

The Lindbergh estate was a blaze of lights when they arrived, and swarming with police. Hibben soon came as well. The first reporter on hand — the start of a media frenzy — was PAW contributing editor Edmund DeLong '22.

During the sleepless weeks that followed, Breckinridge negotiated with shady types who claimed to be the kidnapper. Hibben offered to

do the same. Ransom was paid, but the baby was not returned.

In May, a truck driver stumbled upon a tiny corpse just off the Princeton-Hopewell Road. Apparently the child had been killed during the abduction.

Ransom money was discovered later at a home in the Bronx, pointing to the involvement of Bruno Richard Hauptmann, a German with a criminal record.

Found guilty of the baby’s death, he insisted he was innocent until the end and died in the electric chair in Trenton in 1936. Fifty years after the baby’s body was found, Harry Heher Jr. '49, son of a state Supreme Court justice who had heard Hauptmann’s unsuccessful appeal, presented the 4,320-page trial transcript to Firestone Library.

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