



LSA

COLLEGE OF LITERATURE,  
SCIENCE, AND THE ARTS  
UNIVERSITY OF MICHIGAN

Spring 2016

TO: E. SCHRÖDINGER



UNDEFINED

# #LiberalArtsforLife

Think about how much you didn't know as a first-year student in LSA: the way to the dining hall, for example, or what exactly a registrar does. You probably had no idea what you would be doing 10, 20, or 30 years down the road. The same is true for LSA students today.

You can help the next generation of LSA Victors see what is possible by sharing where your LSA degree has taken you. Join us at [facebook.com/UMichLSA](https://facebook.com/UMichLSA) to hear from students and alumni and to add your story.



GO TO [myumi.ch/careerpathwheel](https://myumi.ch/careerpathwheel) TO EXPLORE MORE ABOUT THE LIBERAL ARTS

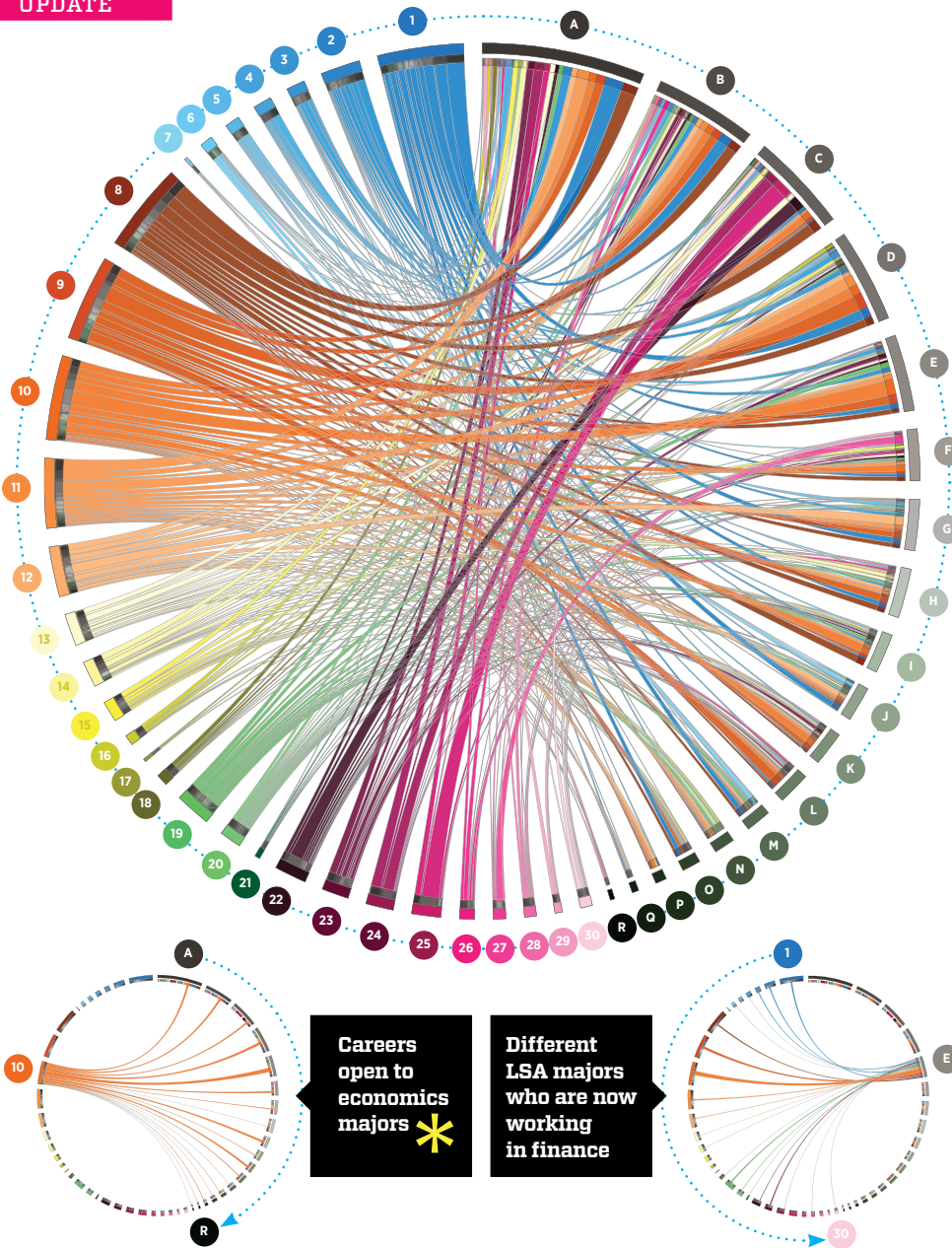
## UPDATE

### LSA MAJORS

1. English/Literature
2. Languages
3. Philosophy/Religion
4. Culture Studies
5. Art/Music
6. Film/Video/Screen Arts
7. Other-Humanities
8. Psychology
9. Political Science
10. Economics
11. History
12. Comm Studies
13. Sociology
14. Anthropology
15. Org Studies
16. Women's Studies
17. Afroamerican and African Studies
18. Other-Social Science
19. General Studies
20. Individualized Major
21. Other-LSA
22. Biology
23. Mathematics
24. Cognitive Studies
25. Cell/Microbiology
26. Earth/Environment
27. Computer Science
28. Physics
29. Chemistry/Biochem
30. Other-NatSci/Math

### INDUSTRIES

- A. Education
- B. Other
- C. Medicine/Health
- D. Legal
- E. Finance
- F. Technology
- G. Marketing/Advertising
- H. Nonprofit
- I. Management
- J. Journalism/Media
- K. Consulting
- L. Government
- M. Arts/Entertainment
- N. Sales
- O. Development
- P. Real Estate
- Q. Digital Media
- R. Engineering



Careers open to economics majors \*

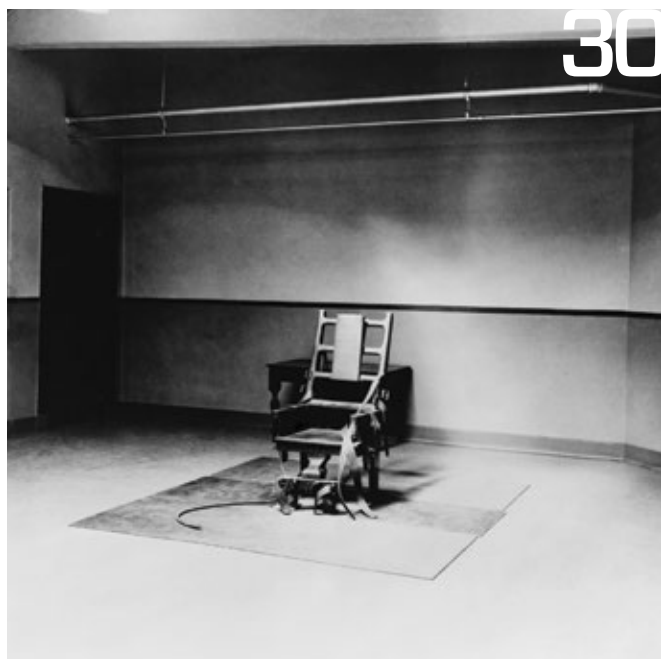
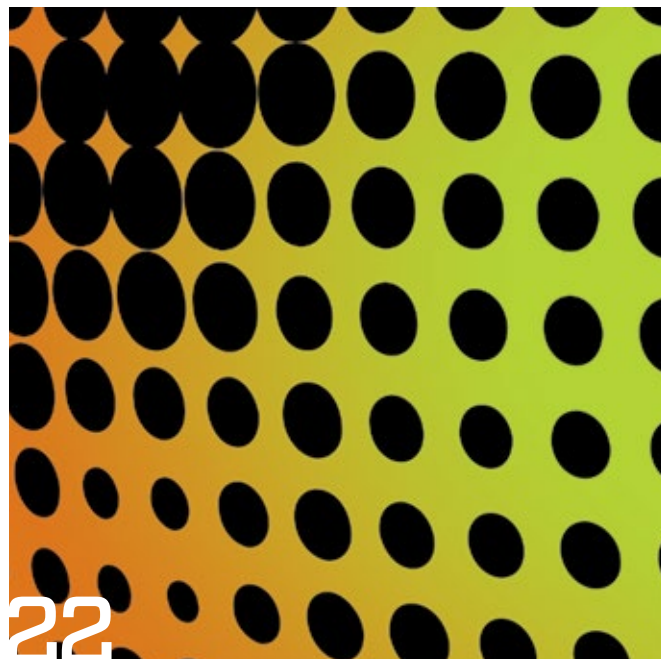
Different LSA majors who are now working in finance

\*Read more about LSA's Department of Economics on p. 57.

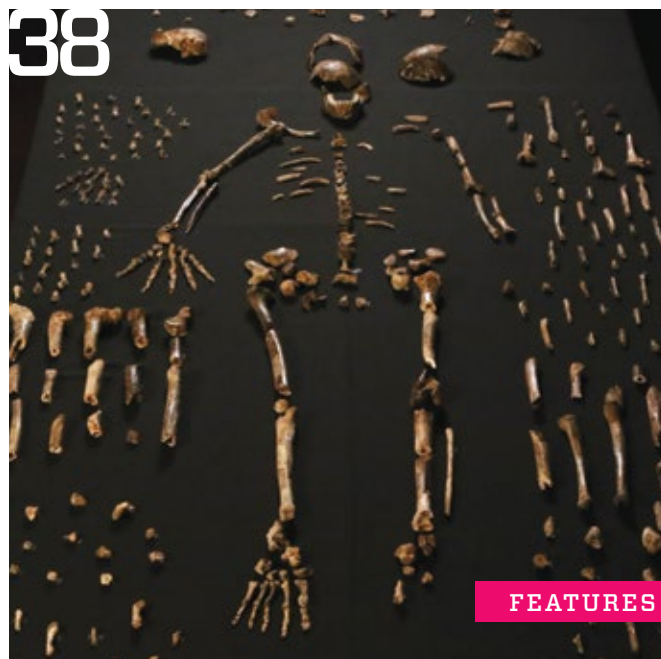




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## This Much Is Clear

**AT LSA, WE EMBRACE THE UNDEFINED.** One of the greatest strengths of a broad liberal arts education, after all, has always been to prepare students to adapt to emerging fields and to answer questions that have yet to be asked. Today, that mission also includes cultivating a spirit of entrepreneurship.

For the College, that means not only constantly looking for new ways to pair traditional classroom learning with opportunities to apply it in hands-on experiences at the undergraduate level, but also listening to students themselves for ideas about how to bridge the gaps they see in their education. In my time as dean of LSA, no program has made this more clear to me than the student-driven initiative optiMize, which runs a social innovation challenge for student teams from a range of different backgrounds.

LSA has always stressed the importance of teaching students how they need to think instead of telling them what they need to know.

A model of innovation itself, optiMize was started by students who didn't want to see great ideas left behind when class ended. The way it works is simple: Student teams apply with ideas for social impact each fall. Over the next seven months, teams attend a series of workshops where they work alongside and learn from one another, while alumni and local entrepreneurs serve as mentors. The winners are then selected by a group of past participants and funded by the University to spend the summer building their startups and nonprofits. That funding totaled more than \$100,000 in 2015.

For students whose projects proceed, they have a unique chance to make meaningful, lasting contributions to local, national, and international communities. And they do. Past projects include an urban farming initiative that in two years has

produced more than 30,000 pounds of fresh produce in a pay-what-you-can model in north Detroit; a collection system that has shipped more than \$1 million in unused medical supplies to Ghana; and an ed-tech company geared toward teaching children history through the stories of women.

Even students whose projects aren't funded gain important skills by addressing a problem, formulating proposals and prototypes wholly their own, and working with others to explore potential benefits and pitfalls. They also learn a crucial lesson: Good entrepreneurs fail far more often than they succeed, but they take what they've learned and apply it to the next challenge.

Fostering this entrepreneurial mindset is a priority at Michigan, where our 15 centers and programs in entrepreneurship and more than 30 entrepreneurial student organizations are a big reason that Reuters recently ranked U-M the fifth-most innovative university in the United States. The fact that a campus-wide entrepreneurial program like optiMize — and our recently introduced minor in entrepreneurship — sit within the University's center for the liberal arts reinforces the notions that complex problems are best addressed through multidisciplinary approaches, that the best ideas come from groups of people with a variety of skills and backgrounds, and that innovative thinking is as much an art as it is a science.

LSA has always stressed the importance of teaching students how they need to think instead of telling them what they need to know. The optiMize challenge is exemplary in that regard, because it gives students a sense of agency, an attitude of resilience, and an awareness of how their learning can be applied for the public good. Such innovative approaches empower students to look to that great unknown after graduation not as a cause for anxiety, but as a source of endless opportunity.

### Andrew D. Martin

Professor of Political Science and Statistics,  
and Dean, College of LSA



INSIDE LSA

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[lsa.umich.edu](http://lsa.umich.edu)



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



## WHERE IT'S @

**Twitter is transforming** the way that LSA scholars engage their students and interact with the general public. Follow the story — and the professors! — to find out how much knowledge can really fit into 140 characters.



## NEW IN TOWN

See what life is like for the thousands of international students studying in LSA.



## FROM SOUP TO NUT GRAPHS

The *Michigan Daily* celebrates 125 years of editorial freedom.



## EAT, DRINK, AND BE WARY

Explore one LSA professor's research about the dangers of food addiction.

Plus!



Read past issues of *LSA Magazine*:

[lsa.umich.edu/alumni/magazine](http://lsa.umich.edu/alumni/magazine)

## M | LSA

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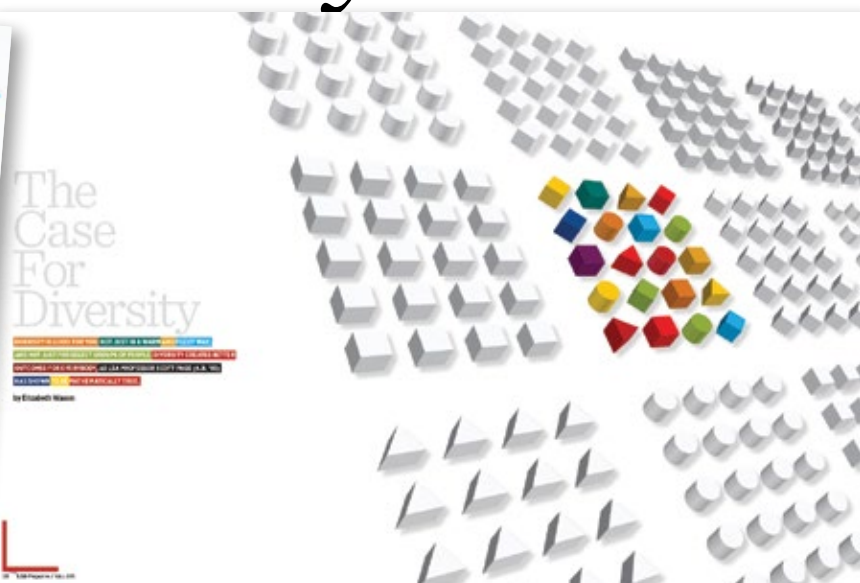
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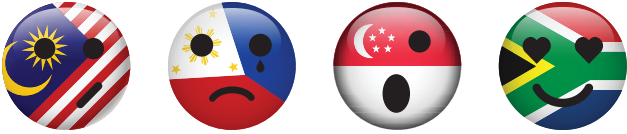
Elizabeth Woodford (A.B. '63)

We are happy to oblige Ms. Woodford's request with the inclusion of [Titanium], a poem by alumnus Benjamin Landry (M.F.A. '15) from his collection *Particle and Wave*, featured in our fall 2015 issue of the magazine.

Ronald L. Trowbridge (A.B. '60, A.M. '62, Ph.D. '67) [in English, would you believe? —RLT]

(Mostly people asking for answers to the crossword puzzle!)

Or write to:  
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*LSA Magazine*  
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48109-1382



## Malaysia, the Philippines, Singapore, South Africa

Countries that are more emotionally complex than the United States, according to research done by **Phoebe Ellsworth**, the Frank Murphy Distinguished Professor of Law and Psychology, and two colleagues at the University of Waterloo. (We're not quite sure how to feel about this news.)



“We thought it was a bent fence post.”

A quote from farmer James Bristle, who accidentally uncovered a trove of mammoth bones while digging in his soy fields in Lima Township, barely 15 miles from Ann Arbor. According to **PROFESSOR DAN FISHER** (pictured above), the director of LSA's Museum of Paleontology, the mammoth is part of a group known as Jeffersonian mammoths, a result of crossbreeding between distinct and separate species, the Columbian Mammoth and the Woolly Mammoth. The bones were later donated to the College of LSA, where they will never again be confused with fencing material.

## Top 5



U-M is one of only two public universities to make Reuters's list of top five most innovative universities in the United States. Go Blue!

## It's a Catch-22



A judgment on the merits of black fur on a squirrel according to **CODY THOMPSON**, a research scientist and mammal collections manager at LSA's Museum of Zoology. The black fur allows the rodents to retain heat more easily in the winter, but it also marks them out for flying predators looking for a cold-weather snack. Black squirrels—long present in northern Michigan—have been making a comeback in the southeastern part of the state.

### PANTROPICAL CAMERA TRAP NETWORK

It sounds more like some kind of villainous organization from a James Bond movie—move over Spectre!—but the PCTN is actually a scientific tool used to gather over a million photographs for a study on protected spaces led by LSA Assistant Professor **Lydia Beaudrot**.

### @ProfADM

Important lesson about being a faculty member: one can learn more from our students than they learn from us. Thanks #LSAstudents

### @Queen\_Ruby\_J

I need a list of everyone who is going to Michigan so I can start making friends. #Victors2020

Follow the College of LSA on Twitter @UMichLSA



## “Oh really, you're cold.”

HAN SOLO TO HIS FAITHFUL AND FUR-COVERED CO-PILOT CHEWBACCA AS THEY SNEAK AROUND THE SNOW-COVERED STARKILLER BASE IN LAST DECEMBER'S *STAR WARS: THE FORCE AWAKENS*, CO-Written by **LAWRENCE KASDAN** (A.B. '70, A.M. '72).





“AS A WHITE MALE, I WOULD BE TRANSFORMED INTO A WOMAN OF COLOR.”

**JEREMY BAILENSON (A.B. '94)**, co-founder of STRIVR Labs, on a virtual reality program built to improve diversity training. STRIVR Labs changed the appearance of users and then allowed them to experience prejudice virtually to increase empathy and improve interpersonal relations. “For about 12 years now,” Bailenson told the *Wall Street Journal*, “we’ve been running study after study showing that feeling discrimination firsthand while walking a mile in someone else’s shoes is a better way to change attitudes and behaviors.”



