



LSA

COLLEGE OF LITERATURE,
SCIENCE & THE ARTS
UNIVERSITY OF MICHIGAN

Spring 2015

Sometimes things
only seem small.

The five-year
project involves
more than 200
researchers,
including faculty
from LSA.
Read more on the
next page.

This star is one
tiny piece of
the hundreds of
millions of
galaxies being
recorded by
the Dark Energy
Survey.



Uncommon Campus

Every issue of *LSA Magazine* affords us the privilege of peeking into a few of the amazing and obscure corners of the College. But this issue was a special case, sending us across campus and around the globe as we searched out stories, researched experiments, and photographed the unparalleled diversity of resources that the College of Literature, Science, and the Arts has to offer.

A HANDFUL OF THE LOCATIONS FEATURED IN THIS ISSUE OF *LSA Magazine*:

CONCEPTUAL DEVELOPMENT LAB East Hall, Ann Arbor

What happens there: Groundbreaking research on how children think.

What it smells like: Kids' shoes and crayons.

Physical description: Inside, the Conceptual Development Lab seems like a cross between a super-cool dentist's office and a kindergarten playroom, filled with toys, stuffed animals, and chairs small enough for toddlers and school-age kids.

Who uses it: Former Interim Dean Susan Gelman, her research team, and families participating in research.

Featured: In "Little Kids, Big Ideas," on p. 50.

SMART CENTER Chemistry Building, Ann Arbor

What happens there: Research involving single-molecule microscope techniques.

What it smells like: The future.

Physical description: The polished surfaces of the center's tables, the heavy, black drapes lining one side of one hallway, and the glowing "Lasers in Use" signs all indicate that this is a place where very delicate work is being done.

Who uses it: The SMART Center is open to researchers from across campus.

Featured: In "The Science of Small," on p. 26.

CERRO TOLOLO INTER-AMERICAN OBSERVATORY La Serena, Chile

What happens there: The cataloging of 300 million galaxies and 3,000 supernovae and the creation of a time-lapse movie covering the last 8 billion years.

What it smells like: Fresh mountain air — the observatory is in the Chilean Andes.

Physical description: An enormous silo houses the 4-meter-diameter Victor M. Blanco telescope, which uses a 570-megapixel camera to take images of the southern skies.

Who uses it: Professor August Evrard (physics), Arthur F. Thurnau Professor David Gerdes (physics), Associate Professor Dragan Huterer (physics), Arthur F. Thurnau Professor Tim McKay (astronomy and physics), Assistant Professor Chris Miller (astronomy and physics), Research Scientist Michael Schubnell (physics), Professor Greg Tarlé (physics), and a team of more than 200 researchers from 26 institutions.

Featured: On the cover.



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China's growing middle class is making new demands on its government. Join LSA for a tour of the challenges facing China's present—and shaping its future.

**by Susan Hutton
and Brian Short**

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LSA's Zell Writers' Program has its own letterpress, where students transform literature into one-of-a-kind objects of beauty and learn the literal weight of their words.

by Fritz Swanson

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The Science of Small

Labs in LSA are using Nobel Prize-winning microscope techniques to see down to the molecular level, magnifying major possibilities for how we may one day see the world.

by Elizabeth Wason

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42.22° N, 83.75° W

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Thinking Big

THE UNIVERSITY OF MICHIGAN IS A BIG PLACE.

We have more than 40,000 full-time students in 19 schools and colleges on a campus that covers more than five square miles. For those of us in LSA, such a vast intellectual and physical landscape brings with it both advantages and challenges: We seek to leverage the strengths of one of the world's leading public research institutions while simultaneously creating the close-knit academic experience that defines the nation's best liberal arts college. In short, we want to help students find their niche while ensuring that no one loses their way.

That starts with our commitment to academic excellence and our outstanding faculty. Throughout the College, we have world-class scholars who are doing

Access to an unparalleled education within the framework of the nation's top public research university is what makes LSA unlike any other liberal arts college.

state-of-the-art research, and 100 percent of our tenure-track faculty members teach undergraduates. LSA is at the heart of U-M's undergraduate experience, so it brings me great pride that the University is consistently ranked among the best in the nation for undergraduate teaching. I'd like to think our 24 LSA Fulbright recipients this year — of 28 total for U-M, the most of any public university in the nation and second only to Harvard — are a testament to that focus on teaching.

We are also constantly exploring ways to enrich students' academic pursuits across disciplines by tailoring our curricula. We listen to students, we follow — and lead — trends, and we take action. This term alone, we introduced new minors in Yiddish Studies, Arab and Muslim American Culture, Art and Design, Intergroup Relations Education, and Entrepreneurship. And we are expanding the

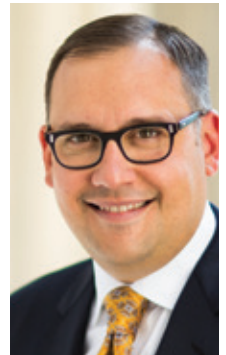
Michigan STEM Academies Scholars Program, which strives to strengthen and diversify the cohort of students who receive their degrees in science, technology, engineering, and mathematics so they are prepared to pursue careers in those fields in the new global economy.

For both undergraduate and graduate students, we have a tradition of innovative approaches to learning. Our highly regarded Undergraduate Research Opportunity Program, for instance, was one of the first of its kind in the country. What started in 1988 with 14 students this year engaged nearly 1,400 students with more than 800 faculty researchers on projects spanning the natural sciences, social sciences, and humanities. Similarly, the Helen Zell Writers' Program has grown to become one of the most respected of its kind, offering unprecedented support for MFA students to practice their craft.

Access to an unparalleled education within the framework of the nation's top public research university is what makes LSA unlike any other liberal arts college. As dean, I celebrate our ability to offer students such a wealth of academic possibilities, along with the support and guidance for them to make the experience their own. It's an approach that prepares students for a lifetime, not just a living. And it provides them the skills to leave here and make a difference in ways big and small.

Andrew D. Martin

Professor of Political Science and Dean



INSIDE LSA

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Visit LSA Today for weekly web exclusives plus in-depth magazine-related content.

www.lsa.umich.edu



Wherever this symbol appears in the magazine, you can find expanded content on the LSA Today website.



SACRED GROUND

LSA celebrates **Earth Day** with a series of stories featuring an environmental history of Detroit and an alumnus working to catalog all of the trees in Ann Arbor.



BEST OF ALL WORLDS

See a slideshow of photos from LSA students who made the world their classroom.



FORGOTTEN PHARAOHS

Explore the mysteries of an ancient kingdom buried under the Sudanese desert town of El Kurru.



COMMON GROUND OR GRIDLOCK?

Political Science Professor Vincent Hutchings examines what shifts in the new Congress mean.



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Plus!



Read past issues of *LSA Magazine*:

www.lsa.umich.edu/alumni/magazine

How to Finish College in an Hour

It was a pleasure to have fellow GARGAlums included in a spread on the MichiGarg Game in the last issue of *LSA Magazine*.

As a former *Gargoyle* editor and co-founder of the *Gargoyle* Alumni Society, I have had the unique opportunity to have known *Gargoyle* editor George Quick ('38) and *Gargoyle* art editor and editor Max Hodge ('39). Both Quick and Hodge attended several *Gargoyle* Gatherings, first in 1993. Both are deceased now.

Max Hodge did the artwork for the MichiGarg Game and donated the original of the game to the Bentley. George Quick was the major creator of the game and kept the original printing plate in his attic for several decades before donating it to the Bentley. Both the original artwork and the printing plate were on display at the Bentley for the exhibit celebrating the *Gargoyle*'s 100th anniversary in 2009.

Each *Gargoyle* with the MichiGarg game was sold with dice...as long as the dice lasted! Quick remained upset his business manager did not order quite enough dice. The issue sold out in a matter of hours.

I know Max and George would appreciate—as do all GARGAlums—your publication of MichiGarg!

John Dobbertin, Jr. ('64)

Too Much Football

As someone lucky enough to be a later-day peer of Allen Jackson ("Too Much Football"; Fall 2014), both as a member of the Michigan football team and as a Rose Bowl champion (1993), it is with some authority that I can state unequivocally that his experience does not ring true with my own.

That said, my view of the sport has changed dramatically since my own playing days ended on January 1, 1993. I remember fondly afternoons in Ann Arbor—but weekdays, not Saturdays—when my friend and teammate Corwin Brown ('94; a captain of our Rose Bowl Champion team) and I would sprint out of French class together at the MLB to race to practice down at Schembechler Hall, only to race each other—and yap at each other—running laps and competing during team drills, he as an All Big Ten defensive back and me as an eternal backup wide receiver.

I went on to a career in law and an M.B.A. with honors from Harvard, while Corwin had a fantastic eight-year career in the NFL, earning the respect of the game's best players and coaches, resulting in opportunities to coach for elite teams, including Notre Dame and the New England Patriots, when his playing days ended.

A DISGRUNTLED GRIDIRONER

“I think it would make a terrific documentary.”

**Dan Chace ('68),
CEO of Black Point
West Films,
on the possibility
of a film about
Rose Bowl hero and
outspoken
college sports critic
Allen Jackson**



But not many years later the toll that football had taken on Corwin's mind and body led to tragic events, and thankfully Corwin survived his self-inflicted gunshot wound.

This country is littered with the bodies of men who gave their all for their schools and teams. Men who can't walk, speak, and, for some, even think. All this from a violent game that we still let 6-year-old children play using the same rules as the grown men who play it. If football was a new drug, the FDA would never allow it be tested on children until it was proven safe in adults. To the contrary, however, it has proven singularly unsafe among adults, and yet small children play on, misled, along with their parents, by fantastic and illogical claims about "newer, safer" helmets and obfuscation by the grown men who run the sport.

Too much football? You're damn right there is. It is simply not an appropriate sport for children under 13 or, apparently, for Allen Jackson.

Julian Swearengen ('93)

Most popular letter-generating article:
"Too Much Football"

TALK TO US

We invite your feedback on *LSA Magazine* content or on topics related to the College. Letters for publication may be edited for style, length, and clarity.

Email: lsamagazine@umich.edu

Or write to:

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Forever Mine

LSA professors **Fred Feinberg** (statistics and marketing) and **Elizabeth Bruch** (sociology and complex systems) joined forces to mine data from a major dating website in order to figure out what makes an online dating profile more likely to get a click or a message. They found that both age and height matter to men and women, and that a profile without a photo is 20 times less likely to get a view. So no photo, no chat request, no first date, no wedding. And to think that online dating was supposed to make things simpler.

28

The number of Fulbright grants awarded to University of Michigan students — the most of any public institution in the United States. 24 of those were awarded to students from LSA.

#one!

The best in the world — that's U-M's ranking among U.S. public universities in last year's **QS World Rankings**, putting the Wolverines ahead of, well, everybody else. Go Blue!

THE RULE OF LITTLE WORDS



The Fish and the Not Fish, a story collection by **Peter Markus ('89)**, takes on a tough task: It only uses one-syllable words. "Even Dr. Seuss books have words such as 'about' and 'around' in them," Markus told the *Detroit Free Press*, "and I wanted to do what hasn't been done before."

"MAKING SMALL THINGS BIG IN THE WORLD OF ORGANIC ELECTRONICS"

The title of a lecture given by LSA Physics Professor **Stephen Forrest** about the possibility of future technology like high-tech presses that print circuits the way we print newspapers now.

@feliciapatelli

Attending Campus Day made me realize I made the right choice in picking @umichLSA #Victors2019

@ProfADM (Dean Andrew Martin)

14.1 inches. Not bad for my first #AnnArbor #SnowDay. Be safe out there.

Follow the College of LSA on Twitter @UMichLSA

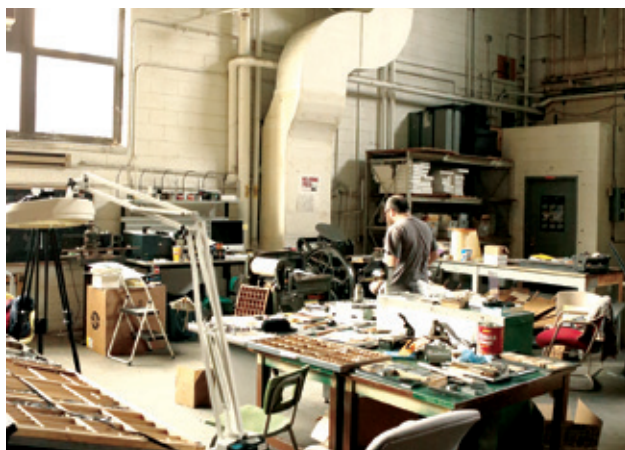


"We wanted to hear how the words would sound coming from a real professor."

ACTOR **MARK WAHLBERG** ON WHY HIS TEAM CONTACTED PROFESSOR **MICHAEL SCHOENFELDT**, THE JOHN R. KNOTT, JR. COLLEGIATE PROFESSOR OF ENGLISH LITERATURE AND ENGLISH DEPARTMENT CHAIR, FOR HELP PREPARING FOR HIS ROLE IN *THE GAMBLER*.

5 lbs

The weight of the *Princeton Dictionary of Buddhism*, co-written by **Donald Lopez**, who is the A.E. Link Distinguished University Professor of Buddhist Studies. The book was named one of the top 25 academic books of 2014 by CHOICE and received the prestigious Dartmouth Medal earlier this year.



BEHIND THE SCENES

A snapshot showing Fritz Swanson operating a letterpress as part of Wolverine Press (see article on page 18). The press is owned and run by LSA's Zell Writers' Program.

"What is the Dutch East India Company?"



THE CORRECT FINAL JEOPARDY ANSWER — WE MEAN QUESTION — THAT EVADED **JOHN SCHULTZ** ('06), ENDING HIS FIVE-GAME WINNING STREAK.

LOCATION, LOCATION, LOCATION

The origins of several stories in this issue and online:

- Kazakhstan
- Strasbourg
- Smyrna Video Store and Tanning Salon
- Crisler Arena
- Under a pillow
- La Serena
- Ishpeming
- Brunswick Square
- Avenue of the Americas
- The corner of Packard and State
- Shenzhen
- Vatican City



The Facts of Lice

Nancy R. Gordon ('88) has made it her business to nitpick. Gordon is the CEO of Lice Knowing You, a head lice removal company with seven offices around the country. Lice spread by head-to-head contact and through the sharing of coats, brushes, and other personal accessories. While lice are a common problem for school-age children, anyone can end up as their temporary home.

"Lice are an equal opportunity bug," Gordon says.



625 BILLION GALLONS

of water in Lake Winnepesaukee, the site of LSA's New England Literature Program (NELP), which celebrates its 40th anniversary this year.

The program takes 40 students and 13 instructors to Camp Kabeyun on the sizeable Lake Winnepesaukee every year, where its participants read, write, and hike together, exploring the physical and literary landscapes of New England.



BUILD A

**YOU CAN HELP THE
VICTORS OF TOMORROW.**


Making a bequest, estate, or planned gift to LSA acknowledges the College in a way that will support your interests and have an enduring impact on the University of Michigan. By making a plan today, you can create a lasting legacy that will benefit students and help solve problems in an ever-changing world.

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the gift of a lifetime

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THERE IS ALWAYS A SENSE OF WONDER.

The first time you catch a firefly.
The first time you walk under a skyscraper.
The first time you look through a telescope at
a distant star and think simultaneously
“It’s so big” and “I’m so small.”

Although our sense of what is *really* big
and what is *really* small changes,
those feelings of awe and inspiration are still
out there, waiting to be rediscovered.
And at the College of LSA, we know
there is as much wonder and wisdom in
observing the rotation of the earth as
there is in understanding the life of a flea.
Because whether something is big or whether
it is small doesn’t matter as much as
whether *it still has something to teach us.*

AS CHINA'S
MIDDLE CLASS
GROWS, ITS
CITIZENS ARE
MAKING NEW
DEMANDS
ON THE
GOVERNMENT
FOR SAFETY,
EQUALITY,
AND SOCIAL
MOBILITY.
BUT IN A
COUNTRY AS
BIG AS CHINA,
THE ISSUES ARE
SO IMMENSE
THAT MANY
SOLUTIONS WIND
UP CREATING
NEW PROBLEMS.
JOIN LSA FOR
A TOUR OF THE
CHALLENGES
FACING CHINA'S
PRESENT —
AND SHAPING
ITS FUTURE.

BIG RED

by Susan Hutton and Brian Short



Flipping through a stack of popular magazines in China today feels a lot like looking through a similar stack in the United States:

The faces looking back are symmetrical, attractive, and have probably been photoshopped. There are the usual movie stars and fashion models staring out, their sculpted hair giving an air of glamour and extravagance. It's hard to believe those same magazines once featured a group of peasant farmers called the Iron Girls.

That nickname originated in 1963 when the group, then a brigade of teenage girls in the remote village of Dazhai, banded together to rebuild their village after a devastating flood.

"It was very difficult work," explains Zheng Wang, associate professor of women's studies and history. "One day their brigade leader, who was a man, said, 'Oh, it's

so cold today. Girls, you should go home.' And the girls said, 'You aren't going home, so we'll stay, too.'"

The brigade leader said the girls were made of iron, and they became known as the "Iron Girls."

The Iron Girls were celebrated as national symbols of personal grit, women's power, and proletariat perseverance. National political figures praised the Iron Girls' fortitude and self-sacrifice. During the Cultural Revolution, a period of turbulence that lasted from 1966 to 1976, the Iron Girls were held up as models for girls and young women around the country. They appeared on a range of propaganda items including posters and postcards, and even

made the cover of the popular magazine *The People's Pictorial*.

When Deng Xiaoping, who led China after Mao Zedong's death, liberalized the Chinese economy in 1978, it opened the country to other changes, including a reversal of attitudes toward ideas Mao had championed. Under Deng Xiaoping, China abandoned the notion of absolute equality between classes and genders, and the Iron Girls became objects of mockery. Comedians joked that you had better not marry an Iron Girl or she'll beat you up if you argue with her. The girls traveled from stardom to scorn in the span of just 15 years.

The history of China in the 20th century includes many such abrupt changes and dramatic about-faces. The economic liberalization of 1978 — which began China's transition from a state-run to a market economy and opened the country's doors for business — has led China to seismic lifestyle shifts, including a staggering rise in per capita income from \$200 in 1978 to \$6,000 in 2014. But economic development has come alongside a number of destabilizing forces, including massive waves of urbanization and increasing levels of financial inequality.

This instability is widespread, touching almost every Chinese citizen. The rules governing things that most people might see as normal life goals — searching for a spouse, saving up for a house, planning

FACING CHANGE

The style of Chinese government propaganda has changed over time, and so have the characters and content it presents, with vigorous workers replaced by willowy young women, and work replaced by leisure. Here are some examples from over 30 years.

TRANSLATIONS:

■ We are proud to participate in the industrialization of the nation. ■ **The fragrance of rice floats a thousand miles. Everybody poses as a hero.** ■ Strive for an abundant harvest; amass grain. ■ **Study hard to gain strength to contribute to socialist modernization.** ■ Have morality.

