The Food Issue

FACING THE FORK

At the crossroads, USC Dornsife researchers tackle food scarcity and our eating culture.
Led by Rhacel Parreñas, the Problems Without Passports course “Forced Labor and Human Trafficking in Dubai” took place this past summer in the United Arab Emirates.

Students investigated why individuals agree to legal servitude and the ways human rights discourses shape the conditions of employment across various occupations in Dubai. Students also studied the ways gender, race and ethnicity shape labor migration.

Migrants, who comprise 95 percent of the labor force in Dubai, are legally bound to work only for their sponsoring employer.

In Dubai, students met government officials, labor recruiters, NGOs, migrant workers, and runaways.

“The students gained a more nuanced perspective on human trafficking,” Parreñas said. “I want them to see that the problem is not black and white and there are multiple solutions.”
I consider myself adventurous when it comes to trying new foods. I enjoy traveling to foreign countries, whether representing USC Dornsife or with my family, introducing my children to exotic flavors. I delight in opening a menu that must be translated for me, or returning to a favorite restaurant and ordering “the usual.” But I always keep in mind that in many parts of the world — including this country — people do not have the luxury of perusing menus. They struggle to have enough sustenance to survive. As much as a liberal arts curriculum is centered on in-class instruction, it must offer students the opportunity to learn firsthand about the world they don’t see every day.

At USC Dornsife, we encourage undergraduate and graduate students to engage in problem-based research. We challenge them to delve deeply into issues such as food security and malnutrition, as well as obesity and diabetes, from all perspectives — whether through biology, history, public health, psychology, or environmental studies.

In my laboratory, for example, we focus on manipulating plants at the molecular level so we can grow more robust crops that amidst a changing climate can serve the needs of an expanding human population.

My research has given me a deeper appreciation of food as something to be both relished and respected. Growing up in Jersey, a small island off the coast of France, I was taught to appreciate fresh seafood and our locally grown vegetables. I believe one of the best ways to connect with other people — and with ourselves — is to sit down over a meal and share the tastes, company and nourishment.

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THE FOOD ISSUE

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A fork’s negative space forms test tubes suggesting science’s role in feeding a growing population. Illustration by The Heads of State
JASON WONG '03, federal prosecutor for the U.S. attorney's office and assistant chief counsel for the Department of Homeland Security, receives a TOMMY AWARD from the USC Alumni Club of New York.

Among the nearly 2,600 degrees awarded during COMMENCEMENT by USC Dornsife are 1,947 bachelor's, 364 master's, 73 graduate certificates and 203 Ph.Ds. View photos at dornsife.usc.edu/facebook.

JASON WONG, federal prosecutor for the U.S. attorney's office and assistant chief counsel for the Department of Homeland Security, receives a TOMMY AWARD from the USC Alumni Club of New York.

“I am a firm believer that there is no point in bringing in students who are not going to succeed — so we need to make sure that we are giving them the resources that allow them to thrive.”

GEORGE SANCHEZ, vice dean for diversity and strategic initiatives, reflects upon receiving Insight Into Diversity magazine’s DIVERSITY VISIONARY AWARD.

Ground is broken for construction of the USC MICHELSON CENTER FOR CONVERGENT BIOSCIENCE, which will stand in the southwest quadrant of the University Park campus.

The 10th anniversary of the HUNTINGTON-USC INSTITUTE ON CALIFORNIA AND THE WEST, directed by Professor and Chair of History WILLIAM DEVERELL, is celebrated with a reception at the Huntington Library.

Junior international relations major DORIS CHEN becomes the second consecutive Trojan golfer to win the National Collegiate Athletic Association women’s title.

USC Dornsife’s Office of Communication receives a gold CASE CIRCLE OF EXCELLENCE award in the institutional relations promotional publications category.

“It doesn’t feel like I left home yet. Maybe it will hit me later.”

First-year student Jessica Wynn of Washington, D.C., reflects on arriving at USC on MOVE-IN DAY.

“None of these stories could be preserved without the men and women with the courage to tell them.”

President Barack Obama accepts the USC Shoah Foundation — The Institute for Visual History and Education’s AMBASSADOR FOR HUMANITY AWARD. Obama thanks the institute for “setting alight an eternal flame of testimony that can’t be extinguished.”

Los Angeles Mayor Eric Garcetti delivers the USC CASDEN INSTITUTE’S CARMEN H. AND LOUIS WARSCHAW DISTINGUISHED LECTURE and describes how Jewish life and culture have informed his life.

USC Dornsife’s philanthropic partnerships are honored at the annual TORCHBEARER LUNCHEON.

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The world of letters, arts and sciences goes beyond the pages you’re holding in your hands. We invite you to use your smartphone or tablet to view exclusive multimedia content about our community of scholars.

1. Download the USC Dornsife Augmented Reality (AR) app on your smartphone or tablet via your mobile app store. The app is available for Android and iOS (iPhone/iPad).
2. Look for the cardinal extra content buttons throughout the magazine to learn which pages have more to offer.
3. Open the USC Dornsife AR app and hold your device 8–12” from the page. Wait for the content to load.
4. The app will launch enhanced content that brings the printed page to life.

View a how-to video.
Go to dornsife.usc.edu/howtoAR

No mobile device?
Relax — videos are also on dornsife.usc.edu

Activate Issue Extras
Augmented Reality (AR) App

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Social Dornsife

@StacyLHope: Great to catch up w/other SIR @USC-Dornsife grads last night & meet current students. Can’t wait for new #USC program in DC to get started!

@LeighJacobsonSC: Just met former U.S. ambassador to Pakistan Wendy Chamberlin on my Dornsife Problems Without Passports trip #thanksUSC

@SielBurt: I’ve been accepted to @USCDornsife for my B.S. in Neuro! I couldn’t be more proud to become a member of the Trojan Family. Fight On!

@BioPhysicalMoh: Can’t wait to dig into @USCDornsife colleague @jakesoll’s book on accounting, accountability & stability.

@KCortez15: Shout out to all the new baby Trojans who are getting accepted this week! Welcome to the best university in the entire world. #AdmitUSC

@MalcsMitty: Awesome meeting Dean Kay and Assoc. Dean McNulty. Great people, leading #Dornsife and #USC in the right direction.

@owenusc: “Fight On for something that matters.” Getting emotional over here at #USC Dornsife Graduation. Proud to be a Trojan today.

Connect with USC Dornsife
Check us out on your favorite social media sites. We welcome your posts and tweets for possible inclusion in the next issue of USC Dornsife Magazine.

Instagram @USCDornsife

#DornsifeLife
This Fall, we asked students to show us their #DornsifeLife through photos on Instagram. We received dozens of entries. View all of the images at Instagram.com/USCDornsife.
Advancing Genocide Research

A newly established center will examine the how and why of mass violence on an international scale.

By Robin Migdol

Seeking to build on the USC Shoah Foundation — The Institute for Visual History and Education's 20 years of success in gathering testimonies of Holocaust and other genocide survivors, USC has established the Center for Advanced Genocide Research to study how and why mass violence occurs, and how to intervene in the cycle that can lead to genocide.

USC President C. L. Max Nikias and USC Trustee Steven Spielberg, the institute’s founder, announced the new center at a campus press conference on April 25. A panel discussion followed, moderated by USC Dornsife Dean Steve Kay, with institute Executive Director Stephen D. Smith, Beth Meyerowitz, vice provost for faculty affairs, and Wolf Gruner, Shapell-Guerin Chair in Jewish Studies, and professor of history. Gruner will direct the new center.

Housed in USC Dornsife, the center will serve as the research and scholarship unit of the institute, building off of the substantial academic work the institute has accomplished since joining USC in 2006. It will also integrate the Resisting the Path to Genocide research cluster, part of the interdisciplinary Dornsife 2020 initiative that has opened new avenues of research on mass violence for the past four years.

“This new center will identify and study the early origins of genocide,” Nikias said. “It will look at the patchwork of patterns that lead to violence on a mass scale and it will help us understand not only how genocide begins but how we may bring it to an end.”

Spielberg credited Nikias for providing the institute a place to “put down roots” and advance the study of genocide.

“We’ve made tremendous progress in the 20 years we’ve been in existence, but every single year it seems our work has hardly even begun,” Spielberg said. “There is such tremendous potential for the groundbreaking research led by Stephen Smith and Wolf Gruner. The world now has a beacon of hope in breaking the cycle that leads to mass violence.”

The center aligns with the university’s strategic vision of creating scholarship with consequence by bringing together experts from various fields to tackle today’s grand challenges.

“By combining ongoing research with the vast amounts of information already collected by the USC Shoah Foundation, I believe we will be able to decode the conditions that can lead to genocide,” Kay said. “And by funneling what we learn through our Digital Humanities Program, we will be able to teach tomorrow’s leaders new ways of stemming the tide of violence and intolerance.”

Gruner stressed that the new center will allow researchers and scholars from various disciplines throughout the world to collaborate and come together at a single institution to study genocide in ways that would not otherwise be possible.

The center will uniquely position USC as the only world-renowned private research institution with substantial original material from the Holocaust and other genocides.
“Writer and Composer” is a unique interdisciplinary collaboration that involves students from three graduate-level courses offered through USC Dornsife and USC Thornton School of Music. Student writers, vocalists and composers work on creative projects, culminating in a public performance of student work at semester’s end.

“To have writers, vocalists and composers together has created opportunities that have been unlike anything I know in any other graduate situation,” David St. John said.

The popular course has been offered at USC every other year for 12 years. It is designed to help students better understand and appreciate the art of creating vocal music in a collaborative context.

“We share a desire to combine words and music in ways that transcend what either words or music alone can do,” Frank Ticheli said.

The class covers the business side of creative works, such as personal contract agreements, publisher agreements, performance rights, ownership and royalty allocations. It can also act as a springboard for ongoing projects.

Poetry graduate student Doug Manuel wrote a poem from the perspective of the sister of Olaudah Equiano, who was a freed slave, prominent African abolitionist and author in the 18th century. Manuel worked with a composition student and vocalist to set the poem to music and song.

“I was drawn to this opportunity mainly for the collaboration,” Manuel said, “and being able to see my work re-envisioned through somebody else’s eyes.” —L.P.
Back in the early 1970s, long before opening for The Smiths, Violent Femmes and Hüsker Dü, androgynous punk performer Phranc was an up-and-coming artist at The Women’s Building, the famously influential Los Angeles feminist art collective.

A self-proclaimed “cardboard cobbler,” Phranc created cardboard paper dolls as an homage to her mentor, Jeanne Córdova, the pioneering gay rights activist, author and editor-in-chief of Lesbian Tide, a groundbreaking newsmagazine for which Phranc wrote. The Córdova paper dolls remain an important part of Phranc’s early nonmusical body of work. In 2007, Phranc’s cardboard and kraft-paper fine art works were exhibited at New York’s CUE Art Foundation. The New York Times compared her work to that of Andy Warhol and Claes Oldenburg.

Córdova gifted her paper dolls to the ONE National Gay & Lesbian Archives, housed in USC since 2010, ensuring preservation of the artistic legacy of Phranc, born Susan Gottlieb in 1957. In addition to books and audiovisual materials, the ONE Archives include an extensive art collection of more than 4,000 paintings, drawings, photographs and sculptural objects.

Collecting archives for more than 60 years, ONE is the longest continually running lesbian, gay, bisexual and transgender (LGBT) organization in the United States. “ONE’s collections are a national treasure assembled by brave individuals back when the struggle for equal rights and social equality for the gay world in the U.S. was just beginning,” said USC Dornsife alumnus and ONE Archives Director Joseph Hawkins (Ph.D., social anthropology, ’99). Based in Los Angeles, the ONE Archives contain important global content.

We’re extremely proud to be the intellectual repository of record for queer studies in history, gender studies, anthropology, sociology, American studies and ethnicity, and a number of other departments and programs at USC,” Hawkins said. “But we are also proud that researchers from all over the world come to us to find out about histories that without our collections would be lost.” —D.K.

Phranc’s paper dolls depict ’70s-era fashions worn by gay rights activist Jeanne Córdova.
“High-tech companies are primarily hiring IQ, and when you graduate with this major, the world knows that you can think mathematically about the most complex problems that exist,” Biederman said.

Whether one pursues medical or graduate school, a job in an industry or the high-tech sector, a graduate with this degree has demonstrated an aptitude to handle complex problems, he said.

“You become a hot ticket.” —L.P.

Energizing Students

Recording artist Akon visits USC to help fight energy poverty in Africa.

Imagine the sound of President Barack Obama’s voice.

You can likely summon the quality of his voice in your mind, the particular pitch and cadence. For someone with a rare condition called phonagnosia, however, this task is impossible. Without seeing the speaker, phonagnosics are unable to identify even someone familiar to them.