## BEHIND THE SCENES

**TYLER MESMAN (A.B. 14)** posing in a 3-D art exhibit in Chiang Mai, Thailand. Read about Mesman’s travels as part of LSA’s Bonderman Fellowship on p. 10.



Sound  
Spiders  
Dolphins  
Fire

Just some of the things that people get turned into in Ovid’s “Metamorphoses” and in Caroline Walker Bynum Distinguished University Professor **Linda Gregerson’s** book of new and selected poems, *Prodigal*, which partly draws on Roman source material.

## LOCATION, LOCATION, LOCATION

The origins of several stories in this issue and online:

- Havana
- Rochester, Michigan
- The Free Market
- The GI Tract
- Pahump, Nevada
- Brooklyn
- Cape Town
- The First Floor of the Thayer Building
- The Bottom of the Ocean
- Ossining, New York
- The Maldives
- Laos



➤ **\$5,000,000 IN FOUR YEARS**

The financial support allocated to the **Michigan Humanities Collaboratory**, a program launched by Provost Martha E. Pollack that will use collaborative methods to create new models for humanities research, its communication to the public, and the training of younger scholars.

A close-up portrait of a young man with dark, curly hair, looking slightly to the right with a thoughtful expression. He is wearing a dark grey zip-up jacket over a white t-shirt. The background is a solid yellow color.

# Enterprising.

## **YOU CAN HELP.**

LSA senior Pablo Mercado has big dreams. The philosophy and computer science double major — and aspiring entrepreneur — wanted experience with an organization undergoing restructuring to see what it's like firsthand. On his own, he sought out an internship at Detroit Water and Sewage, where he convinced the CFO to hire him. The only problem? Without financial support, he wouldn't be able to afford to take advantage of this important opportunity.

## **CONSIDER THE FUTURE.**

Thanks to the generosity of LSA internship scholarship donors, Pablo spent his summer living and interning in Detroit, helping the nonprofit restructure and grow — all the while making valuable professional connections and learning crucial lessons for his future career.

## **TAKE ACTION.**

Give a gift today to help Pablo and others like him apply their learning outside the classroom — and to support the leaders and best of tomorrow.

Move forward.  
Give back.

**EVERY GIFT MAKES A DIFFERENCE.**

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**Finding** what was hidden.

**Saying** what was unspoken.

**Building** what seemed impossible.



Sometimes  
**boldness is what is required.**

Sometimes vigilance.  
Sometimes subtlety. And sometimes it is the courage  
to hold two disparate thoughts in your  
head at the same time — to let a thing or an idea  
**just be.**

Join us for  
**a tour of the invisible,**  
the imperceptible, and the unknowable,  
alongside the voyagers and visionaries who  
clear away the shadows and shine their light  
on whatever they find there.



(THIS PAGE) A series of slow-moving waterfalls in Luang Prabang, Laos. Photographed by Ashline Hermiz.

(OPPOSITE) A street artist's wares in Kraków, Poland. Photographed by Catherine Huang.

One LSA program gives recent grads a chance to learn about the world—and themselves—all expenses paid. Join LSA on a world tour featuring student photographs—and stories—from around the globe.

by Rachel Reed

# NOT ALL THOSE WHO WANDER ARE LOST







**E**very year, LSA sends four graduating students around the world, providing them with \$20,000 in support, and the only requirement is that they travel. A lot. Recipients of each of the four competitive Bonderman Fellowships are required to travel to six countries in two different global regions over the course of eight months, immersing themselves in local cultures and visiting locales usually left untouched by Western tourists.

The fellowship is named after businessman David Bonderman, who received the Sheldon Fellowship at Harvard University to study and travel abroad over 45 years ago, an experience that he says changed his life. The fellowship exposed Bonderman to the richness of the world and later inspired him to establish a fellowship in the family name at the University of Washington. In 2014, David's daughter, LSA alumna Samantha Holloway (A.B. '03), and her husband, Gregory (A.B. '02), created the Bonderman Fellowship in LSA's Center for Global and Intercultural Study (CGIS).

Taking its inspiration but not its structure from the U-W program, the Bonderman Fellowship at Michigan is a one-of-a-kind experience. Although CGIS Director Michael Jordan says they don't look for any type of student in particular, each year they choose four graduating seniors who show an ability to be self-reflective, and who are open to change and spontaneity.

"The people we have selected speak of their desire to get to know things beyond their immediate sphere of familiarity," says Jordan. "You know it when you see it."

Each Bonderman Fellow is provided money and time to travel the globe, with the stipulations that the majority of their travel be solitary to encourage total immersion in the host cultures, and that the fellows visit a set number of countries and regions over the course of eight months. Recipients are also encouraged to explore places less well-traveled by Westerners, but choices about where to go, what to see and eat and read, and how to get from point A to point C to point F — all of that is up to the fellows.

\* \* \* \* \*

Fuvahmulah is a tiny speck of an island in the middle of the vast blue Laccadive Sea south of Sri Lanka. On this atoll, lush green areca palm trees sway gently, heavy with nut-like fruits called betel. For several days, **Louis Mirante** has been heading to this place on board a small ship that appears as barely a blip on the cerulean waters. Mirante heard from a local Maldivian that Fuvahmulah was close to paradise on Earth with white sandy beaches and verdant wetlands—a place where nearly every home has its own mango tree, and whose population of a little over 12,000 always seems to make visitors feel like family.

After Mirante negotiates a rate of \$30 for the three-day journey to the island, he joins a group of fisherman and sets off to sea. At first, things are a little awkward. Although they are kind, the Maldivians are unsure what to make of this American, the first many of them have ever met.

During his first evening on the boat, Mirante joins the men for a dinner of fish curry. Many South Asians prefer to eat with their hands, but out of respect for their guest, the men have found the lone spoon on board and placed it next to him. They sit, quietly watching him. Mirante hesitates, then picks up the spoon and sets it aside. Grabbing a hunk of rice and fish, he tosses it into his mouth and begins eating. After a brief pause, the men break into laughter. The tension is gone in an instant, and the men tuck happily into the rest of their meal.

A few days later, the ship arrives at Fuvahmulah, and Mirante leaves his new friends on the ship and heads off, ready for the next leg of his adventure.

\* \* \* \* \*

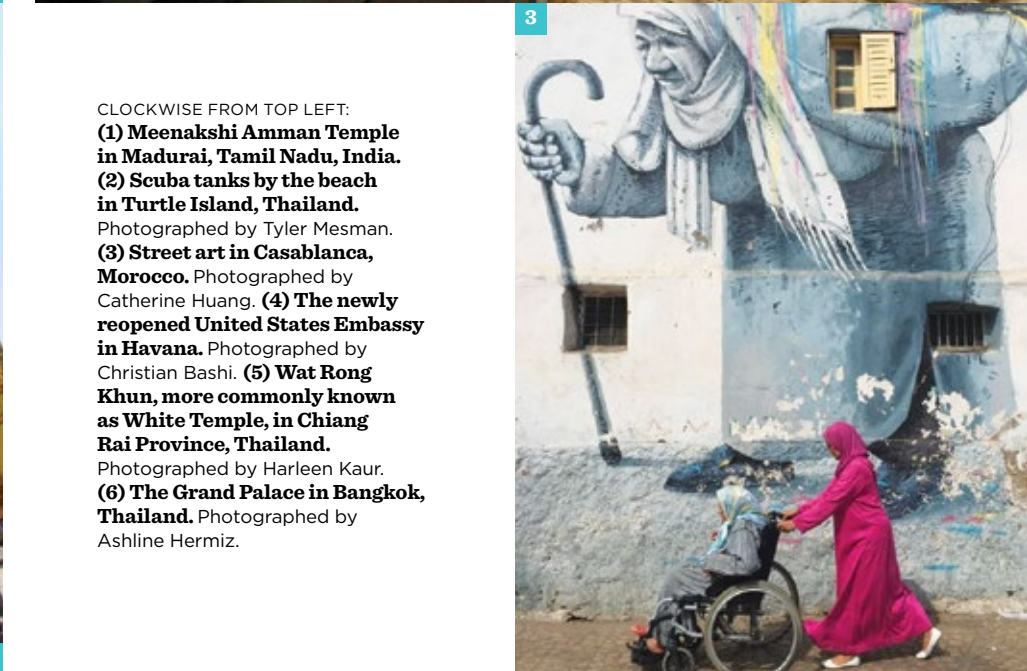




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CLOCKWISE FROM TOP LEFT:

**(1) Meenakshi Amman Temple in Madurai, Tamil Nadu, India.**  
**(2) Scuba tanks by the beach in Turtle Island, Thailand.**

Photographed by Tyler Mesman.

**(3) Street art in Casablanca, Morocco.** Photographed by Catherine Huang.  
**(4) The newly reopened United States Embassy in Havana.** Photographed by Christian Bashi.  
**(5) Wat Rong Khun, more commonly known as White Temple, in Chiang Rai Province, Thailand.**

Photographed by Harleen Kaur.

**(6) The Grand Palace in Bangkok, Thailand.** Photographed by Ashline Hermiz.



3 4





A narrow alley stairwell in what was once one of the most violent neighborhoods in Medellín, Colombia. Medellín is now a model for other cities in Colombia, which has reduced crime by 80 percent in the past three decades. Photographed by Christian Bashi.





Bouncing from country to country, the Bondermans learn to adapt to new foods, smells, and foreign tongues, making new friends with locals and other travelers alike.

\* \* \* \* \*

It is a pitilessly hot August day in the Caribbean, no breeze to break the swelter of the summer sun radiating off the worn streets of Havana.

It is a month after the U.S. Embassy in Cuba has opened its doors for the first time in over 50 years.

**Christian Bashi** is wandering through a park, taking in the sights and sounds of celebration. People are excited for the official opening ceremony the next day. Coincidentally, a Detroit-area news team spots Bashi in his U-M T-shirt and interviews him about how it feels to be there on that historic occasion. Afterward, they invite him to watch the next day's events with them.

The heat drags on, bearing down on the crowd so intensely that one young boy faints. Bashi can barely hear Secretary of State John Kerry's speech, but he can see the raising of the American flag and he feels the swell of emotion as he joins the crowd of thousands of Cubans singing the American national anthem.

\* \* \* \* \*

**Ashline Hermiz** is somewhere in Huay Xai, Laos. She has taken an overnight bus from another town and arrived exhausted and utterly lost. She's been looking for a zip line park she heard about, but so far no one she's asked has any idea where it is. And so she wanders, listless, through the city, hoping for some clue to materialize.

By chance, she drifts into a small shop. Surprisingly, the woman at the counter speaks perfect English, and even though she doesn't know about the zip line park offhand, she makes it her mission to help Hermiz. After a while, she locates it on her phone. But instead of giving Hermiz the directions and sending her on her way, the woman asks her son to give Hermiz a lift there—but not before packing her a hearty breakfast for the road.

\* \* \* \* \*

**The first thing that many Bondermans feel** when they step off the plane in Argentina or Mozambique or Kuala Lumpur is disorientation. Awash in new colors, sights, and sounds, the Bonderman Fellows are entirely on their own to explore, to choose where and how to spend their time. Some stay in hostels, others with local families. Some stick to schedules they've made for themselves. Others play it by ear, lingering as they please in each location, waiting for some internal timer to go off before moving on to the next town, the next country.

"You get used to change," says Tyler Mesman (A.B. '14), who traveled everywhere from India to Thailand to South Africa on his Bonderman Fellowship. "You adapt every day to new surroundings. Even within one country, cities can be vastly different."

Although it's only the program's second year, seven Bonderman Fellows have already crisscrossed the globe. Along the way, they've celebrated Diwali with new friends, visited Bolivian silver mines, and stayed with grape growers in Chile. One fellow ran the Eurasia Marathon from Asia into Europe. Another went snowboarding in the snow-capped Andes Mountains.

Bouncing from country to country, the Bondermans learn to adapt to new foods and smells and foreign tongues, making new friends by forming bonds with locals and other travelers alike. They share meals and laughter, trading stories about their lives, cultures, and hopes for the future. Each of the fellows is happy to recount the generosity of the many strangers they encountered across the globe, remembering the ways in which human kindness can transcend cultural differences. Louis Mirante (A.B. '14) was touched by the countless invitations he received for meals and lodging from strangers he befriended. Christian Bashi (A.B. '15) was humbled by a poor Peruvian woman who shared her fruit with him on a long bus ride. Even traveling solo, the Bondermans don't feel alone.

"At first, traveling by myself was difficult for me, and even a bit isolating," says Ashline Hermiz (B.S. '14). "But then I met so many amazing people along the way who were kind to me when I was in need of a helping hand."

**Bamboo rafts on  
the Yulong River in  
Yangshuo County,  
Guilin, China.**

Photographed by  
Harleen Kaur.



**Despite their very different itineraries,** many Bondermans talk similarly about their experiences. The exhilaration of arriving at the first stop on their trip. The surprising moments of humor and largesse they encounter on the road, on a train, or in the air. The pangs of happiness that occur when they encounter something familiar in an unfamiliar country.

Another curious, parallel reaction that many of the Bonderman Fellows go through is a kind of crystallizing of the self, where fellows talk about

Fellows are bound to have their identities challenged by what they encounter, an experience that's both difficult and illuminating.





suddenly understanding much better who they are and what their place is in the world. The nature of the trip means that most fellows are bound to have their identities challenged and shaped by the things and people they encounter, an experience that can be both difficult and illuminating.

Harleen Kaur (A.B. '15), who is Indian American, says she is accustomed to explaining her background to other Americans. But it came as a surprise when, in China, she was asked if she hoped to return to India someday.

The newfound experience of being “different” in a new place instilled a greater sense of empathy for the challenges of others.



(ABOVE) **Statues guard the entrance to Batu Caves in Gombak, Selangor, Malaysia.**

Photographed by Harleen Kaur.

\* \* \* \* \*

It is near the beginning of her trip, and **Catherine Huang** is still getting the hang of things. She has arrived in Eastern Europe anticipating that she'll be able to hop on the region's numerous and inexpensive trains for a whirlwind tour of the Baltics on the cheap.

What she encounters instead are trains that are closed off, canceled, or packed with thousands of Syrian refugees fleeing civil war and unrest in their home country. At one point, she becomes stuck on a crowded train for seven miserable hours. As she contemplates the delay, she realizes how grateful and lucky she is that she will eventually be free to continue on her travels, unlike so many of her fellow passengers.

\* \* \* \* \*

“I’m from Philadelphia,” she says. “At that point, I had only been to India once as a child, and so it was interesting that they perceived me in that way.”

Hermiz, who is Arab American, began seeing her identity in a more nuanced way the longer she was abroad.

“Growing up, I felt not exactly American but not fully Arab either,” she says. “As I traveled, I started to identify more and more with my American nationality and push back against this idea that there is only one image that an American can have.”

Catherine Huang (A.B. '15), an Asian American, at first took offense to the people staring at her or pulling at their eyes or yelling “*Konnichiwa!*” at her. But then she began gently confronting these people. To her surprise, she managed to have a number of constructive conversations with the people she approached. “They were curious more than anything,” she says.

For other fellows, the newfound experience of being “different” in a new place, of being out of one’s element, instilled a greater sense of empathy for the challenges of others.

“I’m a straight white man,” Mirante says, “and there aren’t too many places that haven’t been built for people who look like me. My experiences traveling gave me a thicker skin, and also gave me more of an appreciation for the problems other people face in our own country.”

The Bondermans come to know the world, and through the world, come to know themselves better.





(ABOVE) A Naxi girl and two Riwoche horses in Shangri-la, Tibet.



(BELOW) A room full of empty shoes from the Auschwitz-Birkenau Memorial and Museum in Poland. Both photographed by Catherine Huang.



(RIGHT) **A first-grade classroom in Tacna, Peru, where Bashi volunteered.**

Photographed by Christian Bashi.

(LEFT) **A mountaintop view inside Sehlabathebe National Park in Lesotho.**

Photographed by Tyler Mesman.





Amid a whirlwind of countries and cultures, perhaps the greatest discoveries the Bondermans make are about themselves.



\* \* \* \* \*

He's had plenty of adventures: everything from watching a speech by the Dalai Lama to enduring a 16-hour bus ride across the Bolivian desert. Yet one small, seemingly insignificant moment stands out most to **Louis Mirante** in all of his travels as a Bonderman Fellow.

He is in West Bengal, riding with some friends between villages. Suddenly he sees a banana cart approach from the opposite direction, and is astonished to notice that its driver has rigged an irrigation pump motor to it, turning it into a motorized vehicle. He is instantly affected by this man and his ingenuity, his ability to make something uniquely useful out of what he has at hand.

Mirante watches this man thoughtfully in his rearview mirror as the cart putters by, rows of bright yellow and green fruit shrinking slowly behind him. Mirante hopes for the man's continuing health and success, and hopes that he can bring some of the man's ingenuity to bear on his own problems, and on the challenges he will face in his future career. Finally, the man and the engine and the cart wink out, disappearing in the distance, and Mirante looks forward again, ready to see what's coming toward him, what surprise he will encounter next on the road ahead.

\* \* \* \* \*

**Amid a whirlwind of countries and cultures**, perhaps the greatest discoveries the Bondermans make are about themselves: about their strength to overcome challenges, about their flexibility and empathy, about the importance of slowing down to appreciate life's tiniest pleasures.

Fellows come back changed, more confident, more adventurous. After she returned from her fellowship, Hermiz, for whom solo travel was once a somewhat frightening prospect, decided to postpone her plans for graduate school in favor of a working holiday year in South Korea. Mesman has some ideas for his future, but he's no longer in a rush to get there. "The world is a really, really large place," he says. "What I learned while traveling is that there are multiple routes to success."

For Mirante, though, the Bonderman experience not only solidified his desire to work for the government and to serve the needs of citizens, but also opened his eyes to better ways to do it.

"I think the most important thing I learned for the career I've chosen is that it's important to be culturally aware," he says. "Sometimes the things you think are problems may not be problems to other people. On the other hand, they may have problems that you wouldn't think of if you didn't ask."

Christian Bashi has come to savor the beauty of small things, like the sight of hummingbirds in the morning fog at Machu Picchu, or the roar of the crowd at a World Cup qualifying match.

"The hardest thing about returning will be that I will start forgetting," says Kaur. "I want to figure out how to hold on to the things I experienced and continue processing it all when I'm back in the U.S."

It's difficult to fully capture the Bonderman experience since each fellow's journey is deeply personal, tailored to their interests and desires. They are united, however, in their eagerness to explore the greater world, and to expand their knowledge of new cultures, peoples, and ideas — all on their own. Without exception, they return home mentally and physically exhausted, but also renewed, ready to take on new challenges and to let life happen as it will. ■



SEE A SLIDESHOW OF PHOTOS FROM THE BONDERMAN FELLOWS' TRAVELS [lsa.umich.edu](http://lsa.umich.edu)

The background features a grid of black circles of varying sizes, creating a halftone effect. The color transitions from a vibrant green on the left to a warm orange on the right, with a diagonal gradient. Small, four-pointed star-like shapes are scattered throughout the grid.