[1954]



[1961]



Pro-democracy protesters on the streets of Hong Kong use umbrellas to protect themselves from police pepper spray on September 28, 2014. The so-called “Umbrella Revolution” lasted from September 26 to December 14, almost 80 days.

a career — are changing at the same time people are doing them, says Mary Gallagher, director of the Kenneth G. Lieberthal and Richard H. Rogel Center for Chinese Studies and associate professor of political science.

“The pace of change that’s happening is so much faster in China,” she says. “It is very discombobulating.”

And nowhere was the potential for massive change more visible in 2014 than on the streets of Hong Kong.

DEMOCRACY NOW?

In fall 2014, images of protests from Hong Kong’s “Umbrella Revolution” flooded international airwaves, creating a set of protest images most Americans placed alongside those from the deadly demonstrations in Tiananmen Square in 1989. To Western audiences, these images showed people longing to live in a democracy. And for many people living in China and under other repressive governments around the

world, that’s true.

But Gallagher says that although widespread dissatisfaction with the government exists, that doesn’t mean that everyone in China wants democracy.

“We tend to assume that because China is authoritarian, because people don’t have the right to vote, or the right to choose their leaders, that they all must want

democratic change,” says Gallagher. “But it’s not clear that’s the case.

“Thirty percent of China’s population live in cities legally,” she continues. “Many of them are either wealthy or on their way to becoming middle class. They look around and see the 70 percent of people who are not like them. They see democracy as a destabilizing threat.”

“WE ASSUME THAT BECAUSE CHINA IS AUTHORITARIAN, BECAUSE PEOPLE DON’T HAVE THE RIGHT TO VOTE, OR THE RIGHT TO CHOOSE THEIR LEADERS, THAT THEY ALL MUST WANT DEMOCRATIC CHANGE,” SAYS GALLAGHER. “BUT IT’S NOT CLEAR THAT’S THE CASE.”

[1973]



[1980]



[1986]



In addition to the 30 percent of the Chinese population living legally in Chinese cities, another 20 percent live there illegally or on temporary permits. Their status is problematic because of a strict Chinese household registration system called *hukou*.

Since its inception, *hukou* has created a rigid, apartheid-like system of inequity that privileges urban residents and relegates rural residents to a distant second class. Because in addition to deciding your legal residence, your *hukou* also determines what social benefits, such as health care or pension payments, you'll receive. It determines your kids' education. In desirable cities, such as Beijing, it also determines whether you can buy a house or a car.

The *hukou* is hereditary: If your parents held a rural *hukou*, then you also hold one — even if you were born in a city and have never been to your home village.

HAVES AND HAVE-NOTS

The *hukou* system was introduced in 1958, the same year as the Great Leap Forward, a disastrous industrialization plan in which millions of mostly rural residents starved to death. The *hukou* system trapped them in a countryside that could not produce enough food to feed them, and it prevented them from moving to one of China's comparatively resource-rich cities.

But as China's urban manufacturing sector grew rapidly after the 1978 economic reforms, its factories needed cheap labor — lots and lots of cheap labor — to keep growing.

As the Chinese economy expanded, the *hukou* system has been reformed multiple

times to accommodate the voracious labor needs of urban factories. These reforms created a class of temporarily urbanized rural workers, and in 2013 a major series of economic reforms laid out a plan to make hundreds of millions of temporarily urbanized workers into legal city residents within 20 years in order to make China's economy more sustainable and efficient.

But increasing urban populations by that much could be dangerous, Gallagher says, inviting an enormous population

illegal immigration, Gallagher says, creating similar conflicts about stolen jobs and the appropriate use of government support systems.

"Illegal immigration in the United States creates this huge debate about how inclusive we should be," Gallagher explains. "What rights should people have? How long should someone have to wait to become a citizen, and when do they get to enjoy the benefits of that citizenship?"

It was China's 1978 economic reforms

THE HUKOU IS HEREDITARY: IF YOUR PARENTS HELD A RURAL HUKOU, THEN YOU ALSO HOLD A RURAL HUKOU — EVEN IF YOU WERE BORN IN A CITY AND HAVE NEVER BEEN TO YOUR HOME VILLAGE.

into cities that lack the infrastructure to support them.

"I don't think we appreciate enough the dramatic competition over scarce resources that this urbanization will engender," says Gallagher.

In a country with over a billion people, the resources in question here run the gamut from food, clean water, and clean air to sanitation, employment, law enforcement, and access to education.

The situation isn't wholly dissimilar to issues in the United States surrounding

which opened the floodgates for economic development and urbanization. But while there were enough legitimate economic opportunities to create a Chinese middle class from almost nothing, economic liberalization also led to a dramatic increase in less legitimate opportunism in the form of government corruption.

SQUEAKY WHEELS

China has experienced meteoric economic growth throughout the past three and a half decades — modernizing 10 times as

fast as Britain did during the first Industrial Revolution and with 100 times as many people. Most economists would tell you that such high growth precludes equally high levels of corruption, but, oddly, China has both corruption *and* growth.

"We are often puzzled as to why China has a high-growth economy but is, at the same time, a really corrupt country," says Yuen Yuen Ang, an assistant professor of political science whose research focuses on

the connections between corruption and growth. "We think that these things are not compatible, but we need to think about the different types of corruption."

In China, someone who is pulled over by a policeman might be asked for a bribe. That's petty corruption, Ang says, something that Americans would be shocked to see in their own country. But a high-stakes situation in which powerful politicians



(LEFT) **Former Prime Minister Wen Jiabao, who once made a rare public comment in support of a series of automotive strikes at Chinese factories (see opposite page).**

(ABOVE) **An ongoing anti-corruption campaign by Chinese President Xi Jinping (on left) has led to the investigation and arrest of hundreds of government officials. The campaign, which began in 2012, continues today.**

THE WORTH OF A WORKER

Strikes are technically illegal in China — mentioned only rarely on state-sponsored newscasts — but they seem to be on the rise. With 1,171 strikes recorded between 2011 and 2013, and 569 strikes during the last quarter of last year, China has experienced a quadrupling of its monthly strike totals, especially on the coast, far from China's capital Beijing. ■ Here are some facts and figures to shed light on some significant Chinese strikes and the magnitude of the country's manufacturing woes.



'89 DEMOCRACY MOVEMENT
April-June 1989
Up to 1.2 million protesters
Beijing

TIANANMEN SQUARE
BEIJING

HONDA LOCK STRIKE
JUNE 2010

■ 500 workers
■ Zhongshan,
Guangdong

DONGGUAN MASSTOP LIQUID CRYSTAL DISPLAY CO. STRIKE
SEPTEMBER 2014

■ 16,000 workers
■ Dongguan,
Guangdong

YUE YUEN FACTORY STRIKE
APRIL 2014

■ 30,000 workers
■ Dongguan,
Guangdong

DONGGUAN
ZHONGSHAN HONG KONG



Counter Strike

LARGELY DUE TO THE government's one-child initiative launched in 1980, China's population is disproportionately aging, and its working-age population has shrunk in absolute size. This means that China, a country of 1.4 billion people and the manufacturing capital of the world, finds itself the victim of a labor shortage.

As often happens in a labor shortage, the power balance has shifted ever so slightly in workers' favor. And because workers in China are primarily rural hukou holders, the power shift has empowered workers to bargain, file disputes, and go on strike.

In 2010, workers in a Honda supplier factory in southern China went on strike for higher wages and better treatment, and the strike spread to automotive factories all over China. It forced Honda to completely shut down production because they could not source the necessary parts.

"The interesting piece was that the strikes were reported in the Chinese media," Gallagher says. "The prime minister commented on the strikes in a press conference and said, 'We think Chinese wages should go up.' It was a signal that even though strikes are illegal in China, the Chinese Communist Party was going to tolerate the strike."

The strikes reveal the difference between younger workers' expectations and the expectations of preceding generations. While older generations of migrants were willing to take on dangerous and terrible jobs that no one else wanted, this

30%
of Chinese citizens live in cities legally

20%
of Chinese citizens live in cities illegally or on temporary permits

50%
of Chinese citizens live outside of cities

1,171
strikes between
June 2011 and December 2013
(39 strikes/month)

569
strikes between October and December 2014
(189 strikes/month)

younger generation is wealthier, more educated, and, therefore, more likely to demand safe working conditions and decent pay.

"In 2010, I started to notice what I called the hairstyle test," recalls Gallagher. "I'd be in a factory, and when the young workers would walk off to go to lunch, I noticed their fabulous hairstyles — dyed dark red hair or a Justin Bieber haircut. And I'd think, 'Hmm, I can't really see them returning to a village to farm.'"

bestow some significant benefit on a supporter — say, a lower tax rate or a good deal on some prime real estate — might seem more familiar.

“As an economy advances, corruption changes forms,” Ang says. “It’s typically legalized, looks very sophisticated, and no longer touches the lives of regular people.

“Real estate developers might make an exchange with party secretaries in China to get the land they want, for example. That does not impede economic growth. That is economic growth,” Ang says. “But it is bad economic growth because it is an unfair distribution of resources and, arguably, it can create distortions like real estate bubbles in the long run. But in the short run, it’s growth.”

I PAID A BRIBE

Recent efforts to curtail corruption at both the local and national levels have been somewhat successful, Ang says, but some attempts to crowdsource information on petty corruption failed to gain traction in China.

The website I Paid a Bribe collects information reported by individual citizens on government corruption. If someone demands extra money to process your passport request or register your child’s birth certificate, then you could go online and anonymously report the details of the

bribe: where and who you paid, and how much. Theoretically, that person could then be prosecuted by the government.

But while I Paid a Bribe was hugely successful in India, the site failed to gain traction in China, which Ang attributes to a lack of civic engagement.

In America, Ang says, people are more heavily connected to their local communities than in China. The connection encourages them to operate with what French political philosopher Alexis de Tocqueville called “enlightened self-interest.”

“So to advance my own self-interest, I need to learn how to work within a community and contribute to my community,” Ang explains. “And that remains a very vibrant part of American society today.

Champions of the East



With almost 40 faculty members across the University, the Kenneth G. Lieberthal and Richard H. Rogel Center for Chinese Studies is one of the most prominent academic centers on China in the world. U-M named the center to honor the contributions to scholarship and public policy on China of LSA Professor Emeritus Kenneth Lieberthal and the generosity of alumnus Richard Rogel (U-M '70, LLD Hon '09) and his wife, Susan. Pictured here are Professor Lieberthal (left), Richard Rogel (center), and Dean Andrew Martin (right).

People accept a general concept of their rights and responsibilities as citizens.

“When you look at China from a Western perspective, you assume that if the state took away its controls, then civil society would automatically pop up to replace it,” Ang continues. “But civil society isn’t something that just appears. It’s cultivated. You have to learn it.”

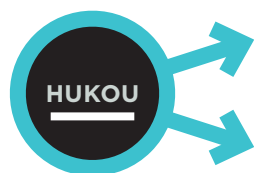
BEYOND CONTRADICTIONS

China is full of contradictions. It is a massive polluter and a huge investor in green energy. It is both a communist country and a country with massive, destabilizing inequalities between segments of its population. It is both a global leader and a developing nation with a comparatively low per capita income.

China likewise resists one-to-one comparisons with other developing countries. Its size and economic success make it different than countries in Eastern Europe and the former Soviet bloc, which

RISKS AND RESIDENCY

China needs factory workers to keep its export business booming, but changes to the country’s residency rules could be risky. Here’s a quick guide to some of the possible reforms and their effects.



**RELAX
REGULATIONS**

The number of legal permanent residents of urban areas increases.

More people get access to local education and health care.

**TIGHTEN OR
MAINTAIN
PRESENT
REGULATIONS**

The number of legal permanent residents of urban areas remains the same or decreases.

Access to local education and health care resources remains closed to temporary and illegal residents.



A pro-democracy protester uses a smartphone as a video camera during Hong Kong's "Umbrella Revolution" demonstrations. Hong Kong's high standard of living and liberal censorship laws differentiate it from mainland China, where public dissatisfaction isn't necessarily tied to pro-democratic values.

CHINA HAS EXPERIENCED METEORIC ECONOMIC GROWTH THROUGHOUT THE PAST THREE AND A HALF DECADES. MOST ECONOMISTS WOULD TELL YOU THAT SUCH HIGH GROWTH PRECLUDES EQUALLY HIGH LEVELS OF CORRUPTION. BUT CHINA HAS BOTH.

also made transitions from planned to market economies. Its culture and government structure are so different from India's — which, like China, governs a massive population within the borders of a single nation-state — that it is unclear what economic lessons the two can learn from each other. As a bundle of contradictory forces and states, China seems difficult to define except on its own terms.

But one analogy that might shed light on the future of China and the challenges

of China's present — one way of understanding the relationship between China's government and its citizens — is that of a parent and child.

"When the Chinese economic reforms started [in 1978], the people were like a baby," Ang says. "Raising an infant is exhausting, but in some ways, it's simple. You don't have to spend much time worrying about what a baby wants on a psychological level. The government really just needed to meet the people's basic needs, making

sure people had food, jobs, industries, and culture.

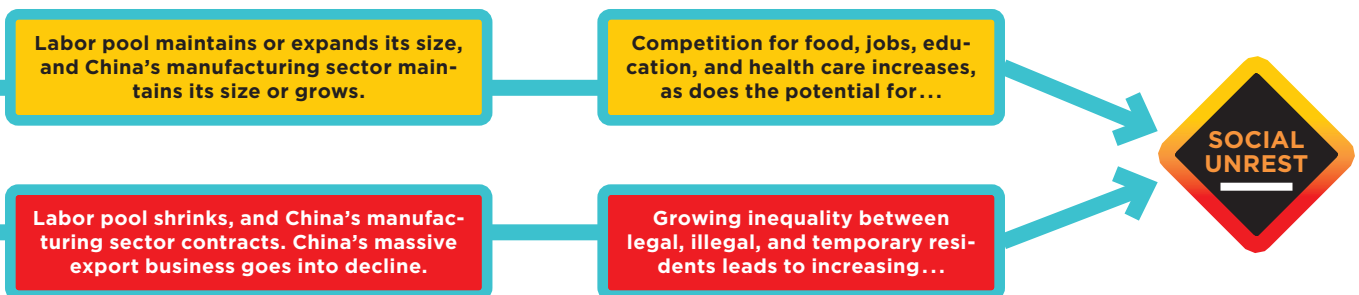
"Now, the people of China are growing up. They're becoming like teenagers. There is this growing middle class which has increasing and increasingly complicated demands. Now that many Chinese have risen out of

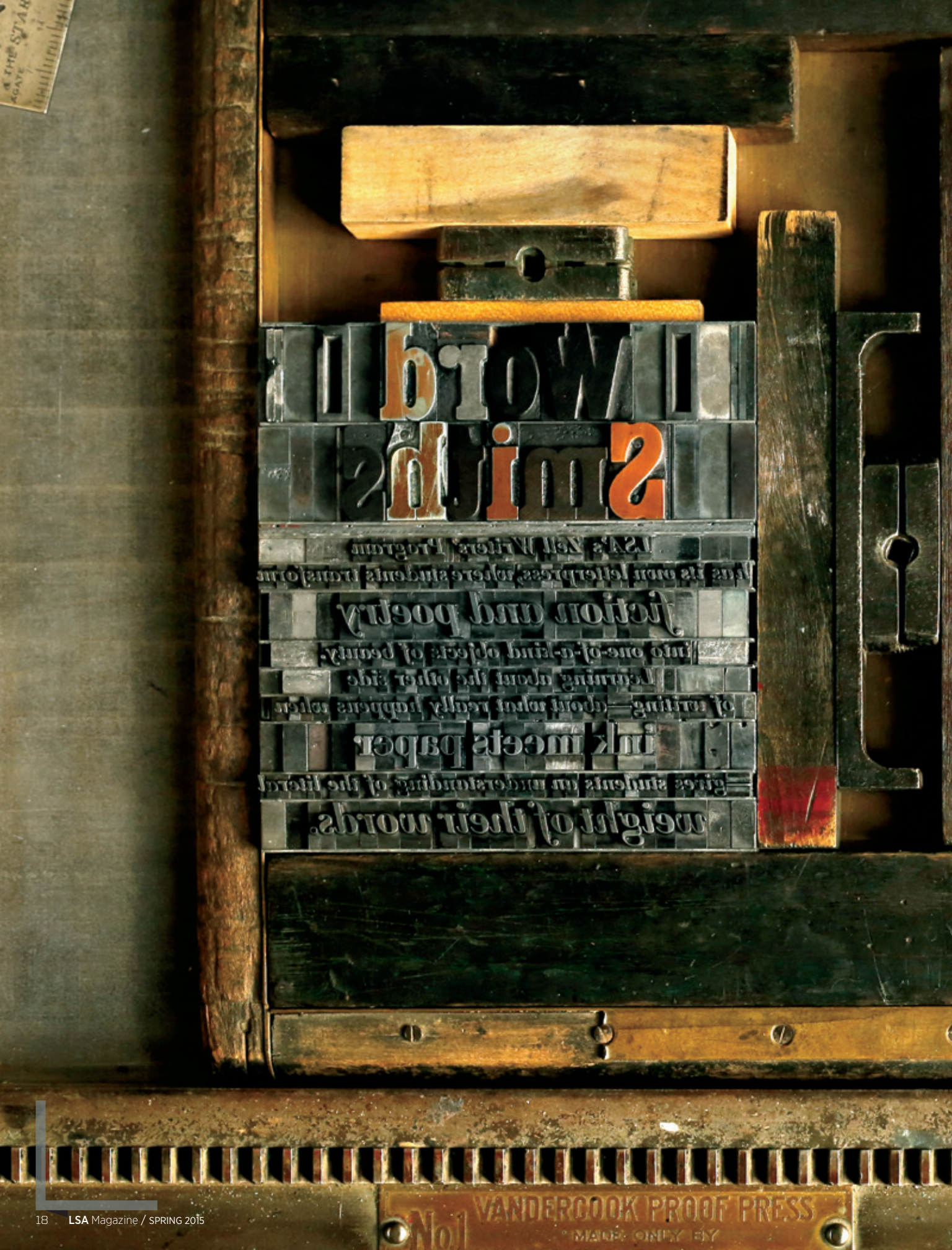
absolute poverty, they expect things like environmental protection and government accountability.

"The people and the government have to learn to have a good relationship with each other," Ang suggests. "The teenager has to learn to be a good teenager, a reasonable teenager, and the parent has to adapt and learn how to respond to the teenager's demands. I can't say whether they will be successful at that or not, but I can say that the last 30 years have shown China as a country to be very resilient, and absolutely determined to solve whatever problems it has at hand." ■

Susan Hutton is the social science writer for the College of LSA.

Brian Short is the editor of *LSA Magazine*.





A THE STAR
AGATE

No. 1 VANDERCOOK PROOF PRESS
MADE ONLY BY

Word Smiths

*LSA's Zell Writers' Program
has its own letterpress, where students transform*

fiction and poetry

into one-of-a-kind objects of beauty.

*Learning about the other side
of writing—about what really happens when*

ink meets paper

*—gives students an understanding of the literal
weight of their words.*

by Fritz Swanson

This sentence is made of words, which can be broken down into letters. And while that might

seem like the smallest unit that we can get to, even letters can be divided into smaller components. A “stem,” for example, is a vertical stroke, like you find on the left side of an L or an R. A “counter” is an enveloped space like the one found in an o, e, b, or d. Every week, students in LSA’s Helen Zell Writers’ Program are asked to come to a place where they very carefully consider issues like these as they choose the shape, size, and weight of their words.