Understanding this condition and identifying its locus in the human brain is one focus of the research under way at USC Dornsife’s Image Understanding Laboratory, led by Irving Biederman, Harold Dornsife Chair in Neurosciences, and professor of psychology and computer science.

Two years ago, Biederman and neuroscience program co-director Sarah Bottjer, professor of biological sciences and psychology, revised the neuroscience curriculum. They added a computational neuroscience degree after Biederman’s observation.

“There was a type of student who was gifted mathematically and fascinated by the workings of the brain, but not necessarily interested in medical school,” he said. “The B.S. in neuroscience lacked the branch of science called computational neuroscience, in which mathematical and computational techniques are applied to understanding the organization and function of complex neural systems.”

In recent years, the computational approach to neuroscience has greatly enhanced scientific understanding of the human brain. Each of the brain’s 100 billion neurons activates or inhibits approximately 6,000 other neurons. This pattern of activation affects the mind: perception, emotions, vision, hearing, memory, personality, and intelligence.

“You couldn’t begin to understand those patterns of interaction unless you had some sophisticated mathematics that would allow you to express them,” Biederman said.

Another factor that makes the department’s new degree unique is the fact that it’s available to undergraduates at all. Computational neuroscience is generally not taught until graduate school.

The degree can prepare students for many professional paths.

How would you cook dinner without electricity? Or do homework after sunset without lights? What if your hospital had no refrigeration for vaccines?

For R&B and hip-hop artist Akon, who was raised in West Africa, a lack of electricity was a way of life.

Akon’s experiences highlight a critical issue facing developing nations: energy poverty. In sub-Saharan Africa, nearly 600 million people lack access to electricity.

In April, Akon and ONE — an advocacy organization fighting poverty and disease in Africa — launched the #PowerProject Campaign Lab at USC Dornsife. During the launch, students presented digital media campaign ideas to be used as the centerpiece of ONE’s nationwide #PowerProject campaign.

The lab was launched in a class taught by Steven Lamy, professor of international relations and vice dean for academic programs. Student teams presented their original campaign ideas to Akon and members of ONE.

Five students devised the two winning proposals, which outlined creative ways of employing hashtags, “photobombs” and user-generated photos on social media in an online campaign in support of an energy bill introduced to the U.S. Senate in June.

“This project has taught me about the effects of globalization and how one of the biggest transporters of information now is social media and the Internet,” said international relations major Kaitlyn Hittelman. —L.P.
Aloe Blacc '01 aims to create positive social change, including working to eradicate food deserts.
Before he was global Top 40 sensation and socially conscious singer-songwriter Aloe Blacc, he was Egbert Nathaniel Dawkins III, a linguistics and psychology major at USC Dornsife.

Even then, Blacc was determined to use his talents for positive social change. Although he considered music a hobby and his future to lie in business or academia, he occasionally allowed himself to daydream about how winning fame as a performer could help him fast-forward his philanthropic goals.

“Where I was in school I was influenced by the civic leadership I saw demonstrated by USC professors and programs,” Blacc said. “I always thought, if I get the chance I'd really like to use my celebrity and social capital to create change, whether through standing for international peace, furthering medical research or reducing poverty.

“Now I’m fortunate enough to be in that position.”

Born in Laguna Hills, California, to Panamanian parents, Blacc described his childhood as “a simple suburban upbringing in a quiet town.” However, it was far from dull. His parents spoke Spanish and their home was filled with aromas from his mother’s Caribbean cooking and exotic sounds — salsa, merengue, calypso — from his father’s stereo.

Blacc began writing hip-hop lyrics at age 9, and took up the trumpet. In high school, he played in the orchestra and marching band. He also started making hip-hop music, teaming with producer Aleksander Manfredi, better known as Exile, and forming Emanon, a mainstay duo of the underground rap movement.

At USC, Blacc, a Renaissance and Trustee Scholar who described himself as “very studious,” didn’t promote his music, except for one campus talent show he entered at the urging of friends. He won with a cheeky song titled “I Love USC,” which became a tailgate hit. Upon graduating in 2001, he landed a corporate job but was laid off, allowing him to concentrate on music.

By the mid-2000s, despite Emanon’s success, the bravado and machismo of rap no longer felt comfortable and Blacc “decided to focus on affecting emotions, rather than projecting my own.” In 2006, he signed to Stones Throw Records and released his debut solo album, Shine Through, followed by 2010’s Good Things.

His big break came the same year when the song “I Need a Dollar” was chosen as the theme for HBO's How to Make It in America. The song sold two million copies worldwide, while Good Things went gold in France, Germany and the U.K.

In 2012, he signed with XIX / Interscope Records. That was followed by hits “The Man” and in 2013, “Wake Me Up,” which topped the charts in 103 countries.

Undiminished by fame, Blacc’s sensibility led him to work with anti-poverty organization Global Citizen and create songs with strong social messages.

“Tne past I’ve written very specific lyrics about certain issues, but those don’t tend to be the most popular songs,” he admitted.

Instead, Blacc began creating thoughtfully crafted videos for songs such as “Wake Me Up,” in which he teamed with the National Day Laborer Organizing Network to speak out in favor of immigration reform, and “Love Is the Answer,” which challenges suspensions for “willful defiance” in California schools.

“I like to use my videos in conjunction with a social message or nonprofit organization, so my music stands for something more than just another pop song,” he said.

“The idea is to take a cue from Bob Marley or Marvin Gaye. A song like Marley’s 'One Love' does more than any protest song I could write. His advice to USC students? Blacc chooses his words carefully.

“Enjoy your passion for art and use your educational experience to inform it and help you find perspective. Find a way to communicate compassion, whether that’s by creating social programs or through community involvement.”

To help develop careers of artist-activists, Blacc recently launched his company Activist Entertainment.

“I believe our most important challenge is fair distribution of resources, so everyone has basic, sustainable levels of healthcare, education and nutrition.”

Blacc believes that food deserts — an area where affordable and nutritious food is inaccessible, particularly for those without a car — can be eradicated. Food can be cultivated in these areas if people come together, he said.

“My goal is to work with communities to transform food deserts into food oases. I hope to inspire change the way Sean Penn is doing for Haiti, or Don Cheadle and George Clooney are doing for Darfur.”

Aloe Blacc?

Yes, you can tell everybody. He’s the man. — S.B.
Politics Comes to Life

Former senior adviser to the U.S. Department of Defense, alumnus Jeffrey Fields joins the USC School of International Relations and directs a new semester-long program in Washington, D.C. by Susan Bell

Joining USC Dornsife as assistant professor of the practice of international relations, alumnus Jeffrey Fields will direct a new program in Washington, D.C., to be launched in Spring 2015.

As a former senior adviser to the U.S. Department of Defense (DOD), Fields’ experience at the highest levels of power has given him unique insight into the inner workings of government — insights he will be sharing with USC students as he leads them to the nation’s capital for a new, semester-long program focusing on national security and intelligence.

At the DOD, Fields, who earned his Ph.D. in international relations from USC Dornsife in 2007, worked at the Defense Threat Reduction Agency, where he was an analyst specializing in thwarting unconventional threats such as biological weapons. In his prior post as a political-military analyst at the Pentagon, Fields was the lead social scientist, responsible for long-term planning and analysis of international security threats. Fields also brings experience from his time in the U.S. Department of State, where he served as a foreign affairs officer in what is now the Office of Strategic Communications and Outreach. He was also an adviser to the special representative of the president for nuclear nonproliferation.

“Jeff was a star as a graduate student, and won a prestigious Presidential Management Fellowship to begin his Washington career in the Department of Defense,” said Robert English, associate professor and director of the USC School of International Relations.

He has had broad experience on proliferation and other key national security issues, and has continued his academic research. This combination — and, of course, the fact that he is a Trojan — make him ideal to direct this exciting new program in Washington.”

Developed by Dean Steve Kay and Steven Lamy, professor of international relations and vice dean for academic programs, the program will enable USC students to take three international relations courses and work part time as an intern in a study-related area. Students will also benefit from Fields’ government connections as he brings in guest speakers from Washington’s political elite.

The interdisciplinary program will eventually have three dimensions: international relations, economics and practical politics. During the program’s second year, courses in economics will be added, followed by courses in practical politics in the third year.

“Since this will be a D.C. experience, the idea is to work with real-world issues, so courses are less theory-based and have more policy relevance,” Fields said. “This is a wonderful opportunity to use my experience in Washington to inspire students by making politics come to life.”

Students from any USC major may apply.
SELF-REPORT

\{self-\textquotesingle ri-\textquotesingle p\textquotesingle rt\}, noun \ From
Old English self and Old French
report\} 1. A report about
oneself or aspects of one’s
behavior, thoughts, feelings
and environment made by
oneself. Self-reports may be
of relatively objective things,
such as prior hospitalizations
or number of children living
in one’s household, or of more
private, subjective matters
such as pain, emotions or opin-
ions. Self-reports are common
in everyday life — when we
speak to our healthcare pro-
viders or complete a consumer
satisfaction poll — and are an
indispensable tool for behav-
ioral and medical research.

Origin: The first recorded
use of the term self-report
appears in an October 1970
article in The Journal of Gen-
eral Psychology.

Usage: “Healthcare
professionals and research-
ers obtain a vast amount of
information from self-reports:
How people are feeling, their
symptoms, how much fatigue
they’re experiencing. Market-
ers and pollsters also make
use of self-reports to provide
information that ends up in
newspaper articles every day,
such as the public’s opinion on
a political issue.”

Arthur Stone, professor of
psychology, is director of the
USC Dornsife Center for
Self-Report Science (CSS).
Stone and his CSS colleagues
are developing new methods
and techniques to improve the
accuracy and reliability of self-
report assessments.
In the News Quotables

“We wouldn’t have music, art, religion, science, technology, economics, politics, justice, or moral philosophy without the impelling force of feelings.”

ANTONIO DAMASIO, University Professor, David Dornsife Chair in Neuroscience, professor of psychology and neurology, and director of the USC Dornsife Brain and Creativity Institute, in a June 17 Q&A in MIT Technology Review on the neuroscience of emotions.

“We are concerned that the entire southern San Andreas Fault is locked, loaded and ready to roll.”

THOMAS JORDAN, University Professor, William M. Keck Foundation Chair in Geology, Sciences, professor of earth sciences, and director of the Southern California Earthquake Center at USC Dornsife, in an April 28 interview with CBS News affiliate KWTV-TV on the center’s research on earthquake forecasting.

“They were pushing back against a safety and security. … They were reacting to what they saw as an adventure deficit in American culture.”

ALICE ECHOLS, Barbra Streisand Professor of Contemporary Gender Studies, and professor of history and gender studies, in an April 11 C-SPAN interview about the 1960s-era counterculture.

Cheeseburger Blues

Meat and cheese may be as bad as smoking, according to a new study led by biologist Valter Longo of biological sciences.

Stop! That cheeseburger you’re about to bite into could be as deadly as a cigarette. In a new study tracking a large sample of adults for nearly two decades, researchers found that eating a diet rich in animal proteins during middle age makes you four times more likely to die of cancer than someone with a low-protein diet — a mortality risk factor comparable to smoking.

“There’s a misconception that because we all eat, understanding nutrition is simple. But the question is not whether a certain diet allows you to do well for three days, but can it help you survive to be 100?” asked corresponding author Valter Longo, Edna M. Jones Professor of Gerontology at the USC Davis School of Gerontology, professor of biological sciences at USC Dornsife, and director of the USC Longevity Institute.

Not only is excessive protein consumption linked to a dramatic rise in cancer mortality, but middle-aged people who eat lots of proteins from animal sources — including meat, milk and cheese — are also more susceptible to early death in general, revealed a March study published in Cell Metabolism. Protein-lovers were 74 percent more likely to die of any cause within the study period than their low-protein counterparts.

But how much protein one should eat has long been controversial — muddled by the popularity of protein-heavy diets such as Atkins. Before this study, researchers had never shown a definitive correlation between high-protein consumption and mortality risk.

The latest study considers how biology changes as we age and how decisions in middle life may play out across the human life span.

In other words, what’s good for you at one age may be damaging at another. The study shows that while high-protein intake during middle age is very harmful, it is protective for older adults: those over 65 who ate a moderate- or high-protein diet were less susceptible to disease. —S.W.

So L.A.

High school students in the Los Angeles Service Academy cultivate an appreciation of their city.

Kiara Cuevas and her high school classmates in the Los Angeles Service Academy (LASA) were tasked with making their way from Los Angeles’ Central Library downtown to the Union Station, located in the northeastern corner of downtown, using public transportation. After studying the system map — and with some guidance from their teacher — they figured out which subway to take.

“It was a lot easier than I thought it would be,” Cuevas said. LASA, administered by the Huntington-USC Institute on California and the West (ICW), housed in USC Dornsife, takes high school juniors on a journey through their city to meet the movers and shakers that make L.A. function.