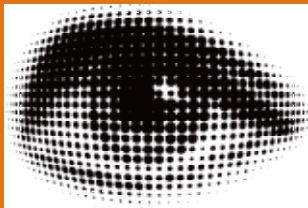
# Seeing th



THERE'S NOTHING MORE UNSETTLING THAN  
STARING INTO THE UNKNOWN, BUT PROBING ITS SECRETS  
CAN BRING NEW INSIGHT AND NEW PERSPECTIVES.  
LSA BRINGS YOU FOUR STORIES OF VISIONARIES FINDING  
NEW WAYS TO SEE THE UNSEEN.

by ELIZABETH WASON

# the Unseen





# We've long been told that gazing deeply into someone's eyes can reveal the secrets of their soul. But now we know that examining someone's eyes can give us a glimpse of something just as important: a person's brain.

You won't need much equipment. A microscope and some diagnostic software will help, but the necessary instruments aren't all that specialized — ophthalmologists can scan eyeballs using smartphones these days. Since eye exams have become such a breeze, researchers are optimistic about finding a way to easily diagnose diseases like Alzheimer's, multiple sclerosis, and Parkinson's with just a quick scan of a person's baby blues or chocolate browns.

This kind of work gets Delia DeBuc (Ph.D. '02) especially excited. Now a research associate professor in the Bascom Palmer Eye Institute at the University of Miami Miller School of Medicine, DeBuc studies how to see vision, in a sense, helping to define the connections between eyes and disease using physics and math.

DeBuc first came to Michigan from Havana, Cuba, with an undergraduate research background in neuroscience. As a Ph.D. student in LSA's Applied Physics Program, she helped improve Lasik surgery by using novel math equations to describe the biomechanics of the cornea — the outer tissue at the front of the eye — allowing ophthalmologists to personalize surgery for diverse patients. DeBuc's new

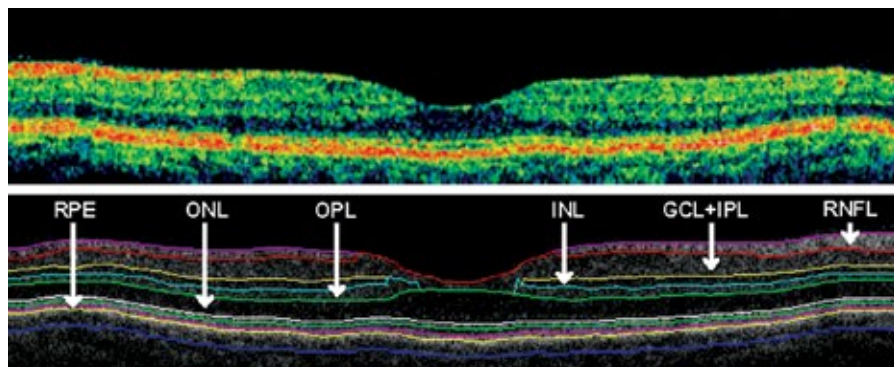
technique modeled the shape of a cornea with more precision, letting doctors consider the quirks of each patient's eyes, instead of a one-size-fits-all treatment.

DeBuc's enthusiasm bubbles over when she talks about her latest project, which takes advantage of the retina as a smaller and more accessible model of the brain. The retina is an intricately complex tissue at the back of eye where the eyeball stores its rods and cones (important for seeing light and color), lots of delicate blood vessels, and nerve cells that lead directly to the brain.

The retina alone contains 10 separate layers.

DeBuc has spent lots of time customizing software that automates the measurement of those retinal layers, "so we can know their exact thickness and optical properties," she says. "In that way, we can know which layer will be more affected by a particular disease and plan surgeries and drug treatments better." And, in some cases, diagnose a problem before we can otherwise see it.

One example: Alzheimer's disease symptoms appear in the retina before the disease is detectable in the brain. "Patients with



**A QUICK EYE SCAN WITH A TABLETOP MACHINE** yields an image of the retina that looks like this. Delia DeBuc built custom software that automatically carves out the separate layers of the retina (labeled with arrows and capital letters) much more quickly than people can by hand. Doctors keep an eye on layer thickness in a single patient over time: A change may warn of diseases like Alzheimer's, multiple sclerosis, or Parkinson's.

Alzheimer's often have symptoms affecting visual function, though their symptoms arise from the brain, rather than from the eyes themselves," DeBuc says. And since the retina can be examined more easily than the brain itself, the eye can be an accessible interface for Alzheimer's diagnosis, easy treatment, and follow-up.

"We have clinics in the community — in the neurology department at the University of Miami, with patients in Havana — and we're collecting data right now," DeBuc says. "We're trying to show that we can use the eye to predict the development of Alzheimer's disease.

"I'm really in love with it, fusing the brain and the eye. I'm finally realizing the dream I had when I came to Michigan from Havana — doing neuroscience again."

## Oh Say Can You Seed [ virtual dissection ]

"What I'd really like is a time machine, so we could go back and collect the living versions of our fossils," says Selena Smith. A paleobotanist, Smith studies fossil plants — most often, their seeds — as a professor in LSA's Department of Earth and Environmental

"A synchrotron is basically like a super-high-resolution CT scanner," Smith says. She uses the synchrotron to peer inside opaque fossil plant parts, including fruits, leaves, woods, and seeds — some as small as a few millimeters — to examine their ancient anatomy. Synchrotrons produce layers of scanned images that allow Smith

**SYNCHROTRONS NOT ONLY TAKE LESS TIME THAN PEELING A FOSSIL BY HAND, BUT ALSO SIMULATE THE DEATH AND DESTRUCTION OF ANCIENT ORGANISMS, A PROCESS KNOWN AS VIRTUAL TAPHONOMY.**

Sciences and Program in the Environment. But she's not about to sit around waiting for the perfect technology, especially because she has access to something that comes pretty close: a synchrotron.

to cut seeds open without actually cutting them open. Only 50 or so synchrotrons exist in the world, and Smith has traveled to facilities in Switzerland and California to use them.

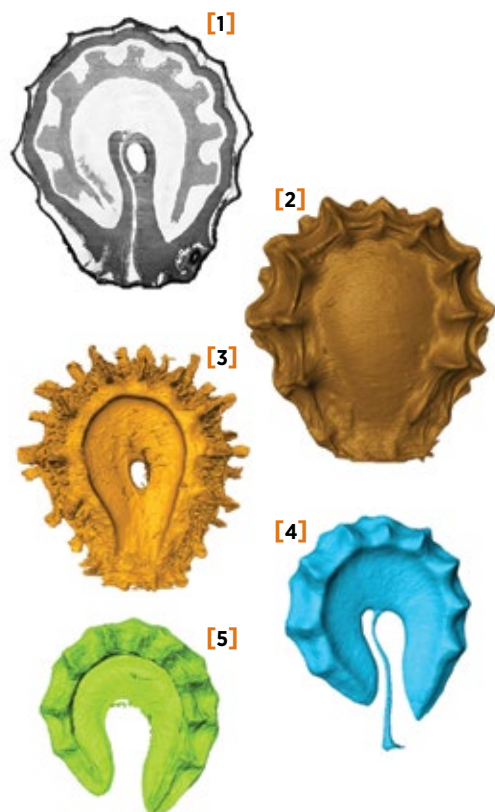
In the synchrotrons, huge rings made of scaffolding, pipes, and wires form a circular path several hundred feet long, through which giant magnets force electrons to traverse that same circular path 1.5 million times per second. Researchers like Smith harness bits of the electrons' energy by using a beamline — equipment that intercepts and guides high-velocity particles — to force that energy through a microscope. "We use a specific beamline that can get at 3-D structures, basically the same kind of X-rays you might use to look at a broken bone," she says, although way more powerful and more precise than in a hospital. And, amazingly, Smith's specimens can stay both fully intact and thoroughly "dissected."

Before, Smith might have used a sharp blade to cut fossils into very thin, sequential layers, and glued those cross-sections onto microscope slides. Or she could have put a sticky plastic sheet onto a flat fossil and peeled it away to collect incredibly thin layers of the preserved material. But these days, she says, "We get museum specimens that we're not allowed to cut or break open."

"For some of the fossils we've looked at, maybe only one or a few specimens exist, so obviously the museums don't want us cutting them," Smith says. So she opts for the nondestructive route that synchrotrons provide, which not only takes less time than peeling by hand, but also lets her simulate the death and destruction of ancient

## Peeling Back the Layers

Selena Smith has used synchrotrons to virtually peel away the layers of fruit and seeds, so she can guess at what kinds of fossils **might** have formed from ancient damaged fruits. Creating "virtual fossils" has helped Smith identify some strange specimens that otherwise would have been impossible to pin down.



1. A cross-section of a contemporary snake vine fruit (*Stephania japonica*), photographed using X-ray microscopy.

2. The external surface of the entire snake vine fruit, digitally rendered.

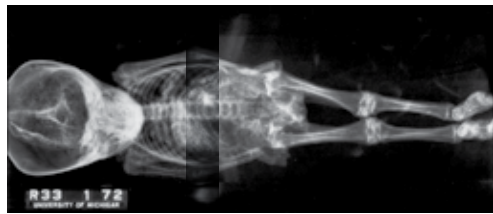
3. An inner layer of the fruit. This is what a fossil might look like if the fruit's surface decomposed or got munched by a seed-eating insect before being preserved.

4. Virtual potential fossil of the space within the snake vine fruit. If minerals entered the empty cavity in the fruit, hardened, and formed a cast fossil, it would look like this. Compare this shape to the light-colored area in the cross-section.

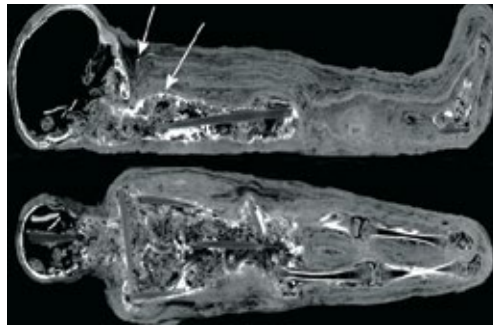
5. The seed itself, at the center of the snake vine fruit.

Note the striking differences in how these layers look. Without X-ray views like these, some fossils could easily be mistaken as different species.

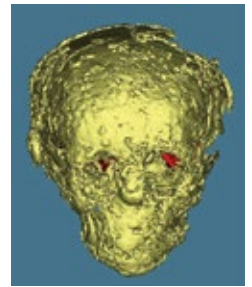




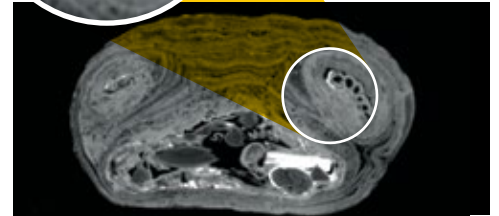
↑ In the 19th century, mummy collectors often unwrapped the bodies to learn about ancient embalming techniques or simply feed their curiosity. But nondestructive X-rays (above) and CT scans (below) of the child mummy at LSA's Kelsey Museum of Archaeology have given more detailed information about the child's age and health.



Undergraduate engineering student Grant Martin digitally modeled the child mummy's skull using CT data; a 3-D reproduction is on display at the Kelsey Museum, alongside the mummy and other related artifacts.



Unlike the X-rays taken in the 1970s, the more recent CT scans revealed an extra finger on the child mummy's left hand.



organisms, a process known as virtual taphonomy.

"With fossils, you can't always control what parts you get," Smith says. Imagine finding an ancient orange. You might find the full fruit preserved, or only the peel, or all the segments without the peel, or a single segment, or just one seed, all in various states of disintegration. It would be easy to mistake any of those hypothetical fossils as different organisms altogether. But with the 3-D data that Smith gets from synchrotrons, she can mimic the process of fossilization by digitally stripping away layers like a fruit peel, a once-fleshy segment, or the coatings of a seed.

"We had this weird fossil of a fruit with some seeds on it, and the fruit was distinctive enough that we knew there's only one living plant with a fruit like that," says Smith. "But the seeds in the fossil didn't match the appearance of the living species." She needed to dissect some modern and fossil seeds that she guessed were related and compare their internal anatomy for a

positive match. "But the seeds of the living plants are something like half a millimeter in size — they're extremely tiny, and there's no way that you could physically go in and peel away layers."

So Smith got beam time at a synchrotron and used high-powered X-rays to digitally strip away the coatings of some modern seeds. "We could show that, once we took away some of the outer layers of the living seeds, we found crazy shapes that looked like the fossils."

"We're so used to being able to go outside, and we can put a name to anything if we really want," Smith says. "But we've got fossils that just don't look like anything that's around.... So where do they fit in the tree of life?"

## Bring Out Your Dead [ *examining ancient anatomy* ]

Mummies want to stay hidden.

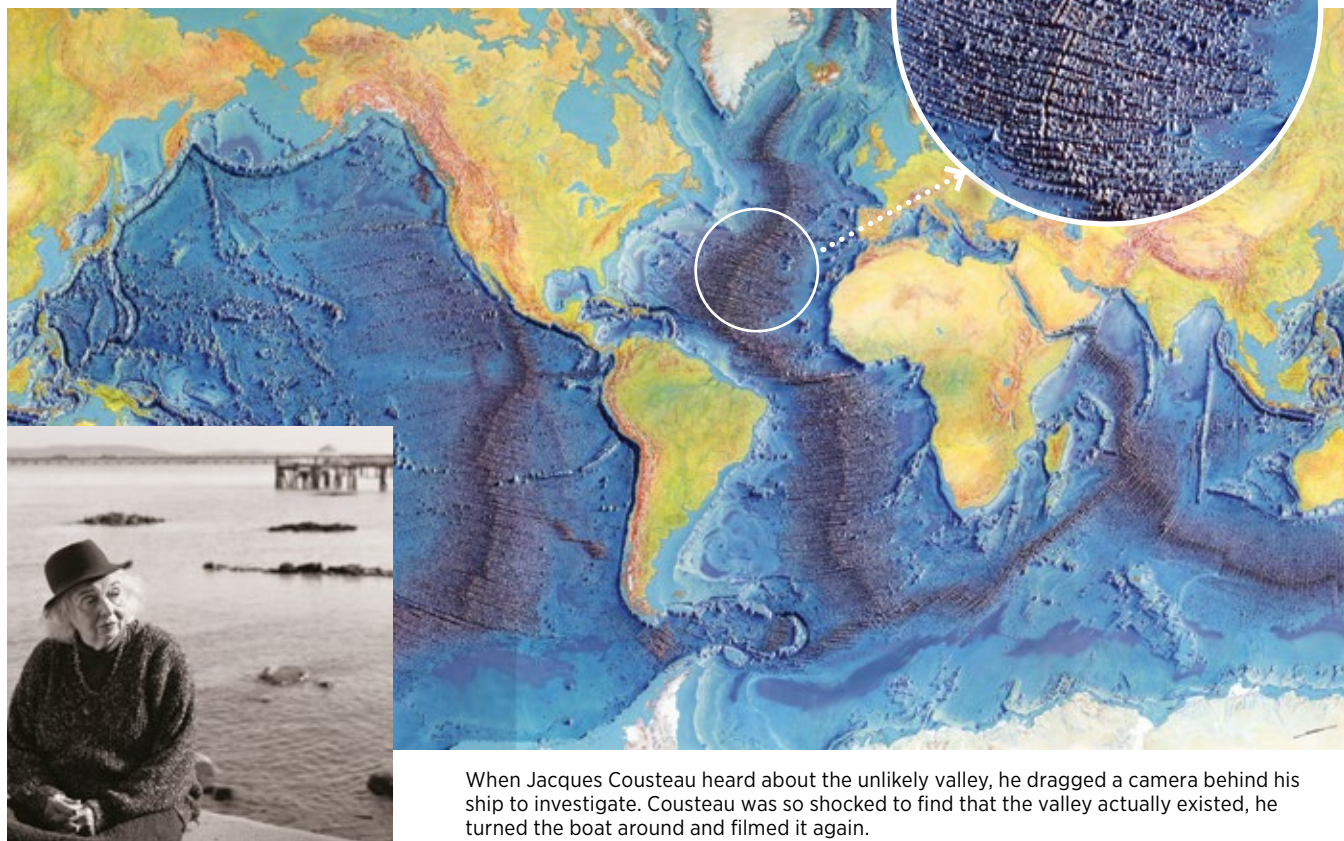
But people exhume them from their tombs, of course. "In our culture in particular, because we're fairly removed from

death and dead bodies, most people don't see dead bodies except in a fairly formal context, like at a funeral," says Terry Wilfong, a professor of Egyptology in LSA's Department of Near Eastern Studies and a curator at the Kelsey Museum of Archaeology. "So people are pretty curious to see mummies and what they look like inside." One enterprising engineering student named Grant Martin (B.S.E.M.S. '03) figured out a way to peek inside the wrappings of a child mummy in the Kelsey Museum's collection — without unraveling a single bit of cloth.

"Once you take the bandages off, a mummy gets exposed to light, humidity, and other things that can cause deterioration, and that's contrary to the Egyptians' intention," Wilfong says. "They did this so that the body would last forever."

Martin's plan involved taking the ancient corpse to a modern hospital. "One thing we didn't realize," Wilfong says, "is that it's illegal in the state of Michigan to transport a dead body in a car unless it's an approved

Marie Tharp (pictured below) drew from her U-M master's degree in geology to create the first comprehensive, accurate map of the ocean floor. Her discovery of a valley in a deep-sea mountain range (inset; the roughly aligned vertical crack) was met with disbelief among researchers.



When Jacques Cousteau heard about the unlikely valley, he dragged a camera behind his ship to investigate. Cousteau was so shocked to find that the valley actually existed, he turned the boat around and filmed it again.

vehicle.” Luckily, Martin knew an undertaker. He borrowed a funeral van, and Martin, Wilfong, and LSA professor and curator Janet Richards drove the mummy to the U-M Hospital in the dead of night, when the CT scanner at the hospital would not be occupied by patients.

The high resolution of a CT scanner can reveal unexpected details of a mummy’s body that the wrappings conceal — much more so than the X-rays that previously had been used to examine the Kelsey Museum’s child mummy. In the 1970s, a professor in the Department of Orthodontics, James Harris, X-rayed the mummy using protocols that he developed, along with other mummies that he examined on an expedition in Egypt. Harris was interested in their teeth, which can say a

lot about a mummy’s age. And while those old X-rays were hard to interpret, says Wilfong, he and Martin were optimistic that the modern CT could produce better images. They just didn’t realize how unexpected the new view would be.

“We found a gurney outside the hospital,” Wilfong says, and the crew rolled the mummy onto a freight elevator. “A lot of people at the hospital got very interested very quickly, because I guess it’s not every day that you have a 2,000-plus-year-old mummy going through your CT scanner.