That place is Wolverine Press, which I direct and helped found. Wolverine Press is a printing studio organized around a 100-year-old, 1,800-pound letterpress machine that rolls ink onto metal type that is held in frames — called chases — and presses the metal type against individually loaded pieces of paper. The process preserves the practical craft of printing as it was invented by Johann Gutenberg in the 15th century, giving student writers the opportunity to become intimately familiar with the most important elements of printing — type, ink, and paper.

It’s important work, but it takes time. We — the students and I — labor for weeks in our space to prepare an edition of a single poem, and we don’t do it just because the press is there, or because it’s old, or because we have too much free time. We do it because we believe that this kind of craftsmanship ennobles the writer whose work is printed, the printer responsible for the piece, and the reader who enjoys each final, unique product.

These values owe a lot to a man named [John Ruskin](#).



and the industrial world, where both the mill owner and the workman were enslaved.

At its heart, Ruskin’s thinking grapples with how our society has divided the work of the mind from the work of the body, and thus made both kinds of labor sad and incomplete. His work spawned a revolution in aesthetics that we are still living with. Whenever you hear people talking about craftsmanship, about artisans and the preservation of traditional skills, that’s John Ruskin you are hearing echoing down through the years.

In a traditional apprenticeship, a boy (often called a “devil”) would be indentured to a master printer at the age of 12 or 13, and until the age of 21 he would labor by his master’s side to learn the craft of printing. Though a printer was a craftsman like a carpenter or a blacksmith, apprentices would learn to read, sometimes not just in English but also in Greek and Latin. One of his first jobs might be to disassemble Hamlet letter by letter through a process called “distribution,” putting each letter back into its appropriate spot in the type case. And though the letters were upside down and backwards, the apprentice would come to know his work so well that he could recite whole passages of the play by heart by the end of the printing. By the time an apprentice left his master, he would be able to compose his own short essays and stories directly in type, setting each letter by hand, hundreds of words an hour, and thousands every day.

The modern world can’t accommodate anything like the immersive experience of a traditional apprenticeship, but we give our graduate students a taste of that life. Kat Finch, a second-year graduate student, came in on the first day of last semester and immediately set to work on a poem written by one of her professors. Over the course of the first month of the semester, she set

DEVILS AND DETAILS

Born in 1819, Ruskin grew up in England at the height of the Industrial Revolution. In Ruskin’s England, the ancient meadows were cut open to make way for canals and railroads, the old country churches were demolished in favor of towering cotton mills, and the spring breeze was heavy with deadly chemical fogs amid the constant whine of steel lathes.

To Ruskin, the whole of the Renaissance had been a mistake. Humanism and learning had led to individualism, nationalism,

Built at the beginning of the 20th century, the Wolverine Press letterpress is made of steel and iron. The round metal plate at the top of the machine is the ink disc, and it holds fresh ink that is applied to the type before each sheet is printed.



**The modern world can't
accommodate anything like the immersive
experience of a traditional
apprenticeship, but we can give
our graduate students
a taste of that life.**



all of “To Make Various Sorts of Black” by Lorna Goodison, and enjoyed ample time to consider the placement of every letter and word in that poem.

There are four devils in the shop this year, and they work between three and 20 hours a week, depending on the scale of the work and the urgency of the deadline. The shop immerses them in the old craft of printing so that they can see their own writing from the other side.

In this way we live out Ruskin’s dictum: “It is only by labour that thought can be made healthy, and only by thought that labour can be made happy.”

JUST MY TYPE

The printing press housed at Wolverine Press was purchased by the Zell Writers’ Program in 2014. It was built around the year 1900 by the Chandler & Price Company of Cleveland and was used by the Parma News Publishing Company until it was sold to Thomas Trumble, a farmer and former employee of Parma News. It was from Trumble’s estate that the press finally came to the Zell Writers’ Program.

Since 2014, Wolverine Press has introduced 15 devils — fiction writers and poets — to the craft of printing and has produced five printed projects, including poems by Eduardo Corral, Paisley Rekdal (M.F.A. ’96), and Lorna Goodison, and an excerpt from Jane Smiley’s novel *Horse Heaven*. Each project was challenging and rewarding in its own way, but the press’s fifth project, completed last fall, had a special resonance for many of us: It was a story written by our beloved professor Nicholas Delbanco, printed on the occasion of his retirement.

Delbanco, the Robert Frost Distinguished University Professor of English Language and Literature, is the author of 16 novels, numerous short stories, essays, textbooks, speeches, and an endless supply of show-stopping anecdotes. He is hard to classify in terms of his importance to the University of Michigan writing community because he, more than anyone else, created it.

From the mid-1980s until the end of the century, he presided over the master of fine arts program in creative writing and directed the Hopwood Writing Awards. It was Professor Delbanco’s vision to create a community that is truly communal in character, where the students and faculty are never in competition with one another for resources or attention, but where, for three years, the pressing concerns of the banks and the

Fritz Swanson (top opposite page) runs Wolverine Press and the Devils apprentice project, including graduate students like Amanda Rybin Koob (M.F.A. ’16, bottom opposite page).

In addition to Nicholas Delbanco’s story “Composition,” Wolverine Press has also printed the work of novelist Jane Smiley, the poems of former LSA Professor Lorna Goodison, and short editions of the literary magazine *harlequin creature*.

businessmen can be set aside, and writers can focus on writing for its own sake. Through Professor Delbanco’s leadership and the unprecedented support of Helen Zell (’64), who donated \$50 million to the master of fine arts program and for whom the program is now named, that vision is now a reality.

After 30 years of his leadership it was, of course, very sad to hear that Professor Delbanco was finally stepping down. But at the same time, when we looked around at the program we worked in, we — his fellow faculty members, his former and current students — could feel something of his satisfaction. The community is thriving. He did what he set out to do.

Because of all this, I wanted to do something special for Delbanco’s retirement. But I was limited by how much type the press did — and didn’t — have. When we type away at our computers, or even when people type away on their typewriters, we see

An American Original

IN THE WAKE OF TRAGEDY, AN AMERICAN TYPE DESIGNER MAKES HIS MARK.

In January 1908, **Frederic Goudy** watched his young business, The Village Press, burn. The police held Goudy back as his printing presses crashed through six fiery floors.

“They didn’t let me go to my own fire,” Goudy said later.

A decade of type designs were destroyed in the fire, forcing Goudy to do freelance advertisement illustrations for money.

In 1911, the publisher Mitchell Kennerley came to Goudy with the story collection *The Door in the Wall* by H.G. Wells. Inspired, Goudy persuaded Kennerley to not use the nearly

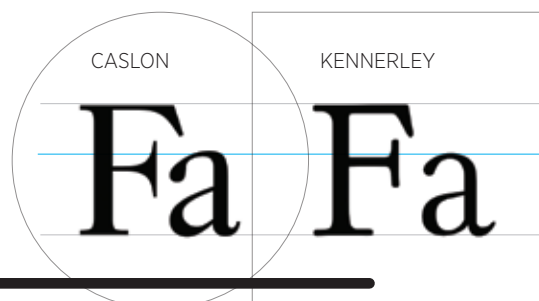


200-year-old Caslon typeface, which could be readily purchased. Instead, Goudy wanted to design a new typeface. He named the style Kennerley.

When you compare Kennerley to Caslon, the

difference is stark. The Kennerley letters swagger, bowlegged and proud, while Caslon’s are rigid and formal. The Kennerley letters are also bigger, and sit more tightly together (like good, slightly drunk friends) so that a line of Caslon runs longer, and looks looser.

Goudy drew the whole alphabet by hand in just a few days. The result was an instant American classic.



The short story
is transmuted in the process.
The story is not just ideas or
beauty or language; it is also
letters and lead and paper.
It's skill and time and sweat
and love.



printed letters spiraling out endlessly. But in a print shop, if I have 35 lower case a's in 12-point Bodoni bold, then I can't use that type to set a poem that needs 36 a's. Even though we have literally a ton of type, there are only a few sizes and styles that we have enough letters for that can be used to set work.

For this reason, we had focused almost exclusively on poetry before Professor Delbanco's retirement. But the occasion inspired us. We decided that we needed to produce an edition of an entire short story, choosing his very first short story, "Composition," published in 1979. At 2,384 words, it's almost the same length as the article you are reading. But even a story that short — with 1,391 lower case e's and 790 lower case a's — was impossible to print with the type resources that we had. It was time to cast new type.

WHAT WE LIVE FOR

There are only two commercial type foundries left in America, both very small operations. Beyond that, there are perhaps 50 or 100 hobbyist type casters in all of North America. In the whole world, there may be fewer than 500.

One type caster happens to live in Washtenaw County, and he very obligingly agreed to help us cast enough type to set the whole of Delbanco's story. One of the shop devils, Maya West (a fiction M.F.A. candidate), helped operate a nearly 100-year-old casting machine that injects molten lead from a pot heated to 700 degrees Fahrenheit into a mold. At the end of the mold, a special die is attached that prints the face of each letter onto the cooling lead. After four days of work, we had cast more than 100 pounds of type, enough to print Professor Delbanco's story.

The typeface we chose was 14-point Kennerley Old Style. Kennerley was designed in 1911 by Frederic Goudy for publisher Mitchell Kennerley and is considered by most authorities the first original American typeface. We felt it matched Professor Delbanco's important role in American letters and creative writing education.

When you examine Kennerley, you can feel the human hand in the slight bowing outward of the upper case A, or in the

Wolverine Press purchased the bulk of its type from the estate of a Michigan printer, John Moran of Muskegon, including several tons of cabinetry and type ranging in size from 72 point (equal to one inch) all the way down to 6 point (1/12 of an inch).

asymmetry of the bowls of the lower case b's and d's such that the d is not just the inversion of the b, but is truly a separate artistic creation. (The trailing serif of the lower case z also has a jaunty little zip to it; I recommend checking it out.)

This was the type we used to set "Composition." As a small chapbook, the story ran for 32 pages with illustrations, plus a flyleaf and a cover. We printed an edition of 250. Setting the type took us a month and a half. It took another month to build the forms for printing, to proof the forms, and to correct the proof. And it took still another month to print the sheets, cut them, collate them, hand sew them, and glue the cover on. From the time we selected the text and prepared to cast the type all the way to the night when we delivered our edition to a dinner celebrating Professor Delbanco's life and work, we spent eight months working on the project.

The short story is transmuted in the process. The story is not just ideas or beauty or language; it is also letters and lead and paper. It's skill and time and sweat and love.

Here is the opening paragraph of the story, which I have been living with for almost a year:

Food, clothing, shelter, our teachers instructed us, are the three conditions of dignified survival. Man requires each. It's a comprehensive list and makes a kind of catch-all sense, but lately I've found myself questioning it; why not air, for instance, or any of the things we swear we live for — art, tactile alertness, God, love?

The story is a meditation on the dichotomy between the physical world we live in and the internal spiritual and aesthetic world we live for. Our hope with Wolverine Press is that it shows our student devils, and anyone else who comes into contact with the press or one of our projects, that those worlds don't have to be separate. We aren't preserving the antique work of printers be-

cause it is antique; we are doing it because craftsmanship matters. In writing and in printing, that is equally, elementally true. ■

Fritz Swanson (M.F.A. '01)
founded and runs Wolverine Press.

A Devil's Work

Here's what it feels like to work at Wolverine Press:

First, choose a poem. Now count the lines. Then count the letters in the last line, how many s's, how many o's, that kind of thing. Next, you'll set down a series of lead strips that the type will rest on. Then you add the letters and the spaces between the words until the line is completed.

When you're finished with that line, lay another strip of lead on top of it, like

mortar, and set out the second-to-last line of the poem there. Then, lay another strip and another line. The poem rises up in its frame like a wall being built.

Typesetters have been called "word masons" because of this building and stacking process. And the letters, like stones, have weight that bears down. A sonnet might weigh three or four pounds, galley included. Once the poem is locked up into its steel chase, the whole unit can weigh from 10 to 30 pounds.

The galley must be carried from cabinet to press, the paper cut and prepared, and the press hand-fed, one print at a time.

Remove the sheet from the feeder and voilà, you have printed exactly one page of text. Congratulations. You have earned the right to start over at the very beginning.



WATCH A VIDEO OF WOLVERINE PRESS
PRINTING NICHOLAS DELBANCO'S
"COMPOSITION"
www.lsa.umich.edu



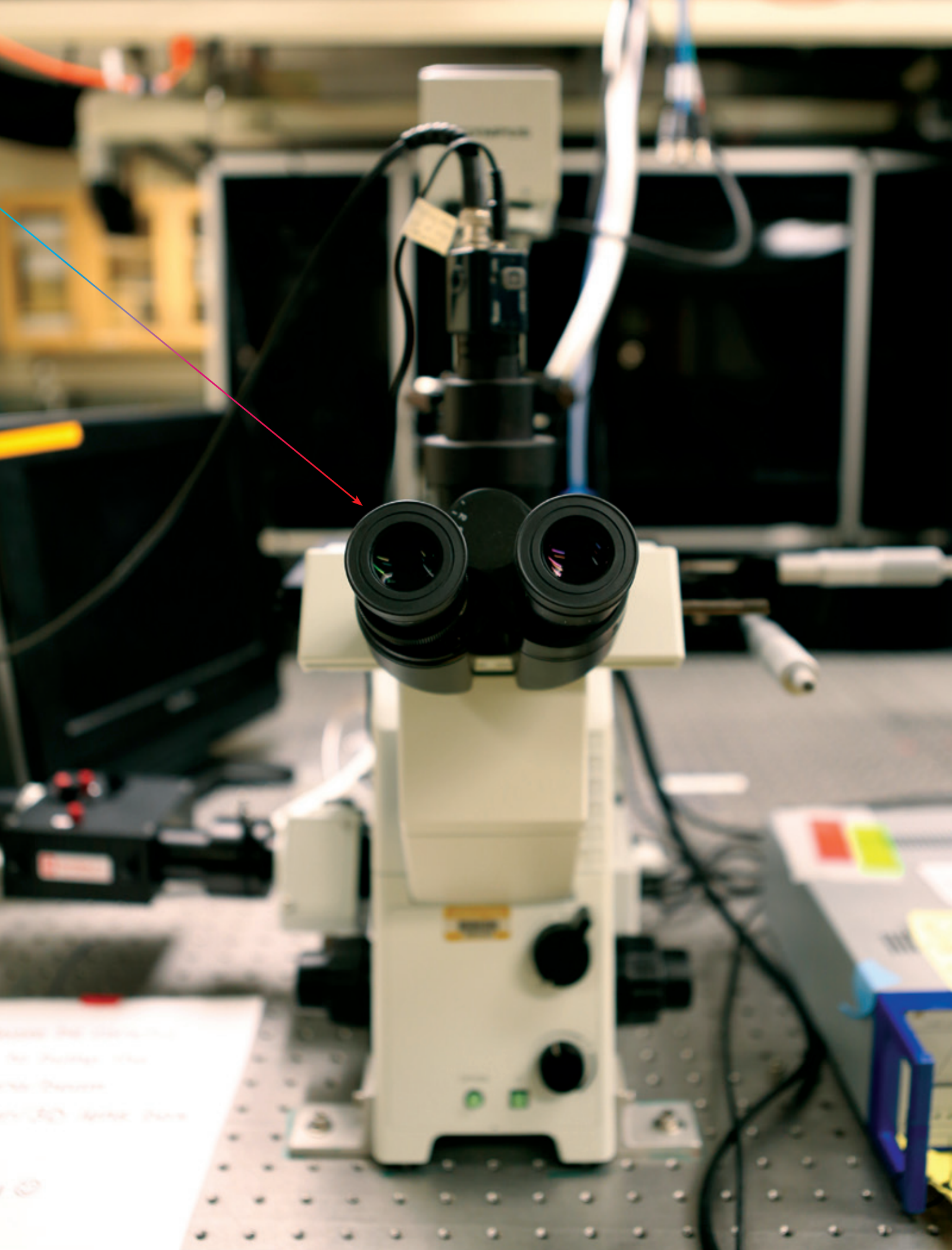
THE SCIENCE OF SMALL

THIS IS A **GRAIN OF SALT**.

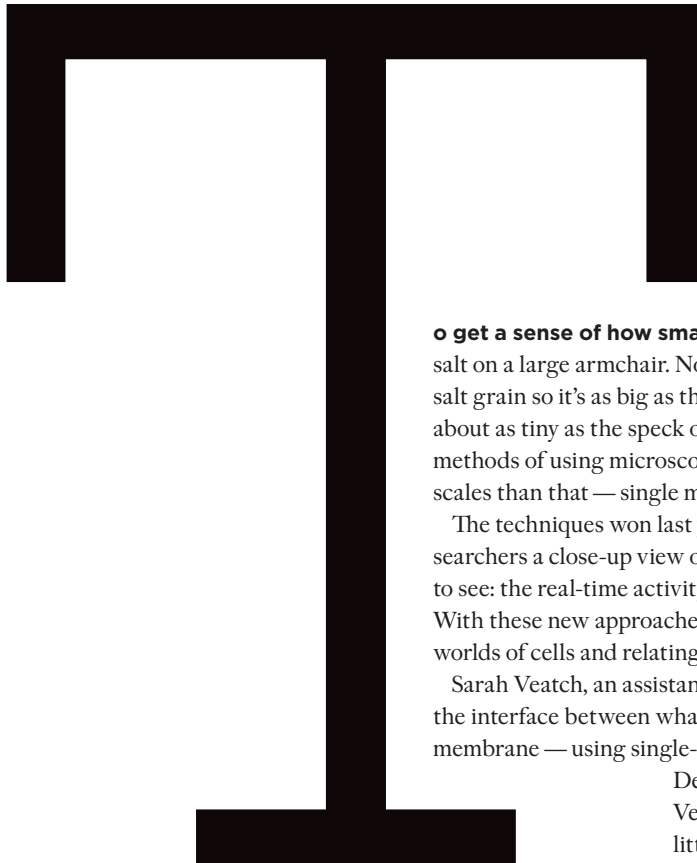
A PROTEIN IS **50,000 TIMES** SMALLER...

LABS IN LSA ARE USING NOBEL PRIZE-WINNING MICROSCOPE
TECHNIQUES TO LOOK CLOSELY AT WHAT SCIENTISTS
ONCE THOUGHT WOULD STAY INVISIBLY TINY—**MOLECULES MOVING
AROUND INSIDE OF CELLS**. THE NEW VIEW MAGNIFIES SOME
MAJOR POSSIBILITIES FOR HOW WE MAY ONE DAY SEE THE WORLD.

by ELIZABETH WASON. photographed by ROB HESS.



“What you’re looking at is **this one protein that’s moving around through the cell, kind of hopping around,** and one thing we noticed is that it loiters for longer at the center.”



To get a sense of how small a bacterial cell is, picture a single grain of salt on a large armchair. Now imagine that you can stretch the size of the salt grain so it’s as big as the chair. A bacterium sitting on the grain of salt is about as tiny as the speck of salt relative to the armchair. In recent years, new methods of using microscopes have allowed researchers to see at even smaller scales than that — single molecules inside bacteria and other living cells.