“Students spend a year thinking about the question, ‘How does a large metropolitan region like Los Angeles work?’” said LASA Executive Director Douglas Smith.

Over eight Saturdays, students learn about transit, public safety, food, housing, business, and culture in L.A. The program kicks off each summer with a four-day seminar led by Smith and William Deverell, chair and professor of history at USC Dornsife.

“Our goal is to pull the sinews of the city together so it’s not so anonymous and huge,” said Deverell, ICW director. “We also aim to instill in the students the notion that public service and public awareness are closely related. We really hope to inspire them.” —M.S.R.

PHOTO COURTESY OF WILLIAM DEVERELL
A Racing Legend Revisited

Archaeology students and faculty help recover the remains of famed racehorse Native Diver at Hollywood Park racetrack.

Black gelding Native Diver, a member of Thoroughbred Racing's Hall of Fame, was the first horse bred in California to win more than $1 million in the 1960s. In his illustrious racing career, he won three consecutive Hollywood Gold Cups and 34 stakes, the highest level of horse races.

Jet black with a white blaze, Native Diver was an amazing animal to look at, said alumnus Richard Shapiro. Shapiro, grandson of Louis K. Shapiro, who bred and raised Native Diver, grew up watching the thoroughbred race. When Native Diver died in 1967, he was laid to rest in a memorial at his hometown racetrack, Hollywood Park in Inglewood, California. Hollywood Park ceased operations in December 2013.

Shapiro, who earned his bachelor's in political science from USC Dornsife in 1974, reached out to USC Dornsife's Archaeology Research Center to help recover the horse's remains. Shapiro's brother Thomas, sister Peggy and father, Marvin, also attended USC.

Archaeologists Lynn Dodd, associate professor of the practice of religion, and Thomas Garrison, assistant professor (teaching) of anthropology, and a team of USC Dornsife students excavated Native Diver's burial site in March. The horse's remains will be laid to rest at the racetrack in Del Mar, California.

Senior Alex Williams, who majors in archaeology and anthropology, appreciated the experience.

"Hands-on learning and field work are important for our major," Williams said. "This is what we study in the classroom, so to be able to do it in the field is incredibly rewarding."

Shapiro said he was grateful for the help USC professors and students provided in recovering Native Diver, who was an important part of his family's history.

"Now, USC is part of Native Diver's history as well."

"I definitely keep an open mind when I'm abroad. That's also the best thing about traveling. You get to see so many different points of view."

Caleb Farro, who earned his bachelor's in international relations, travels the world as part of GoPro's media team, helping to coordinate shoots for commercials and internet videos. For instance, Farro went to Chile to assist with two videos. The first featured professional snowboarders and skiers who were lifted up by helicopter to breathtaking peaks in Valle Nevado in the Andes Mountains. The second featured mountain bikers riding through Valparaiso, a port city with steep, winding streets and colorful stairways.

"That was an amazing shoot," Farro said. "I got to heli-ski. We had beautiful weather and fresh snow — everything lined up."

Farro credits his time at USC Dornsife for broadening his world view. In particular, he was inspired by an introductory international relations class he took with professor Steven Lamy, vice dean for academic programs. "Professor Lamy was the one who taught me to look at things from everybody's point of view, not just from one side," he said.

Farro said he continues to take that message to heart, whether he's traveling for work or fun.

See back cover photo of Farro working for GoPro in Queensland, Australia.
KNOT A PROBLEM
For their practical, aesthetic and symbolic importance, knots have fascinated humans since prehistory. Mathematicians have been drawn to the study of knots since the 18th century.

First developed in 1771, becoming a discipline in the 19th century, knot theory is simply the study of mathematical knots.

“Knot theory is a field of mathematics concerned with studying properties of knots and distinguishing them from each other,” said Aaron Lauda, professor of mathematics. “If you take a piece of rope and tie an arbitrary knot and then seal the ends together, how can we tell if any two knots are the same? Knot theory provides a series of tools and techniques we can use to determine that.”

Lauda uses knot theory to teach students how mathematical knowledge is acquired and processed. He demonstrates by laying a knotted rope flat on a table so all of the crossing points are clearly visible. As any knot can be drawn in many ways using a knot diagram, knots are often distinguished by using a knot invariant. This is an assignment of algebraic data to a knot, such as a number or a polynomial. For example, the smallest number of crossings of any diagram of the knot is an invariant called “the crossing number.”

“By looking at the diagram of this knot, I can calculate a polynomial unique to this knot,” Lauda said. “By waving two knots around it may seem impossible to tell if they are the same, but if their polynomials are not equal then we know the knots are not identical.”

1771
The first mathematical theory of knots is developed by French mathematician Alexandre-Théophile Vandermonde.

1860
Tabulating knots and distinguishing knots becomes a problem of interest when Scottish mathematician and physicist William Thomson, Baron Kelvin of Largs, theorizes that an atom is a vortex in the “ether.” Although ether’s existence was later disproved by Albert Einstein’s theory of relativity, a more serious investigation into the problem of distinguishing knots led to Peter Guthrie Tait’s creation of the first knot tables. While Thomson’s proposal did not ultimately lead to a theory of the atom, knot theory has found its way back into modern theoretical physics in various aspects of string theory.
Six Billion Knots and Links

More than six billion knots and links have been tabulated since knot theory began. However, knot theory is not about drawing up huge knot tables. Research into knot theory has many aims, including applications to theoretical physics — most notably string theory — as well as applications to chemistry and biology, where knots are used in understanding knotting of DNA. Knot theory can also be crucial in the construction of quantum computers, through the model of topological quantum computation.

Math with a Twist

At a May 6 event, Lauda worked with undergraduates enrolled in “Founding Principles of Mathematics and Acquisitions of Mathematical Knowledge,” a new course taught by David Crombecque and devised with Cymsa Haskell, both of mathematics. The event brought 20 students from Augustus Hawkins High School in South Los Angeles to USC for a day of math-based games, thanks to funding from Lauda’s National Science Foundation CAREER Award.

High school junior Jailyne Olvera’s brow was almost as knotted as the rope in front of her as she attempted to match a complex knot with one shown on a chart. “Our knot-matching game introduces mathematical tools knot theory provides for solving a math problem,” Lauda said. “We’re trying to teach high school students that math goes beyond algebra or memorizing multiplication tables.”

Diabetes Detectives

Two papers in the leading journal Diabetes contain research that may greatly help those suffering from hypoglycemia.

Groundbreaking research by Casey Donovan, professor of biological sciences, and Alan Watts, professor of biological sciences, physiology and biophysics, and their team has helped identify the mechanisms involved in detecting hypoglycemia or low blood sugar.

The findings, which could have far-reaching consequences for the development of insulin therapies for Type 1 and Type 2 diabetes, are the first to link peripheral glucose sensing with brain activation during a hypoglycemic episode. This is a critical step in allowing the body to restore normal blood sugar levels.

“Severe hypoglycemia can cause convulsions, coma, even death,” Donovan said. “And unlike hyperglycemia or diabetes, which take many years to become lethal, severe complications of deep hypoglycemia can develop within hours.”

It’s often difficult to judge the amount of insulin needed to reduce glucose levels, Watts said. “The challenge, particularly with Type 1 diabetes, is to manage insulin therapy effectively so patients don’t go into hypoglycemic shock,” he said.

Increasingly, aggressive diabetes treatment is inducing more hypoglycemic incidents. A vicious cycle results, as the body becomes progressively unable to detect low blood sugar.

One Diabetes study, led by USC Dornsife’s MaryAnn Bohland-Matveyenko, is the first to show a direct functional connection between blood glucose sensing of slow-onset, or clinical, hypoglycemia and brain activation.

Bohland-Matveyenko, Donovan and Watts mapped the hindbrain and hypothalamus, finding that if sensory input from the portal vein is eliminated, little activation occurs in the hindbrain during slow onset hypoglycemia.

“This shows the brain can’t detect hypoglycemia under most physiological conditions without this peripheral input,” Donovan said. “But neurons in the hindbrain continue to respond to fast-onset hypoglycemia even in the absence of peripheral sensors.”

The researchers also confirmed that information from the portal vein travels to the hindbrain via the spinal cord, not the vagus nerve as previously thought.

A second study lead by USC Dornsife’s Anne Jokiaho found that a major neuronal connection between the hindbrain and the hypothalamus is unneeded during a fast drop in glucose, but is essential in slow-onset hypoglycemia.

“This research could have far-reaching consequences for the way treatments are developed, particularly for treatment-induced hypoglycemia,” Donovan said. —S.B.

H₂O Robo Kids

Fourth and fifth graders at Foshay Learning Center get a hands-on lesson in robotics and ocean science.

At his playground, fourth grader Leonel Aquino ditched the jungle gym to construct from polyvinyl chloride pipe an underwater, remotely operated vehicle, or ROV.

“This is like making Legos but bigger,” said Aquino, who followed a schematic illustration showing him how the pipes should fit together. “It’s scientific and fun.”

Aquino was participating in a studio held by the Joint Educational Project’s Young Scientist Program (YSP), based at USC Dornsife.

That day in April, James A. Foshay Learning Center’s Elementary Village near USC was transformed into a science laboratory. Stations called “ROV Building,” “Plankton Races,” “Marshmallow Mash” and “Cartesian Divers,” to name a few, invited Foshay’s fourth and fifth graders to learn about underwater scientific concepts such as pressure, volume and buoyancy.

“Our goal with this studio is to introduce the idea of underwater robotics in an engaging way, and allow the students to explore a new STEM field,” said Dieuwertje “D.J.” Kast, YSP director. “Students get to see how fun disciplines like engineering can be and their real-life applications.” —M.S.B.
“I was fortunate enough to be raised by two physicians who really love their careers. Of course, we have a lot of stress ahead of us. Medicine will be very different when we are practicing it than when my parents started. But I think when you follow your heart, the rest will follow.”

Hometown: Northbrook, Ill.
Major: psychology
Minors: applied theatre arts and natural science
Activities: USC Troy Camp counselor, USC Global Medical Brigades volunteer and leader; study abroad in Prague, Czech Republic; Alpha Delta Pi sorority (2013 Greek valedictorian).
Hobbies: Dance, theatre, the arts and, “cheesy as it sounds, reading. I’m a huge reader. I read every night.”
Favorite Trojan memory: “My first summer at Troy Camp because it was the first opportunity that I really got to spend extended amounts of time with kids from the surrounding areas of USC.”
After graduation: Volunteered at Troy Camp, then visited with her family Machu Picchu in Peru. Starting medical school at Northwestern University.

Despite widespread use of a single term, Alzheimer’s disease is actually a diverse collection of diseases, symptoms and pathological changes. What’s happening in the brain often varies widely from patient to patient, and a trigger for one person may be harmless in another.

In a unique study, an international team of researchers led by USC Dornsife psychologist Margaret Gatz compared the brains of twins in which one or both died of Alzheimer’s disease. They found that many of the twin pairs not only had similar progressions of Alzheimer’s disease and dementia prior to death, they also had similar combinations of pathologies — two or more unconnected areas of damage to the brain.

The current paper provides more evidence that there may not be a single smoking-gun cause of Alzheimer’s, but rather a range of potential causes to which we may be susceptible largely depending on our genetics. The study appeared in the February issue of the journal Brain Pathology.

“The try to make inferences based on tests and diagnoses, but we have to assume that what we’re seeing is a manifestation of what’s going on in these twins’ brains,” said Gatz, professor of psychology, gerontology and preventive medicine. “For this reason, we wanted to compare the brains of twins to ask whether identical twins’ brains are actually more identical.”

The researchers had the rare opportunity to directly autopsy the brains of seven pairs of twins who both died after receiving diagnostic evaluations over many years. They studied a pair of identical twins who were both diagnosed with Alzheimer’s and died at age 98 within a year of one another.

“Across the whole array of neuropathological changes,” Gatz said, “the identical twins appeared to have more similar pathologies.”
**A Case for Balancing Your Checkbook**

Jacob Soll’s new book names financial accountability as the reason for the rise and fall of nations.

As the United States was spiraling into one of its worst financial collapses in history, Jacob Soll found an interesting parallel in France’s “Sun King.”

The professor of history learned that Louis XIV, better known for his wigs, mistresses and the Palace of Versailles, had also taken a keen interest in accounting and carried golden notebooks in his pockets that detailed the royal budget.

Eventually, the monarch destroyed the budget books, which only reminded him of the rising debt accrued through costly wars and his spending on Versailles. By the time the king was on his deathbed, France was bankrupt.