“It was going back and forth through the scanner; you could see the laser shining onto it,” Wilfong continues. “We were in the technicians’ room, watching the scans as they emerged, and at one point they all started shouting, because that’s when they

discovered its sixth finger.”

The polydactyl child not only had an extra finger, but also was bound to a frame of wooden stakes, probably during the mummification process. Wilfong could see that the mummy’s body was in poor condition; the child either died in an awkward position or deteriorated before the embalmers could get to the body, situations that would have called for the wooden supports. The scans also showed thick layers of linen wrapped around the remains, which explained why the small but heavy mummy took some muscle to heft out of the van and onto the gurney.

Martin combined the CT data with rapid prototyping to create a precise polymer resin model of the skull. The plastic model gave up-close, three-dimensional access to



details of the mummy's head, leading to the surprising realization that the child was two or three years old when he died — eight years younger than previously believed.

Surely more surprises lie hidden among the Kelsey Museum's artifacts. Already, X-rays have shown that the Kelsey Museum's dog and baboon mummies suspiciously contain human bones. Maybe one day, new technology and insights from curious students can help explain why. These questions are more than just about dead bodies, Wilfong says. Each answer unravels a bit more about the Egyptian culture and religion that's been kept under wraps for all this time.

## Depth of Knowledge

### [ ocean floor sonar ]

The ocean's surface and the inaccessible depths below it hide an enormous mountain range that spans the entire globe — right there on the ocean floor. Marie Tharp (M.S. '45) created the first detailed maps of this 40,000-mile-long mountain range, called the Mid-Oceanic Ridge, even though she wasn't allowed to set foot on a research ship.

Before Tharp's time, the conventional way to explore the ocean's depths involved attaching a heavy weight to a rope, tossing it overboard, waiting for it to thunk on the seafloor (hopefully without first giving a porpoise a concussion), and measuring the length of wet rope as the crew yanked it back to the surface. Another method involved dropping dynamite into the drink and recording the time it took to hear the explosion, assuming the dynamite didn't explode on the ship's deck.

But in the 1940s, researchers were developing technology that could measure the bumps of the ocean floor easily and accurately — the beginnings of sonar. At around that time, Tharp scored a job in the very lab at Columbia University where those innovations were being designed and deployed.

Born in Ypsilanti, Tharp grew up all over the country, tagging along with her father on soil-surveying expeditions for the U.S. Department of Agriculture, a highly unusual pastime for a young girl in the 1920s. She earned an undergraduate degree in Ohio with two majors and four minors. In

1943, she enrolled at Michigan for a master's in geology — an easier prospect when most male students were off at war — where she did fieldwork at U-M's Camp Davis in Wyoming and wrote a thesis about the geology of the Detroit River. She earned yet another degree in math while working full time for a petroleum company in Oklahoma. And then she wound up in New York.

Women on ships were considered bad luck, so Tharp had no hopes of collecting her own data. Instead, Bruce Heezen, a male graduate student who was younger, less educated, and less experienced than she, brought back data from his own research expeditions at sea. Heezen worked as Tharp's direct supervisor and, eventually, her close research partner. Through Heezen and the Columbia lab, Tharp had access to reams of sonar data gathered by vessels plowing through the Atlantic Ocean between western Africa and the eastern United States, which she translated into the contours of the ocean floor. Those sonar data, though, only traced the narrow passages along the routes of six separate ships that traveled many miles away from one another. So Tharp applied her expertise to infer the geological features in the blank spaces between the ships.

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### THARP'S DISCOVERIES LED TO OUR CURRENT UNDERSTANDING OF PLATE TECTONICS AND THE SOLID BUT SURREAL EVIDENCE THAT THE CONTINENTS ARE MOVING BENEATH OUR FEET.

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While Tharp drew her maps by hand — a process that took months — another member of the lab sat at an adjacent drafting table, plotting the locations of tens of thousands of earthquakes that had been recorded in the open ocean. The aim was to find a safe spot to install transatlantic telegraph cables. Amid the gigantic mountains of the Mid-Oceanic Ridge that Tharp outlined on her maps, she soon noticed that a deep notch interrupted the series of peaks. That notch — an enormous valley, it looked like, wider than the Grand Canyon — aligned at about the same spot in all the ships' paths. Most surprising of all, the earthquake epicenters plotted at the table next to Tharp's lined up perfectly with the valley that Tharp had drawn.

This discovery blew everyone away, because the notch in Tharp's map implied that the roiling disturbances of volcanoes, accompanied by molten rock pushing up through the seafloor, caused earthquakes that forced the mountain range's peaks ever higher through unseen layers of the ocean's abyss. No scientist wanted to admit that the Earth's crust was in turmoil at invisible depths. If they did, then experts would have to acknowledge that the seemingly insensible idea of continental drift — the infinitesimally slow movement of the continents relative to one another — was true. Years went by as Tharp continued to map essentially the entire ocean floor until the skeptical scientific community acknowledged the great valley she'd spotted in the sonar data and its geological implications.

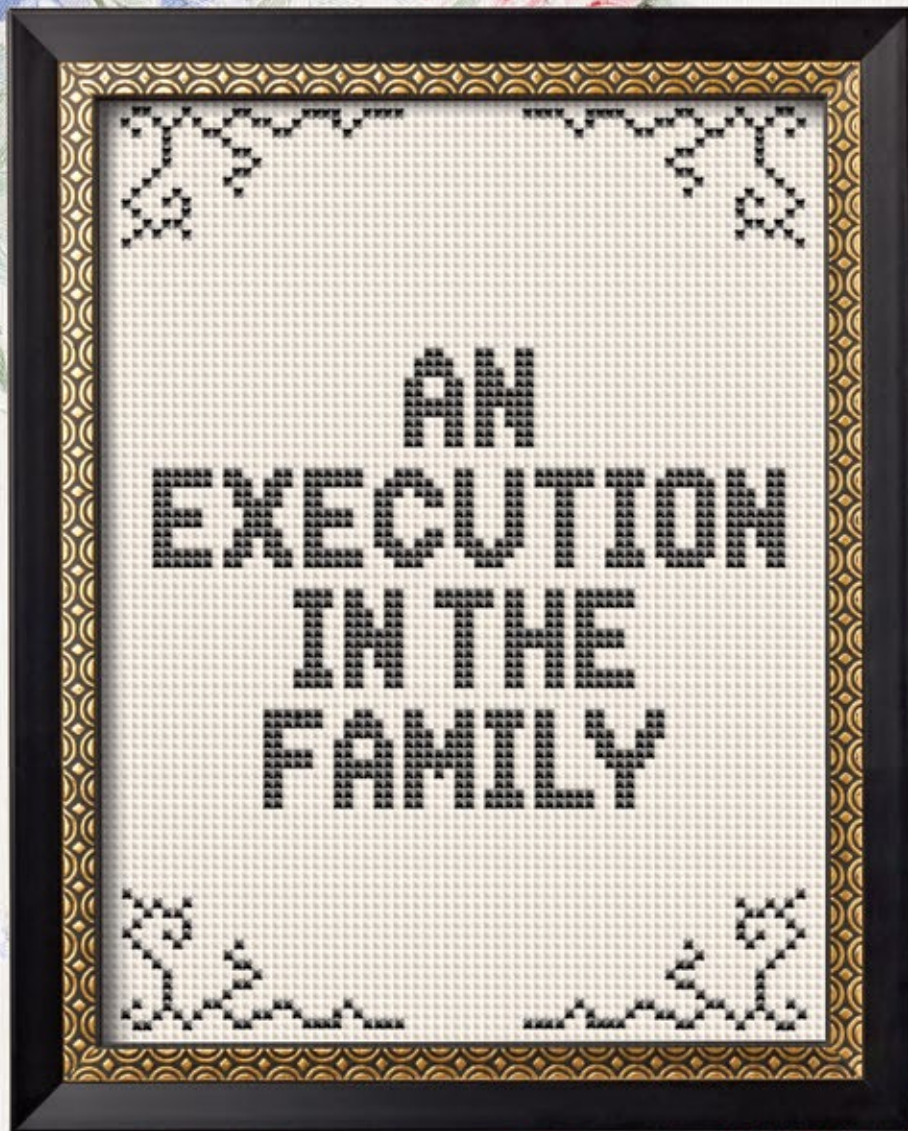
Tharp's painstakingly drawn maps, her persistence, and her willingness to challenge social and scientific norms changed how we see the ocean floor. Her discoveries led to our current understanding of plate tectonics and the solid but surreal evidence that the continents are moving beneath our feet.

Throughout her life, Tharp worked toward making her maps accessible to the general public, convinced that more than

just a narrow demographic of researchers should be able to see and uncover Earth's secrets. Tharp's maps were first published in colorful detail by *National Geographic* in 1977. They were exhibited at the Library of Congress, alongside maps drawn by George Washington and pages from Lewis and Clark's journals. Google Earth overlaid Tharp's maps onto its digital ocean.

Through her work, Tharp saw not only what remained invisible on the ocean floor, but also the hidden possibilities for what she as a woman could do in her male-dominated world. For Tharp, challenging social barriers imposed on her gender was no less a feat than diving to great depths to map the ocean floor without even getting near the water — and she did both. ■





**Robert Meeropol was only six years old when his parents, Julius and Ethel Rosenberg, were executed for espionage.**

**Now Meeropol is fighting to exonerate his mother while continuing to build his life's work — an organization that provides support for the children of targeted activists.**

by BRIAN SHORT





# We

all have moments in our lives when everything in the world seems to stop. The wind drops. The clouds slow their crawl across the sky. Something deep is happening inside of us, some unseen reshaping whose eventual consequences we can feel but not see. For Robert Meeropol (A.B. '69, M.A. '70, C.A. '72), one of those moments occurred during the fall of 1986. Meeropol had recently finished a yearlong clerkship, and he was preparing to start his new position as an attorney at a local law firm. He delayed the start of his job to be with his family, and he took one day — September 10 — to spend alone before his new career officially began.

Meeropol found a secluded field in the Green Mountains of Vermont and ate his sandwich among the asters and goldenrod. Sitting there, Meeropol had a deep feeling of being at peace with the world, but not with the job he was about to start. The moment is described two-thirds of the way through Meeropol's memoir *An Execution in the Family*. It is a rare moment of rest in a life of tragedy, tumult, movement, and action, a life whose story began at the dawn of the atomic age.





(TOP ROW, FROM LEFT) **Klaus Fuchs, Harry Gold, and David Greenglass** all confessed to spying for the Soviet Union. Fuchs named Gold, Gold named Greenglass, and Greenglass named his sister and brother-in-law, Julius and Ethel Rosenberg, as spies.

(MIDDLE ROW) **During the four weeks or so between Julius's arrest and Ethel's,** Julius sent multiple letters home concerning the family's machinist business, including quotidian details like valve purchases and when to bill a company called Precision Milling & Depressing.

(BOTTOM ROW) **Protests and counter-protests of the time revealed an American public motivated at turns by anxiety, anger, and atomic fears.**

**O**n July 16, 1945, the United States tested the first nuclear weapon in Trinity, New Mexico, and four years later the Soviet Union tested their own weapon, nicknamed Joe-1 by the Americans. The Soviet test opened the door to nuclear war and awakened fears of global destruction in people in every city, on every continent. Many Americans, including those in the highest levels of government, were demanding to know how the Reds had got the bomb.

In early 1950, a British physicist by the name of Klaus Fuchs was arrested on suspicion of espionage on behalf of the Soviet Union. Fuchs confessed, fingering an unassuming chemist named Harry Gold. Gold admitted his guilt in turn, directing the investigation to an information-gatherer associate of his, a soldier and native New Yorker who had been stationed in New Mexico. The soldier was identified as David Greenglass, who was arrested and who identified his wife, Ruth, and his brother-in-law Julius Rosenberg as part of the Soviet spy ring that he had participated in. Greenglass let the authorities know in no uncertain terms that if they arrested his wife that he would no longer cooperate. The FBI arrested Julius on July 17, 1950, and although she hadn't been mentioned in Greenglass's earliest testimony, Julius's wife, Ethel, was arrested less than a month later, on August 11, 1950.

The Rosenbergs refused to talk, insisting on their innocence repeatedly to the FBI and to their family. Largely on the basis of Greenglass's testimony, the Rosenbergs were found guilty of conspiracy to commit espionage in 1951. They were sentenced to death.

The execution took place two years later, commanding headlines around the world and leaving two children orphaned: Michael, 10 years old, and Robert, 6.

**W**hile their parents were still in jail, many of the boys' relatives refused to take them in, and Michael and Robert moved from place to place, hoping for a more permanent home. They stayed with their grandmother Tessie Greenglass briefly; then for a time in the Hebrew Children's Home in the Bronx; then with their other grandmother, Sophie Rosenberg; then with a friendly family, the Bachs, in New Jersey. None of these stays lasted very long, and the feelings of transience and worries about their parents produced tremendous anxiety in the boys.

Then, in 1954, the year after their parents' execution, the boys were welcomed into the home of Abel and Anne Meeropol, and three years later, they were officially adopted by the couple. The boys took on their adoptive parents' names, and Robert Rosenberg became Robert Meeropol.

The Meeropols provided the boys with a stable and loving home, and the two flourished there through the end of high school. Robert initially followed some New York friends to Earlham College, but he found both the college and Indiana to be poor fits.

Ann Arbor was more to his liking. There, Meeropol became an avid student of cultural anthropology. But it was as a student activist that he found friends and a community that he believed in. Both Meeropol's biological and adopted parents had been members of the Communist Party, and Meeropol found himself drawn to the leftist Students for a Democratic Society, with whom he participated in picket lines in support of striking service workers and joined sit-ins to increase the per-child winter clothing allowance for Washtenaw County. (The amount was raised from \$40 to \$50 a few days after a demonstration.)

Civil rights and anti-war causes were the most popular issues of the day, but Meeropol also encountered feminism and environmentalism in Ann Arbor, even attending the first Earth Day, in 1969.

"I read somewhere that 1968 was the worst year to be on campus at Michigan because of all of the turmoil," Meeropol says. "But you know, there was so much questioning going on. There was so much excitement. It seemed like the whole world was opening up."

But something changed. Meeropol participated in a protest following the conviction of the so-called "Chicago



**Robert Meeropol** (THIRD FROM RIGHT) discussing the Rosenberg trial while in East Berlin in 1976. **Morton Sobell** (FIFTH FROM LEFT), the Rosenbergs' co-defendant, was also present. Sobell served 18 years in prison for espionage. He admitted his guilt in 2008.



Seven,” who had organized the protests surrounding the 1968 Democratic National Convention that erupted into violence. After the conviction, over 5,000 students took to the streets of Ann Arbor, and what started as a peaceful march ended with a series of smashed storefronts and other property destruction. Soon after, Meeropol and his wife traveled to Europe for Meeropol’s anthropological field study, and they spoke together about the direction their politics were taking them.

**The Rosenbergs insisted on their innocence repeatedly to the FBI and to their family. Largely on the basis of Ethel’s brother David Greenglass’s testimony, the Rosenbergs were found guilty of conspiracy to commit espionage in 1951. They were sentenced to death.**

“We reminisced about how once we laughed and had fun with our politics,” Meeropol writes in *An Execution in the Family*. “Until recently we’d never taken ourselves too seriously and never lost sight of the absurd in the world. But in [our last year in Ann Arbor] we’d become deadly serious. Our recent actions had been motivated by responsive anger rather than the joy of creating a better world.”

Seeking that joy again, the couple left Michigan and moved to Springfield, Massachusetts, near where Meeropol’s brother, Michael, and his family lived, with the hope of starting a new chapter in their lives.

**T**he Meeropol brothers had long believed their parents to be innocent of the espionage charges they had been convicted of and executed for, and much of that belief relied on questionable evidence now known by spy buffs all over the world. There was a seemingly innocuous Jell-O box that supposedly linked Harry Gold and David Greenglass — a strange choice, if it had been used — and a table that prosecutors claimed was given to the Rosenbergs by Russian agents to photograph classified papers but turns out to have been purchased by the Rosenbergs at Macy’s.

The trial largely hinged on the testimony of witnesses, especially that of Ethel’s brother, David Greenglass, which the Meeropol brothers found suspect. They fought both publicly and in the courts, succeeding in getting hundreds of thousands of pages of government documents regarding their parents released. But even more documents remained unreleased, and the brothers continued their fight for over 20 years to learn what really happened.

It was during this decades-long legal battle that Robert Meeropol found his calling. After getting a graduate degree in anthropology from U-M and then becoming a lawyer, Meeropol still felt distant from his work. That moment of peace in the Green Mountains was a harbinger for what was literally a middle-of-the-night



**Sophie Rosenberg** (SECOND FROM LEFT), **Julius’s mother**, and **Anne and Abel Meeropol** (third and fourth from left), then foster parents to Robert and Michael, exiting the New York Supreme Court. The Meeropols adopted the brothers in 1957. Abel Meeropol was a prolific songwriter, best known for “Strange Fruit,” sung most famously by Billie Holiday.

epiphany, when Meeropol realized what it was that he wanted to do with the rest of his life: He wanted to help children going through what he went through as a child, the disruption of one’s family.

“I like to say that it took until I was 43 years old to figure out what I wanted to do with my life,” Meeropol says with a chuckle. “My biggest regret for the Rosenberg Fund for Children is that I didn’t think of it sooner.”

Meeropol’s organization is dedicated to helping children whose parents have been targeted for political reasons. Meeropol’s initial goal in 1990 was for the organization to have a budget of \$100,000 a year. Through hard work, perseverance, and a sustained fund-raising effort, the fund now delivers over \$350,000 in grants each year to hundreds of children to help them pay for therapy, school, and classes in art, drama, and music. Working on behalf of children who experienced something like what Meeropol himself experienced has been, he says, his life’s work: a chance to pass on the good of what was given to him during that time, and a way to heal the terror, loneliness, and isolation that one feels when a parent is gone in a flash.





**D**espite long periods without further material, new evidence in the Rosenberg case was still coming. In 1995, the American government declassified messages pertaining to the Venona project, an American Cold War effort that intercepted messages sent between Soviet intelligence units, messages that contained highly valuable information about Soviet espionage missions against the United States. Julius Rosenberg is mentioned by name multiple times in Venona, including a string of aliases given to him by the Soviets like “Antenna,” “Liberal,” and “King.” Rosenberg’s connection to David Greenglass is listed clearly in Venona, as well. This and other evidence makes it mostly settled that Julius, at least, was a spy.

The information released in Venona indicates that the government officials prosecuting the Rosenbergs in 1950–51 likely knew that Julius Rosenberg was guilty, but did not share the classified proof. (Decades later, the government said this evidence could not be used at the trial because it would reveal the code-breaking effort.) Because of that, the trial contained some questionable evidence of the couple’s guilt, evidence that might not have been enough to convict the Rosenbergs in a completely fair trial.