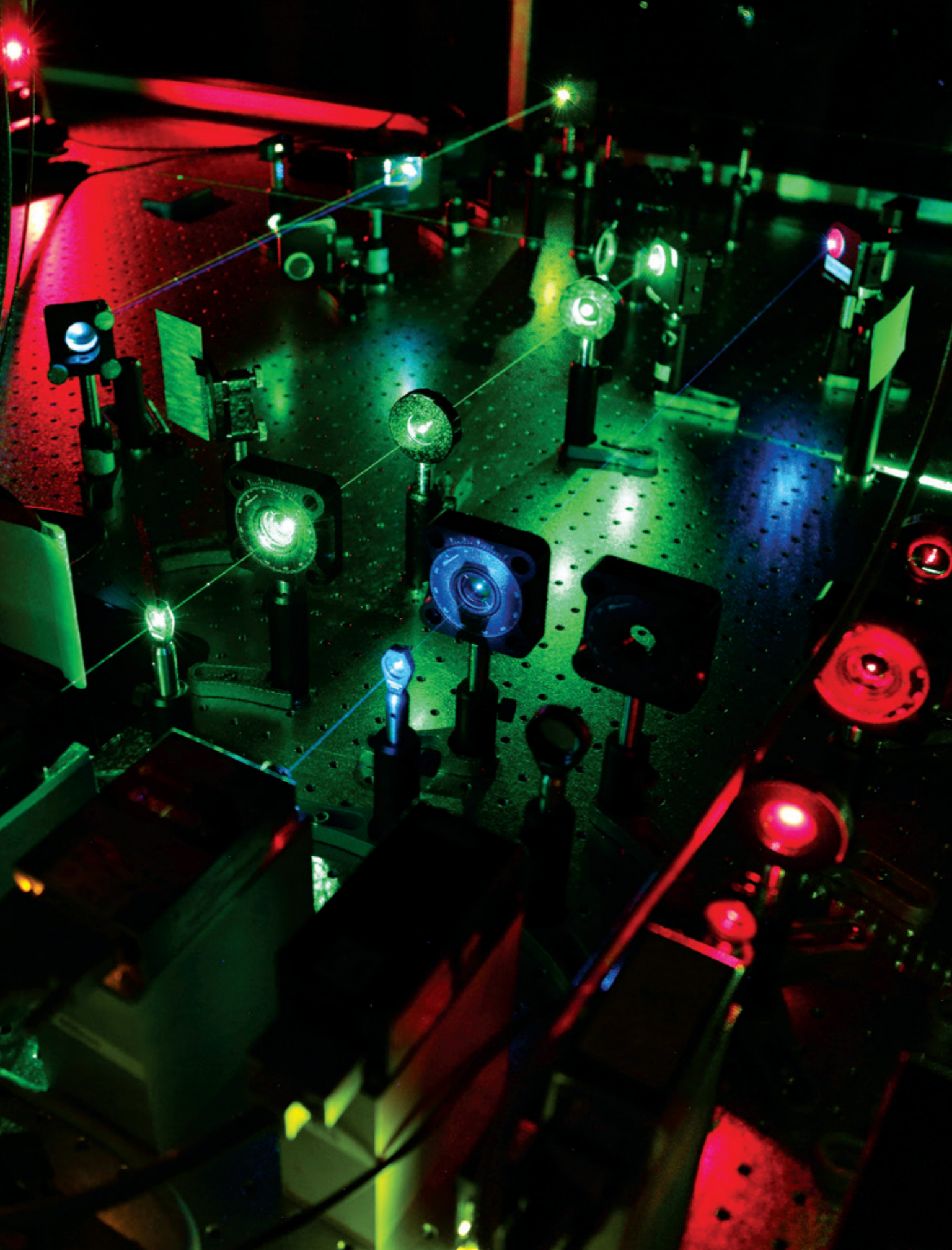
The techniques won last year’s Nobel Prize in Chemistry for giving researchers a close-up view of what they once thought might be impossible to see: the real-time activity of individual molecules inside living cells. With these new approaches, LSA professors are gaining access to the tiny worlds of cells and relating those tiny worlds to the way our bodies work.

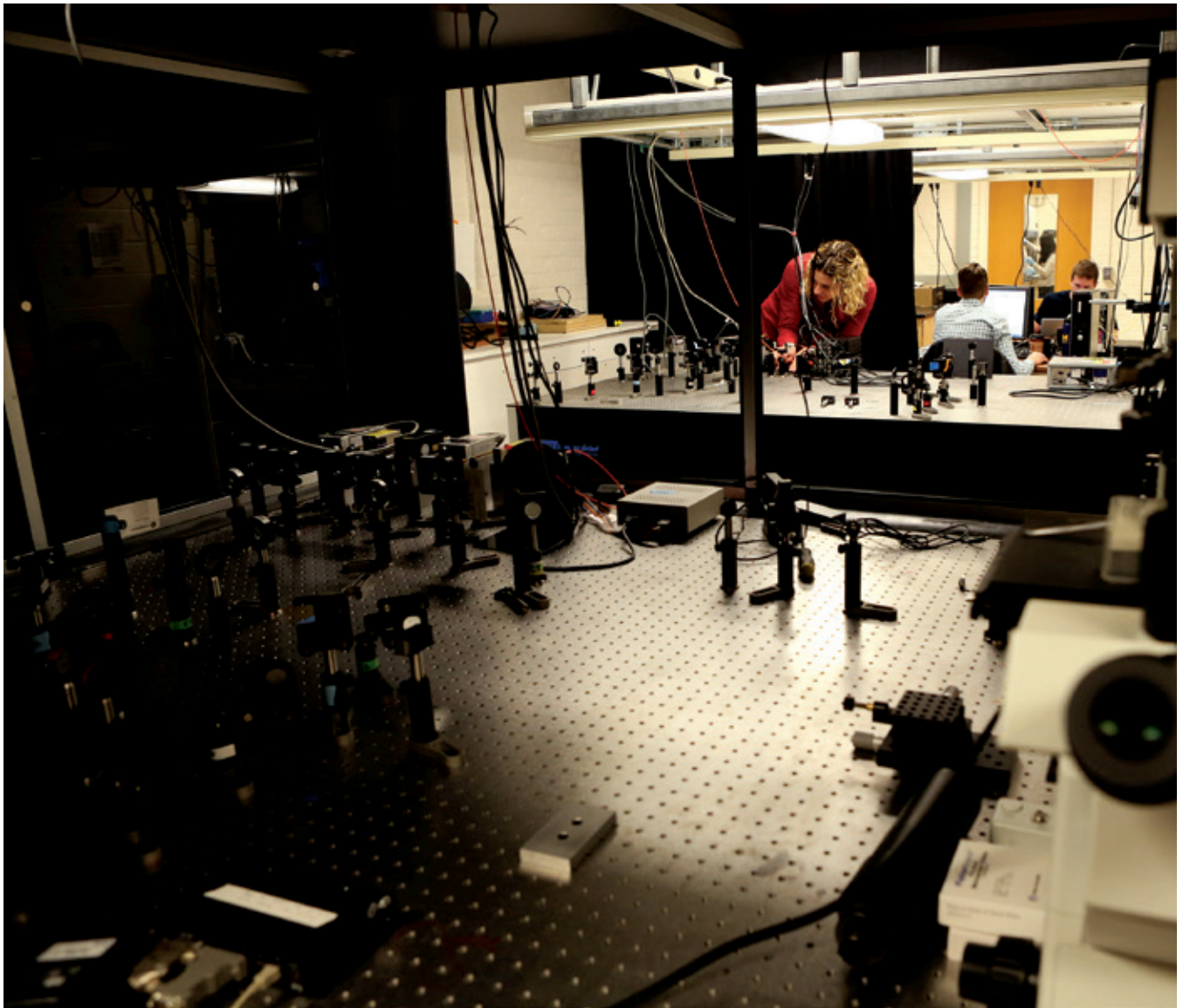
Sarah Veatch, an assistant professor of physics and biophysics, examines the interface between what’s inside a cell and what surrounds it — the cell membrane — using single-molecule tricks. Associate Professor of Cell and

Developmental Biology and LSA alumna Kristen Verhey ('87) watches mobile molecules crawl along little tracks within a cell; she can even manipulate single molecules to measure the “horsepower” of their molecular motors. And Assistant Chemistry Professor Julie Biteen — who has worked with W. E. Moerner, one of the Nobel Prize winners — tracks the position of individual molecules as they go about their business inside a single tiny bacterial cell.





“What you’re looking at is this one protein that’s moving around through the cell, kind of hopping around,” Biteen says, referring to a movie she shot under a microscope of a bacterial protein called MutS. “And one thing we noticed is that it loiters for longer at the center. It’s moving in a sea of other proteins that haven’t found their targets yet. That distinction

Researchers often use optical tables like this one to get a close look at the molecules inside cells. Shoot a labeled molecule with a laser, and it lights up. Shoot a bunch of labeled molecules with lasers under the microscope, and a glowing map of molecules comes alive in the cell.





HOW *SMALL* IS SMALL?

OBJECT ACTUAL SIZE Size Ratio of Object to Protein	PROTEIN 10 NANOMETERS 1:1	ABBE'S LIMIT* 200 NANOMETERS 20:1	BACTERIAL CELL 5,000 NANOMETERS 500:1	NAKED-EYE LIMIT** 100,000 NANOMETERS 10,000:1
ANALOGOUS OBJECT/DISTANCE	BLOCK M IN DIAG 	HILL AUDITORIUM STAGE 	U-M DIAG 	LSA BUILDING TO YPSILANTI WATER TOWER 
SIZE TO SCALE	3.68 FEET	73.6 FEET	1,840 FEET	36,800 FEET (6.97 MILES)

*A now-obsolete theoretical lower limit to what we can see using a microscope

Bacterial cells **traditionally have had a reputation for being uncomplicated, primitive, gelatinous bags of stuff.** As it turns out, they're well ordered and rather sophisticated.

between one slow-moving population localized at the center and another faster-moving population that's diffused all over the cell — a conventional experiment would really just wash out all those differences.”

While conventional test-tube experiments tend to stereotype similar molecules, crudely lumping them together as a group, single-molecule microscopy reveals just how unique individual molecules can be.

In Biteen's experiment, for example, MutS proteins hang out in the bacterial cell, scanning DNA and searching for errors in the DNA code. Biteen is testing the hypothesis that MutS moves quickly and efficiently to correct errors in DNA. In a traditional experiment, she probably would have dumped her bacterial cells into a test tube, not knowing where MutS proteins traveled in the cell, nor how fast they moved. But single-molecule methods give an accurate, nuanced view of the interior of a bacterial cell.

“What we've uncovered is that, because of specific interactions with other proteins, the MutS proteins are poised and ready, so that they're there when a mistake happens,” Biteen says. Dozens of MutS proteins constantly swimming around inside the cell thus act as “lifeguards” that save the cell from hazardous mistakes in the DNA code.

Single-molecule techniques allow researchers to

note subtle differences among molecules, rather than rely on generalizations and assumptions based on how an average molecule tends to function in the cell. And the results potentially subvert our prejudices. For example, bacterial cells traditionally have had a reputation for being uncomplicated, primitive, gelatinous bags of stuff. As it turns out, they're well ordered and rather sophisticated.

Now that we can see the impossibly small, it's hard not to notice that the closer we look, the bigger our biases appear.

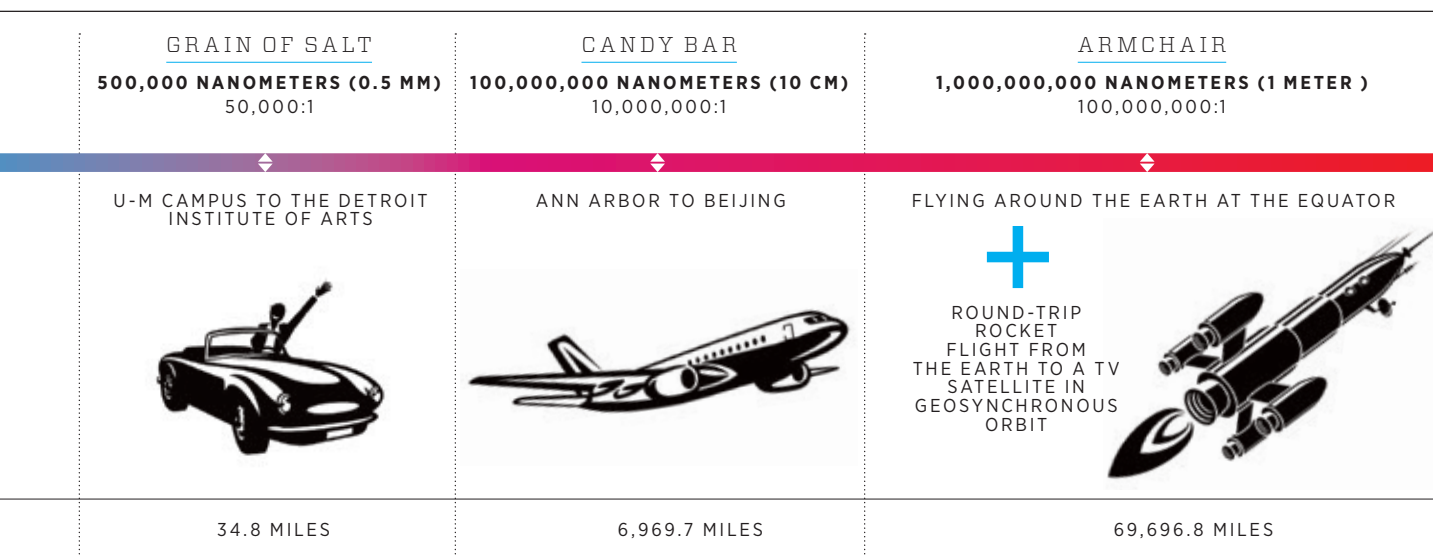
LASERS AND JELLYFISH

Looking at *living* cells — that's a key advantage of single-molecule techniques. Although researchers have produced stunningly high-resolution images under a microscope by other means for some time, those methods required the specimens to be frozen, in a vacuum, or sliced razor-thin. In a word, dead. With single-molecule techniques, researchers can observe in high resolution the real-time activity and interactions among molecules in living cells. And these explorations are possible thanks to a jellyfish and a laser.

Researchers can attach fluorescent proteins that act both as labels and as little biological spotlights on the molecules they want to see under the microscope.



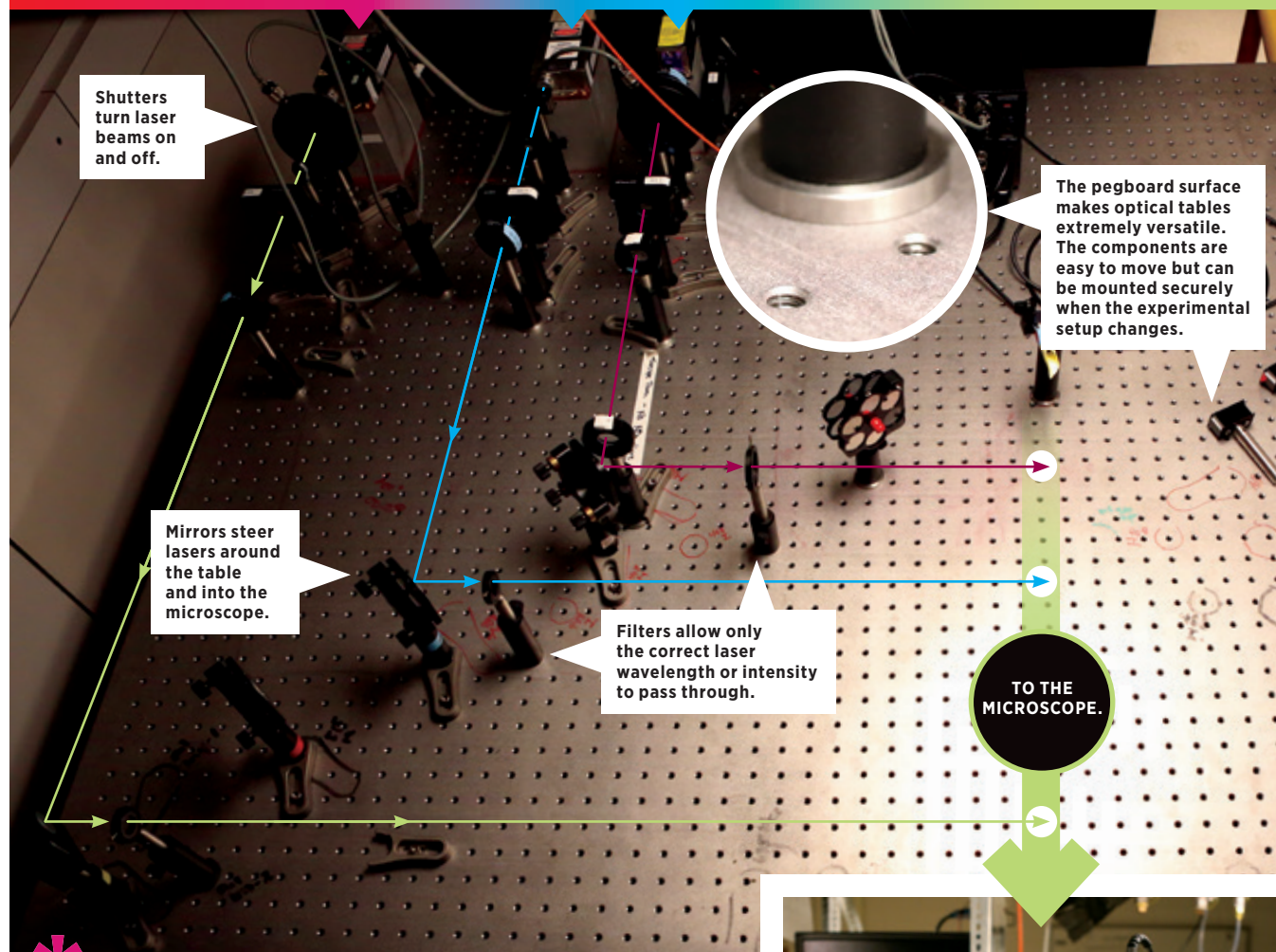
Assistant Professor Julie Biteen (above) holds up a precision rotation mount, which she uses in lab experiments (opposite page) to ensure that only the correct laser light hits the microscope.



**The smallest we can see with the naked eye

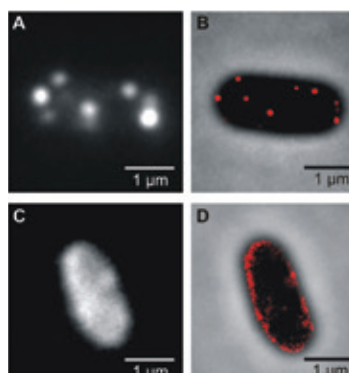
The Single-Molecule Photo Shoot

THE WAVELENGTH OF LIGHT DETERMINES THE COLOR OF A LASER BEAM. DIFFERENT LASER COLORS HAVE DIFFERENT EFFECTS ON MOLECULES.