“[T]hat blows me away because here you have remarkable innovation and then willful destruction of the innovation as soon as accountability comes around. That’s one of the lessons for today,” said Soll, who holds a joint appointment at the USC Leventhal School of Accounting. Winner of a 2011 MacArthur “Genius” grant, Soll has led the way in combining the study of history with accounting.

When Soll witnessed the collapse of U.S. investment bank giants in 2008, he turned his focus to this pattern that has persisted since ancient times: Capitalism and government flourished during times of financial accountability, and fell when leaders abandoned those practices. His book, *The Reckoning: Financial Accountability and the Rise and Fall of Nations* (Basic Books), was published in April.

“This is a cultural tradition that we play out over and over again,” Soll said.

In modern times, the rise of the credit card and computerized banking have made it even easier for people to avoid a reckoning of their own personal finances, Soll said. He hopes his book, and the 700 years of history it brings to bear on today’s financial woes, will help bring debates about accountability back into the public sphere. —M.B.

**Move, Move, Move**

Once you reach middle age, the mantra is move more, eat less. That’s because your energy homeostasis may be broken.

Lorraine Turcotte has rigged her desk to electronically move up and down when she pushes a button. Every 30 minutes, she stands up. Her desk moves with her so she can continue working on her computer.

After researching metabolism for 35 years, she knows the human body must move to stay healthy. She studies the best ways to keep energy homeostasis. That’s the ability to maintain body weight by having equal amounts of energy intake and output (eating and exercising).

“The problem is when we get older and we’re not running to class every day, we get a job and we sit from 8 to 5,” said Turcotte, professor of biological sciences at USC Dornsife.

“There is a disequilibrium and the homeostasis is broken.”

As we get older, we must decrease our intake of calories, she said. By the time you reach middle age, you’re maintaining the same energy in and out, but suddenly it doesn’t work anymore and you’re gaining weight.

“That’s because your metabolic rate is plummeting, so you have to cut out even more food,” she said referring to the process by which our body converts what we eat and drink into energy. “That’s what I tell women in their 50s and 60s. ‘You’re not going to like this. Are you ready to be hungry?’ ”

This is where behavior modification comes in. Burn those calories by taking the stairs instead of the elevator, she said. Keep a pair of tennis shoes at the office and walk around the building at lunchtime.

“If you have dogs walk them more. Garden. Move, move, move,” she said.

Eat the amount of calories right for your age, height and gender.

“Of the calories you eat, there is no magic trick in what those calories should be,” she added. “A certain percentage of your calories should be from carbohydrates, proteins and fat, every day.” —P.J.J.
Welcome to the Jungle

Human and evolutionary biology Ph.D. candidate James Askew follows the call of the wild to Southeast Asia to study orangutans.

In April, a USC Dornsife graduate student embarked on an 18-month expedition to study orangutans in Southeast Asia, inviting colleagues and classmates to follow along via his postings on Scientific American’s “Expeditions” blog.

James Askew, Ph.D. candidate in human and evolutionary biology, is spending nine months each at Gunung Leuser National Park in Northern Sumatra and Kutai National Park in East Borneo, Indonesia.

Askew’s work ranges from high-tech — using wireless microphone networks and drones to record male calls — to low-tech — standing under trees with plastic tarps to catch orangutan urine for sampling.

“Orangutans are hugely understudied and easily the most endangered of the great apes,” Askew said. “By conducting research in Indonesia, I can help publicize their plight, increase capacity-building by employing field assistants or working with local universities and even work toward direct conservation efforts by collaborating with other researchers in the field.”

Askew’s research investigates the role of male calls in social structures and reproductive strategies of orangutans.

“On the first day, we sat in a room meditating for four and a half hours. With my eyes closed, it could have easily been seven hours — or two. It felt timeless.”

This is how sociology major Sarah Newell described her arrival at a spiritist healing center in central Brazil. She had traveled there as part of a Problems Without Passports course.

Taught by Erin Moore, associate professor (teaching) of anthropology, “The Global Performance of Healing” allows students to learn about cultural anthropology firsthand by examining the practices of healing in cultural contexts outside the United States. As a case study, they focused on spiritism, a healing modality in which mediums are said to channel spirits from otherworldly realms to deliver messages or instructions.

“All healing uses the power of the mind to engage the body to heal,” said Moore, a cultural anthropologist and expert on medical anthropology. “People everywhere get sick and all societies have developed practices, technologies and medicines to treat illness. However, not all peoples understand sickness and healing the same way.”

In June, Moore and her students traveled to Brazil for two and a half weeks of fieldwork after two weeks of classroom instruction at USC.

“We were not in Brazil to heal ourselves or to disprove anything,” Moore said. “We were there to explore a culture. … The most important thing is that students learn open-mindedness and understand that how they see the world is only one way, based on their education, gender, cultural background and ethnicity. Others are experiencing their worlds based on their own backgrounds.”

In a new study abroad program, USC students will join counterparts from other elite universities around the world. USC joins Cornell, Georgetown and Princeton universities, King’s College London, and the University of Geneva in the endeavor. These institutions will partner with Keio University in Tokyo, Yonsei University in Seoul, Korea, and the University of Hong Kong.

Researchers from all partner schools attended a memorandum of understanding signing ceremony in Hong Kong on May 13.

This program for comparative East Asian studies is a chance for selected undergraduates from diverse backgrounds to study and intern for an extended time in Japan, Korea and China, alongside peers from each of the Asian institutions, as well as students from the other partner universities.

This elite and competitive program is open to undergraduate students of all majors. The Office of Overseas Studies at USC Dornsife will operate and manage USC’s participation in the three-campus consortium.

Students will be selected for participation beginning in Spring 2015.
**Most Valuable Trait**

Economics alumnus Malcolm Smith’s fierce sense of determination earns him the title of Super Bowl XLVIII MVP.

After defeating Penn State in the 2009 Rose Bowl and joining his teammates for a celebratory dinner, Malcolm Smith ’11 faced his most challenging adversary. “These guys were crushing the prime rib and I could barely swallow one bite,” Smith, a backup linebacker for the Trojans at the time, recalled in an NFL Network Podcast. “It just got progressively worse over time and I couldn’t even swallow water for a little bit. I started losing weight and I was like, ‘I think there’s something wrong with me.’”

After tests, doctors diagnosed Smith with a rare disorder of the esophagus known as achalasia, which affects about 1 in 100,000 people. The disease makes it nearly impossible to eat and maintain a nutritious diet; each bite is difficult to swallow and is often followed by regurgitation. The then-19-year-old’s weight dropped from 240 to 205 pounds. Smith feared his football career was over.

During the 2009 off-season, he underwent a surgical procedure called a myotomy. After recovery, he trained relentlessly. Now a 24-year-old Seattle Seahawks linebacker, Smith was named Super Bowl XLVIII MVP, accepting his trophy on Feb. 2. “It’s not how you start, it’s how you finish,” Smith told Sports Illustrated. “Let it humble you, and let it give you fire.”

**ALUMNI New Jersey**

**ALUMNI Cook Islands**

**FACULTY Saudi Arabia**

Sailing across the Red Sea, Douglas Capone and Linda Duguay hoped to get an up-close view of the reddish blooms created by cyanobacteria, which give the water its eponymous hue.

“The Red Sea is a phenomenal environment,” said Capone, William and Julie Wrigley Chair in Environmental Studies, and professor and chair of biological sciences. “It’s one of the warmest and saltiest bodies of water on Earth, but the amount of oceanographic research performed there has been very limited because of political and jurisdictional issues.”

That is about to change. Capone has launched a collaborative research project between USC Dornsife and King Abdullah University of Science and Technology (KAUST) in Saudi Arabia. Funded by KAUST, the project will focus on aspects of the fundamental ecology of the Red Sea.

Capone and Duguay, associate professor (research) of biological sciences and director of the USC Sea Grant Program, will work closely with Burton Jones, professor of marine sciences at KAUST.

“‘In the long term,’ Capone said, ‘we will be providing fundamental information on how productive the coastal ecosystems of Saudi Arabia are and thereby what the potential may be for developing fisheries resources and aquaculture.’”

After earning a master’s degree in marine biology from USC Dornsife in 2009, Tina Weier now lives in the paradisiacal Cook Islands. There, she works for the Ministry of Marine Resources, Pearl Support Division, which provides technical and management support to assist with the sustainable growth of the Cook Islands black pearl industry.

As the staff marine biologist, Weier is stationed on the remote atoll Manihiki, where she works directly with pearl farmers and the community to assess their needs and develop work programs. She runs the water quality monitoring program, generating weekly reports to allow farmers to adapt their practices based on environmental conditions.

“Because oysters require pristine environmental conditions to produce pearls, the industry itself demands conservative and environmentally friendly practices,” Weier said. “It is a perfect example of people working sustainably and in harmony with the marine environment.”
PHOTOS BY BRITTANY THOMPSON, KAREN TONGSON AND LINDA WANG
With a farmer’s knife in hand, Richard Martinez knelt by a line of bright green heads of lettuce and cut off one. He snapped off the crispy leaves from the spine.

Blanketed by a brilliant blue sky over Oxnard, California, tidy rows of romaine lettuce, kale, Swiss chard and bok choy stretched to the horizon.

“There’s a little dirt, but the dirt’s good for you,” Martinez joked as he dispensed the freshly picked leaves for everyone to sample. “It’s organic.”

A third-generation farmer, Martinez is a manager at Deardorff Family Farms, which launched its organic operation five years ago on 130 acres of prime Southern California soil.

Gathered at Deardorff’s organic fields, USC Dornsife students in the Maymester course “Food Culture and Food Politics in the Land of Plenty” were touring farms and produce-processing facilities in Ventura County, 60 miles north of Los Angeles. As they munched on just-picked lettuce leaves, Martinez described the business of organics — and the inherent politics involved.

Organically grown food adheres to rigorous production and processing standards overseen by the National Organic Program (NOP), administered by the U.S. Department of Agriculture (USDA). NOP certifies food — strawberries, broccoli and other fruits and vegetables — as organic in the United States, designating it with a small green and white “USDA Organic” seal.

Products bearing the label must be grown and processed without the use of toxic and synthetic pesticides and fertilizers, genetic engineering, antibiotics, synthetic growth hormones, artificial flavors, colors, preservatives, sewage sludge or irradiation, Martinez pointed out.

In addition to explaining organic food policies and regulations, the course looked at food through the lens of politics, class, race and gender.

Karen Tongson, associate professor of English and gender studies, asked her students to consider how farmers follow regulations to get their product to markets in order to get meals on tables. They examined the cultural origins of dishes, from sushi made by a Japanese grandmother to Korean-Mexican fusion tacos from a food truck. They studied who cooks our food — from mom to predominantly male chefs.

“We all assume we come to food as people — with no labels, no gender, no race, no ethnicity,” Tongson said. “After all, eating is a universal process. But food is so incredibly personal. It’s routed through our cultural histories and the way we move through the world as gendered people.”

Starting from a gender studies framework, the class investigated how gender roles factor into food.

“Women are traditionally seen as homemakers, cooking for the family,” said Avalon Igawa, a sophomore with an undecided major. “While that standard has been changing, it has been a tradition in our society for a long time. We can’t seem to break away from it.”

Television personalities still mimic that paradigm, Igawa pointed out. In kitchens, Rachel Ray and Martha Stewart regularly coach viewers on how to create family meals, while chefs like Anthony Bourdain and Andrew Zimmern traipse the globe experiencing foods from various countries.

Back in Oxnard, Martinez noted that starting an organic farm can be costly.

“It takes three consecutive years of organic farming on a parcel of land to become certified. During that period, all produce grown on the land must be sold as conventional and at the less profitable conventional rate.
When Deardorff started its organics division, it had to adopt pest and weed management practices that were more costly and labor intensive than conventional practices. The farm pays regular certification fees, among other expenses. “It’s not inexpensive,” Martinez said.

However, the conversion made sense, considering consumer demand. Organics is a $28.6 billion industry in the U.S.

“We saw the writing on the wall,” Martinez said. “There is a future there.”

Students also visited farmers markets, ethnic groceries, food stalls and restaurants in L.A., the Bay Area and the Pacific Northwest. Maymester courses are experiential, hands-on learning opportunities for students to study a topic in-depth, usually in the field, in the month of May.

In Berkeley, California, the class visited Alice Waters’ restaurant Chez Panisse, which is credited with advancing the local, sustainable food movement now referred to as California cuisine. In Portland, Oregon, students toured the local institution of food pods, a stretch of more than 600 small, artisanal semi-permanent food carts. Their guide was food critic Karen Brooks, author of *The Mighty Gastropolis*, a cookbook and cultural exploration of Portland’s food culture.

Students tasted Thai curries, spicy sea urchin, bucatini with clams, savory fritters called vadas from South India, and eastern European khinkali — stuffed Georgian dumplings.