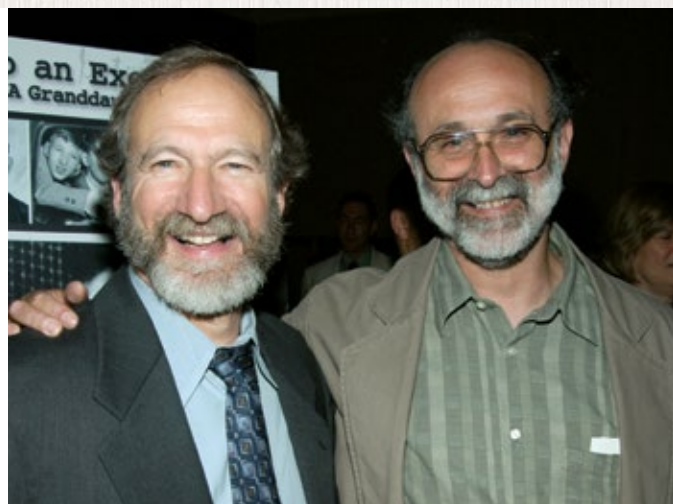
There were further complications to come. In 2001, David Greenglass admitted that the testimony he gave at the trial was not accurate. His grand jury testimony, unsealed just last year, confirms that not only did Greenglass not recall his sister Ethel typing up essential notes about atomic plans — notes that Greenglass once claimed to have passed on to Soviet agents and that were the foundation of the U.S. government’s case against Ethel — but also that Greenglass’s initial testimony to the court

### **For the Meeropols, the injustice of the Rosenbergs’ trial and the asymmetricality of the punishment that Ethel received warrant another look at her part of the Rosenberg case.**

didn’t mention Ethel’s involvement at all, bringing the culpability of the Rosenbergs as a pair deeper into question.

Other evidence uncovered in the 65 years since the trial points to the fact that Ethel was arrested at least partly to pressure Julius into naming his co-conspirators. There is a letter from then-director of the FBI J. Edgar Hoover suggesting the strategy of using Ethel’s arrest to motivate Julius’s cooperation. Myles Lane, an assistant U.S. attorney at the time, described the case against Ethel as “not too strong” but suggested that a conviction and strong sentence could be strategically useful with regard to Julius. William P. Rogers, who had been the acting deputy attorney general in the early ‘50s, says simply, “She called our bluff.”

Based on the unsealing of Greenglass’s grand jury testimony last summer, Robert Meeropol and his brother, Michael, wrote an op-ed calling for Ethel’s exoneration for the *New York Times*,



(OPPOSITE) **The Rosenberg boys awaiting news in 1953.**

(ABOVE) **Michael and Robert Meeropol—pictured here at a 2004 screening of Michael’s daughter Ivy’s documentary *Heir to an Execution*—have remained very close.**

working with an editor there, Meeropol says, “who wasn’t even born when my parents’ case was in the news.”

The piece immediately set off a series of articles and responses, including at least three follow-ups — most taking the opposite side in the argument — in the *Wall Street Journal*. Chief among the evidence cited by the Meeropol brothers’ opponents is the mention of “Liberal and his wife” in Venona regarding the recruitment of David Greenglass. And to those only casually familiar with the case — even those conflicted about the severity of Ethel’s sentence when compared to that of admitted spies like Morton Sobell (18 years in prison), David Greenglass (9 years), and Harry Gold (14 Years) — the Venona evidence is troubling.

But for the Meeropols, the injustice of the Rosenbergs’ trial and the asymmetricality of the punishment Ethel received entirely warrant another look at Ethel’s part of the Rosenberg case.

“It is time for Ethel to receive exoneration,” Meeropol says. “Her conviction was unjust, and if you’re unjustly convicted, that means that you should be presumed innocent. That is the request that we have made to President Obama and his administration.”

Meanwhile, Meeropol still lives in New England, and he still spends time fundraising for the Rosenberg Fund for Children, although he has given over the day-to-day directing of the organization to his daughter, Jennifer. He spends a lot of time writing about the dangers of climate change, a cause which he attributes to his deep love of the natural world — in all honesty, he prefers the Berkshires and the White Mountains to the Greens — and to the fact that he was exposed to the early environmentalism movement at Michigan, a time period that Meeropol still remembers happily.

“A lot of very important things were coming alive then, and Michigan was one of the best places in the country to be,” Meeropol says. “That air of excitement, if you could have bottled it and released it now, it would energize people even to this day.” ■



A team of paleoanthropologists organizing some of the more than 1,550 fossil specimens recovered from the Rising Star cave. The find included bones from 15 individuals, including infants, children, adults, and elderly hominins.





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SPECIES OF HUMAN.

by Susan Hutton

**Paleoanthropologists researching human evolution** haven't had a lot of material to work with. The early human fossil record's thousands of entries have been inscribed in fragments: Isolated teeth and solitary bones are the scant dots that connect us to our earliest ancestors across millions of years. Those occasions when paleoanthropologists have found semi-intact figures — the Taung child or the skeleton we know as Lucy — are so extraordinary they became international headlines.



(LEFT) *Homo naledi* fossils are confusing in many ways. The hands have human-like wrists and fingertips, but very curved fingers. The teeth are nearly the same size as human teeth, but the jaw and the skull are smaller.

(ABOVE) Because bones like the femur looked the same on all of the specimens, it helped confirm the team was looking at a single species.



So when a peculiar Facebook ad appeared in 2013, the anthropology world took notice. Paleoanthropologist Lee Berger, working at a UNESCO World Heritage Site known as the Cradle of Humankind, was looking for individuals with excellent archaeological excavation skills who were skinny, small, fit, and not claustrophobic.

In early October 2013, two recreational cavers had brought Berger some photos they'd taken in a cave called Rising Star. Located 30 miles northwest of Johannesburg, South Africa, Rising Star is part of a cave system that has more than a kilometer of twisty underground passages, making it

a popular spot for weekend spelunkers to explore, often searching for new passages to put on the map. That September, the cavers had found just such a passage and were able to squeeze into it. And *squeeze* is the word: In places, the passage was just eight inches wide. The passage led them to an incredible chamber they photographed and showed to Berger.

The Facebook ad yielded six slender excavators — who all happened to be women — whom Berger called “the underground astronauts.” The sextet spent five weeks working underground and recovered a whopping 1,550 pieces of bone fossils.

Back on the surface, an international team of senior paleoanthropologists cleaned and prepared the fossils, and were joined by an even larger team of paleoanthropologists who reconstructed and identified them. Two years later, the team announced that the bones belonged to a previously unknown branch of the human family tree, a new species they called *Homo naledi*.

## NEW BRANCHES ON THE FAMILY TREE

The earliest humans belonged to the genus *Australopithecus*, which included species that shared both human and ape-like traits. Like humans, they walked on two legs and had small canine teeth. Like apes, they had small brains and long, curved fingers. *Australopithecus* includes several species who all lived between 4.4 and 1.3 million years ago.

The *Homo* genus began about 2.5 million years ago. “In anthropology, we tend to classify things in *Homo* if they have large brains and hands that look like they're capable of making tools,” explains John Hawks (M.A. '96, Ph.D. '99), a leader of the Rising Star Project. “The idea is these different traits belong together, that the *Homo* genus happened because some sort of hominin — the name of the tribe to which we, extinct humans, and our immediate ancestors all belong — became smarter, made tools, and got larger brains and smaller teeth. For a long time, that's the way we thought these things went together.”



But anatomy specialists working to reconstruct the *Homo naledi* skeletons discovered that its bones didn't fit that way. Part *Australopithecus* and part *Homo*, the Rising Star bones were all over the map. Within the profession, anthropologists call specimens whose traits demonstrate different stages of evolution mosaics. And *Homo naledi* is an example of a mosaic so extreme that Berger described it as "a Mr. Potato Head disaster."

## FROM HAND LAND TO HIP HEAVEN

Before publishing, anthropologists usually keep their discovery within a small circle of collaborators as they study the nut they're trying to crack. With a discovery as big as Rising Star's, following a model like that would take decades. Plus, they had a hunch that the Rising Star fossils were going to be pretty big. In other words, they needed a lot of pairs of eyes to get the job done.

A typical endeavor of this sort includes about a dozen senior scientists, but the Rising Star team asked about 20 senior

scientists to join the project. Even more surprising, they also invited more than 30 early-career scientists. The anthropologists divided themselves by specialty. Hand people worked with fossils related to the hand in what became known as Hand Land. The Tooth Booth was concerned with fossilized teeth. The pelvis fossils were located in Hip Heaven.

With fossils from 15 individuals, there were multiple samples of each bone for the scientists to review and compare. Working all together in a windowless vault, the scientists analyzed the fossils within their areas of expertise and engaged other stations in constructive cross talk that allowed researchers to discuss the ways in which *Homo naledi* was similar and the ways in which it was different from previous finds.

"The *Homo naledi* have the most modern-looking feet I've ever seen in a fossil human," says Jeremy DeSilva (Ph.D. '08), a project leader and paleoanthropologist whose expertise is in foot and ankle anatomy. "They have a human-like foot and

**Anthropologists call specimens whose traits demonstrate different stages of evolution mosaics. And *Homo naledi* is an example of a mosaic so extreme that Berger described it as "a Mr. Potato Head disaster."**

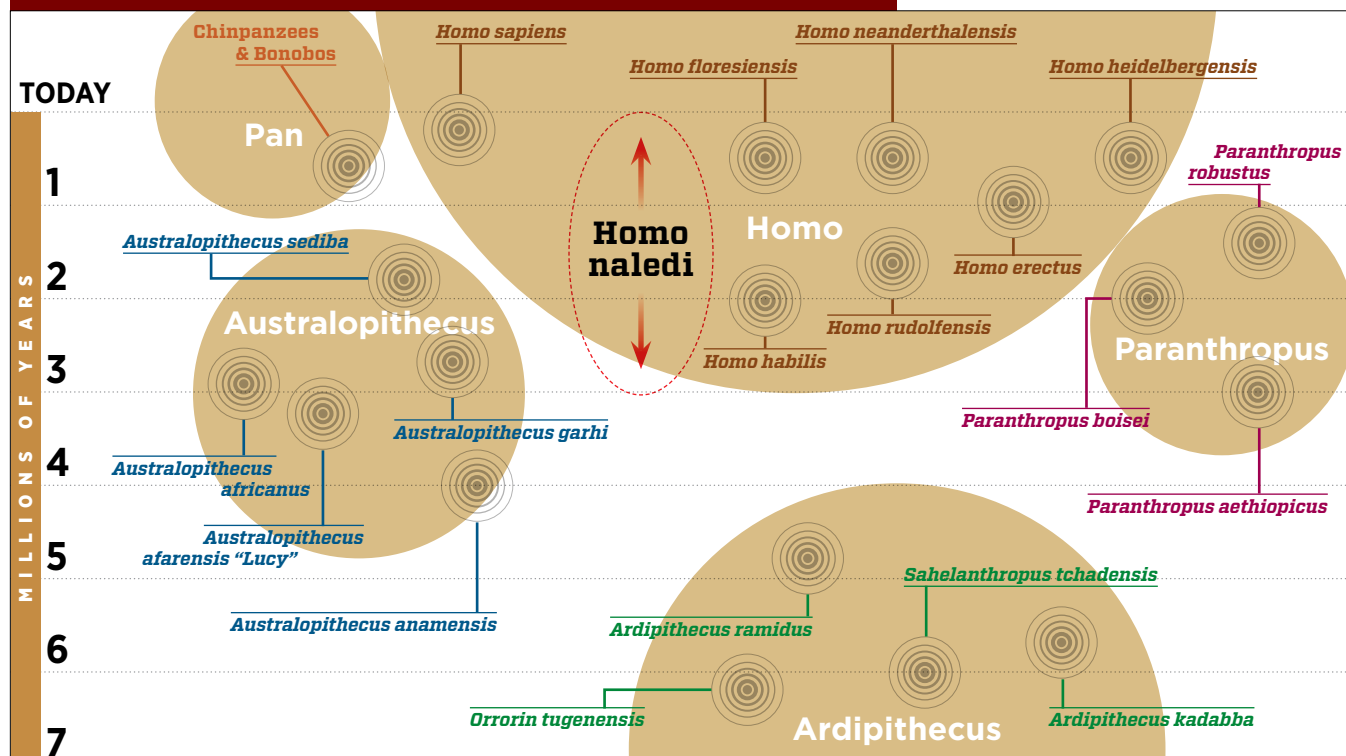
leg that's well-adapted for a long-distance striding gait."

Their feet might be familiar, but their pelvis is not, says biological anthropologist Caroline VanSickle (M.A. '10, Ph.D. '14). "The upper part of the pelvis is similar to Lucy's," VanSickle explains, referring to the famous *Australopithecus afarensis* skeleton discovered in 1974, "but the lower part shares traits with members of our genus. It seems like the pelvis is in transition between an older-looking torso and human-like lower limbs. It is not a pelvis we would have expected anything named *Homo* to have."

In the Tooth Booth, paleoanthropologist Juliet Brophy (B.S. '02) compared the

## Somewhere in Time

THE SEDIMENT IN WHICH *HOMO NALEDI* WAS FOUND MAKES ITS BONES DIFFICULT TO AGE. HERE'S A PRELIMINARY ESTIMATE OF WHEN THESE EARLY HOMININS MAY HAVE LIVED.





**There are some subtle differences between your foot and *Homo naledi*'s, says alumnus Jeremy DeSilva. The fossil feet appear to be flatter, and the toes are more curved.**

recovered teeth to other pre-human species. Small brains, like *Homo naledi*'s, should come with large teeth, but *Homo naledi*'s teeth are small with subtle but significant differences in their features. "The shape of some of the teeth are complete outliers," says Brophy. "There is no overlap with any other human ancestor we've recovered."

Understanding *Homo naledi* is complicated: Is it a convergence for separate species, or a point of origin? Is it a case

**The recovered bones appear to have been deliberately deposited into the remote, pitch-black chamber where they were found. In other words, the evidence suggests *Homo naledi* disposed of their dead — a very surprising thought.**

of something more human-like reverting to pre-human characteristics? Is this an ancestor, the first of our kind, or the result of species interbreeding?

"Working out the tree is difficult," says Hawks. "In the olden days, when *Homo habilis* was discovered, we said, 'Well, it has a large brain and tool-making hands.

Clearly, that's *Homo*, that's us.' But maybe *Homo naledi* isn't *Homo*, or maybe *Homo* isn't what we thought."

### **APING BEHAVIOR**

In addition to defying anatomical expectations, *Homo naledi* also seems to elude expectations about its behavior. The recovered bones appear to have been deliberately deposited into the remote, pitch-black chamber where they were found. In other words, says Hawks, the evidence suggests *Homo naledi* deliberately disposed of their dead.

The bones have no tooth marks or cracks, Hawks explains, so they weren't dropped into the cavern by predators. The chamber has no opening, and tests indicate its sediments never had contact with the surface, so the chamber wasn't an open pit *Homo naledi* could have fallen into. Articulated appendages, such as their hands, were found together, which means that the bones weren't carried there by water. Other than birds and rodents, there were no bones from other species, meaning the chamber was probably inaccessible. And the bodies are layered, suggesting they were added over time, rather than in a single, unlucky event where individuals climbed into a chamber from which they couldn't escape.

The one theory left standing is that *Homo naledi* ritually deposited their dead. "We're looking for evidence that rejects that scenario," says Hawks, "but so far it's the one that fits. If it proves correct, it means that a fossil species whose brain was the size of a chimpanzee's was engaging in behavior we've long held as a hallmark of being human."

### **OPEN SOURCE PALEOANTHROPOLOGY**

From its onset, the Rising Star team flouted convention. They found scientists through social media, welcomed researchers still early in their careers, and built a team of 60 scientists who came and worked together on site all at once rather than working in the more traditional way, with a small team of senior scientists doing their research at different times and then collaborating over email. "We wanted to

do things much differently," says Hawks.

"The field of paleoanthropology can be needlessly competitive, and some of our colleagues have, at times, restricted access to fossils," explains DeSilva. "With Rising Star, we had a large team of people who shared data to interpret fossils that are available to anyone interested in studying them.

"Lee Berger, John Hawks, and others decided to create teams that included some wonderfully talented young scholars who have large and innovative data sets, and to anchor the teams with more senior specialists, like myself," DeSilva continues. "A find of this magnitude really benefits from the field's collective knowledge, and including younger scholars allowed us to say a lot about these fossils in what is a comparatively short amount of time. We didn't rush the analysis; we just had more people working on them than is typical."

Openness has remained one of the Rising Star team's guiding principles. The team's paper was published online and is available for anyone to download. It has been read more than 250,000 times around the world. Fossil scans are also available on an open-source site for anyone to download and print as everyone from senior scientists to K-12 teachers have done. "There are huge scientific advantages to such openness," says Hawks. "It makes everyone's work better, and this is the first time it's been tried in anthropology." And it is a practice that recalls his experience as a U-M student, where he, along with many key members of the Rising Star team, were mentored by Milford Wolpoff, a professor of anthropology and a committed supporter of fledgling paleoanthropologists.

"Milford was such a leader in anthropology that whenever there was a new discovery, we knew about it in advance," recalls Hawks. "People shared fossil casts with him, and he shared them with us so we could assess them. This project and all of the Michigan people that were involved in it are part of his open legacy."

"These fossils are extremely precious," concludes DeSilva, bringing us back to the bones. "Each one has a story to tell. And now, after all of these years, we have this extraordinary opportunity to tell them." ■



42.22° N, 83.75° W

From the **art of hair** to the **science of stomachs**,  
our tour of campus starts here.

CAMPUS

## The New World Next Door

LSA's Institute for the Humanities gives artists an intimate gallery space to ask challenging questions. And they put the answers right up on the wall.

by Brian Short



**THERE'S A SHOT IN DOUG HALL'S *CHRYSOPLYAE* WHERE A**

container ship with the word “Evergreen” — it’s the name of the shipping company, written in two-story-tall letters on the ship’s side — pushes into the left side of the frame. Many shots in Doug Hall’s two-screen video installation show objects in and around San Francisco’s Golden Gate Bridge — boats, fog, people, birds — moving across the frame while the camera itself remains still.