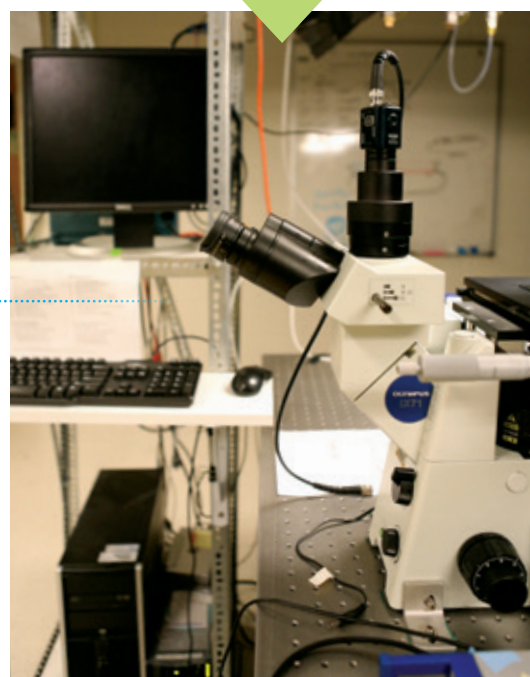


Optical tables are cushioned by air. The pneumatic table dampens even minuscule movements like sound vibrations that can disturb the lasers and change experimental results.

Optical tables don't shift in response to most nudges and bumps because they weigh hundreds of pounds.



Compare these photos of the interior of bacterial cells. Blurred spots (on left) are molecules photographed using older methods. Red spots (on right) are molecules shown in high resolution using newer techniques.



One day, a physician may be able to **hold a device over a person to see exactly which of her molecules needs tweaking**, so that a prescribed dosage of medicine can be fine-tuned for each patient.

Fluorescent proteins glow brightly when shot by a laser, illuminating the position of each molecule. The first fluorescent protein came from a bioluminescent jellyfish. Since then, researchers have found other fluorescent proteins in various reef corals and have created synthetic versions in the lab. They've devised a series of ingenious methods of attaching the fluorescent labels to target molecules.

One of these methods involves inserting the fluorescent protein's DNA into a cell's DNA right next to, let's say, the code for a target protein they want to examine. Each time the cell manufactures that protein by following the blueprint of its native DNA, the cell likewise creates a glowing label that's integrated into the protein, based on the instructions in the introduced DNA. "The cell puts what I think of as a 'backpack' on each protein," says Biteen.

This fluorescent backpack, conveniently manufactured and attached to the specific target protein by the cell's own machinery, glows when it's hit by a laser, allowing researchers to witness what goes on in a cell at the tiniest scale.

THE DIFFERENCE A MOLECULE MAKES

Nils Walter has enormous ideas for what researchers can accomplish using single-molecule techniques. A professor in the Department of Chemistry, Walter directs LSA's Single Molecule Analysis in Real-Time (SMART) Center, which he and an ad hoc think tank of other U-M researchers helped to establish in 2010 specifically to carry out single-molecule experiments. The SMART Center offers five microscopes, multicolored lasers, and personalized assistance in designing single-molecule experiments for anyone who asks.

"We are at the cusp of being able to actually look inside a live mouse brain," Walter enthuses. In the past, researchers could employ fluorescent proteins to observe the mechanics of mouse cells, but the old methods gave researchers very little control over where those fluorescent labels would attach in a cell. But they've come a long way since then.

"Now, we have the tools to insert a fluorescent protein in a particular DNA or RNA sequence and label *exactly* this molecule in *that* position," Walter says. By using the fluorescent backpack method in a living mouse, it's possible to attach fluorescent proteins to



The trick to these single-molecule experiments is keeping everything dark, which gets rid of visual distractions in the cell; lasers brighten the one molecule of interest by illuminating its fluorescent label.

the biological components that have relevance to a human disease and see exactly how those factors behave in a living system.

After that, it's a matter of translating our understanding to human beings. "How we can really do what people refer to as 'personalized medicine' will depend on us understanding how these molecules actually interact, and how it's different in different people," Walter says. "We are individuals also at a molecular level."

One day, a physician may be able to hold a device over a person to see exactly which of her molecules needs tweaking, so that a prescribed dosage of medicine can be fine-tuned — quickly and effectively — for each patient.

As methods in science penetrate increasingly small worlds, scientists can help to rapidly expand our perspective on how the larger world works. They accomplish all this by viewing particles so small that observing them closely was once thought impossible.

"People are doing this," says Walter. "It's not science fiction anymore." ■

Elizabeth Wason is the science writer for the College of LSA.



A PRIZED INVITATION BEHIND THE CURTAIN OF THE NOBEL PRIZE

BY ELIZABETH WASON

W

WHAT'S IT REALLY LIKE TO BE AT a Nobel Prize ceremony?

Chelsea Wood, an assistant professor in the Department of Ecology and Evolutionary Biology and a fellow in the Michigan Society of Fellows, had the chance to attend the ceremonies in Stockholm, Sweden. (The Peace Prize is awarded at another event in Oslo, Norway.) Wood was on hand to receive a different award, the *Science & SciLifeLab Prize for Young Scientists*, for her research on the ecology of infectious diseases.

"They purposely scheduled our visit to Stockholm during Nobel week, so we could join in some of the Nobel activities," Wood says. "I had no idea how much the awards take over all of Stockholm! They happen right in the center of the city. There are luxury cars bringing laureates in and out as they attend all sorts of events during the week.

"The ceremony is in this big, beautiful, ornate hall," Wood says. "It was a totally opulent affair, highly regimented and choreographed. The ceremony of the ceremony made it surreal. The royal family was sitting off to the right, decked out in white tie and big, fluffy, tulle ball gowns. I don't want to focus on the fashion of the one female laureate, but May-Britt Moser, who helped discover 'grid cells' in the brain that encode spatial memory, wore a custom-made dress with a decorative pattern of crystals in the shape of those grid cells, which was awesome."

Wood was thrilled just to be close to Nobel laureates at an earlier reception, but a bigger highlight of her trip was having lunch with some of them. "It was fancy—white tablecloth, china plates with the gold Nobel seal, gold-plated silverware. To my left was Torsten Wiesel, a laureate from years back. And on my right: Edvard Moser, one of this year's recipients. Moser talked about his upbringing in Norway, how he and May-Britt hit upon the neuroscience path, and the discovery that eventually netted them the Nobel Prize.

"It was wonderful to get to know the two of them as humans, and not just



Amid the pomp and circumstance of Nobel week, Chelsea Wood traveled to Stockholm to receive the *Science & SciLifeLab Prize* (top right) last year. Wood was also in the audience for the Nobel Prize ceremony, which recognized scientists like May-Britt Moser (directly above, on left) and scientific developments such as single-molecule microscopy techniques.

as these rarefied recipients of science's greatest prize.

"The Nobel ceremony itself was extremely formal, but I think the personalities of the people who received the award came out at different points, like at the lunch. May-Britt is the person who sticks in my mind the most, because she is not a staid and stuffy academic. She's an effusive, enthusiastic speaker."

It took a while for the whole experience to sink in, Wood says.

"I didn't expect to be so moved by the Nobel ceremony. It made me so happy that there's an institution in the world that encourages and rewards scientists who work for the betterment of humankind."

42.22° N, 83.75° W

From Earth Day assemblies to infinitesimal insect investigations, our tour of campus starts here.



STUDENTS

Food Network

Students led the charge for a new minor focused on sustainable food, eager for a fresh entry point into one of the massive issues of our day.

by Matt Nelson

“YOU REALLY CAN’T QUARREL with the relevance of food.”

So says Gregg Crane, the director of LSA’s Program in the Environment (PitE), which last fall launched a new minor in Sustainable Food Systems. That Crane is also an English professor specializing in American literary and intellectual history speaks to an idea at the very core of both the program and what has come to be called “the food minor.”

“The push of the minor is toward the interdisciplinary study of food and food issues in relation to the environment,” says Crane. “The food topic gets studied from the natural sciences side, social sciences side, and humanities side. And we built it because students asked us to.”

PitE already offers a minor in sustainability, but — jokes about students’ hunger

for knowledge aside — part of the reason they were so interested in a food minor, Crane believes, is a matter of scale.

“The environmental crisis is so massive and so difficult that one response is to put your head in the sand and do nothing,” he explains. “But if I narrow the thing down to a very concrete topic like sustainable food production, I can get my head around that. Sustainability as a concept is useful, but as a topic of study, it’s just far too broad and amorphous to capture students’ interest in quite the way that I think concrete things like food do.”

Finding a narrower avenue through which to approach such a daunting topic hardly limits the impact students can have, however.

“One of the things I love about studying this,” says senior Meredith Witt, a PitE

Evolutionary Biology (EEB) who has been involved in research and teaching food- and agriculture-related topics for more than 40 years, stresses that link between food and the environment.

“In my opinion, there are two issues of the day,” he says. “One is climate change, and one is agriculture. And it’s not just that the climate is going to affect our agriculture in negative ways, which is true, but it’s also that the industrial agricultural system is contributing to the problem of climate change.”

Vandermeer is one of numerous professors from across the University who, with students, came together to form the Sustainable Food Systems Initiative. The initiative looks to “learn from and build food systems that are health-promoting, economically viable, equitable, and eco-

FIVE-COURSE MENU

The Sustainable Food Systems minor consists of completing at least five courses analyzing the current food system across a range of disciplines.

Below is a list of just some of the classes that students can pursue:

Food: The Ecology, Economics, and Ethics of Eating

Much Depends on Dinner

Nutrition and Evolution

Architecture, Sustainability, and the City

Practical Botany

Ocean Resources

Understanding and Making Arguments About Food

The Measure of Our Meals

Urban Agriculture

Food, Land, and Society

“The food topic gets studied from the natural sciences side, social sciences side, and humanities side. And we built it because students asked us to.”

major on track to be one of the first to graduate with the new minor, “is that when you’re taking a food class, you’re talking about so many different issues.”

For example, Crane relates the story of how one student taught him that there is carbon trapped in the earth through organic processes that gets released simply through the act of tilling land, a standard agricultural practice. Exploring and promoting methods of no-till farming, then, could significantly lessen the amount of carbon released into the atmosphere. And that’s just one way sustainable food is linked to sustainability on a grander scale.

TAKING THE INITIATIVE

John Vandermeer (Ph.D. ’68), a professor in the Department of Ecology and

logically sound.” In 2012, the provost’s office approved their proposal for a cluster hire on sustainable food systems, and four new faculty have since been added in EEB, the School of Natural Resources and Environment (SNRE), the Taubman College of Architecture and Urban Planning, and the School of Public Health.

(PREVIOUS PAGE) **LSA senior Marissa Sil-verberg gathers tomatoes at the Campus Farm at Matthaei Botanical Gardens.**

(OPPOSITE PAGE) **More scenes from the Campus Farm. While the farm allows students to explore small-scale sustainable food production and delivery, the minor is designed to stress that the issue is not just local or national, but one that spans the globe. Faculty members have current food research projects based in Mexico, Bolivia, Brazil, and India.**

42.22° N, 83.75° W



“Three of the new hires are teaching a foundational course together that’s part of the minor, and it had a wait list,” says Ivette Perfecto, a professor in SNRE who also helped to form the Sustainable Food Systems Initiative. “They got about 50 students in that course, and they had to turn people down.”

GROWING ENTHUSIASM

Perfecto points to a few reasons why she thinks there is so much interest in the topic now.

“Several things have happened,” she

explains. “Michael Pollan’s book *The Omnivore’s Dilemma* really had a strong impact popularizing the interest in where your food comes from. Then writers like Mark Bittman in the *New York Times* and

the food crisis in 2008 put the topic in the news in general. And then there’s the growth of urban agriculture in many cities, including Detroit — which is one of the main cities where we’re seeing a

“It’s not just that the climate is going to affect our agriculture in negative ways, but it’s also that the industrial agricultural system is contributing to the problem of climate change.”

boom. Students are seeing that and getting interested.”

The demand for the food minor is only one testament to that awareness. A number of student groups have emerged in recent years at U-M, ranging from the thriving Campus Farm at Matthaei Botanical Gardens to organizations like Michigan Bees. The activity and activism suggest a more holistic approach to healthy food that’s as much about “you are what you eat” as it is about “you reap what you sow.”

“The Campus Farm gives me the chance for hands-on projects and research,” says Witt, who after graduation is hoping to teach environmental education classes using school gardens as a resource. “For bio classes, you’re going to your bio lab. The Campus Farm, that’s the food lab.”

“Ivette and I talked for so many years about why we didn’t have a student garden at the University of Michigan and how we needed to start a student farm,” says Vandermeer. “Well, suddenly it happened, and we had nothing to do with it. We really have to acknowledge the student input on this whole thing. They’re doing an absolutely wonderful job.” ■

The farm functions as a combination classroom and laboratory where students like junior Arjun Nagpal use what they’re learning in their coursework to grow food sustainably. The best part — you can eat the homework, and it’s delicious.



by Natalie Bakopoulos



A World of Good

Earth Day celebrates its 45th anniversary this year, and LSA takes a look at the important role that the University of Michigan played in its founding and the long-term impact it made on one alumnus's life and career.

HISTORIAN ADAM ROME has referred to the first Earth Day as “the most famous little-known event in modern American history.” U-M played a vital role in creating the event, which shaped a movement and a generation by delivering a single message: The environment is in crisis, and something has to be done about it.

Although the first official Earth Day was observed on April 22, 1970, its roots lie in the teach-ins that occurred across the country for weeks prior to the actual event. A direct response to a national call to action given by Senator Gaylord Nelson of Wisconsin, a lifelong conservationist and political activist for environmental issues, the U-M teach-in was inspired by similar consciousness-raising events held by the antiwar movement, this time with the aims of informing the public and galvanizing support for environmental concerns.

The environmental teach-in on the U-M campus launched on March 11, 1970, and continued through March 14 — the largest and most visible of the pre-Earth Day teach-ins happening across the country. It included more than 125 activities and



“Everything is connected to everything else. Everything must go somewhere. Nature knows best. There is no such thing as a free lunch.”

inspired students at more than 1,500 separate colleges and 10,000 schools to hold their own teach-in events. The first day of the Michigan teach-in drew a crowd of 14,000 to Crisler Arena (now the Crisler Center), which buzzed with the energy of determined and passionate people coming together to effect positive change.

It began with music, with the Chicago cast of *Hair* performing “Let the Sunshine In.” Michigan Governor William Milliken was the first speaker, followed by the keynote address delivered by biology professor and activist Barry Commoner, who

had recently gained fame by appearing on the cover of *Time* magazine as the “Paul Revere of Ecology.” Commoner’s rules of ecology were simple: “Everything is connected to everything else. Everything must go somewhere. Nature knows best. There is no such thing as a free lunch.”

TEACH IN, REACH OUT

John Russell (M.S. ’66) attended the first Earth Day teach-in at U-M, and his strongest memory of being among the thousands of people in Crisler Arena is how awed he was by the massiveness of the event. He was also happy and relieved: The organizers had somehow pulled the whole thing off. When Russell, who helped organize the teach-in, realized there was nothing left for him to do except watch the event unfold, he turned to a friend and said, “Now what? I don’t know what to do.” It was the first time he had been able to relax in months. “I had slept two hours a night for six months straight,” he says, and as the teach-in continued and then concluded, Russell found

himself searching for what to do next.

But there was plenty of work to be done. Russell, as part of a Michigan student group called ENACT: Environmental Action for Survival, had goals beyond a few days of celebration and consciousness raising. He says that he and the group wanted to leave something permanent to the community, a longer legacy of environmental awareness and responsibility. They lobbied for new state legislation in Lansing, including the returnable bottle bill. They also created the Ecology Center of Ann Arbor in 1970, which is still active today as a space for members of the community to discuss environmental issues and advocate for the promotion and legislation of pro-environmental practices.

And the subsequent Earth Day celebrations across the country have left their own legacy. They are credited with inspiring the Clean Air Act of 1970, the Clean Water Act of 1972, and the Endangered Species Act of 1973. Only eight months after the first Earth Day, the Environmental Protection Agency was formed.

Although environmental protection has since become a highly partisan issue, it seemed far less so then. “It was bigger than that,” Russell says. “Pollution was very visible then. It was easy to document, easy to see, from the burning smokestacks to the burning rivers.” Now, Russell says, pollution is often harder to track.

The teach-in itself was decidedly bipartisan, Russell notes. Governor Milliken was a Republican, and he praised the environmental reform movement for resisting both partisanship and the generation gap, calling it “a crusade that knows no geographical or political boundaries or boundaries in age.” After the first Earth Day, the *New York Times* wrote: “Conservatives were for it. Liberals were for it. Democrats, Republicans, and independents were for it. ... It was Earth Day, and like Mother’s Day, no man in public office could be against it.” ■

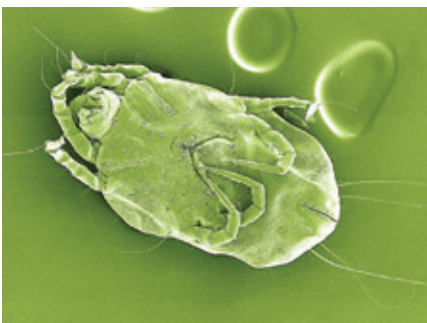
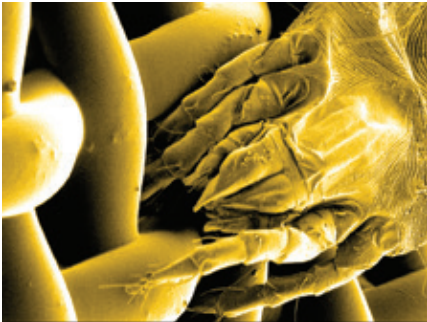
(PREVIOUS PAGE) A series of pins created by students to promote the Ann Arbor teach-in that occurred before the first Earth Day. The holiday celebrates its 45th anniversary this year.

(ABOVE) An outside rally at an Earth Day event in 1970. Organizers raised more than \$50,000 to put on the Earth Day teach-in, and the events included a mock trial in which a 1959 Ford sedan was prosecuted for “crimes against the environment.”



CATCH MORE OF LSA'S EARTH DAY
COVERAGE ONLINE
www.lsa.umich.edu

by Brian Short



FACULTY

Pillow Talk

Meet the dust mite—a tiny bug that moves across the globe by clinging to your coat sleeve or carry-on bag. One LSA researcher is shining a light on the minuscule mites to better understand how they travel and more accurately predict reactions in people who are allergic to them.

(PREVIOUS PAGE) **Close-up shots of house dust mites, whose entire life cycle only lasts between three weeks and a month. That short cycle allows mite populations to balloon rapidly if the right conditions are present — mites can live in subzero temperatures, but if the air gets too dry, the bugs will not survive.**

Klimov maintains a very specific humidity in his lab, to protect his subjects from dry air. “Otherwise,” he says, “the cultures will die.”

DON'T BE ALARMED, but it's possible that you have a few — or a few hundred — roommates that you didn't know about.

Meet the house dust mite, a minuscule arthropod that eats dead skin and lives in places where human skin particles accumulate — namely, your bed.

“Dust mites can live in your bed, and especially your pillows,” says Pavel Klimov, an assistant researcher in LSA's Department of Ecology and Evolutionary Biology, who studies house dust mites. “But you might not see them. They are so small that even against a black background, they are only just visible as whitish specks to most people.”