Experiencing various flavors was an integral part of expanding students’ cultural understanding, Tongson said. “It’s important to stretch their presupposed knowledge and assumption of what they may or may not like,” she said. “Something might not sound appealing, like fish sauce, but by experiencing it you’re learning the flavor structures of different cultures.”

One afternoon, the group met for lunch at Kogi founder Roy Choi’s newest culinary endeavor, Pot, in L.A.’s Koreatown. Scholar and author Oliver Wang of California State University, Long Beach, joined them.

Students had read Wang’s paper “Learning From Los Kogi Angeles: A Taco Truck and Its City,” an examination of the food truck trend that swept through L.A. starting in 2008, headed largely by Choi’s Kogi BBQ-to-Go truck. Kogi’s main draw was a Korean-inspired, short-rib taco that blended Korean and Mexican flavors. “Kogi is my representation of L.A. in a single bite,” Choi told *Newsweek*.

But as Wang pointed out, traditional food trucks, or *loncheras*, were a mainstay in L.A. long before high-concept mobile food establishments were tweeting their locations for Angelenos to turn up for upscale grilled cheese sandwiches. While new food trucks assume customers have the technology to follow their every move, *loncheras* park outside construction sites and nightclubs, offering food at a cheap price.

For Igawa, the conversation was eye-opening. “I had never really thought about the way food reflects social and economic class,” she said.

“Oliver Wang talked about the large void in the neighborhoods where new food trucks turn up, and how that void is tied to lower income levels. *Loncheras* are still invisible to a lot of people.

“It’s interesting to think about how taste becomes an element of class,” she said.

Lunching at Pot was in itself a lesson in the ways that...
class and taste go hand in hand, said Linda Wang, a senior majoring in philosophy, politics and law, and sociology.

The high-concept restaurant mixes fine dining with down-to-earth ingredients — a $26 soup for two combines instant ramen noodles and Spam with seafood and tofu.

“It’s the type of food intended to be appreciated by an audience that has a certain level of cultural capital,” Linda Wang said, meaning that the menu caters to restaurant goers who recognize the art of the dishes.

Students also explored their own relationships with food, keeping food diaries to keep track of their food choices.

Brittany Thompson, a senior majoring in gender studies, said recording what she ate each day made her realize that convenience plays a large part in her choices.

“I definitely eat out a lot,” Thompson said.

The class also experimented with cooking — a new experience for most students. One afternoon, Tongson and her students met at Echo Park Lake, bringing grillable dishes that reflected their cultural backgrounds. They used ingredients they had purchased the previous day on a group trip to Silver Lake Farmers Market.

Igawa and her Japanese grandmother, Wakiko Igawa, prepared a family recipe of teriyaki marinade for a grilled chicken dish. That day, her grandmother joined the class for lunch and ended up inviting students to her home in Whittier for a lesson in making sushi.

In preparation for the sushi lesson, students visited a Japanese grocery store, where they purchased seaweed wrapping paper, rice, vinegar and sashimi-grade tuna, yellowtail and mackerel. At Wakiko Igawa’s home, they were treated to tea and cold soba noodles prepared by her husband.

They listened as Igawa’s grandmother carefully explained how to prepare the sushi rice with the perfect mixture of vinegar and sugar, and how to roll the ingredients in just the right way.

While prepping, Wakiko Igawa talked to the group about Japanese culture — how food is presented, how Japanese eating habits differ from those of Americans, and what it was like to immigrate to the U.S. as a 19 year old.

This kind of cultural exchange was what the course was all about. Wakiko Igawa touched on culture, explaining the role food played for her as an immigrant assimilating into a new country. She also addressed gender roles, discussing how as a wife and mother she would prepare meals for the family.

“Avalon’s grandmother put a very human face on the subjects we’d been studying throughout the class,” Wang said. "It’s interesting to think about how taste becomes an element of class.”
THE SEARCH FOR A WILD WEED

Oyster mushrooms (*Pleurotus ostreatus*)

*By Ava Chin '06*
A native New Yorker from Flushing, Queens, Ava Chin forages throughout the five boroughs and the Tri-State Area, writing about her finds for publications such as The New York Times and Saveur magazine.

Her memoir Eating Wildly: Foraging for Life, Love, and the Perfect Meal (Simon & Schuster, 2014), about being raised by a single mother and loving Chinese grandparents, reveals how foraging and the do-it-yourself food movement helped Chin to heal from the wound of an absent father and taught her important lessons in self-reliance.

Chin earned her Ph.D. in literature and creative writing from USC Dornsife in 2006. Here is an excerpt from the first chapter of Eating Wildly.

I am walking along a secluded, wooded path in a park in Brooklyn — my favorite place to forage for wild edibles in the city. My backpack is filled with plastic bags, a worn field edition of Euell Gibbons’ Stalking the Wild Asparagus, and a box cutter that doubles as a knife. The wood mulch and dirt are damp beneath my sneakers as I make the slow climb up toward my destination. Down below, cyclists and joggers are making their way along the road that loops through the park, and I can hear the resounding clomp of a horse along the bridle path. In the height of early autumn, everything below is obscured by a rich tangle of leaves just starting to turn reddish gold in the morning light. A dog barks in the meadow. I pause under the wooded rise, across the road, and up to an even higher peak, and each time I discover something new. A chipmunk scrambling across my path before disappearing into a hollow log. An assortment of edible wild fruit — mulberries, blackberries, black raspberries — that explode with bright flavor in my mouth. A cluster of cool-to-the-touch jelly mushrooms sprouting on a decaying tree. I’ve never seen anyone here except the occasional jogger, and once, a summer camp group of 8 year olds doing a lesson on wilderness survival.

I’ve done this walk innumerable times, traversed over the wooded rise, across the road, and up to an even higher peak, and each time I discover something new. A chipmunk scrambling across my path before disappearing into a hollow log. An assortment of edible wild fruit — mulberries, blackberries, black raspberries — that explode with bright flavor in my mouth. A cluster of cool-to-the-touch jelly mushrooms sprouting on a decaying tree.

I forage for myself nearly every week, even in winter-time when the landscape is icy and to an untrained eye it appears that nothing is growing, but today’s walk is special: I’m gathering ingredients for a pie that I’m going to enter in my first food competition. I’m on the hunt for savory lambquarters, that free-range weed that gardeners hate but food lovers consider a culinary and nutritional treasure. Related to spinach, beets and quinoa, Michael Pollan called lambquarters “one of the most nutritious weeds in the world” (In Defense of Food). The first time I ate it raw, it fell flat on my palate — I really couldn’t distinguish the edible weed from any other leafy green — but once I’d sautéed some in extra virgin olive oil with a little salt and pepper, I realized how very much it tasted like spinach.

In fact, lambquarters out-spinaches spinach in terms of pure greeny flavor. Lambquarters grows in backyards, on college campuses, and even around parking meters on the busiest avenues in my Park Slope neighborhood, but the best place to get it is in the park, away from traffic and pollution. It’s a much-desired vegetable in Bangladeshi and Persian cuisine, but here it’s considered a weed — even otherwise open-minded urban farmers I’ve met tend to treat it with disdain.

Since lambquarters thrives in full sunlight, I am heading toward a clearing on top of one of the highest points in Brooklyn, where the Chenopodium album grows on a slope unchecked, producing one of the best-tasting crops in the city.

Once on the hill, I pass a variety of familiar flora. I see the arching canes of blackberry bushes, with their smaller-than-store-bought fruit that are a lot zingier in the mouth; last month I’d picked a small container full but now the bushes are empty. Mugwort, or wild chrysanthemum, which were one inch sprigs in spring, now brush my shoulders. In Flushing, Queens, where I was born and raised, I’ve encountered Chinese grandmothers collecting bundles of it for medicinal purposes — called moxa — where they burn the dried stalks to stop aches and pains.
I bypass patches of violets with their heart-shaped leaves, so pretty in spring salads, and the insistent stalks of Asiatic dayflower, with an azure blossom that rivals the blueness of the sky, and which is as transient as your last thought. At this peak, I sometimes encounter birdwatchers, or the occasional parks department worker wrestling weeds — the very things I like to eat — but today the peak is mine alone. Out in the distance, I can see the drape of the Verrazano, that elegant suspension bridge, which I take to my job as a professor at a local college; the giant cranes on the shoreline of Bayonne, New Jersey; and nearly everywhere I look, apartment rooftops and the verdant leafy tops of trees.

At the sunny, southern-facing slope that I like to call Lambsquarters Hill, the Chenopodium album are out in abundance. But instead of displaying thick goose-foot-shaped leaves, the lambsquarters have completely gone to seed: giant bunches of buds sit clustered at the top of the plant, with only the scraggiest bits of foliage below. It would take hours to collect a colander full of leaves, and even then, when cooked, it would reduce to less than a cupful of greens.

During the high, humid days of summer, I'd led a small group of newbie foragers here, and the plants were thick and lush. Picking the tops like we were snipping garden basil, we collected enough lambsquarters for a large mixed salad and a sauté with eggs for everyone. At brunch, we added to our table an assortment of wild wineberries, which many agreed tasted like a cross between a raspberry and a California orange; freshly picked Asiatic dayflower and violet leaves; some local breads and upstate cheeses; and my own homemade mulberry jam, collected from a bodacious berry-laden Morus alba tree only blocks away from my apartment. The others marveled at the feast, foraged mainly by their own hands, before descending hungrily into the meal. But here I stand now, looking down at thin, paltry leaves. It’s not the first time I’ve missed the timing of a plant, and I feel the familiar lunge of disappointment in my gut. Out of habit, I reach out and grab a lambsquarters leaf, tasting it. It’s a zero on my tongue — with a tougher consistency than its young summertime form, and rather tasteless. When a plant diverts its energy into making seeds, it leaves

FUNGUS AMONG US
Ava Chin holds dryad’s saddle mushrooms, sometimes called pheasant back or hawk’s wing. Brown with scales that look a bit like feathers, they grow on various dead hardwoods, especially elm.
the foliage with little-to-no culinary value. I’ve been foraging long enough to know that what you’re looking for is often elusive, and what you do find can be completely unexpected. You can train your eye, research the telltale clues and signs, but nature has a way of surprising you, especially here in the city. Even if you return to the same place, at the same time year after year, charting the weather patterns — noting the ratio of sunshine and temperature to rain — it’s no guarantee that you’ll get what you’re looking for, no matter how well prepared you might be. Foraging for food is a little like a mythic quest. You may think you know what you want, and expend a lot of energy and dogged determination making lists and plans for obtaining it — losing a lot of sleep and garnering no small amount of heartache along the way — only to find it shimmering elsewhere, like a golden chalice, just out of reach.

In the seasons that I’ve spent searching for wild edibles, taking long walks as solace after a breakup, or searching for fruit-bearing trees after the death of a loved one, I’ve learned that nature has a way of revealing things in its own time, providing discoveries along the way — from morel mushroom rooms bursting through the soil to a swarm of on-the-move bees scouting out a new home. I’ve been lucky to meet other foragers on my journey: herbalists who’ve introduced me to the healing properties of common weeds like motherwort and stinging nettles; Asian ladies collecting ginkgoes, those stinky fruit that litter sidewalks every fall; expert and amateur mycologists, who’ve taught me how to make mushroom spore prints that resemble honeycomb and starbursts, and how to cook up my fungal finds into fragrant culinary wonders; burly beekeepers who’ve shown me the art of relocating honeybees safely in the city and given me tastes of the sweetest wild honey. It’s the unexpected bounty and regenerative powers of nature that have deepened my connection with my hometown, my family, and even myself, transforming old feelings of being “not good enough” or “unworthy” into new ways of seeing and being, like fresh wild asparagus or violets erupting from the earth every spring.

But this morning, I make my way down the hill empty handed. Lambquarters is one of the most sustainable, abundant foods available here, and without a big bagful of it, I am in serious trouble in this food competition. It doesn’t help that we are in between seasons: all the summer berries have disappeared — even the elderberry peaked early, so that only a few clusters remain on the trees — and it’s too soon for the new dandelion and garlic mustard rosettes to appear.

Ordinarily, I go home through a shortcut on the road, my bag filled with goodies, but today, I double back to the old path that led me here.

Back under the shade of tall trees, I pass a fallen log lying horizontally alongside the path. This is where the reishi mushrooms grow — a medicinal fungus that boosts immunity and is prized in Chinese medicine. Even though **Ganoderma lucidum** cannot help me with my dish, out of habit I peer over the log, which is damp and coming apart under the weight of my fingers.

But there is only the ribbonlike curl of a few turkey tail mushrooms clinging to the bark. I straighten up, disappointed, when there it is: that smell of mushrooms in the air again. Time my eye goes up an old tree — a tree with dark, grooved bark that’s nestled so closely among its neighbors that it’s grown its branches up high in order to reach the sun. It is impressive: stories tall, higher than my fourth-floor walkup apartment. I cannot make out what kind of tree it is from its faraway leaves. But then right where the trunk ends and the first of many central branches begin, I see it: a wide, creamy-white cluster of oyster mushrooms spreading out from the tree like Chinese fans.