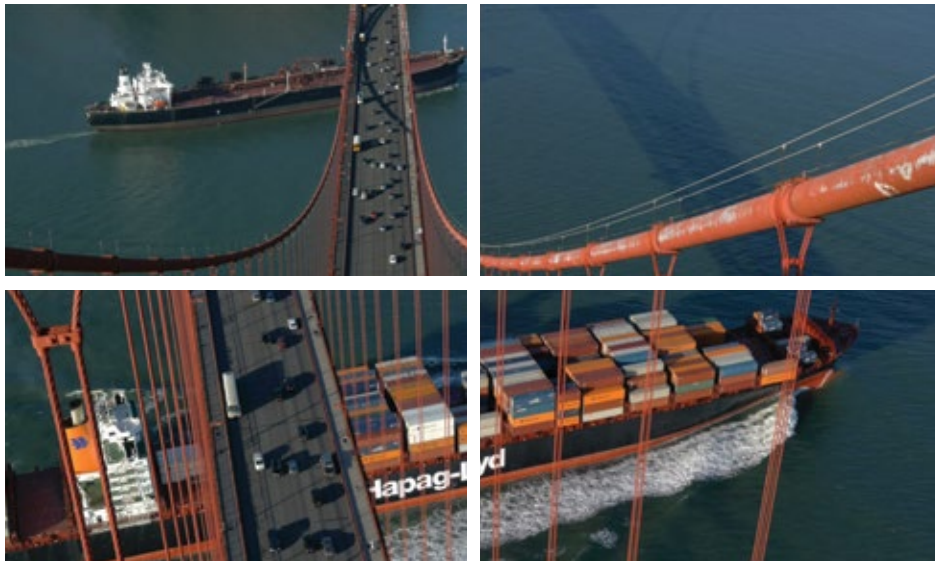
But as the Evergreen ship approaches the rightmost edge of the video screen, the camera unsticks and starts to pan with it, keeping the ship just inside the frame. This rare camera movement makes you feel as if you have been lifted from your seat and carried through the air, floating after the ship as it heads away from the bridge and into port.

*Chrysopylae*, which literally means “Golden Gate,” was the first exhibit in the “Year of Conversions” programming at LSA’s Institute for the Humanities. Featuring artist exhibits, author panels,

touch on conversions as broad as emigration and climate change and as personal as gender, race, and identity.

“The ability to do a turnabout or a flip, to reinvent oneself or think about things in an entirely new way, has long been a powerful notion, a bracing notion,” Smith says about the idea of conversions. “There’s always the potential to make radical change — large and small, to project a new paradigm, to reorient meaning. And the afterlife of that turning, that conversion, plays out in often unpredictable ways.”

Highlights have included talks by Institute for the Humanities fellows on topics such as the power of the algorithm in the digital age and a lecture by writer Naomi Klein that drew nearly 1,000 people. But the daily connections that people make with the project are often through the institute’s gallery on the ground floor of 202 South Thayer, where students and faculty encounter art on their way to and from classes and office hours.



(THIS PAGE) **Artist Doug Hall rode a rickety elevator to the top of the Golden Gate Bridge’s tower to get these shots.** (PREVIOUS PAGE) **Detail from Sonya Clark’s exhibit at the Institute for the Humanities.**

“The gallery has really become a different way to think about exhibitions on campus,” says Amanda Krugliak, the Institute for the Humanities curator, who worked closely with Professor Smith on the Year of Conversions exhibits. “It has become part of people’s comings and goings, something that changes their tracks, and I think that’s really profound.”

performances, and lectures, the Year of Conversions aims to illuminate the kinds of intense changes that we all experience, the places where those changes take place, and the ways in which we understand — and sometimes fail to understand — the consequences of those extreme changes.

“When we decided to do the Year of Conversions, we wanted to make sure that we were thinking of conversions in a capacious way,” says Sidonie Smith, the Mary Fair Croushore Professor of Humanities and director of the Institute for the Humanities, “looking at many different aspects of change across time.”

## COMMUNITY AND CONVERSION

The institute’s Year of Conversions program was inspired by a large grant-funded project on early modern conversions hosted by McGill University in Montreal and involving 15 partner institutions in Canada, Europe, Australia, and the United States, including U-M. The Institute for the Humanities wanted to take that topic and push it further, including exhibits and speakers that

Artists who visit often spend time working with students, as multimedia artist Sonya Clark did. Clark’s gallery installation revolved around hair, race, storytelling, and identity, and like many other exhibits in the gallery, the Clark exhibit was interactive. Visitors were invited to pluck a story from the wall and then write their own story on a slip of paper, roll it into a slender shape, and place its end into the slot they had removed a story from. By replacing dark paper with white, the wall seemed to slowly age, hair by hair.

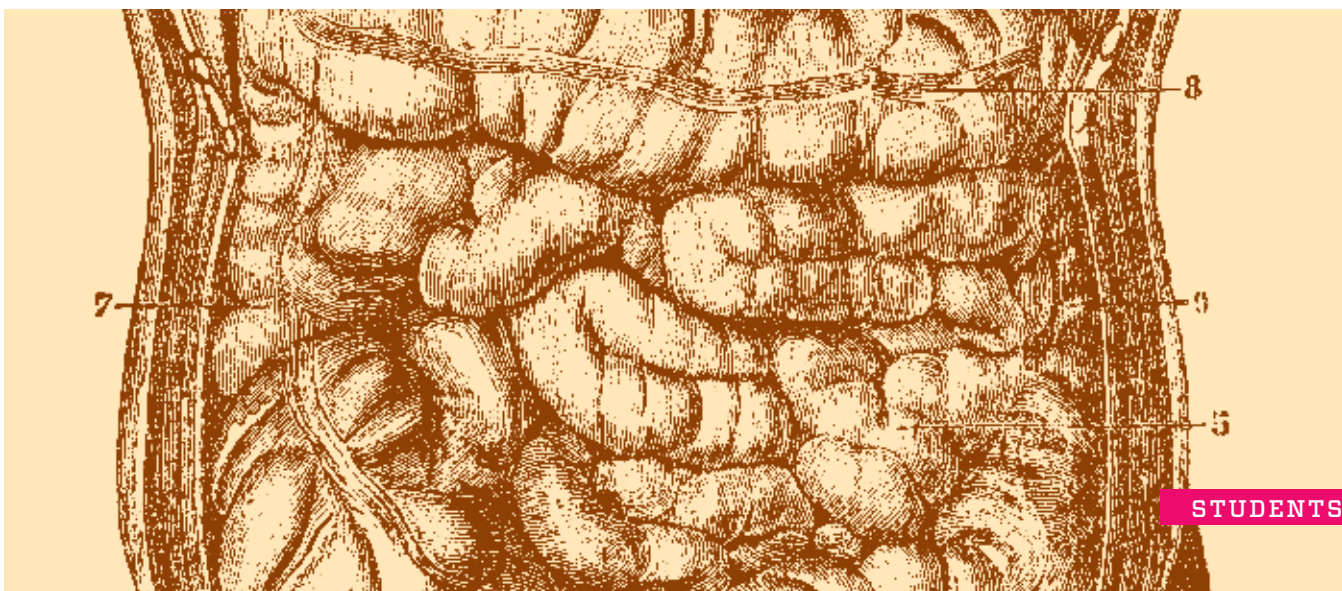
That interactive element is incredibly important, Krugliak and Smith agree, in creating a space on campus that is challenging and unique, the kind of place that has become a destination for engaging art on campus.

“The gallery has become a small space that holds worlds of ideas in it,” Smith says, “a space that explodes with provocative ideas and sounds and material forms. We want it to be a place that compels people to enter.” ■



SEE IMAGES FROM THE YEAR OF CONVERSIONS [lsa.umich.edu](http://lsa.umich.edu)





STUDENTS

# Trust Your Gut

LSA students in a new introductory biology lab have been taking a closer look at what might be the most compelling study subject of all — themselves. Using their own bodily bacteria, these students conduct “me”-search to take a truly hands-on approach in scientific research.

**IN PRIOR CENTURIES, SCIENTISTS HAD TO** get uncomfortably close to the objects they studied — tasting plants to get a sense of how much poison was on each leaf, harassing stinging insects to prove that yes, those bugs are venomous. The tradition continues in the 21st century, as professional researchers and stay-at-home scientists continue to poke and prod themselves for the sake of discovery. The personal genetics kit 23andMe, for example, allows anyone to sequence their own genes and discover their disease risk or Neanderthal heritage. Another kit called Wisdom Panel helps pet owners unravel their mutt’s mixed breed.

Welcome to the world of “me”-search, where the “quantified self” is the most compelling subject of study, through analyzing personal data and sitting in on scientific experiments. Some LSA lab courses are

running with the idea. By including stool samples in the syllabus, for example.

By dry weight, poop is 40 percent microbes — the bacteria and other tiny organisms that live inside our bodies. An accurate census is hard to pin down for the population of microbes that lives in each person, but trillions of microbes outnumber human cells and account for three pounds of an average person’s weight. Some of them harm us, but the vast majority of microbes live in our digestive system and help us process food, overcome allergies, and generally maintain our health. By analyzing their own samples, LSA students in a new intro biology lab are researching the contents of their very own gut microbiome.

Using a protocol that involves wax paper, a Popsicle stick, and several flushes, students extract DNA from their

fecal samples and sequence the members of their gut microbe community. The students then link the DNA information to data about themselves: height, weight, gender, daily diet, and other relevant stats. They use those data to test hypotheses about how their gut microbiome actually affects their health: Does the microbial community differ between lean students and students with higher BMIs? Students who were breast-fed and those raised on baby formula? Students delivered by Caesarian sections and those by natural births?

## SMELLS LIKE THEY’RE LEARNING

In lab one afternoon, students mix mouse droppings with foul-smelling ingredients. “A lot of undergrads will never get a chance to grow anything like this,” says postdoctoral fellow Jessica Sieber as she demonstrates the techniques they’ll need for rearing gut microbes in the lab. She notes that researchers don’t often culture these kinds of microbes; the work of growing them is unwieldy, not to mention stinky. Instead, labs often turn to DNA sequencing — studying microbes with computers instead of using hands-on lab techniques. But in this LSA lab, Sieber says, students gain experience with both digital analyses and practical lab work.



**Lab experiments relate to the data students collect about microbes in their own bodies. For their final projects, teams of students use class data to test a hypothesis about the gut microbiome. For example: Do students' microbial communities differ based on what dorm they live in?**

across campus, collectively known as the Michigan Microbiome Project, aim to link microbial communities to other pressing public health concerns, like obesity, mental illness, and harmful algal blooms in the Great Lakes. Michigan Microbiome Project faculty, including Professor Tom Schmidt (B.S. '78) — who helped launch the gut microbiome lab — will compile the student data from these intro biology labs and share their results with the broader scientific community.

Really, this work is just beginning. Microbes are difficult to identify as species, let alone understand as communities,

The goal of the mouse poop experiment is to see how different microbe species behave in different environments. Students create microcosms for the bacteria — tiny environments that are realistic but seriously scaled-down versions of a gut microbiome — giving students a peek at the workings of their own microbes. They introduce their bacteria into different microcosms and watch what happens. They've found that, when the bacteria are exposed to different environments, the gut microbiome's chemical secretions differ. One of those chemicals is an anti-inflammatory that's good for human health.

All semester, the students huddle in the lab to learn firsthand about the data they've collected. The syllabus steers away from more traditional "cookbook" lab courses, in which correct, expected outcomes are easy to grade.

"We want students to see the whole process of discovery, from when we don't know the answer to when we get the answer," says Deborah Goldberg, a professor in LSA's Department of Ecology and Evolutionary Biology who helped spearhead new

“We want students to see the whole process of discovery, from when we don't know the answer to when we get the answer. That's the real excitement of science.”

interactive lab courses on campus. "That's the real excitement of science."

This hands-on approach will hopefully produce insights about the gut microbiome that can have an impact beyond the classroom. Maybe the "me"-search of labs like this one can turn outward to improve public health for people around the world.

### ▲ A POSTERIORI

That's the big plan. More labs in LSA have followed this practical research model, with students building solar cells to figure out how to improve renewable technology or scooping snow from the highway to see how road salting can change environmental chemistry. And faculty from

and we know little about their specific functions. "I feel like we're actually at the start of something big," says Andrew Stevens as he injects microbes into a test tube. He's an undergrad who's planning on a career in psychiatry or alternative medicine. "When we first discovered DNA, people didn't realize that it would be useful for anything like identifying things at crime scenes. As we research the microbiome more, we're going to realize its effects and that we can manipulate it. We're going to be able to actually affect the microbiome, and affect our body as a result."

"Knowing I contributed to that in some way," adds another student working at the lab bench, "is pretty cool." ■



FACULTY

## When the Water Is Gone

LSA Professor Claire Vaye Watkins's new novel explores the growing menace of disappearing water in the American West and the connection between physical survival and the human imagination.

by Brian Short



**2015 FELT LIKE THE YEAR OF THE DROUGHT.**

There was the story about human-made Lake Mead, already shrinking, and the series of “straws” inserted into it to provide drinking water for the citizens of nearby Las Vegas. There was the one about the city of Los Angeles covering its reservoirs with millions of four-inch black plastic balls to prevent evaporation. And then there were the reports that there was “no snow whatsoever” at 6,800 feet in the Sierra Mountains, in light of which California Governor Jerry Brown issued mandatory water restrictions to reduce consumption by a staggering 25 percent.

We’re all talking about the dangers of the West’s water woes now, but when Claire Vaye Watkins, an assistant professor of creative writing in LSA’s English department, started work on her novel *Gold Fame Citrus* five years ago, almost no one was. The novel takes place in a near future where drought and rising global temperatures have utterly transformed the American Southwest. Without water, many of the area’s inhabitants have evacuated to relocation camps farther east, but some have refused to leave, remaining behind out of a desire to profit from the region’s new lawlessness or because something about the place reflects who they are. Some just can’t — or won’t — let go.

Both Watkins’s novel and her award-winning short story collection, *Battleborn*, confront the intersection of larger-than-life forces — politics, climate change, geology — and the lives of everyday people. Watkins herself was a child of the West, growing up in Pahrump, Nevada, separated from the lights of Las Vegas by the Spring Mountains. LSA spoke to the author about her new novel, the limits of the creative imagination, and her experience teaching in LSA’s Zell Writers’ Program.

**LSA: You write about the intersection of geological time and human time, and you have spoken in interviews about how human beings aren’t all that good at imagining geological time. What is it about the scale of**

**geological time that we’re incapable of understanding? What do you think keeps us from being better at it?**

**CLAIRE VAYE WATKINS:** I often think of a computer program I heard about, developed by the insurance industry after research on the brain showed that we think of our future selves the same way we think of other people — as distinct and apart from ourselves. The program, if I remember correctly, “introduced” the participant to her future self at retirement age, and the future self then explained to the younger, present self how important it is to save for retirement. To me, this is a startling illustration of how difficult it is for us to empathize with ourselves across even a little bit of time.

Considering that, it’s sadly unsurprising that we so struggle to act in a way that is considerate of future generations, ecosystems, or other species. It seems we’re not good with abstract empathy, except, most interestingly, when it comes to art. So a novel about drought seemed a good place to experiment with the collision of abstract conundrums that are tough to grasp with emotional immediacy, such as the draining of aquifers, and immediate, corporeal concerns that the reader would feel as she read, like thirst.

**LSA: You’ve spoken about a danger, or a worry, that writing about drought in the American West could have come across as too didactic. What is it that worried you, and how do you deal with that concern?**

**CVW:** It seemed dishonest to write *Gold Fame Citrus* from a didactic position in part because I had no answers to the questions I was asking — if I did, the project wouldn’t have been interesting to me. Of course, I certainly have thoughts about the way the mythology of the American West enables a type of entitlement that encourages the careless and obscene use of natural resources in that fragile region, but my artistic approach isn’t especially compatible with explicating those ideas. That’s not to dismiss that mode, as many

writers I admire announce and explore their ideas explicitly in their fiction, among them Margaret Atwood, Edward Abbey, and Kurt Vonnegut. It just isn’t the way I work.

And, too, I think I was wary of the novel being pigeonholed at all, whether it be as eco-lit, cli-fi (short for climate fiction, a genre I learned existed only after someone informed me that I’d clearly intended to write it), or post-apocalyptic, because for me so much of a book’s electricity comes from its chimeric qualities.

**LSA: Do you see your books *Battleborn* and *Gold Fame Citrus* as overlapping in any way other than geographically?**

**CVW:** I’ve come to consider *Battleborn* and *Gold Fame Citrus* sister books. My hope is that when read together, they offer more intricate and deeper ideas about the mythology of the American West, though each addresses the subject on its own. They also use time similarly in that while most of the stories in *Battleborn* are contemporary, and *Gold Fame Citrus* is set in an imagined future, both books look to the past.

**LSA: What is it like teaching in the Zell Writers’ Program?**

**CVW:** It’s tremendous! I’m grateful every day for the high caliber of the MFA students, for the richness and intentionality of their work as it allows us to extend our conversations beyond mechanics (although those are important) and into more challenging and exuberant terrain of meaning, theme, aesthetic, audience, and purpose. I think that’s the place all teaching writers want to get to, and I’m there every day. Beyond the classroom, it’s obvious that the program’s faculty and alumni have spent decades as stalwarts for this community, insisting on its inclusivity, artistry, and rigor. It’s among the liveliest and most robust creative fellowships I’ve ever been a part of.

**LSA: What are you working on now?**

**CVW:** Oh, I’m far too superstitious to say. ■



by Matt Nelson



STUDENTS

# The Humble Trundle

An LSA student builds a tiny house in pursuit of a big idea.



**CHRIS CERK WROTE HIS MOST IMPORTANT** paper before the semester had even begun. It represented wholly original research, ended up bringing him no small degree of notoriety among his peers, and saw his work celebrated in outlets as far ranging as *USA Today* and the U.K.'s *Daily Mail*. But Cerk didn't turn the paper in to a professor; he turned it in to his mom.

When the LSA junior started crunching the numbers on housing costs, he decided it would be more economical — not to mention interesting — to eschew dorm life and spend his last two years in Ann Arbor living in a 170-square-foot house of his own construction. There were, understandably, a few parental concerns.

"My mom's pretty Type A, very detailed," says Cerk, whose initial idea of taking up residence in a VW van was rejected out of hand. "When I had thought about the tiny house and decided I wanted to do it no matter what, my next thought was, 'How am I going to convince my mother?'"

"So I wrote a multipage paper with, you know, the reasons it was a good idea and possible reasons it was a bad idea," Cerk says. "And she wanted a detailed budget, and by detailed I mean, like, every nut, bolt, screw, and board of lumber."

## THE NEXT BIG THING

While the history of intentionally living simple and small in America winds down from Thoreau through the counterculture of the late 1960s, it has gained a remarkable resurgence in the past 20 years. There are a slew of companies dedicated to building tiny houses ("tiny" typically means fewer than 400 square feet), architects for hire, and a community of enthusiasts sharing their trials and triumphs on blogs and in videos. HGTV alone offers a handful of shows dedicated to the phenomenon, including *Tiny House Hunters* and *Tiny Luxury*.

So even though the most complicated construction project Cerk had undertaken prior to his current home was a wooden skimboard he uses with friends in a stream emptying into Lake Michigan, he found that a wealth of support and guidance was

“I remember that first night, I was looking around at all of this stuff that was unpacked and it looked like a mess and I thought, ‘What am I doing here? Did I completely screw up? Was this a really dumb idea?’ It was just the unknown.”

no farther away than YouTube.