For a long time, dust mites lived in birds' nests, and they evolved the ability to digest the nutritive content in tough materials, such as bits of feather. To do that, dust mites developed a powerful enzyme that

to sequence DNA strands from various dust mite populations, Klimov discovered that some dust mites in North America share a rare mutation with other dust mites from across the globe, in South Asia. That meant that the critters were somehow getting all the way from Islamabad, Pakistan, to Ishpeming, Michigan. The only explanation that made sense was air travel.

“Dust mites can grab onto your clothes or your skin, your food or luggage,” Klimov says, and move with you all the way from ticketing through security, onto the plane, and on to your final destination.

This research on dust mite variation has important implications for medical tests and allergy diagnoses. Right now, doctors apply a skin prick test using an inactive version of the dust mite enzyme to identify whether a person experiencing allergies is reacting to house dust mites or to something else in the environment.

“For mites, doctors use an inactive form of this digestive protein for the skin prick test, but variations in that enzyme can make certain tests in certain situations inaccurate,” Klimov says. “So there is an important link to be made between a deeper understanding of mites and direct medical applications.”

As for whether you have dust mites in your bedspread or not, the chances are pretty low overall, but get much higher if you're near the water.

“Most people who are affected by dust mites live in coastal areas,” Klimov says. “Mites can live at subzero temperatures and they won't die, but humidity is a key factor for them.”

If you identify mites in your house, you have options. You can use a dehumidifier to lower the moisture in the air, and you can replace your bedding materials or wash them in special washers that reach 140 degrees Fahrenheit, which kills the mites.

But most people aren't harmed by contact with dust mites' digestive enzymes, making the critters largely harmless, near-invisible roommates.

Sleep tight. ■

Critters were somehow getting all the way from Islamabad, Pakistan, to Ishpeming, Michigan. The only explanation that made sense was air travel.

is often still active in their waste. Humans have to deal with that enzyme once the mites' waste goes airborne.

“It gets into the air, and you breathe it into your lungs, and it begins to break down the very delicate cells that are in your lungs,” Klimov says. Contact with the enzyme can cause an allergic reaction, and some studies even suggest that exposure to mite waste can make people more likely to have other kinds of allergic reactions to things like food and pollen.

HAVE ENZYMES, WILL TRAVEL

Klimov's research into dust mite genetics is shedding light on how dust mites travel, and he's hoping that his findings will help allergy sufferers better understand the true causes of their problems.

While working with a former student

From the Wu Tang Clan to the Pope's Twitter feed, the worldwide LSA impact starts now.



ALUMNI

Like a Rolling Stone

Alumnus Christian Hoard turned a passion for music into a career in rock journalism. Now he writes about huge acts for *Rolling Stone*. But to get there, he had to realize the power of good criticism.

by Brian Short

IT'S SPRING. YOU'RE DRIVING around Ann Arbor, not really going anywhere. You just graduated, and you're trying to figure out what you want to do next: Take a job? Go to grad school? What do you even want to go to grad school for?

You crank up the stereo until the speakers crackle, waiting for the light at State and Packard to turn green and while you're waiting the pressure builds and builds.

"I remember being stressed almost to the point of tears, just deciding what I wanted to do with my life," says Christian Hoard ('00), who was listening to The Replacements' *Let It Be* — his favorite album — that day while he drove around Ann Arbor looking for answers. He had been accepted to both U-M and Harvard law schools, but he wasn't sure that being a lawyer was what he really wanted to do. He was considering an ethnomusicology degree at Columbia — where a beloved musicology

(PREVIOUS PAGE) **Christian Hoard in the *Rolling Stone* offices.** The magazine's cover has featured a who's who of American pop, rock, and rap music, including now-iconic images of John Lennon and Yoko Ono, Janet Jackson, and Jim Morrison. The covers are so recognizable that they inspired the song "The Cover of the *Rolling Stone*," written by Shel Silverstein and recorded by Dr. Hook & the Medicine Show.

(RIGHT) **Christian Hoard at his desk.** Hoard oversees the front section of *Rolling Stone* magazine, which includes pop culture notes on rock, rap, reality TV, art, film, comics, and more.

athletics and academics, and he never really considered going anywhere else. But Ann Arbor was a lot different than the Grand Rapids suburb where he grew up.

"I kind of felt like a bumpkin," Hoard says. "Coming to a place like Ann Arbor where there were all kinds of different

“I thought that music writing was just something that I would do while I was figuring out this ‘real writing’ thing. My attitude is different now.”

professor of Hoard's, Travis Jackson (formerly of U-M), had studied — but writing about music had always felt less substantive than fiction and poetry.

But once Hoard could see beyond his guilt from passing on law school — his mother is “still disappointed” he didn't go, Hoard jokes — Hoard knew he wanted to pursue writing as a career.

“For a long time, I thought that music writing was just something that I would do while I was figuring out this ‘real writing’ thing,” Hoard says. “My attitude is different now.”

SCHOOL OF ROCK

Growing up, Hoard had been a shy kid who loved writing and University of Michigan sports. When he made it to high school, he realized that U-M had great

cultures and all kinds of fresh ideas was slightly intimidating, but it was also really exciting to be there.”

Hoard quickly made friends with fellow Honors Program students while taking the program's famous Great Books course. He studied English literature with instructors like Arthur F. Thurnau Professor John Whittier-Ferguson and John R. Knott, Jr. Collegiate Professor of English Michael Schoenfeldt. Hoard wrote his senior thesis on postmodern fiction, which won the department's top award for writing and research.

But music was always there. Hoard played in bands outside of school, and he spent a lot of time at record stores like Schoolkids Records and Harmony House. When a friend asked Hoard if he would write for the *Michigan Daily*, Hoard agreed,



starting with a review of The Clash's live album, *From Here to Eternity*.

"I was having an awakening as a music listener in college right at the time I started writing for the *Michigan Daily*," Hoard says. "I began to read a lot of rock criticism, people like Lester Bangs, Greil Marcus, and Robert Christgau." Christgau made a particularly strong impression, and became Hoard's favorite rock critic of all time.

Music writing took up more and more of Hoard's time and attention. When he finally



graduated and took that car ride around Ann Arbor, Hoard knew that it was something he wanted to build a life around.

And almost as soon as he landed in New York to attend graduate school, his career took off.

THE BIG SHOW

Hoard interned with the *Village Voice* when he arrived in New York, where he got to meet Robert Christgau, who became Hoard's mentor. When Hoard became an

intern at *Rolling Stone*, Christgau convinced his colleagues there to let Hoard start writing for the magazine.

Now Hoard is a senior editor. He writes and edits feature stories and oversees the front of the magazine. He has written and edited pieces on some of his favorite artists, including Miranda Lambert, the Wu-Tang Clan, and the Replacements, who recently reunited.

Hoard's experience at the magazine has only increased his respect for the power

that music writing has.

"I respect my favorite journalists every bit as much as James Joyce and my favorite fiction writers," Hoard says. "When you are in love with a subject, and somebody can give you an incredibly insightful idea about that subject — whatever it is — it sticks in your mind and changes the way you see that subject.

"Those writers changed my life," Hoard says. "It sounds like a big, heavy statement, but it's true." ■

ALUMNI

Ars Brevis

One LSA alumnus's Latin language skills led him to an official position serving the Pope.

There, he translates big messages of joy and thanksgiving into CXL — sorry, 140 — characters or fewer as *il Papa's* official Latin tweeter.

MANY OF US SPEND OUR WORKDAYS

poring over important documents, crafting messages, maybe even sending a tweet or two. So does Monsignor Daniel Gallagher ('93), only he does all of those things for the Pope.

Yes, *that* Pope.

Gallagher is one of seven language specialists at the Office of Latin Letters

in the Vatican's Secretariat of State. He's also the only American. Gallagher helps translate the Pope's official business into Latin, which is still the official language of the Catholic Church. Just don't say it's a dead language.

"Anything can be said in Latin," Gallagher says, and his tweets for the Pope, from Bible passages to nuggets of wisdom and inspiration, show that.

Gallagher, who holds a microbiology degree from LSA, was raised Catholic and spent his senior year at U-M deliberating between medical school and the seminary. Over time, he realized he felt a special calling toward religious studies. Coincidentally, a good friend he'd met in the men's glee club had been considering his own spiritual journey — to rabbinical school.

"It was a tribute to Michigan that I was forced to think and question my values and learn to articulate them, which helped strengthen my convictions," Gallagher says. "It gave me the freedom to choose the path to ministry."

From Michigan, Gallagher eventually landed at the Pontifical North American College in Rome. That's where he met a priest in the Office of Latin Letters, and one of the top Latinists in the world, Father Reginald Foster of Milwaukee. Although Gallagher had some familiarity with Latin, he hadn't really felt any spark about it until he met Foster. Foster had a legendary way of teaching Latin, breaking it down into its simplest elements and emphasizing speaking and preciseness.

"I was struck by how beautiful it sounded in music and in classes," Gallagher says. "Probably what I enjoy most is the thought process it requires. It takes a certain kind of discipline, but when you master it, you can create some wonderful things."

After the seminary, Gallagher returned to U-M for a master's degree and began teaching Latin at Detroit's Sacred Heart

Major Seminary. His talent — and passion — for the language did not go unnoticed. In 2007, Gallagher was assigned to the Vatican to help translate documents from Latin into English. Then, in 2009, his old mentor Father Foster retired from his position in the Office of Latin Letters. To Gallagher's surprise and honor he was named as Foster's successor.

These days, Gallagher happily spends his time translating the Vatican's many requests, including anything from penning a document appointing a new bishop to tweeting to more than 300,000 people who are following the Pope's Latin Twitter feed (@Pontifex_in).

On a day in mid-September, Gallagher spent his morning toiling over a beautiful calligraphic version of a letter to canonize Kateri Tekakwitha, the first Native American to be made a saint. From that tradition, steeped in thousands of years

of church doctrine, he then moved on to sending out a "Breviloquium" — Gallagher's Latin word for "tweet."

"We have found a resurgence in the interest in Latin, and new media helps connect the younger generation to the language and to the church," Gallagher says. "You can read the history of the Western world in the Latin language. Social media helps to show that there's no conflict between Virgil and the modern world, and gives a sense of continuity of being a part of the human family over time."

Despite Pope Francis's success at reaching out to the world's Catholics in new ways, the majority of Gallagher's time is still spent on more traditional forms of communication.

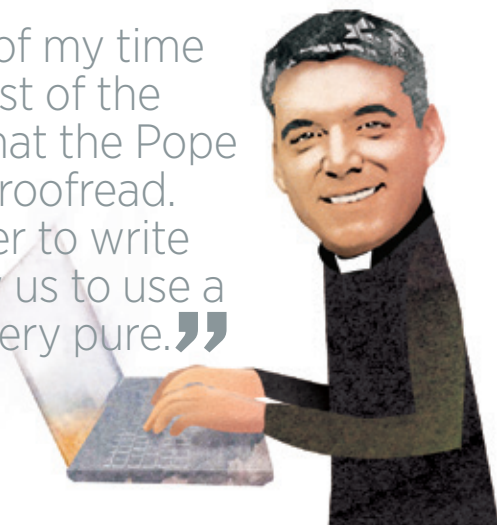
"Only a small part of my time is spent tweeting," Gallagher says. "Most of the time, it focuses on what the Pope needs translated or proofread. Other things we prefer to write from scratch, to allow us to use a style of Latin that is very pure."

Asked about the future, Gallagher says he's honored to go wherever the Church and the Pope call him. But for now, he's enjoying his time as the Vatican's go-to guy for communications in Latin.

"If I'm here for the rest of my life, wonderful," Gallagher says. "But the priesthood is an abandonment to the needs of the Church and the world, and I'm ready to change gears if necessary."

In the meantime, he signs off with a cheerful phrase: "*Pergite Veneti!*": Go Blue. ■

“Only a small part of my time is spent tweeting. Most of the time, it focuses on what the Pope needs translated or proofread. Other things we prefer to write from scratch, to allow us to use a style of Latin that is very pure.”





Art with **Strings Attached**

People tend to dismiss puppets as toys, but one LSA researcher is studying how puppets can be used to tell big stories in post-socialist countries like Kazakhstan and around the world.

FACULTY



These state-run puppet theaters were regulated by the central Soviet government and featured elements from both Communist art and native Kazakh culture.

FOR MEGHANNE BARKER, a Ph.D. candidate in LSA's Department of Anthropology, big messages come in small packages.

Barker studies puppetry in post-socialist countries, at sites like Kazakhstan's Almaty State Puppet Theatre. Founded in 1936, the Almaty State Puppet Theatre is one of several theaters the Soviets established in Kazakhstan throughout the 20th century. These state-run puppet theaters were regulated by the central Soviet government and featured elements from both Communist art and native Kazakh culture.

Performances were bilingual — in Kazakh and Russian — and included traditional Kazakh folktales. A hub for government agendas, local workers, and traditional stories, the theater was ideal for Barker's research.

"I study the relationships behind puppetry," says Barker. "From the carpenters and seamstresses backstage to the puppeteers cooperating to animate a single puppet — all the pieces that bring the puppet to life."

LARGE STAKES, SMALL PUPPETS

Though there were small, independent puppet theaters, for many years the Almaty State Puppet Theatre was the only state puppet theater in Kazakhstan. The theater sent puppeteers out to collective farms where some audience members had never seen the art form before. Traversing Kazakhstan's wide, sweeping spaces, the puppet shows connected people by telling stories that were relevant to them, and remain so today.

Take Anton Chekhov's children's story "Kashtanka," which the Almaty State Puppet Theatre performed in 2014. In the story, Kashtanka, a dog, gets separated



from her original master, who beat her and couldn't feed her. She is taken in by a clown who gives her food and cares for her, and provides Kashtanka with a stable life. The memory of her former master fades, but Kashtanka is nagged by melancholy. When, by chance, her former owner comes to the circus, Kashtanka has to choose between staying with the clown or leaving with her original master: She chooses to leave.

The story, and its difficult emotional choice, resonated among the directors and performers as Russia and Ukraine battled over the fate of Crimea.

(OPPOSITE PAGE) **Puppets from the Almaty State Puppet Theatre, where it can take a team of three puppeteers to coordinate a puppet's movements. Puppeteers say they "become one self" when they animate a puppet together.**

(ABOVE AND RIGHT) **Animal puppets from the play *Kashtanka*, in which the dog, Kashtanka, must choose between freedom and security.**



"The story was written more than 100 years ago, and the theater's rehearsals had begun months before the Crimean Crisis," Barker says, "but when tensions rose between Ukraine and Russia, the directors decided they wanted to take the play to Russia."

Barker says it's a mistake to think that a puppet's small size means it can't deliver a powerful message.

"A lot of people argue that the puppet's power is in its size," says Barker. "The figures' smallness enables them to exert influence on a very large scale, and creates a very moving kind of intimacy." ■



FACULTY

Little Kids, Big Ideas

For a long time, psychologists assumed that babies and young children thought about the world in a superficial way. But former Interim Dean Susan Gelman's pioneering research has opened up an entirely new understanding of how sophisticated children's thoughts really are.



UNTIL ABOUT 30 YEARS AGO, people believed that infants and toddlers lived in a permanent present where they only thought about the things right in front of them — this spoonful of applesauce, that stuffed animal.

Influential developmental psychologist Jean Piaget's experiments about object permanence suggested that once you removed an object from a baby's view, the baby would forget about it. This idea became fundamental to the way we thought about babies and how their minds work. Based on this and many other experiments he conducted over more than 50 years, Piaget neatly laid out stages of cognitive growth that became a central tenet of developmental psychology.



“It used to be thought that babies in particular and even young children didn't know anything. Now we marvel at the depth and sophistication of all that they know.”

It turns out, says Susan Gelman, Heinz Werner Distinguished University Professor of Psychology, we were wrong about a lot of it.

“This puts it too crudely, but it used to be thought that babies in particular and even young children didn't know anything,” says Gelman. “Now we marvel at the depth and sophistication of all that they know.”

THE HOW AND THE WHY

Piaget's research set the stage for many important discoveries in developmental psychology in the almost 80 years since he began his work in 1936. Piaget was

brilliant at observing children and noticing real changes that were taking place in their approach to the world, Gelman says, but he misunderstood the reasons why those changes were taking place. He greatly underestimated what children bring to the task of learning, and he greatly underestimated the importance of social interactions.

“Children live in a social and cultural context,” says Gelman, “and social interactions — including language — deeply influence what they think.”

Gelman's research confirms that kids seem to think with many of the same patterns, structures, and cognitive biases as adults — including a fundamental bias psychologists describe as “essentialism.”

Essentialism, explains Gelman, is the way we think about many everyday categories, such as cats or elephants. It's the idea that these categories have an underlying reality that we can't directly see. Cats not only have four legs and pointy ears, but they also have an inborn, invisible “cat essence.”

(OPPOSITE PAGE) **In Gelman's family-friendly Conceptual Development Lab, researchers conduct experiments in a home-like setting that puts kids and parents at ease.**

(ABOVE) **Toys like blocks, houses, and stuffed animals are selected and adapted to allow researchers to gauge children's understanding of abstract concepts like authenticity.**

In one study, preschoolers said that a crow would feed its baby the same food as a flamingo, not a bat, because the crow and the flamingo are both birds — even though the crow and bat looked more alike. In another study where researchers told 4-year-olds about a baby kangaroo that was raised by goats, children said that the kangaroo would still have a pouch and be better at hopping than climbing. Yet another study found that children expected an animal's internal parts to determine its identity even more than the way it looked.

Gelman finds such experiments compelling because they illuminate that children expect the world to have a hidden structure. This expectation has far-reaching implications for how children think about social categories, such as gender, ethnicity, or race because it means the children treat some social categories as if they are as fixed and inflexible as biological categories.

"It turns out that young children are essentialist about some of these social



(ABOVE) **Some experiments in former Interim Dean Gelman's lab use toys like kings, castles, and stuffed animals.**

(BELOW) **Other experiments use made-up words like "ziblet" and "flurp" to test kids' ability to generalize their perceptions from one category of objects to another.**

categories from a very early age, but not universally," Gelman says. "Figuring out when and why they do so is very important for understanding issues related to stereotype and intergroup conflict."

Such awareness shows that small children are not simply passive collectors; they are actively analyzing the information they're absorbing from the world, and they're

Such awareness shows that children are not simply passive collectors; they are analyzing the information they're absorbing from the world, and doing so at a very early age.



doing so at a very early age.

"I think the findings from essentialism show that children are searching to understand the causes of things," says Gelman. "They're trying to understand invisible properties and hidden features, and these things are very central to how they view the world."