I peer up under it as close as I can manage. The mushrooms are a light beige-cream color, with barely a tint of yellow on the edges, and very young and fresh. The delicate gills run down the short, almost nonexistent stem. Although you really need to make a print of the mushroom spores — the cells that allow fungi to replicate and grow — to make a proper identification, I know that if I had microscopic vision, I’d be able to see the white spores gently raining down. A mushroom — the fruiting body of a network of threadlike mycelium that thrives underground or inside decaying wood — is the organism’s virulent attempt to reproduce. This act of self-propagation, prompted by the right timing of weather conditions and moisture, is what I, and other foragers and mushroom-hunters like me, see as a supreme eating opportunity.

I’m on my tiptoes trying to reach the mushrooms, but all I feel is the rough bark under my fingers. I jump up and miss them entirely. Tree-climbing was a favorite activity when I was a kid, but when I try to scale the trunk, my sneakers slide off the surface as if it’s been waxed.

Across the leafy ground, I spy a log the size of a small wastepaper basket several yards away. It’s too heavy for me to lift and carry, but after a few moments of pushing, tugging, and kicking, I discover that I can roll it with both hands until it sits at the base of the tree.

I climb aboard the log, which wobbles under my weight, and now I can just about grab hold of the entire cluster of oysters. I rip a section off with my fingers — separating the flesh from the bark of the tree, my chin pressed up against the trunk. I am so focused on getting this lovely hunk of **Pleurotus ostreatus** that I forget about the blade in my knapsack and the precariousness of my footing. All of my tugging and pulling disturbs a spider the size of a quarter, which races out of the mushroom’s white folds.

I laugh as it crawls on delicate, spindly legs across my fingers, tickling me, and disappears into a peel of bark. I step off the log with more than two pounds of oyster mushrooms heavy in my hands.
Walking into the supermarket, browsing the seemingly endless rows of fresh produce and canned goods, it's hard to fathom a food shortage. But with the current world population of 7.2 billion expected to explode to 9.6 billion by 2050, the United Nations warns food scarcity is in the wind.

Although urbanization will have gobbled up most arable land, more food will be needed. To cope with rising food insecurity, China is purchasing agricultural land throughout the world, in countries that include Russia, Mexico, Cuba and Australia.

The greatest spike will occur in developing countries, with more than half of the growth in Africa. By 2050, the U.N. reported, Nigeria's population will exceed that of the United States, which is expected to balloon by 31 percent from 305 million in 2008 to 400 million in 2050.

"There's a perfect storm on the horizon," USC Dornsife Dean Steve Kay said. "We also have climate change that will stress our water resources. As we move from 2030 to 2050, it will be a challenging time for food security."

It's happening now in Central America, where drought conditions are wreaking havoc on crops. By early 2015, food security in four Central American countries is expected to rapidly deteriorate, according to an August alert sent out by the United States Agency for International Development's (USAID) Famine Early Warning Systems Network.

To meet the food demand, agriculture production must at least double by 2050, the U.N. asserts, and “innovative strategies are needed to help combat hunger, which already affects more than 1 billion people in the world.”

Answering the call, researchers at USC Dornsife are finding innovative ways to feed the world. Some have built the foundation that may lead to the design of more robust crops. Others are tapping into aquaculture to bolster food from the ocean. Still others are homing in on palm oil and the small but mighty chickpea to help avert the world’s looming food crisis.

**THE GOOD SEED**

The key word in the food security challenge is yield.

“How can we keep crop yields rising if traditional plant breeding isn’t working anymore?” Kay said. “We can now use genome sequencing or molecular markers to build more efficient plant breeding programs. Technology gives us a boost, but there’s absolutely no doubt in the minds of almost every expert that we will need agricultural biotechnology as well — or genetically modified foods.”

Kay, professor of biological sciences, and his research team have made giant strides toward constructing hardier crop plants — onions, beets, soybeans and the like.

In one major step, Kay and his team have created the first comprehensive library of genetic switches in plants, available for scientists to use around the globe. The collection contains about 2,000 clones of plant transcription factors, nature’s genetic on-off switches. Conducted over eight years, the research making the library possible was published in July in *Cell Reports.*

“They’re like smart missiles that go into the nucleus and bind to specific sequences of DNA,” Kay, the study’s...
provide more seafood. 

While many countries are investing heavily in sustainable aquaculture, the United States imports 91 percent of its seafood, half of which comes from farms. While many countries are investing heavily in sustainable aquaculture, the U.S. ranks last in aquaculture production. USC Dornsife scientists are finding ways the U.S. can provide more seafood.

OUTSOURCED ECONOMY
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Research on grasses, too, is paramount. Most human calories come from grasses — wheat, maize and corn. Kay’s team was the first to thoroughly characterize the impact of the circadian clock on grass growth.

In a study published in *Current Biology* in July, researchers from Kay’s laboratory revealed that internal cues generated by the circadian clock do not cause grasses to grow. Regardless of the presence or absence of light, grasses grow in warm temperatures.

“Sales that things grow faster when they’re warm and enzymes work faster when they’re warmer; temperature is a catalyst,” said Kay, who has researchers circadian rhythms, or the biological clock, in plants. 

The clones were taken from Arabidopsis, a flowering plant related to cabbage and mustard. The plant is used as a genetic model because it shares most of the same genes as many plants and crops. 

You can think of Arabidopsis as the community of the botanical world,” Kay said. 

The availability of these clones has great implications for scientists such as Kay, whose research sets the stage to design a more robust plant for future food security. 

“Ultimately, this collection will help us understand at the molecular level the mechanisms of how plants work,” said Jose Pruneda-Paz, co-first author on the paper. 

Pruneda-Paz helped to create the library as a postdoctoral researcher, first in Kay’s laboratory at The Scripps Research Institute in La Jolla, California, then at the University of California, San Diego (UCSD), where he is now a faculty member. 

By manipulating those transcription factors, we will be able to ultimately improve plant traits such as stress resistance or seed quantity and quality,” Pruneda-Paz said. “This is the larger goal.” 

Kay elaborated: “Along the way we are going to understand the wiring — the instruction manual — for how plants grow and develop. From that knowledge base comes all the translational opportunities.” 

The collection will help in the underfunded field of plant research. Of all biomedical research, the federal government spends approximately 1 percent on plant research. “Given how important food is to human health, that’s rather concerning,” Kay said, adding that the goal is to build the foundation for any number of plant biology projects. 

One study made possible by the library was published in *Current Biology* in July. In the research, Kay’s team investigated how plants regulate their gene expression in the cold. Using the library, they conducted tests isolating an interaction between two key genes — LUX and CBF1 — now known to be responsible for freezing tolerance in plants. 

The research showed how plants adapt to temperature changes during the normal course of the day-night cycle, and to extreme change such as frost. “We knew very little about how cold intersects with the clock and this really reinforced the idea that transcriptional regulation is key,” said Brenda Chow, referring to when a gene is triggered to respond to an environment. The first author on the *Current Biology* study, Chow recently started a position at GenBank, a genetic sequence database in Bethesda, Maryland. 

“The library has been very useful across the plant community. For my project, it was a unique way to identify the interaction between CBF1 and LUX. It would have been very difficult to identify this any other way.”

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“It’s known that things grow faster when they’re warm and enzymes work faster when they’re warmer; temperature is a catalyst,” said the study’s first author, Samuel Hazen, now a faculty member at the University of Massachusetts, Amherst. “But the complete absence of the involvement of light/dark cues in grass growth is what we discovered in the study.”

This breakthrough is highly relevant to researchers who, as Kay said, can use the knowledge as the base for translational research. For example, it becomes the foundation for scientists to modify genes in grasses to withstand drought and other adverse weather conditions.

In two more recent studies, published in the *Proceedings of the National Academy of Sciences* (PNAS), Kay and his collaborators identified genes and pathways crucial for plant growth under stressful conditions, such as heat and lack of nutrients. 

In one study, Kay’s team discovered a key molecular cog in a plant’s biological clock — one that modulates the speed of circadian (daily) rhythms based on temperature. Postdoctoral scholar Dawn Nagel identified transcription factor FBH1, revealing a novel role for this switch in the plant’s ability to respond and grow in warm temperatures. This discovery provides clues to managing crops under high-temperature stress.

And in collaboration with professor Nigel Crawford of UCSD, Kay’s lab identified another genetic switch, TCP20, important for how roots forage and sense nutrient levels. Understanding root growth under limited nutrient availability, particularly nitrogen, is vital for developing crops that lack this important nutrient source. 

Kay also noted that while some claim genetically modified organisms (GMOs) may be unsafe for human consumption, he believes this stance is based on suspicion rather than evidence. 

“It comes from a lack of understanding,” he said. With more transparency and facts, the public will come to see GMOs as a solution.”

ANGLING FOR ANSWERS
Moving from land to sea, aquaculture is also a way to help feed the world.

As oceans are reaching their maximum potential of wild, captured seafood, fish farming has become the world’s main way of producing species such as trout and salmon, according to the U.N.’s Food and Agriculture Organization.

Over the past 20 years, the world’s wild-fish catch has flattened, with the depletion and threatened extinction of some species. Meanwhile, fish farming continues to rise at a sharp rate.

Fish farming — the breeding, rearing and harvesting of plants and animals in ponds, rivers, lakes and the ocean — is now providing more than half of the world’s 44 pounds per capita of fish consumed annually. (In the U.S., annual consumption is 15 pounds per capita, compared to 110 pounds per capita of red meat).
In 2012, the amount of farmed fish produced globally was at an all-time high of 90.4 million tons. But the U.S. ranks last in aquaculture production. China ranks first, producing 59.7 percent of all farmed seafood. Indonesia comes in second with 10.6 percent, followed by India with 4.7 percent. The U.S. is responsible for 0.5 percent of farmed production, just below North Korea.

“Why don’t we learn this process ourselves and be leaders instead of followers?”

Currently, the U.S. imports 91 percent of its seafood. Looking to our own coastlines to provide seafood is economically and socially imperative, said Dennis Hedgecock, Paxson H. O’field Professor in Fisheries Ecology and professor of biological sciences at USC Dornsife. Along with Donal Manahan, professor of biological sciences and vice dean for students, Hedgecock is working on establishing a one-of-a-kind facility for complete lifecycle culture of model marine organisms at the USC Philip K. Wrigley Marine Science Center on Catalina Island.

The culture facility would become a national stock center for pedigreed lines of Pacific oysters and purple sea urchins — marine invertebrates with sequenced genomes. They may culture other species such as Kumamoto oysters, Mediterranean and California mussels, and purple-hinge rock scallops.

Hedgecock acknowledged that fish farming in the U.S. has been sorely misunderstood, with environmentalists concerned about pollution caused by on- and off-shore farms, and consumers worried about taste and nutrition. Permits can be tough to obtain.

“Aquaculture is the future,” Hedgecock said. “If there are problems, we have to solve the problems. We already get our seafood from other countries where we have no say in what environmental damage they may cause. It’s irresponsible to push off our consumption to other countries.

“Why don’t we learn this process ourselves and be leaders instead of followers?”

Along the U.S. West Coast, some shellfish farms are economically and environmentally thriving. To help promote aquaculture research, Hedgecock, Manahan and biologist Dale Kiefer have spearheaded a new initiative at the USC Wrigley Institute for Environmental Studies called “Future of Food From the Sea.”

This research is unlocking many of the genes involved in oyster growth and survival, helping scientists and aquaculturists understand and improve the relationship between oyster genetics and production. Hedgecock and Manahan’s research relies on hybrid vigor — or heterosis — to produce oysters resistant to environmental stressors. In research published in *PNAS* and other publications, the scientists have shown how crossbreeding genetically different oysters to create hybrids increases size, yield and other positive characteristics.

Right now, Hedgecock and Manahan operate an oyster hatchery on Catalina, but aim to create a facility that can accommodate the oysters through adulthood, enabling researchers to further understand how these important species survive, grow and adapt.

Hedgecock said that while the genomes of a growing number of marine organisms have been sequenced, few have the well-developed genetic resources and methods of model terrestrial animals.

Most research on marine species relies on wild-type animals taken directly from the field, obtained from biological supply houses or the aquaculture industry. This practice contributes to variation in results among laboratories and, more importantly, prevents a sophisticated partitioning of genetic and environmental causes of variation in complex phenotypes, he said.

“Earth’s largest habitat, the ocean, is undergoing rapid anthropogenic change,” Hedgecock said. “The ocean is warming, becoming more acidic as a result of anthropogenic carbon dioxide; toxic, plastic particles and other wastes; and heavy exploitation for mineral resources and food for human consumption.”