"I spent a large chunk of time just looking, because I had no idea how you build a house," he says. "Then I came up with a basic design. And I'm kind of a person who, I'll keep building things and if something changes, I'll just make improvements and keep going."

Cerk kept going for two summers, juggling first a job waiting tables and then an internship with an insurance company. He spent parts of 90-degree days on a hot metal roof, worried over damp forecasts when he needed to finish sealing the exterior, and sacrificed summer fun in pursuit of his dream goal of living in a house he built himself.

"I couldn't not do work on the house for even one week," says Cerk, who estimates he spent more than 700 hours on the project. "I had to plan out my time and estimate how much everything would take just so I'd have somewhere to live this year."

## SWEATING IT

Cerk built his home with a trailer as the foundation, partly to make it easier to move from one place to another and partly because the ambiguities of regulation mean that homes on wheels straddle the line between recreational vehicle and permanent dwelling. Because of that gray area, Cerk doesn't like to get too specific about how or where he found a place to park his dwelling. He prefers to focus instead on the experience of living in what he calls "the Humble Trundle." Naturally, it began with a few moments of anxiety.

"I remember that first night," he says. "My mom had helped me move down. It

was really hot, and we were sleeping on these two couches I built and running two battery-powered fans. I was looking around at all of this stuff that was unpacked and it looked like a mess and I thought, 'What am I doing here? Did I completely screw up? Was this a really dumb idea?' It was just the unknown."

After a week or so, the temperatures began to cool and Cerk began to grow accustomed to a life where the kitchen



**Cerk says that people often ask why he didn't just buy an R.V. to live in. Aside from the option to add energy-efficient insulation and to customize things like his couches and counter space, the tiny house afforded Cerk something even more significant: "I wanted a home to live in," he says. "It was important to me to live in something I built myself." He even included a shower run from a three-gallon reheatable canister (above).**



is a camp stove, where the refrigerator is a cooler or a snow bank, and where the shower involves leftover roofing material, a pond liner, and some rocks. He did install a solar panel, but Cerk says he intentionally decided not to arrange Internet access, a move that has had surprising benefits for someone carrying an 18-credit course load.

“Not to have Internet in the tiny house has made a crazy difference in my life in terms of getting things done and just thinking about things differently,” he says. “I don’t even have data on my cell phone, and it’s a great break not to deal with this constant stream and just concentrate. I’ve been reading more this semester, and I think that’s affected my productivity.

“One of the main reasons, too, that I wanted to build the house is that I didn’t want to have a lot of stuff to weigh me down mentally and emotionally and financially. I appreciate a lot more things that I

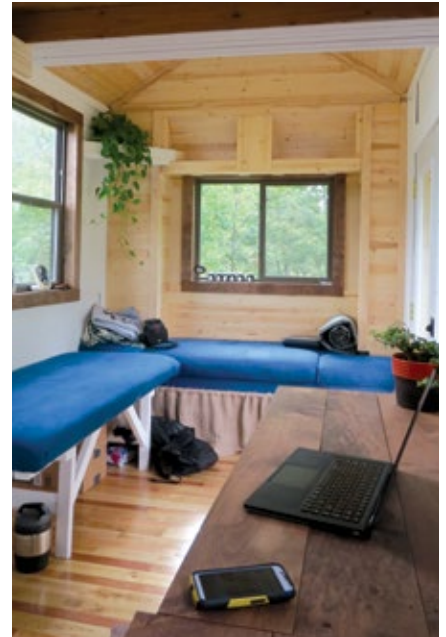
wouldn’t have originally, and I’ve realized that some things that are nice to have aren’t always essential or even the most practical in every situation.”

Cerk says he’s lived comfortably in the house even through the winter months, and as he continues to study computer science and ponder life after graduation, he plans to take the Humble Trundle — and the lessons he’s learned — with him.

“It’s opened up doors I might not have considered,” he says. “I mean, I’ve never worked so hard on one thing in my life. It’s led me to realize what can happen if you really do stick to something.”

Without Internet or cell phone distractions, Cerk says, it’s easy to see what the real priorities are.

“After I graduate and have enough time,” he says, “one of the first things is going to be putting some tile in that shower.” ■



 EXPLORE THE HUMBLE TRUNDLE  
[lsa.umich.edu](http://lsa.umich.edu)



by Susan Hutton



As a social neuroendocrinologist, van Anders has made her career from such questions, many of which she investigates in her lab. The lab's research is broad, and its subjects are complicated. Some examples: sexuality, sexual diversity, and the relationship between gender and sex. The lab also investigates hormones from within a social context, including a recent study about the king of hormones: testosterone.

### ACTING BOSSY

We usually associate testosterone with men, and for good reason: We all produce testosterone, but men produce three to six times more than women. One study from van Anders's lab suggests power might partly explain why men have higher testosterone.

The study participants, all trained actors, were directed — in an interdisciplinary collaboration with Jeffrey Steiger, then at U-M's Center for Research on Learning and Teaching — to pretend to sack a subordinate in a stereotypically feminine way one day and a stereotypically masculine way the next. In both scenarios, when men fired the employee, their testosterone climbed by three or four percent. When women did the same, their testosterone spiked by a surprising 10 percent.

The study suggests that it's simply wielding power that increases a person's testosterone, whether it's exerted in a stereotypically male or female way. It's an early finding, but it raises a classic chicken-and-egg scenario: Does living in a culture that discourages women from acting powerful explain (in part) their lower levels of testosterone, or does men's higher testosterone encourage them to behave in ways that make them more powerful, as is more typically assumed?

"We usually think of gender as something on the body, like clothes. But our research shows gender can actually get into our cells and our brains and change them," explains van Anders. "I'm really interested in how gender gets into the body."

"I see the contribution — or the interruption — my work creates when people hear about these things, people who never thought sex and gender were different, or who never thought about testosterone as more than a number that a doctor might measure," van Anders says. "This shift is happening among scientists and the medical community and in the general public, too."

"Most people don't know the difference between gender and sex, and trying to convince them that gender affects sex is many steps beyond. I'm trying to just introduce these ideas, and I'm hoping people can make the leap." ■

## You've Got Male

It has long been understood that hormones have a powerful influence on our behavior. New research suggests our behavior can actually influence our hormones, too.

**THE GENDER STEREOTYPES THAT DEFINE** the way we expect men and women to behave have blurred in the last 50 years, but many of the basics have stayed the same. Women are generally considered to be nurturing, intuitive, and more submissive. Men tend to be seen as competitive, in charge, and good at math. For a long time we believed that gender — the specific ways that cultures encourage each sex to behave — had a biological basis, namely hormones. Sari van Anders, an associate professor of psychology and women's studies, found herself thinking about the ways we assume hormones induce gendered behavior and then wondered: What if it's gender that affects hormones instead?



# His American Life

An alumnus's life telling stories—  
from the first rough cut all the way to your ear bud.

ALUMNI

**Joel Lovell has edited for *New York Times Magazine* and for the popular podcast *Serial*, and his work for *This American Life* includes stories about his interactions with a drunk tax attorney and how he trained himself to not sleep when he was eleven years old.**

#### JOEL LOVELL (M.F.A. '94) IS TAKING A

break from listening to teenage girls talk about photos on Instagram to chat with me. No, he's not a high school guidance counselor, or even a cultural anthropologist — he is an editor at *This American Life*, the iconic, 20-year-old radio show created by WBEZ in Chicago.

Now in his second year on the job, Lovell has come to expect the unusual. One week, he's puzzling through decades-old mysteries surrounding the assassination of an Israeli prime minister. The next, he's tackling the story of a 90-year-old woman finding love in a nursing home.

In each episode, *This American Life* generally features two to four pieces of non-fiction, fiction, and interviews relating to a central theme. Topics range from the highbrow to the quotidian, suggesting that no aspect of culture is unworthy of exploration. For each story, Lovell's task is the same: He helps polish the pieces to perfection in time for broadcast every week. And the stakes are high — *This American Life* beams weekly episodes to over 500 stations and more than 2.2 million listeners.

Today, Lovell has been in editing sessions for an episode called "Status Update." During these meetings, he and his colleagues listen and re-listen to the stories, trying to figure out what works and what doesn't. They look for holes in the narrative that need to be filled, or pieces of the story that should be moved for clarity or better flow. Lovell decides if someone needs to be interviewed again, or if a new person's perspective could be helpful. It's his job to ensure that each and every piece keeps



the listener riveted from beginning to end — and that it all seems effortless.

"You have to look at what's working in the story, but also, in a less intellectual sense, you look at the way in which things are said," says Lovell. "You start paying a crazy amount of attention to the sound of things, such as, 'Oh, there's an intake of breath here that makes the next thing she says difficult to understand.'"

In the end, Lovell and his team whittle down stories to the compelling, bite-sized slices of the human experience that fans

have come to expect from the series.

"On the best weeks," says Lovell, "the stories explore the central idea in an interesting way, and the sum is even greater than the individual parts."

#### **/ TUNING IN**

Lovell's résumé is packed with gigs at some of print and radio journalism's heaviest hitters, and yet he is humble in recounting his life story. He was raised in upstate New York and went to college at Cornell University, expecting to eventually go on to



“You have to look at what’s working in the story, but also, in a less intellectual sense, you look at the way in which things are said. You start paying a crazy amount of attention to the sound of things, such as, ‘Oh, there’s an intake of breath here that makes the next thing she says difficult to understand.’”

medical school. As a student, he discovered that he had a burgeoning interest in literature and storytelling.

“At some point, I started reading and writing a lot of fiction,” says Lovell. “So I decided to apply to an M.F.A. program, which is how I ended up at U-M.”

Even after he received his M.F.A. and began teaching undergraduate fiction writing at Michigan, Lovell still figured he’d end up in medical school. But then something interesting happened.

“I kind of lucked into a magazine job at *Harper’s*,” says Lovell. “My friend had applied for a job at the magazine but decided not to take it, so he recommended me. I literally just got a call one day from an editor asking if I’d be interested in applying for an editing job. That was 20 years ago.”

And he’s still editing. Lovell spent several years at *Harper’s* before he went to the *New York Times Magazine*, then on to *GQ*, then back to the *New York Times Magazine*. And he has continued to write. In 2013, Lovell authored a cover story for the *Times Magazine* about author George Saunders and made waves with his August 2015 *GQ* cover profile of Stephen Colbert as the comedian made the transition to his new gig as late night host.

Lovell has also appeared on *This American Life* as a contributor multiple times, sharing

anecdotes about odd jobs, insomnia, and college life. In 2014, he began editing for the show on a part-time basis. It was the first time he would edit for radio.

“When I started at *This American Life*, I thought the editing process would be similar, just listening to it rather than reading,” says Lovell. “I was so totally wrong.”

In radio, he learned, there is no way to correct a mispronounced word, or write around a speaker’s quote to better reflect their intent, as in a written story. Instead, he says, everything depends on the tape.

“In the best radio stories, the narrative unfolds through the tape — including emotion — and the script, if there is any, is in service of the tape itself,” he says. “There is a tyranny of the tape.”

Although his gig at *This American Life* is still fresh (he began working full time for the show in July 2015), Lovell also spends time exploring new media as an editor for the *Atavist*, an online magazine working to revolutionize digital storytelling. He also helped edit the first season of the wildly popular *Serial* podcast, which followed a tangled murder investigation.

“I think one of the reasons *Serial* was so popular — and there were a number of them — was because it was just so transparent,” he says. “Often we pretend that journalism is a function of pure objectivity. But it’s not. There are always all sorts of biases

at work, because we’re human beings. With *Serial*, the host was deftly honest about her subjectivity, and she examined it so that the listener always knew what she was struggling with, and it made the series even more compelling.”

Radio, Lovell says, is experiencing a resurgence because it is so intimate and feels, at times, more raw than other forms of journalism. “It’s like someone talking directly into your brain,” says Lovell.

But Lovell cautions not to assume that the recent podcasting boom means that they’re easy to produce, or that all radio shows are created equal. “It’s really hard to make a good podcast,” he says. “There’s a reason that *This American Life* has been the most popular radio show for 20 years, and I can say that since I’m a recent arrival and all of their success has nothing to do with me. The people who make it are extraordinary — they’re crazy, crazy good at it.”

With Lovell’s help, *This American Life* will continue to produce the engrossing content for which the show is known, bringing stories of all aspects of our culture to millions of listeners across the globe for years to come.

For now, though, Lovell has to get back to the editing room. There are a few more stories to play around with today. This afternoon, it’s the politics of Instagram. Tomorrow—who knows? ■



# In Good Company

A team of U-M students created the Companion app to improve public safety in Ann Arbor. Now, they're taking their mission around the world.

**NOT EVERY CEO SLEEPS ON AN AIR** mattress in his friend's apartment.

But Nathan Pilcowitz (A.B. '15) isn't your average CEO. At 24 years old, Pilcowitz has strong opinions about the power of digital technology for public safety, interests that he and a team of U-M students combined into a powerful safety app called Companion, which has been downloaded over half a million times in 138 different countries.

Here's how it works. You click into the app and pick someone from your contact book to walk you home virtually. From

afar, your companion keeps track of where you are and when you make it home. If you start running, the app gives your virtual chaperone 15 seconds before automatically prompting them to call the police.

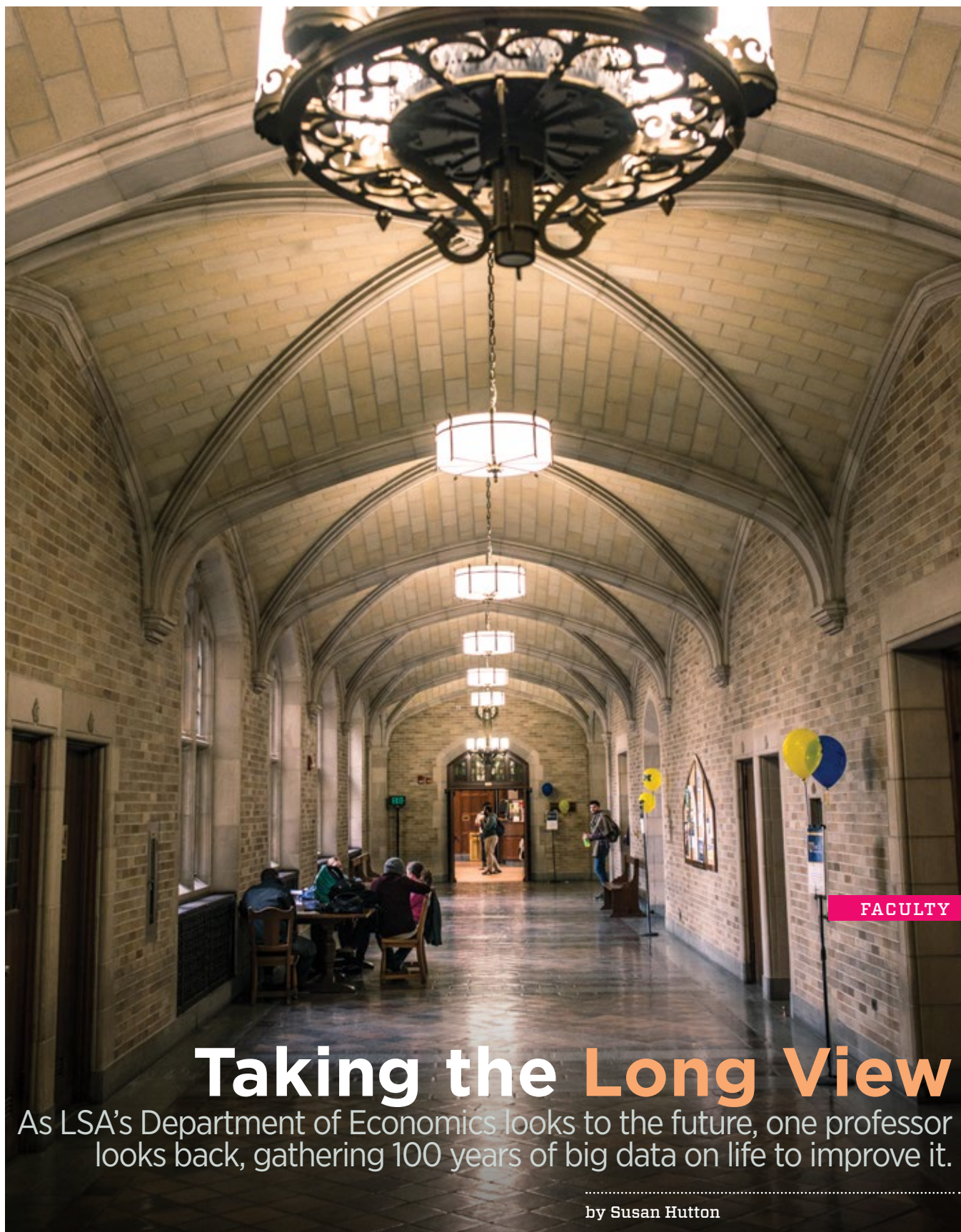
"Our tagline is, 'Bringing public safety into the 21st century,'" Pilcowitz says. "But what we really mean when we say that is that we want everybody to have a tool that they can trust that will actually get them from point A to point B and make them safer. Not just make them feel safer, but to actually make them safer."

Eventually, addressing a problem as

huge as public safety around the globe might require the company to grow more. But for now, Pilcowitz is happy to stay in Ann Arbor, sleeping on an air mattress while he does his part working out the bugs and cyberinfrastructure of the app.

"It suits me," Pilcowitz says, "sleeping on an air mattress in my friend's apartment. I don't want to ruin any of the energy that's coming from living like this right now. It keeps me honest, keeps me working, keeps me interested. I don't want to move on until I'm sure it's time." ■





FACULTY

# Taking the Long View

As LSA's Department of Economics looks to the future, one professor looks back, gathering 100 years of big data on life to improve it.

by Susan Hutton



**YOU CAN'T CAPTURE EVERY ASPECT OF** life in LIFE-M, but you can collect an awful lot.

Led by Associate Professor of Economics Martha Bailey, a team of researchers is aiming to create something called the Longitudinal Intergenerational Family Electronic Micro-Database, known around campus by its friendlier name: LIFE-M.

The LIFE-M project will pull data from literally millions of vital records of health, demographic, economic, and family-structure information from the last 100 years. Together, this data can capture and illustrate the ways that lifestyles and lives changed across the 20th century, and



“Getting a century-long look at all of these trends allows researchers to understand when progress is being made and when regressions have occurred.”

give researchers information they need to more accurately understand why those changes occurred.

What's clear right away, says Bailey, are the important gains in quality of life that people have made in that time. People live longer. Disease and disability are no longer the inevitable consequences of old age. Many more people have access to education than they did 100 years ago, and literacy is thankfully the norm.

Such data also provide insight into significant social and cultural shifts, such as access to education for African Americans, women's entry into the paid labor force, and changes in economic inequality. Getting a century-long look at all of these trends allows researchers to understand when progress is being made and when regressions have occurred.