THE ROOTS OF IDEAS

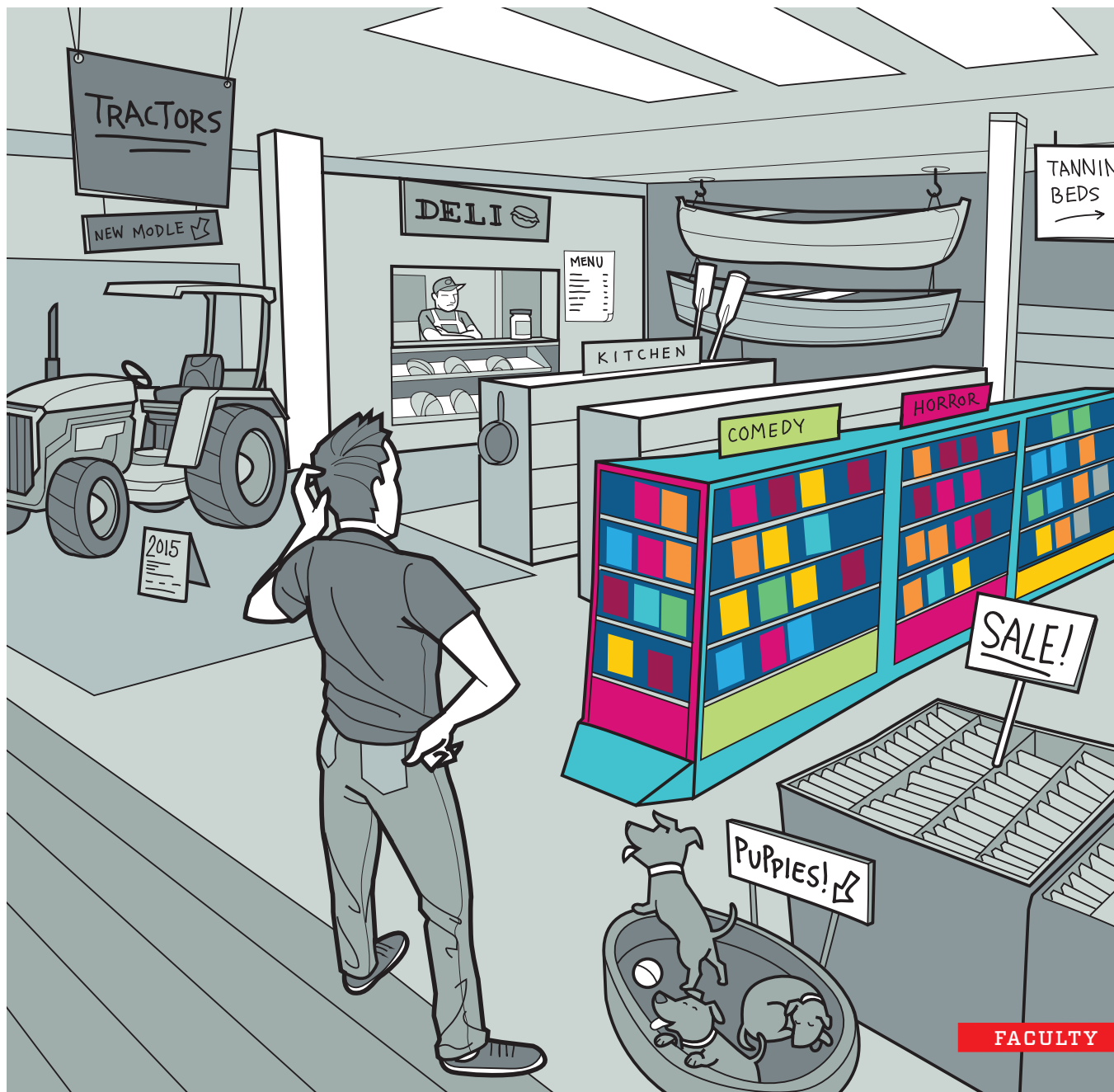
In her Conceptual Development Lab on campus, Gelman and her team of researchers have conducted myriad experiments related to essentialism that have helped to map out additional details about the way young children think.

Gelman's research confirms a number of things: Very young children have a definite grasp of cause and effect. They understand that human processes — like building a table — are distinct from biological ones — like a puppy growing into an adult dog. They are also savvy about extremely subtle cues in language. "Even 2-year-olds distinguish Lily as a proper name from lily as a common noun," Gelman says.

These insights are drawn from experiments conducted at different points in Gelman's long and distinguished career, and studying the mix of essentialist tendencies, environmental conditions, and social categories that shape children's thinking continues to captivate her. "This is something," Gelman says, "I've been interested in forever."

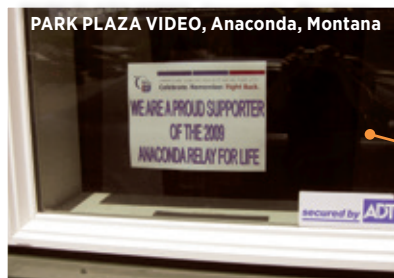
"I think very few scientists study kids just because they're cute and charming, although they certainly are," she says. "But by studying small children, you can also get a clear look at the origins of concepts before they've been altered by education and social desirability. You can really see which ideas require intensive instruction and which are really basic and core to being a human being."

Perhaps the lasting outcomes of Gelman's research will not only be a deeper understanding of the richly textured world that small children experience, but a better understanding of how big people's minds work, too. ■



The Last Video Store

While you might still have a Blockbuster card hidden in the back of your wallet, chances are you haven't used it lately. LSA Professor Daniel Herbert took a road trip across the United States to learn about the people who work in small town video stores — before those stores disappear.



PARK PLAZA VIDEO, Anaconda, Montana



VIDEO KINGDOM, Oglala, Nebraska



DRIVE-IN VIDEOS, Cozad, Nebraska



ALL STAR VIDEO, Salmon, Idaho



CUSTER VIDEO, Challis, Idaho



JIFFY RENTAL CENTER, Riverton, Wyoming



VIDEO HITS & GAMES, Rawlins, Wyoming



UPTOWN VIDEO, La Junta, Colorado

IT'S AMAZING WHAT YOU can get done at the video store.

You can price a tractor and rent *Field of Dreams* at a video store in rural Wyoming. You can rent a tuxedo, buy a cheeseburger, and grab *Ferris Bueller's Day Off* from a small town store in Tennessee. Or you can spend a few minutes bronzing your gams before renting the first season of *Dukes of Hazzard* at one of the many tanning salon–video rental combo stores all across the South.

LSA Screen Arts and Cultures Professor Daniel Herbert has seen them all. His book, *Videoland: Movie Culture at the American Video Store*, catalogs the ways that our tastes have been changed by video stores and the ways that video stores serve and affect the communities around them.

"They reflect the community," Herbert says. "Stores will have hunting and fishing

sections, or Christian sections, or Spanish-language sections, based on what people in that area want to see."

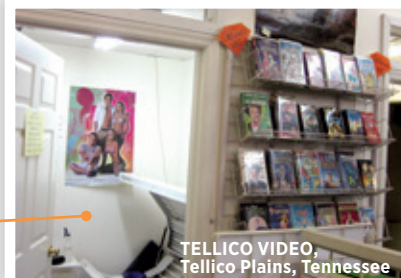
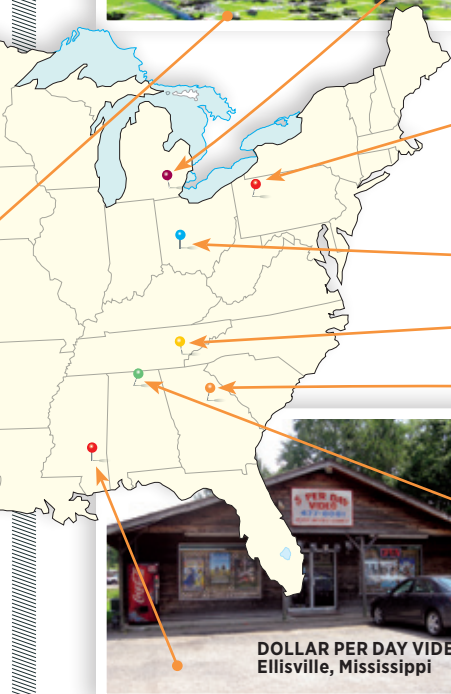
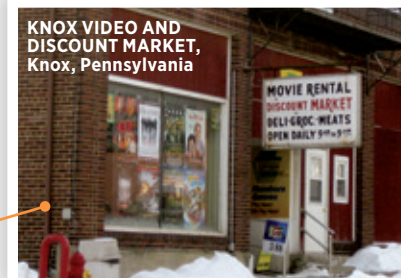
Video stores also reflect the personalities of their owners, including one in Georgia who sold purebred dogs alongside DVDs. The owner could do this, Herbert says, because the video rental business is so flexible, making many of them one-of-a-kind destinations.

"A video store doesn't require any

specific architecture," Herbert says. "It can pair itself with a wide range of other activities. So you see local conditions and people's personalities and tastes coming together in these unique spaces."

Herbert drove more than 8,000 miles across the country between 2009 and 2011 to interview the people who owned and clerked in small town video rental stores to find out what it was like pointing customers toward the new releases at a

“Video stores became a de facto community center because of the habitual ways that people used them. You rent a movie, you return it. You rent another one, return that one. You run into neighbors, you talk to the clerks. It becomes a touchstone for your life.”



time when fewer and fewer people were renting movies.

And it's good that he went when he did, because pretty soon there might not be any stores left.

BE KIND, REWIND

The year 2010 — when Herbert did much of his research for *Videoland* — saw the closing and liquidation of Hollywood Video, a national video rental store chain. That same year, Blockbuster declared bankruptcy, and has since closed up all of its shops, down from a high of about 5,000 stores in the early 2000s.

The 2008 recession was part of the problem, but the industry's biggest problem was competition. New digital options, including on-demand services like Netflix and Amazon Instant Video, as well as digital piracy, posed an existential threat

to video stores. While people are gaining the convenience of movies with the push of a button, they're losing something important, Herbert says.

"In many towns, video stores became a kind of de facto community center because of the habitual ways that people used them," Herbert says. "You rent a movie, you return it. You rent another one, return that one. You run into neighbors, you talk to the clerks. It becomes a touchstone for your life."

"Losing video stores isn't about losing movies — movies are doing fine — it's about the loss of these public spaces where we have an opportunity to share ourselves and learn who other people are," Herbert says. "Now, I don't know where those spots are."

But some large video stores have survived. Some niche stores like Scarecrow

Video in Seattle (Herbert serves on the board of Scarecrow) have successfully reimagined themselves as nonprofit organizations, adding an educational component to their mission. The key to video stores surviving might be to embrace what made many of them unique in the first place — the communities they serve. And educating people about movies is important, because with smartphones and tablet computers, movies are now available anywhere.

"They're good tokens of social exchange because everyone watches them," Herbert says. "No matter what your educational background is or what your economic background is, you watch movies and you have something to say about them." ■

SEE A SLIDESHOW FROM PROFESSOR HERBERT'S ROAD TRIP
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ALUMNI

(Prehistoric) Life Imitating Art

John Meszaros ('06) illustrates speculative creatures with a scientific bent. But he never thought one of his fictional creatures would precede the discovery of a real animal — until it happened.

NOT LONG AFTER PUBLISHING his treatise on evolution, Charles Darwin came across an orchid from Madagascar with an outlandishly long flower. The orchid's nectar pooled at the bottom of a floral chamber that was way too narrow and deep for any known pollinator to reach. He speculated that some living creature, probably a moth, must have an extraordinarily long tongue specially adapted to drink from the flower. Darwin didn't live to see the pollinator he imagined, but sure enough, naturalists in Madagascar eventually found a moth with mouthparts that could unfurl to match the length of the unusual specimen. Darwin's hypothetical creature had turned out to be real.

John Meszaros ('06) recently accomplished a similarly uncanny feat: He invented a hypothetical animal that, he later learned, actually existed.

IMAGINARY CREATURES

Meszaros is an artist who creates biological illustrations of animals, often with a twist. He always grounds his work in science, but he playfully speculates about what kinds of animals might have populated the planet before going extinct, leaving no trace of their heyday in the fossil record. “My animals are speculative,” he says, “but they might have existed, or something like them may have existed — we just haven’t found the fossils for them yet.”

Meszaros has a special obsession with extinct animals called anomalocaridids. “They look almost like shrimp, with flaps on the side of their body,” he says, and they swam in the oceans about 520 million years ago, during the Cambrian Period. “The most prominent feature of these animals is they have two huge appendages on the front of their head that are used for grasping prey and feeding,” he explains, and researchers say that those appendages often came equipped

“My animals are speculative, but they might have existed, or something like them may have existed — we just haven’t found the fossils for them yet.”



with spines capable of impaling prey.

Most artistic renderings of prehistoric life are full of blood and guts and aggression — think of iconic dioramas showing dinosaurs fighting each other with their teeth bared. For anomalocaridids, the general understanding followed the same pattern: These apex predators eviscerated prey with spines that jutted from their feeding appendages. But Meszaros

wondered whether the animals could have used their anatomy differently.

By having a more relaxing meal, for example.

He looked to contemporary animals such as baleen whales, whale sharks, and basking sharks, which don’t need sharp teeth to eat. Instead, they filter feed, sieving the tiniest plankton from the water simply by swimming with their mouths open.

Pretty much all major geologic periods have at least one filter feeder in the

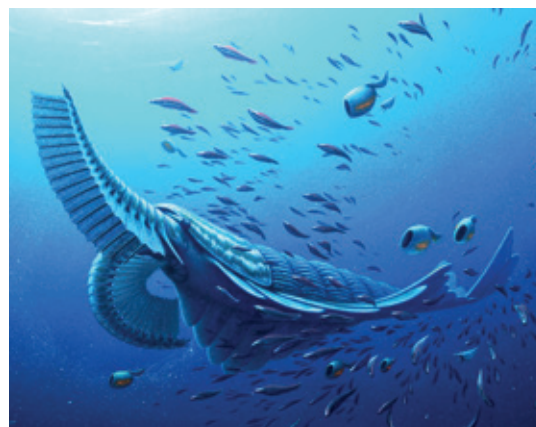
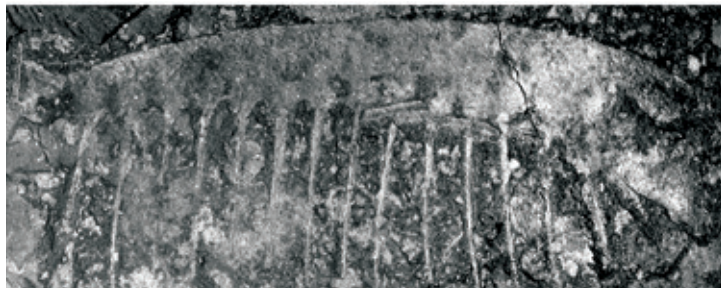
(OPPOSITE PAGE) **An ancient animal invented by John Meszaros, later verified by a Greenland fossil. Its filter-feeding mouthparts are the red hairlike structures under its head.**

(ABOVE) **Meszaros also invented “hookgourds,” animals with intertwined tails that, he imagines, might live on a Jupiter moon.**

THE REAL TAMISIOCARIS BOREALIS

Meet the animal that was invented after it went extinct and before it was discovered in real life.

A fossil of the oral anatomy of *Tamisiocaris borealis* (below), with spines that allowed the animal to filter feed. Fine spines on the extinct predator’s feeding appendages extended to form a “fishing net” that ensnared small prey in the water as it swam (right).





ecosystem, but strangely, not the Cambrian. “There’s a huge gap of time where there’s not really any evidence of a filter-feeding animal,” Meszaros says. “So I was trying to think what sort of creature could fit that niche, and I thought anomalocaridids would be perfect.”

So for fun, Meszaros invented a Cambrian filter feeder by adding a special twist to his favorite animal.

“I drew an anomalocaridid where the great appendages have these long hairs on them, kind of like the baleen of a whale, and I imagined them gliding through the ocean, scooping up plankton along the way.” He embellished the drawing with other animals that he dreamed up for the ecosystem, such as creatures that hypothetically could hitch a ride on the body of an anomalocaridid, just like barnacles on a whale.

His illustration was included in a collection of speculative creatures by various artists called *All Your Yesterdays*. After publishing his filter-feeding anomalocaridid, Meszaros moved on. But then something happened that he never would have predicted: A fossil of his made-up animal was discovered in real life.

Close to the North Pole, at the very northern edge of Greenland, paleontologists found the fossil of *Tamisiocaris borealis*, an anomalocaridid whose appendages

“They just thought it was a crazy coincidence that I predicted this creature that they actually found.”

not only had spines, but whose spines also had spines — enough to create a sort of “fishing net” that could allow the animal to filter feed. One of the researchers came across the image in *All Your Yesterdays* and was astonished to see that Meszaros had predicted the animal before they’d even encountered its fossil in the rocks

(ABOVE) **Meszaros surrounds two trilobites, already known from existing fossils, with colorful marine creatures that are based on contemporary animals. His medium of choice is colored pencils.**

(BELOW) **Artist John Meszaros showing his work at the 2014 Ann Arbor Street Art Fair.**



of Greenland. They named the fossil’s ancestor “Cetiocaridae” in honor of the original name of the animal that Meszaros invented.

“They just thought it was a crazy coincidence that I predicted this creature that they actually found,” Meszaros says.

ORIGINS

As an undergraduate majoring in biology and creative writing, Meszaros spent a lot of time in LSA’s Museum of Natural History. He met his wife there — Karen Meszaros (B.S.E. ’06), an aerospace engineer — while they both worked as museum docents.

Leading tours through the Hall of Evolution, Meszaros talked with student

groups all day about extinct creatures, which he credits as a major influence on his art. His work as a docent gave him practice explaining deep history and evolution to people who aren’t familiar with ancient animals and their origins. Meszaros adds that his background in creative writing also helped him create characters and tell a story, critical skills when it comes to developing a world of speculative creatures.

Among his many projects, Meszaros has gotten commissions to illustrate real contemporary animals, which can be as bizarre as his speculative creatures. One such animal is a predatory tunicate, which lives in the deep sea as a sort of oceanic Venus flytrap, preying on the unfortunate creatures that brush past its mouth.

“As much as we do know about life in the past, there’s still so much more that we just haven’t found yet, and that we don’t know about,” Meszaros says. “I want people thinking about that, and the huge diversity of life on Earth that exists now and in history.” ■

From **golden lions** to **five people on train tracks**, our interactive ride accelerates this second.