Understanding and predicting biological stability and change amid rapid anthropogenic modifications of ecosystems is a grand challenge facing environmental life scientists, he said.

“In the short term, organisms withstand environmental stress, including disease,” he said. “In the long term, across generations, populations evolve using primarily genetic variation in traits that increase fitness. Separating nature and nurture is key to understanding the potential for adaptation to future environmental change.”

Helping to make the hybrid vigor research possible are donors including Sam King, a member of the USC Wrigley Institute Advisory Board, the USC Dornsife Board of Councilors, and chief executive officer of King’s Seafood Company. King, Hedgecock and others give talks throughout the nation on the institute’s aquaculture research.

“I think our attitudes are starting to change,” King said. “As long as we have great scientists and great science, then hopefully the minds of American people will change. Like people in other countries, they’ll learn to embrace aquaculture.”

Sergey Nuzhdin, professor of biological sciences at USC Dornsife, is working with Hedgecock on some of the aquaculture research. Nuzhdin’s laboratory has long been interested in tackling food insecurity.

In 2008, Nuzhdin received a $3.2-million National Science Foundation grant to fund a three-year study on the legume *Medicago truncatula*, a plant that can improve soil fertility naturally, even under saline conditions.

The species is a genetic model for crop legumes such as soybean, alfalfa, pea, bean and peanut. The principal investigator for the cross-cultural study, Nuzhdin collaborated with researchers from Tunisia and France.

From that study, other projects have evolved. Nuzhdin became a key member of the Chickpea Innovation Lab, among 23 “innovation labs” participating in USAID’s global hunger and food security initiative, Feed the Future.

The project is led by professor Doug Cook of the University of California, Davis, with major collaborators at USC, Florida International University, Turkey’s Harran University and the Ethiopian Institute of Agricultural Research.
BARE CUPBOARDS

What will happen when the world population expands to 9.6 billion by 2050 and twice as much food is needed? Researchers are studying ways to feed the world.

EAT YOUR PEAS

USAID’s five-year, $4 million genetic research program — with $1 million slated for USC Dornsife — aims to expand the climatic range in which the chickpea can be cultivated. By creating more and higher yielding varieties of chickpea, the productivity of small-scale farmers will also increase.

In early 2013, Nuzhdin and his colleagues conducted research in Turkey, where some 10,000 years ago people turned wild plants into crops — the advent of agriculture.

Also called the garbanzo bean, the chickpea is extremely high in protein and its natural ability to fix atmospheric nitrogen contributes to soil fertility. In developing countries, the crop provides a crucial source of income, food security and nutrition to poor farmers.

Nuzhdin and his fellow researchers are capitalizing on the genetic potential of the wild chickpea to create traits that withstand heat, drought, frost and disease, and encourage increased nutrition.

Ethiopia, the largest chickpea producer in Africa, was chosen as the thematic focus of the project because of its history of chickpea cultivation stretching back more than 2,500 years. As a result of their religious practice of fasting, many Ethiopians have a high dependency on the chickpea as a source of protein.

Ultimately, the chickpea plants will be tested in the U.S., Canada, Australia, Turkey and Ethiopia. Nuzhdin’s research has the potential to improve chickpea breeding for the next century.

In another project, Tatiana Tatarinova, associate professor of research pediatrics at Children’s Hospital, Los Angeles, and Nuzhdin have teamed up on research supported by the Malaysian Palm Oil Board (MPOB) — a Malaysian government research organization. The team will help develop tools to accelerate the interspecific hybrid breeding of oil palm trees.

An MPOB collaborator since 2010, Tatarinova was drawn to the group’s vast collection of high-quality, diverse, biological information on oil palm.

“For a bioinformatician, it’s like a trip to Disneyland,” Tatarinova said. “It’s a rare chance to get access to an unexplored wealth of data that can have immediate practical applications for agriculture.”

Oil palms produce an edible vegetable oil derived from the reddish pulp of their fruit. Palm oil has become among the world’s major sources of vegetable oil, a common cooking ingredient and butter substitute.

Nuzhdin and his team will study *Elaeis oleifera*, a species of palm native to South and Central America, and compare it to *Elaeis guineensis*, an African oil palm. In view of *E. oleifera’s* lack of traits linked to high oil yield and *E. guineensis’* high oil yield, researchers will help to develop tools to quicken interspecific hybridization of both species.

“We’re interested in using modern genomics tools to improve the oil palm tree,” Nuzhdin said. “Artificial selection plays a central role in making those improvements. But selecting alone will be too slow for the oil palms, since they grow for 10-plus years before starting to reproduce.”

His team will use the power of biodiversity in this effort. Rather than genetically modifying an organism, they will use the tree’s genetic makeup to predict its agronomy and traits.

“We use principles of evolution and ecology to understand what is important and then enhance what is natural,” he said.

He acknowledged that while palm oil is the main component of all processed foods, cosmetics and cleaning products in the U.S., harvesting the trees to make the oil has raised concern regarding deforestation and species extinction.

While the debate continues, Nuzhdin’s research will boost breeding efficiency and help make the production of palm oil more sustainable.

“Since many economies, like Malaysia’s, completely depend on oil palm production, they are not about to stop producing the trees,” Nuzhdin said.

“The only way of reducing the impact is to intensify the production on already existing fields, instead of extending to new land. Breeding the trees that can produce faster and more reliably will mitigate any damage to the environment.”

Applying the research to the real world is essential, he said. “We have a set of deliverables,” Nuzhdin said. “Those deliverables are cultivars that will get into the hands of small farmers in developing countries.”

Senior writer Susan Bell contributed to this report.

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*Bare Cupboards* What will happen when the world population expands to 9.6 billion by 2050 and twice as much food is needed? Researchers are studying ways to feed the world.
the vicious circle
When people eat a hot dog just after gobbling down a slice of pizza, it may not be due to lack of willpower. Rather, the brain’s signaling has been hijacked. It’s the “vicious circle” of our Western diet, said Scott Kanoski, assistant professor of biological sciences. Kanoski has published research describing how consistent consumption of saturated fatty acids and refined carbohydrates (i.e., sugars) disrupts the blood-brain barrier, which leads to dysfunction in the hippocampus, a seahorse-shaped region of the brain, located in the medial temporal lobe.

**Hunger and Satiety Cues**
Kanoski’s research shows that the hippocampus controls feeding behavior through detection and processing of circulating hormonal signals. The hormones include ghrelin, which signals hunger, and leptin, which signals satiety. His lab’s most recent paper published in *Neuropsychopharmacology* identifies the hormone glucagon-like peptide-1 (GLP-1) as a key signal that acts in the hippocampus to limit how much food is consumed during a meal and to reduce motivation to eat unhealthy yet tasty food.

**Compromised Hippocampus**
Once the hippocampus is affected by excess consumption of foods high in saturated fat and sugar, its ability to detect and utilize these hormonal signals becomes compromised, Kanoski said. Once this happens, people tend to turn to external cues to determine what, how much and when to eat. But the external cues in our environment contribute to unhealthy and excessive eating. For instance, you may become tempted by vending machines at work and fast food restaurants you see on the way home.

**Fats, Sugars or Both?**
The next step in Kanoski’s research is to determine which foods exactly — fats, sugars or both — are guilty of damaging the hippocampus, how early in life this cycle begins, and whether or not changing eating habits can reverse this cycle on a neurochemical level. His research also unravels how the hippocampus communicates with other regions in the brain to curb excessive overeating.

Kanoski hopes that his research will help send the message that restaurants and companies that produce processed foods must alter their ingredients and people must change their eating habits. “Increased public awareness of the neurological changes caused by the foods we eat, and serve our children, will hopefully help people make different food choices and ultimately transform our eating culture.”

*Contemplating devouring that doughnut? Biologist Scott Kanoski’s research shows that eating junk food tricks the brain into wanting to reach for that sugary or fatty treat.* By Lizzie Hedrick
An English major becomes a grilled cheese goddess. A creative writing major finds her calling as a butcher. An international relations and German major is now assistant vice president of retail operations, overseeing the dining experience at USC. Guided by their love of food, these alumni took unconventional career paths and tasted success. They remember what Julia Child always said, “If you’re afraid of butter, use cream.”
HEATHER APRAKU: NOSTALGIC NOSH
What do grilled cheese and cereal have in common? For starters, both are comfort foods steeped in nostalgia.

“Grilled cheese is probably the first sandwich you eat as a kid,” said Heather Apraku, co-owner of Mix n’ Munch Cereal Bar and Grilled Cheese Café in South Pasadena, California. “And you’re eating Cheerios in your high chair as soon as you get a few teeth.”

Many of us have memories of mom’s grilled cheese made with Kraft singles and digging for the prize in a box of Cap’n Crunch.

Only the creative mind of an English major could dream up this twist for a café. Combining Apraku’s obsession with cheese and her older sister Kim’s abiding love of cereal, the pair opened the café in 2010.

In addition to a menu of specialty sandwiches, patrons can customize their own, selecting from a wide assortment of breads, cheeses and toppings.

American cheese. White bread. Spam?

“That sandwich is delicious,” insisted Apraku, who earned her bachelor’s from USC Dornsife in 2005. “But people love it or hate it, there’s no middle ground.”

Maybe the Betsy Ross sounds more appetizing, with cheddar cheese, sliced apples and caramel sauce. Or Carol’s ChOP made with Chinese barbecue pork, pickled red onions and provolone?

“We even have some creative customers who make cereal sandwiches. When we first opened, a local elementary school kid created his American cheese and Cocoa Puff on white grilled sandwich. He would come in frequently for it.”

Apraku never imagined opening a restaurant, let alone one that specializes in the infinite permutations of grilled cheese and sweetened kids’ cereals.

But while writing her thesis for her master’s degree at USC Annenberg School for Communication and Journalism, the idea blossomed. For her thesis, she wrote a business plan for Mix n’ Munch.

“The concept just seemed like a fun idea. But as I worked on the business plan and did more and more research, it started to seem increasingly viable.”

Today, the café is thriving.

The eatery also offers grilled dessert sandwiches with additions like Nutella, peanut butter, fruit and Marshmallow Fluff. If sandwiches aren’t your thing, you can choose from among 20 cereals, a dozen mix-ins and a variety of milk options to create your own bowl.

“People get to be really creative here, which is fun,” Apraku said, while conceding that it isn’t exactly health food.

“That’s not the goal of this restaurant,” she said. “But we also have oatmeal bowls and yogurt parfaits, so you can make choices that are less gluttonous.”

If someone feels nostalgic for a certain cereal, this is their place, Apraku said.

“Adults are probably not going to buy themselves a whole box of Fruity Pebbles, but here they can have a little bowl.”

The café also offers old gems such as Quisp, a cereal introduced in 1965 now in limited distribution. The cereal is primarily purchased online.

“People come in and are so excited to see we carry that cereal,” Apraku said. “It’s a blast from the past.”

The ages and backgrounds of Apraku’s customers run the gamut — a testament to the fact that this food is for everyone, she said.

“We have lot of regulars that have been with us from the beginning, and it’s nice to see familiar faces. That’s why we picked South Pasadena — we both grew up and went to school here, and we know the vibe of the city and the community.”

The sisters also do in-store fundraisers for various community groups and high school classes, and donate gift certificates to a public library to support youth reading programs.

She remembers the challenges of getting her business up and running.

“It was sometimes overwhelming, with all these things popping up that you didn’t even know about,” she said. “But you just figure it out as you go. It’s the best way to learn.”

Thinking back to her undergraduate years, Apraku recalls two English faculty members in particular who had a great impact on her: Thomas Gustafson and Jim Kincaid.

“They made me think and question things in a different way. I enjoyed their nonconforming teaching styles in letting their students think for themselves, freely and creatively.”

The Trojan Family, she said, is an unbreakable bond.

“So often I meet fellow Trojans at the restaurant and we immediately click,” she said. “If I had not been an undergrad at USC, I would not have applied to graduate school at Annenberg, and there would likely be no Mix n’ Munch!”

She envisions opening more Mix n’ Munch cafés.

“I’d love to open one at, or around, USC,” she said. “We could hire USC students, and maybe they could even open their own franchises.”

HEATHER APRAKU ON THE PERFECT GRILLED CHEESE
First of all: butter! Butter is very important. And stay away from panini presses — I’m a big proponent of not smashing sandwiches. I’d rather just be patient and let them do their thing on a flat-top griddle or a frying pan if you’re at home.

Butter both sides of your bread and use medium heat to get the cheese really gooey. Grill the sandwich to a deep golden-brown, so that it’s crispy on the outside and melty on the inside. Do about three minutes on each side. As I tell my employees, there needs to be a perfect balance of melted cheese and golden-brown bread — you don’t want to burn the bread to get the cheese melted and gooey, but if it’s pretty on the outside and not gooey on the inside, you’ve failed!