“Are the last 30 years anomalous,” asks Bailey about current trends in income inequality, “or are we returning to the norm of 100 years ago? LIFE-M's perspective on

the 20th century is invaluable for research and for formulating public policy.”

The project came together in a flash, says Bailey, though it wasn't clear how it would be funded. LIFE-M initially received support exclusively from funds from around U-M, including the Michigan Institute for Teaching and Research in Economics (MITRE) fund. Other University support followed, and Bailey and her team were able to begin building LIFE-M with around \$200,000. Now, a \$2.1 million dollar grant from the National Science Foundation (NSF) will allow LIFE-M to



**Professors Martha Bailey (left) and Dominick Bartelme (right) both embrace the Department of Economics and its open-minded approach. “We’ve been doing interdisciplinary work for years,” says Bailey. “People don’t realize how different U-M is because that curiosity and rigor are the lifeblood of this place.”**







aggressively expand its scope.

"It's tough proposing something that hasn't been done," Bailey explains, "because the assumption is that it can't be done, that the idea is too big. If I hadn't had the proof of concept that the MITRE fund facilitated, I would not have gotten the NSF grant."

## THE NEXT LEVEL

Such groundbreaking work falls neatly into the department's storied history. Over the last 100 years, the Department of Economics has set a high standard, with faculty and alumni working as part of such elite public policy bodies as the World Bank, the President's Council of Economic Advisers, and the Board of Governors of the Federal Reserve.

They have also produced a slate of distinguished alumni, including a Nobel laureate, a Rhodes Scholar, and numerous eminent research scholars at leading universities around the world. With a long-standing 100 percent job placement rate for graduate students, the department continues to be a vital place for

cutting-edge scholarship and world-shaping policy work.

With a major renovation of the department offices in Lorch Hall and eight recent faculty appointments, the department is aggressively building on a very strong foundation by improving its physical space and growing the breadth of economic areas of study that it offers. Combining a strong core of economic theory, a full repertoire of applied economic specialties, and a vigorous interdisciplinary ethic, the department hopes to probe both the depths and fringes of the field in a way few economics departments across the country can.

"Over time, the personalities and the specific interests of the faculty have changed, but the flavor of the department has remained remarkably constant," says Jim Adams, the Shorey Peterson Professor of Industrial Organization and Corporate Finance, an Arthur F. Thurnau Professor, and the Chair of the Department of Economics.

"Michigan Economics is known for the breadth of its expertise, for its eclecticism and tolerance in both methodological and political orientation, for its receptivity to interdisciplinary approaches, and for its commitment to sedulous and sober analysis of problems that affect real people."

"We cover a pretty broad range of applied work, but there is always a willingness to talk to each other across field boundaries," agrees Associate Professor C. Hoyt Bleakley. "There are also many opportunities to interact with scholars in other units who confront similar questions in different disciplines."

"We're part of a truly great arts and sciences college that has excellent departments, many of which are in the top three of the nation," affirms Professor Justin Wolfers. "Deans at other universities talk about cross-disciplinary work, but they have no real way of doing it. We do."

## WHERE IT COUNTS

Thanks to alumni, LSA's Economics Leadership Council, and friends of the department, the Department of Economics has funds to support undergraduate, graduate, and faculty research. That includes MITRE, which was funded by an anonymous donor and has provided

## THE PARLANCE OF HIGH FINANCE

From credit default swaps to carry trades, economic terms in the news can be confusing. See if you can spot the fake financial term in each of the following lists of otherwise actual economic nomenclature. Answers are at the bottom of the page.

- |   |   |
|---|---|
| <p><b>1</b> A. Reflation<br/>B. Stagflation<br/>C. Playflation</p>      | <p><b>3</b> A. Synthetic Collateralized Debt Obligation<br/>B. Mordenkainen Market Trial<br/>C. Bespoke Tranche Opportunity</p> |
| <p><b>2</b> A. ISDA License<br/>B. Torque Floor<br/>C. R-Word Index</p> | <p><b>4</b> A. Exotic Financial Instrument<br/>B. Unclaimed Corpse Indicator<br/>C. Default Commodity Swizzle</p>               |

1 2 3 4 5 6 7 8 9 10 11 12

**A proud alumnus, Bartelme calls his time at U-M a “profound intellectual awakening.”**

hugely important support for a number of projects, including LIFE-M.

“The research funding and teaching package is very supportive,” says Assistant Professor Dominick Bartelme (A.B. ’08). “It allows us to focus on research as well as on quality teaching. It has personally enabled me to experiment more in the classroom.”

Such investments return dividends for everyone. Ambitious research relies on support at all levels, and, says Bailey, students are the bedrock. “The graduate and undergraduate students on my team are extraordinary,” she says. “They have skillfully done much of the preliminary behind-the-scenes work we needed for our analysis, and this has been crucial to our success.” ■



## GIVING COUNCIL

One of the Economics Leadership Council’s original members reflects on the ELC’s role in developing a flourishing Department of Economics.

Since 1996, LSA’s Economics Leadership Council (ELC) has funded four of the department’s five endowed faculty chairs and raised funds for the department chair to spend however he or she sees fit. “I’ve known a number of chairs,” says **John Sweetland** (A.B. ’58, M.A. ’59; pictured at right), who created the first endowed chair in International Economics in 1997 and endowed the Shorrey Peterson chair. “They know more about running an economics department than we ever will.”

In addition to Sweetland, the ELC also counts Gail Wilensky (A.B. ’64, M.A. ’64, Ph.D., ’68), a senior fellow at Project Hope; Allen Sinai (A.B. ’61), the CEO of Decision Economics; and David Berson (A.B. ’82), a senior vice president and chief economist at Nationwide Insurance, among its members. “The Council is really set up to be a helpmate to the chair and to offer aid however the

chair wants,” Sweetland explains. “We’re governed by the trust that flows between the chair and the ELC and the friendship that comes from working for the same cause.”

It’s a rewarding arrangement matched only by seeing ELC’s ultimate effects. “It’s one thing to give money for a scholarship or a chair, but when you can help a young student assimilate into the economics world — that’s an art.”





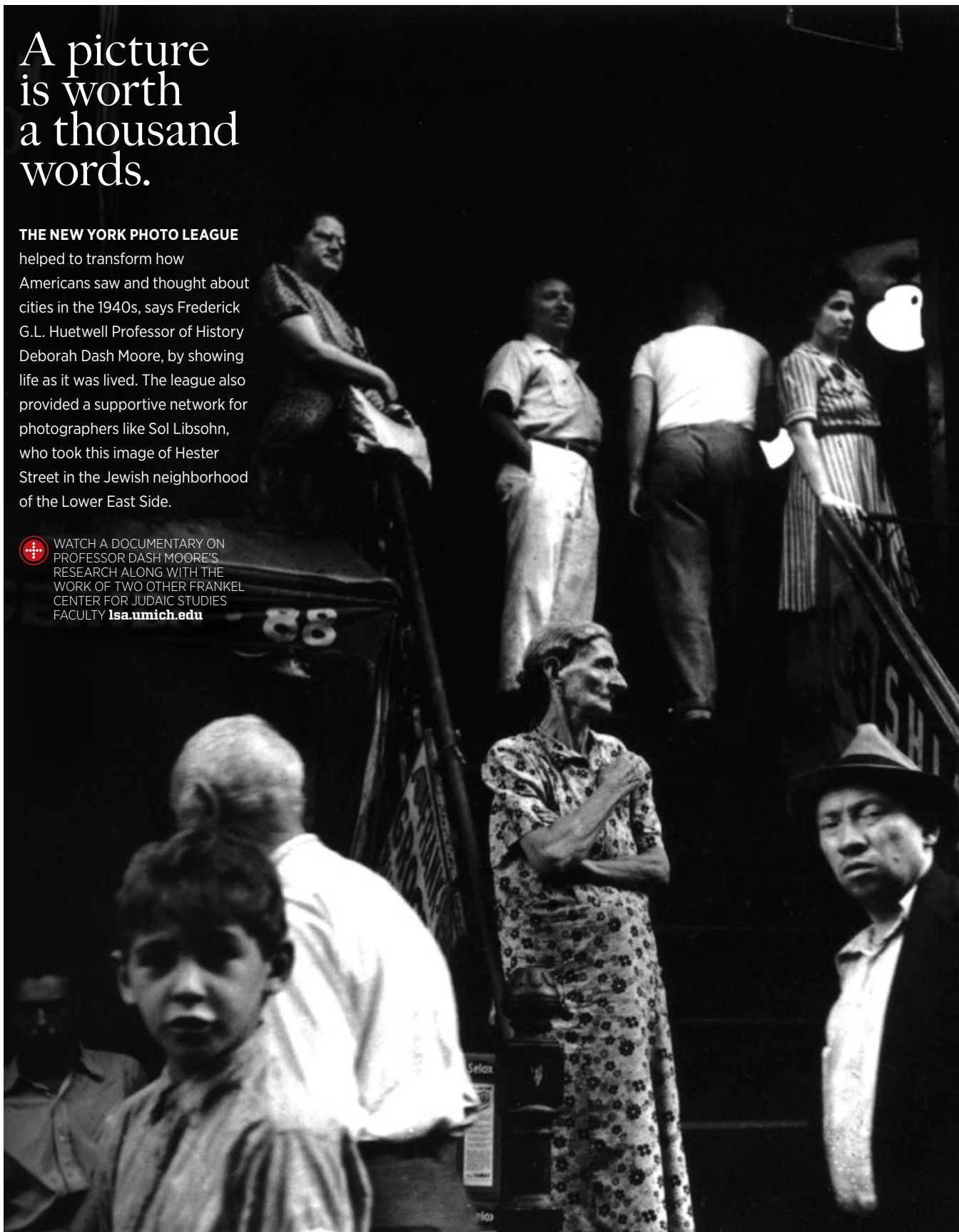
# A picture is worth a thousand words.

## THE NEW YORK PHOTO LEAGUE

helped to transform how Americans saw and thought about cities in the 1940s, says Frederick G.L. Huetwell Professor of History Deborah Dash Moore, by showing life as it was lived. The league also provided a supportive network for photographers like Sol Libsohn, who took this image of Hester Street in the Jewish neighborhood of the Lower East Side.



WATCH A DOCUMENTARY ON PROFESSOR DASH MOORE'S RESEARCH ALONG WITH THE WORK OF TWO OTHER FRANKEL CENTER FOR JUDAIC STUDIES FACULTY [lsa.umich.edu](http://lsa.umich.edu)





# Life Without A Script

As a television news director for ABC's flagship New York station, Camille Edwards tracks one of the most dynamic beats on the planet. Find out how one alumna stays on top of it all—including the ratings.

**CAMILLE EDWARDS (A.B. '88) REMEMBERS EXACTLY WHAT GOT** her hooked on the news as a kid. Growing up, her family would eat dinner together each night, sitting around the table and discussing her dad's business, the day's events, and what was going on in the world. It thrilled her. By the time she was a teenager, she knew that she'd be a reporter one day.

She was right. Today, she is the vice president and news director for WABC-TV — ABC's flagship station — leading a team of more than 100 people to become the top-rated news operation in the New York tri-state region.

Edwards was born in Delaware but moved around a lot, first to Detroit, then St. Louis, then back to Rochester, Michigan. Her father ran a Chrysler manufacturing plant, passing on to his daughter a practical business sense and a drive to succeed. In high school, she was already hard at work realizing her dream, becoming the student newspaper's features editor, and even snagging an interview with a local television anchor during her tenure there.

She applied to Michigan — her dream school — and got in, where she pursued a degree in communication studies.

"Michigan prepared me for the career I'm in now," she says. "It helped me figure out how to be aggressive, and how to ask for what I needed out of professors and classes."

**"Have I faced challenges? Absolutely," says Edwards. "Have I let them get in my way? Absolutely not."**



## LET'S GO TO THE TAPE

As a student at U-M, she interned at several Detroit-area television stations, learning the basics of the business. After graduation, she was hired at WDIV in Detroit.

"I was a desk assistant," she says. "I helped with scripts, answered phone calls, got coffee...I just absorbed everything I could."

Edwards worked at the station from 4:00 a.m. to noon. After that, she'd drive to her father's auto plant, where she did a shift that ended at 9:00 p.m. In her few moments of spare time, she received advice and mentorship from Emery King, one of the station's anchors, who also helped her put together a sample tape of her reporting.

Finally, her résumé was ready, and she mailed her first tape out. And was rejected.

"Back then, you'd get a letter of rejection instead of an email," says Edwards.

Edwards submitted dozens more tapes, receiving rejection after rejection. But Edwards was undeterred; she pressed on, convinced that she would eventually find the right fit.

"In the end, I had 300 rejection letters," she says. "I kept all of them until about 15 years ago, just to remind me of how many tries it took."

At last, her persistence paid off. WNWO in Toledo hired her as an assignment editor and reporter. She was happy to have achieved her goal — but after a few months, there was a small problem: "I realized that I didn't actually like being on television," she laughs.

Instead, she decided to turn her focus to news production, where she could continue to write, interview, and bring the news to the community from behind the scenes. Once she discovered her niche, she rose meteorically through the ranks. In July 2012, she landed at her current position at WABC-TV, where she is responsible for producing the news for the New York/New Jersey/Connecticut area — a diverse region with a population of over 20 million people.

## A WHIRLWIND JOB

Edwards is responsible for the morning, afternoon, evening, and weekend news broadcasts, and her work encompasses everything from selecting stories to doling out assignments, reviewing coverage, and coordinating news teams.

"We produce over 40 hours of news per week," she says. "My days and nights bleed together. Thankfully, I have managers who work with me who are very talented and who I completely trust and rely on for help."

In fact, Edwards says she and her team were put to the test in the very first weeks of her new job. Only a few months after she started, Hurricane Sandy hit, and she needed to get news to the community — fast.

"I was still trying to figure out how to find the bathroom while trying to lead us through one of the largest stories I've ever had to cover," she says. "I had to make sure that the public got the important information it needed and that my team was safe at the same time. Everything worked out well, because I have a great team."

Under Edwards's leadership, a long-time No. 1-rated news operation in New York has started the process of transforming and refitting for a future where digital and social media are increasingly vital. She credits the success to her team and colleagues, and to the diversity of viewpoints at the station.

"I try to make sure our news reflects what is going on in our community," says Edwards. "I want to get a balance of positive and uplifting things in addition to the more serious stories. It's also important to have diversity. The news you put on TV must reflect the people you serve."

Edwards still makes time to mentor budding young journalists — and she has some good advice for the rest of us, too.

"Push through your fears and make sure that your life and your career is the way you intend it to be," she says. "You don't want to have regrets." ■

## JOURNO JARGON

Do you know the difference between a donut<sup>1</sup> and a talking bean<sup>2</sup>? Take our TV news lingo quiz and see if you can manage a clean kill<sup>3</sup> without any black holes<sup>4</sup>.

**1 What is a producer talking about when they mention the 100s, the 200s, and the 300s?**

- A. The first, second, and third blocks of a newscast.
- B. The combustion temperatures of copy paper, celluloid film, and weatherperson green screens, respectively.
- C. Groups of Spartan warriors, useful for inclement weather news reporting.

**2 When a camera operator mentions getting footage of BOPSA, they are referring to:**

- A. A bunch of people standing around, for example, at a city council meeting.
- B. A bunch of penguins swimming around, for example, at feeding time in the Arctic Adventure enclosure at the zoo.
- C. A bunch of pistoleers sailing aground, for example, in 18th-century Lisbon.

**3 When a news crew calls at the last minute to let the producer know they will be doing a stop-and-pop, that means that they:**

- A. Will pick up champagne on the drive back to the station.
- B. Have a last-minute Father's Day celebration to attend and are sorry they didn't mention it before.
- C. Got caught in traffic and will report the news from wherever they are at time of broadcast.

1. Recorded footage deployed within a live shot.

2. A "talking head" that doesn't say anything.

3. A newscast that goes perfectly.

4. Blank sections meant to be filled with B-roll footage.

# The “A-Word”

by Nancy Gordon (A.B. '88)



**MY SON JOSH WAS DIAGNOSED WITH** autism on July 21, 2003. The “A-word.” That’s what we called it. He was just over two years old at the time.

Back then, we thought Josh’s diagnosis was the worst thing in the world. We didn’t want to hear the “A-word,” but we were lucky. We knew another kid with autism, and that family was the first call we made. Those parents then gave us other people to call for help, including an inclusion-based preschool in Seattle. We enrolled Josh right away.

Josh spent the next few years there, making friends and getting therapy. When he was old enough, we enrolled him in the local public school, but almost right away we could tell it wasn’t a good fit. The teachers hadn’t been trained to work with kids like Josh, and they struggled to reach and include him.

Another mom that I had met at Josh’s inclusive preschool and I got to talking, and together with another family we decided to open an inclusive school together. We started in the basement of a local synagogue with four kids, all of whom were on the autism spectrum. By the end of that first year, we had five kids and five staff people. We started small, and we didn’t give up.

Year by year and bit by bit, the school kept growing. We went from 5 to 19 to 50 kids. Now we serve over 100 students, and we’re a successful and inclusive K-12 private school.

Looking back, I think that Josh’s diagnosis was probably the best thing in the world for our family. I really mean that. It has made us different people in so many ways. We don’t get stressed out about silly or pointless things. You learn pretty quickly

not to sweat the small stuff. And I think you see that mindset in our school, also.

When Josh first went to that inclusive preschool, I was really focused on Josh having autism, on how terrible that diagnosis felt. But then we saw a kid in Josh’s class who had spina bifida, and another kid with Down syndrome. And we all learned very quickly that the real disability is often that people look at you not as a person but *as* a disability.

That’s what I wanted so badly for Josh, for him to have a safe place where people see him for who he is. And that’s what I want our school to be for every kid who goes there because every kid has something to teach us, because every kid deserves it.

**Nancy Gordon is one of the founders of the Academy for Precision Learning in Seattle.**



# Everybody Into the School

Inclusive school movements across the country measure success by student scores—and by the fact that *everybody* is involved. Here are some of the benefits and some of the obstacles affecting inclusive school programs nationwide.

**Despite the proven advantages of integration**

# 56%

of students with intellectual and developmental disabilities learn in a segregated educational environment.



## **BENEFITS FOR INCLUDED STUDENTS**

- Stronger, more sophisticated social networks
- Fewer behavioral issues
- Higher academic achievement
- Better communication skills

## **BENEFITS FOR SCHOOLS**

- Increased student engagement
- No duplicated systems of instruction
- More responsive general learning environment
- More welcoming environment

## **BENEFITS FOR 'TYPICAL' STUDENTS**

- Higher academic achievement
- Broader understanding of human experience
- Access to diverse perspectives
- Daily opportunities for increased understanding, empathy, and growth

## **OBSTACLES TO MORE INCLUSIVE EDUCATION PROGRAMS**

- Time-intensive training for teachers
- Financial support for necessary additional training, resources, and staff
- Long-term commitment to new teaching methods

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