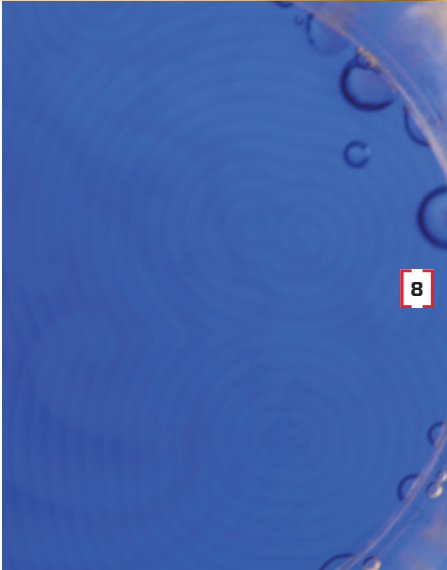
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In Plain Sight

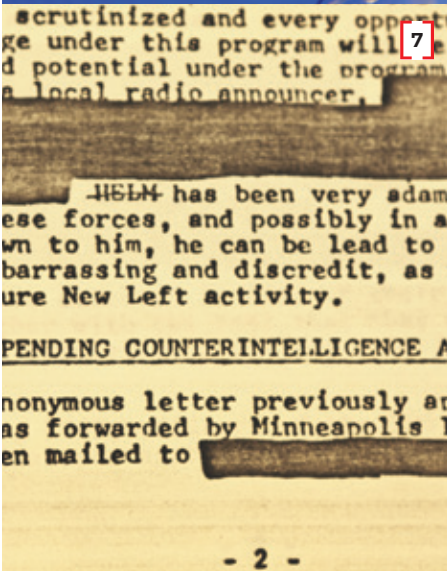
Maybe we don't notice something because it's too big, too small, or too hard to find. Can you guess where each of these often overlooked objects sits on U-M's campus? Turn the page for the answers.

by Elizabeth Wason



4

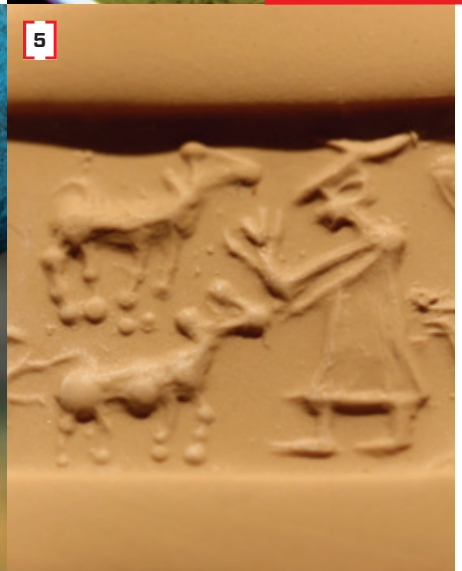
CAMPUS



7



6



5

1

"It's really unusual to turn up something that's been overlooked in our area," says Tony Reznicek, assistant director of **LSA's Herbarium** and curator of vascular plants. "But this is quite a striking new entity." He's talking about the grass-like plant that he's pulled from a cabinet in the Herbarium, the first of its kind ever described. Reznicek and his colleagues discovered it right here in Washtenaw County. The new sedge species, *Carex viridistellata*, looks so much like its relatives that, until only recently, it lived unnoticed in the wetlands of Michigan, Indiana, and Ohio.



2

Golden lions peer out from book spines in the **Buddhist Studies room**, adjacent to the **Near Eastern Studies library**.

Yiddish texts lean on shelves in the **Martin Salinger Learning Resource Center**, the library of the **Frankel Center for Judaic Studies**, alongside colorful stratigraphic maps of Jerusalem. In small libraries and reading rooms like these, departments across LSA make rare materials easily accessible to students and faculty. The beauty of these reading rooms, says Professor of History and Director of Judaic Studies Deborah Dash Moore, is the experience of browsing in a more intimate library.



3

"The problem with a lot of store-bought laboratory glassware," admonishes Roy Wentz, "is that it breaks too easily." With more than 25 years of glassblowing experience under his belt, Wentz helps keep research labs up and running across campus by handcrafting sturdy equipment at the **glass shop in LSA's Department of Chemistry**. Of his many creations, Wentz is famous for his Schlenk line, a ubiquitous tool that chemists use when handling air-sensitive substances. Wentz has been reinforcing and perfecting the design for decades. "I'm from the old school," he says. "I like to make things heavy duty."

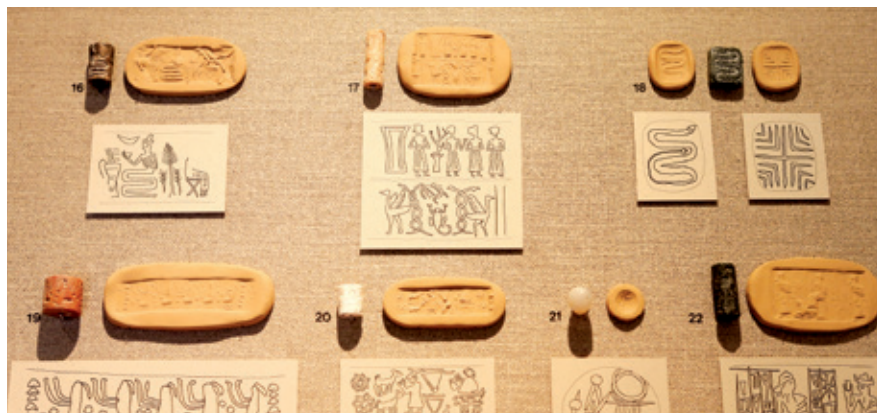


4

That tower among the trees helps us see the forest breathe. Sensors fastened to the two research towers at **LSA's Biological Station** in Pellston, Michigan record light intensity, temperature, carbon dioxide, wind speed, wind direction, and other variables exchanged between the forest and the atmosphere. Teams of chemists, atmospheric scientists, biologists, and engineers can use the data to see how much carbon the forest absorbs and releases each year. By tracking the gases that flow between the trees and the sky, researchers can measure how much the forest breathes and grows.



SEE A SLIDESHOW OF LSA WONDERS
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In ancient days, losing your seal could be as big a hassle as misplacing your driver's license or passport today. A seal pressed into damp clay created a unique "signature" that people applied to things like documents and clay vessels. Seals were so important that seal carvers in ancient Athens were forbidden to keep the impression of any that they sold, probably to prevent fraud and identity theft. And the link between a seal and a person was so strong that seals were often either buried with their original owners or handed down as valued family heirlooms. Find the seals and the impressions on display at **LSA's Kelsey Museum of Archaeology**.



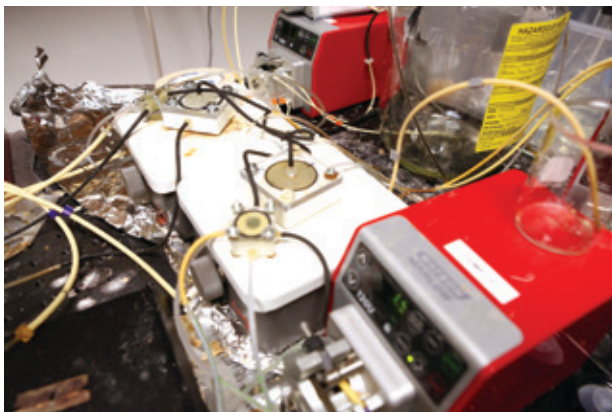
When big names in billiards come to campus, they head straight to the **Michigan Union Billiards & Games Room**. Like Jeanette "Black Widow" Lee, the highest-ranking female pool player of the 1990s. Her first visit drew a crowd that filled risers surrounding the pool table where she played. And Nick Varner, another legendary pool player, showed up unannounced last winter. "Within ten minutes, there was an influx of fans," says Betsy Sundholm, the Billiards Room supervisor and director of the U-M Team Pool Championship. The Billiards Room has been attracting legends since 1919.



The FBI began trailing Thomas Hayden ('61) when he was an LSA undergraduate in 1960. He drew enough suspicion as co-founder of the activist group Students for a Democratic Society and primary author of its manifesto, the Port Huron Statement, that his FBI file bloated to 22,000 pages. In 1982, Hayden won a seat in the California State Legislature and spent 18 years as an assembly member and senator, working for change from within the system. His personal papers, including redacted documents, are now available to scholars through the **U-M Library's Labadie Collection**, which preserves the materials of people whose ideas are considered marginal or dangerous.



Just a peek inside his **research lab** is enough to see that Robert Deegan, associate professor of physics and complex systems, indulges his curiosity in all kinds of tactile phenomena. He studies droplet splashes, seed pod explosions, the rotation of sinking objects, and the famous Belousov-Zhabotinsky chemical reaction that creates a curious spiral pattern, all because he's driven by one major question: "I'd like to understand how, at the largest scale, the planet has organized itself," Deegan ventures. "We'd like to scale up, from our very simple experiments, to something that large."





FACULTY

The Trolley Problem

Five people are stuck on the train tracks, and you can help them only by hurting someone else. What do you do? Philosophers have spilled gallons of ink on this “Trolley Problem,” but now they’re using some new tools to get more insight into questions of morality and mortality.

YOU CAN’T SAY PHILOSOPHERS are afraid to tackle the big questions.

Chandra Sripada, who teaches in LSA’s Department of Philosophy, the Weinberg Institute for Cognitive Science, and the U-M Medical School’s Department of Psychiatry, lectures on moral philosophy. Specifically, Sripada teaches students about the Trolley Problem, which is a thought experiment so famous in moral philosophy that it spawned its own sub-discipline: Trolley-ology.

In fact, the Weinberg Institute, started in 2014 with a \$7.7 million gift from

Marshall M. Weinberg ('50), recently sponsored a symposium on the topic, inviting speakers from around the country to share their thoughts.

The scenario goes like this: You're standing next to a train track when you spot a locomotive approaching. Farther down the track are five people in the path of the train but too far away for you to shout a warning to them. A lever next to you would allow you to divert the train — saving the lives of five people — onto a track with only one person standing on it. If you knew that one person would die if you flipped the lever, would you still do it?

There are numerous variations on this basic scenario, some gruesome, some silly. But they all have the goal of helping people better understand the moral vector of choices made in real life, Sripada says, decisions like those made during wartime (like when civilian casualties are acceptable) and battling epidemics (like how much money to give and when to give it).

"In deciding how we allocate scarce support dollars for medical interventions especially, it's often the case that there are tradeoffs where inevitably some people are going to die this way or people are going to die that way," Sripada says. "We end up doing this horrible tallying of how many lives we do, or even can, save."

TOOLS OF THE TRADE

For years, philosophers investigated Trolley cases mostly from the armchair. Over the last 15 years, they have been joined by a new group of "experimental philosophers" who use scientific tools such as survey methods and functional imaging scanners to figure out why we make the judgments we do in these scenarios.

"There is a long tradition of philosophers drawing heavily on the natural sciences. The contemporary field of experimental philosophy focuses on one area that is particularly relevant for moral theory: the judgment processes that produce our spontaneous moral intuitions," Sripada says. "These philosophers want to

figure out the inner workings of intuitive judgment — the hidden processes and principles that lead us to judge the way that we do."

But figuring out why people make moral judgments like these is only part of the problem that philosophers face. Because even if we understand the mental systems and impulses governing our decisions, philosophers still have to figure out

whether we should accept those instinctive responses or challenge them.

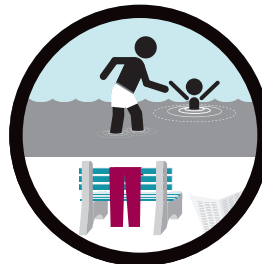
"For the most part, philosophers aren't going to be designing the next Hubble Telescope," Sripada says. "That's not the kind of work they do. Scientific tools can lay bare the principles that we are bringing to confront these problems, but there's no microscope that's going to tell you that this principle is a good one or a bad one." ■

NICE SLACKS

Professor Chandra Sripada offers up two more thought experiments from philosopher Peter Singer for readers to try.



yes



no



NEVER

Consider whether you think you **HAVE TO** make a personal sacrifice in each of the following situations, or **CAN YOU** act more in your own self-interest? Answers are at the bottom.

SCENARIO A

You are walking across campus when you spot a child who has fallen into a pond and is drowning. Saving a child would mean ruining the \$200 pants that you're wearing. ■ Do you **HAVE TO** jump in and save the kid no matter what happens to your pants? Or **CAN YOU** hang back, hoping that someone else will help the kid and you can preserve your precious pants?

SCENARIO B

You receive a flyer from a reliable international charity organization. The flyer states that for \$200, you can save the life of a child in a faraway country. But *you* were planning to buy yourself a new pair of pants with that money. ■ Do you **HAVE TO** send the money abroad? Or **CAN YOU** shred the flyer and head over to Diesel for a flashy new pair of chinos?

A: HAVE TO. Almost everyone polled said it is morally wrong to not save the child even though it will ruin your pants, or make you late for class, or otherwise inconvenience you. ■ **B: CAN YOU.** Answers are mixed for this scenario, which doesn't earn nearly the same consensus from polling participants as scenario A does. But Singer and Sripada both ask us to think about what actually makes the two scenarios different systems of moral judgment track very subtle features in the situations that are different and that might merit different kinds of moral responses.

Life in the Big City

by Debjani Mukherjee ('13)



ON THE FIRST DAY OF CLASS AT U-M,

my instructor asked us to go around the room and say where we were from. One student was from Lansing, another was from New Jersey. Finally, I got to tell everyone that I was from Dubai. The class gasped.

"But you're Indian!" one person said.

"Is Dubai in India?" another asked.

"Wow, I've always wanted to go there."

"Isn't Dubai, like, a desert?"

People treated Dubai like it was this exotic wonderland, but my childhood was pretty normal. The Emirati government controlled the Internet, so I didn't know about the movie *Jackass* or what songs were on top of the American pop charts, but I didn't really feel sheltered. I rode to school on a bicycle and worried about homework and getting into a good college, just like everyone else.

I came to Ann Arbor for college and I loved Michigan, where I learned to communicate clearly and build professional relationships. After graduating, I decided to brave the cold a while longer by taking a human resources job in Milwaukee. After a year there, though, I was ready for another change and decided to return to Dubai.

The culture shock from my return to Dubai was even more intense than it was when I moved to Ann Arbor, an experience that psychologists call "reentry shock." When I had left, Dubai was a city still finding its bearings in a globalizing world. But the city I returned to was a bustling, over-packed metropolis that barely resembled the place where I had grown up.

It's easy to point to the crazy aspects of the new Dubai, the man-made islands and Lamborghini-driving policemen. But many of the things I found most disorienting were the ways that places that had been familiar to me had changed dramatically.

The quiet neighborhood I used to ride my bike around now had a highway running through it. The mall I loved going to because it was so big and spacious was now packed wall-to-wall with people every night. The waiters spoke a creole of Tagalog and English that I used to understand, but that talent was gone now, obliterated

after so many years speaking English in America. What had happened to my home, I wondered. What had happened to me?

Work was even more disorienting. In Milwaukee, I was late if I showed up at 8:02 A.M., but now I could stroll in at 9:30 A.M., no problem. Whereas Western work culture prioritized punctuality and professionalism, my new job stressed likeability and creative problem solving.

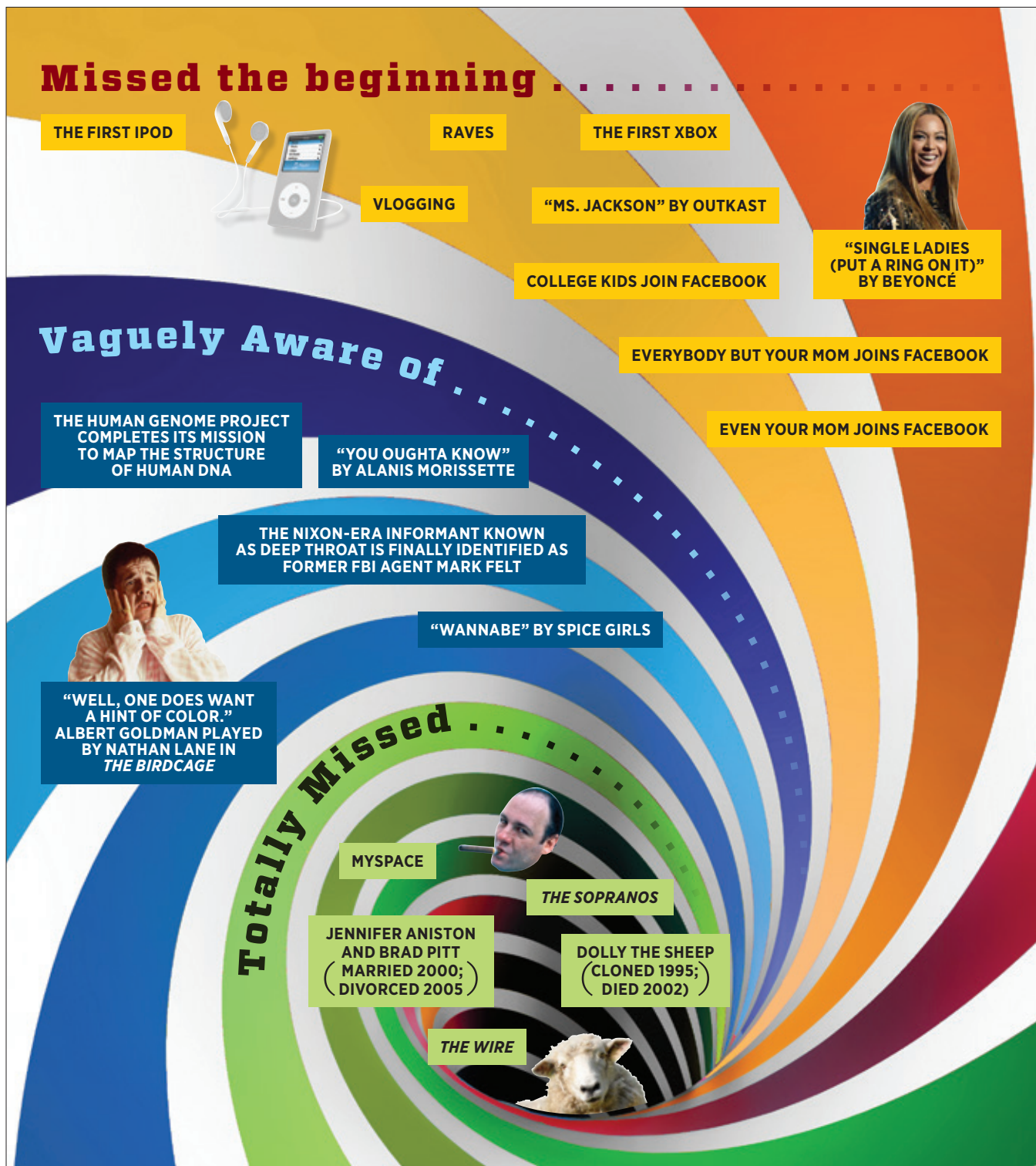
It's been almost a year now, and I am still getting used to my new old home, and I'm still getting used to life as what's known as a "third-culture kid": born in India, raised in Dubai, matured in the United States. Whenever someone asks me, "Where are you from?" I have to give them a 30-second monologue. But I'm grateful for it.

Seeing the world from so many different perspectives has allowed me to become the kind of person who can live and work anywhere in the world. And I'm proud that when I explain all of the places that I come from, I get to say, "I'm from Michigan, too." ■

Former *Michigan Daily* writer Debjani Mukherjee works in public relations at Cohn & Wolfe in Dubai.

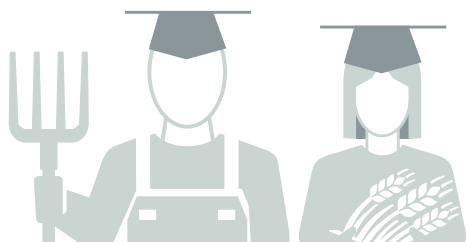
Pop Culture Black Hole

Alumna Debjani Mukherjee (see opposite page) lived in Dubai from 1995 to 2009, and Emirati censorship kept her from experiencing the full glory of American pop culture during that time. Here are a few of the gems she missed.



DID YOU MISS IT?

Make sure you check out these stories!



Students with a lot on their plates. **P. 35**

How to say “Go Blue” in Latin. **P. 46**



THE LAST VIDEO STORE. **P. 53**

Back home in Dubai. **P. 64**