I’m actually fine with using only cheese — give me cheddar on buttery bread and that’s just perfect. But I’ve never had a bad grilled cheese. You can get crazy with gruyère, brie, cheddar and Swiss and it will taste delicious. Grilled onions and mushrooms are great, and you can’t go wrong adding meats or veggies. Just heat the meat and veggies before adding them to the sandwich for the final minutes of grilling — unless it’s avocado, tomatoes or apples, of course.

CHEESE WHIZ
After majoring in English, Heather Apraku cooked up the idea of a café that sells an unusual but compelling combination: grilled cheese and sweetened cereals.

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For many, an average workday begins by checking e-mail over a mug of hot coffee. Sara Bigelow's day often starts with a 100-pound slab of meat. On delivery mornings, Bigelow pulls large cuts of raw meat, one by one, from big delivery bins and loads them onto a helper's shoulders to haul into the butcher shop where she works.

“Butchering is definitely hard work,” she said. “It’s physically exhausting and your arms, legs and back all get sore. But I really like the delivery days. That physical exertion is what reminds you that you’re a butcher.”

Situated in the artisanal food mecca of Williamsburg in Brooklyn, The Meat Hook is a whole animal butcher shop specializing in locally sourced meat. Originating from family farms in New York state, the beef sold at the shop is grass-fed and the pork and lamb are pasture-raised.

“We don’t work like a grocery store, where you can order, say, four boxes of chicken breasts,” said Bigelow, general manager of the shop. “We order whole animals, directly from the farm, and work with the farmers to make sure the product meets our specifications.”

The Los Angeles native had long been intrigued by the artisanal food industry. After graduating from USC Dornsife in 2007 with a bachelor's in creative writing, Bigelow moved to New York City and took a job in culinary public relations that drew on her interest in writing. But when she found herself taking a charcuterie class, she immediately felt in her element.

“The meat industry, unless you go digging for information, is not a very transparent field. You can go to pastry school, but I couldn’t find anything like that for butchering. At the time I was looking, it was still untrodden ground.”

Bigelow was willing to learn the ropes unpaid, but shops turned her away, maintaining that men were butchers and women were cashiers. Finally, at The Meat Hook, co-owner Tom Mylan allowed her to come in and observe, which got her foot in the door.

These days, schools charging thousands in tuition train students to become butchers, and many artisan shops have unpaid apprenticeship programs. But the field is still disproportionately male.

As a woman butcher, “I’m still in the minority in this country,” Bigelow said. “But recently I went to Barcelona and I’d say 90 percent of the butchers I saw were women.
A CUT ABOVE
Sara Bigelow left a career in culinary public relations to experience the food world hands on. Now she’s a trained butcher working in Brooklyn.

Expert Advice

SARA BIGELOW ON THE BEST CUT OF MEAT

There are a few things to consider when picking out meat for your meal. On the macro level, you may want to consider the origin of the animal — its diet, standard of living and the distance it traveled to get to your kitchen. Everyone has different priorities in terms of their food, but a good general rule is if your butcher can answer some basic questions about where your meat came from and what the animal ate, you’re on the right track to great meat.

On a micro, meal level, there really is no perfect cut of meat. Rather, each cooking method calls for its own cuts. Are you looking for a great piece of meat for the grill? A rib eye will do nicely, but so would a meaty pork shoulder chop, or skewers of beef heart (my personal favorite).

As a whole animal butcher, I’m always encouraging people to try something new. Want a steak that’s lean and tender, but cheaper than filet? Try a flatiron steak. Never heard of a flatiron steak? Seek out a butcher who’s familiar with more than the standard grocery store cuts and who can guide you through other parts of the animal. Try something new, and take advantage of that great L.A. weather that lets you grill outdoors all year round. I’m jealous.

So it seems to be different in other places.”

The imbalance in the United States is improving, Bigelow said, noting that The Meat Hook has hired at least four full-time women staffers and plenty of female interns.

“The guys at my job find my being female a nonissue. To them, I’m just Sara who bugs them to get their stuff done on time and yells at them for messing around.”

A vegetarian in high school, Bigelow later began to miss meat — and for reasons beyond enjoying a good steak.

“Food is a really big part of my family, something we talk about and do together a lot, whether eating or cooking,” she said. “By not eating meat I would have lost out on things like cooking with my grandmother and learning the recipes that have been passed down in my family.”

Studying creative writing, Bigelow got the chance to see the world through the eyes of people who had chosen a path less ordinary.

“I think seeing that you could live a less conventional life as a poet or a writer gave me more courage than I would have otherwise had to pursue a career outside the corporate structure.”
KRIS KLINGER: MR. HOSPITALITY

“Hey, Mr. Klinger!”
A hostess, bussers and waiters flash Kris Klinger smiles as he enters the restaurant and heads to a table on the patio.

He’s at Moreton Fig, a stylish eatery nestled beneath a twisting mass of branches belonging to the fig trees in the center of University Park campus. Opened four years ago, the restaurant features a menu of seasonal, farm-to-table cuisine.

“I don’t think most other campuses have anything like it, and we’re proud of that,” said Klinger, adding that most of the produce comes from local farmers. “The food really is amazing and we have a fantastic chef and crew.”

As assistant vice president of retail operations at USC, Klinger develops strategy and customer service programs, continually revitalizing the university’s dining program under the banner of USC Hospitality. This extends to the 42 residential dining halls, cafés, food stores, bars and restaurants at the University Park and Health Sciences campuses, as well as the Figueroa corridor.

The former U.S. Marine and food industry veteran, who joined USC in 2009, also oversees the Radisson Hotel Los Angeles Midtown at USC’s team and property. His group includes 106 managers, 700 hourly associates and 400 to 500 students, depending on the time of year.

Now his jurisdiction includes the hospitality portion of USC Village, an expansion project bringing in all-new student housing, academic space and retail shops just north of campus. It will include a bar and grill, cafés, a Starbucks and fast food options. Klinger is directly involved with the residential and retail planning and programming.

“In my job, my basic goal is to remove obstacles from everyone’s way,” he said between bites of the day’s special, a Greek gyro sandwich with tzatziki yogurt sauce and fries.

“I put a really good team together and give them the tools and direction they need, then I just let them go do what they have to do.”

Most broadly, USC Hospitality is committed to creating the best USC dining experience for all customers — professors, students, parents, alumni and staff as well as potential faculty and students visiting campus.

When Klinger first arrived, he removed communication barriers — maybe culinary wasn’t talking with operations — so that now everyone reports to the same person and shares the same vision and goals.

One of those goals is to try new things, and to be cutting edge and creative.

“We implemented Tapino this year, which has been a huge success,” he said. “It’s app-based ordering, so students can order food on their smartphones and go pick it up after class.”

Klinger also reduced the number of food vendors at USC from 300 to 70, creating efficiency and strengthening existing relationships.

His team solicits feedback from students via surveys and focus groups. The recent creation of a marketing department has greatly expanded USC Hospitality’s social media presence.

“We provide food that students are familiar with, but wouldn’t probably expect in a residential hall,” he said, pointing out on-campus restaurants such as The Habit, California Pizza Kitchen, Lemonade and Nekter.

Klinger also plans to add more international food options while continuing to offer healthy choices, which have become increasingly in demand.

Outside the office, Klinger is a food lover and self-proclaimed cork dork.

“That’s another thing that attracted me to hospitality. In my first job as a waiter while in the Marines, there was a wine tasting component, and I was blown away by how you could get all these flavors out of a simple grape. It was amazing to discover how wine can really complement and enhance food.”

Klinger earned his bachelor’s in international relations and German at USC Dornsife in 1994, thinking he’d “work at an embassy or something cool like that.” His majors appear unrelated to his career choice, but Klinger draws from his undergraduate degree.

“At Dornsife, I learned to look at things differently, to consider all of the different angles and perspectives to understand how and why decisions were made in the past, and the impact of those decisions,” he said.

“In the hospitality business you deal with so many tastes, cultures and people. Connecting with people in this manner has helped me to navigate many of the challenges we face and overcome them.”

Expert Advice

KRIS KLINGER ON THE QUINTESSENTIAL MULTI-COURSE, WEST COAST MEAL

I love California’s fresh produce, local cheeses, seafood and wine. My favorite cuisine is farm-to-fork: straight from the farm to the table. Just get a great olive oil, some salt and pepper, and that’s all you need to make California produce taste great!

I like a glass of wine while I cook, maybe a 2012 Gainey Vineyard Chardonnay. For a cheese board, try manchego (Spanish hard cheese made of sheep’s milk), blue and a good aged cheddar along with dry salami and prosciutto. Throw in some grapes, olives and crackers and that’s enough to get any party started.

Rub some lamb T-bone steaks with olive oil, salt and pepper and let them come just to room temperature before grilling to medium rare. I like a baby kale salad with strawberries, sliced almonds and fresh-ground pepper with a light, flavorful honey-balsamic vinaigrette.

To go with the lamb, in the summer I like sweet corn and snap peas. Give the corn a quick grill, slice off the kernels and add to a sauté pan with snap peas, garlic, salt, pepper and olive oil. Pair the lamb with a great Zinfandel like Ridge Geyserville or Turley Hayne Vineyard.

For dessert, serve fresh berries with mint and a drizzle of honey along with a pour of 15-year-old Blandy’s Madeira. Bon appétit!

CULINARY DREAMIN’
Food industry veteran Kris Klinger directs the dining experience at USC. Soon, his job will extend to the forthcoming University Village and its array of eateries.
Despite its handsome, embossed, brown-calfskin cover and imposing size, the unpublished 18th-century manuscript had been overlooked by academics until Juliette Parsons, a doctoral student in history at USC Dornsife, discovered it while researching early American food culture.

“Although the cover is impressive, the manuscript is in poor condition,” Parsons said. “The paper is yellowing and torn, some pages are missing altogether and the ink on those that remain has faded to such a light brown that the text is sometimes impossible to read.”

Rising to the challenge, Parsons is focusing her doctoral dissertation on this rare document, The Recipe Book of Better Saffin and Ann Ellis, housed in Philadelphia, at the University of Pennsylvania Kislak Center for Special Collections, Rare Books and Manuscripts. Her efforts show this previously ignored manuscript to be a treasure trove of information.

First composed by a well-to-do gentlewoman living in Somerset, Southwest England, and continued by her daughter, who immigrated to the United States and settled in Pennsylvania, the cookbook demonstrates how traditional English recipes were adapted to meet the challenges of the New World, evolving into the basis of modern American cooking. Closer reading also revealed the compelling story of a family’s descent into poverty.

“When researching American food history prior to 1800, historians have concentrated on unpublished cookbooks written by wealthy Southern women,” Parsons said. “This is one of the first times that anyone has seriously studied as a historical document an unpublished 18th-century recipe book written by a Northern woman from a less privileged background.

“Ann’s early education as a member of the wealthy English elite meant she was more literate than her peers, and her
writing provides unique insights into Northern, middle-class cooking. Much of what came to be considered Early American food originated in Southeastern Pennsylvania and Philadelphia and is typified by Ann’s recipes.”

As a young girl in 1716, Bettee Saffin started the cookbook. It was a labor of love that would continue through the decades after her 1728 marriage to John Ellis. For 47 years, Saffin carefully noted friends’ recipes, or painstakingly copied instructions for dishes from published cookbooks and popular London magazines. She also used the cookbook to record medicinal remedies and handy household tips, such as how “To Make China Ink as the Chines doe it [sic],” instructions “For the cleaning of any Sort of Oyl [sic] Pictures” and how “To Make a Fine Glow to Cherry or hard Wood [sic].”

Like many 18th-century English mothers of her class, she entrusted her cherished cookbook to her eldest daughter, Ann, on her 24th birthday, the year before Ann’s marriage. However, by then the family’s fortunes had suffered a serious reversal. As the 18th century advanced, Somerset’s rural economy collapsed in the wake of the Industrial Revolution and many wealthy families lost their savings overnight.

“Until 1757, Bettee bought exotic, expensive ingredients like spices for her recipes,” Parsons said. “Now she and John found themselves in dire financial straits and Bettee started writing thrifty recipes for times of famine.” In 1761, after John’s death, Saffin and Ellis left the rural comforts of Somerset for the poor south London neighborhood of Bermondsey.

“They must have been desperate when they moved,” Parsons said. “As two impoverished, unmarried women unaccustomed to poverty or the city, their future looked bleak. “When Ann married Christopher Smith on Feb. 2, 1763, she likely did so out of desperation. Christopher could barely sign the marriage record and since he never wrote in the cookbook as Ann’s father and brother did, it’s unlikely he ever learned to write.”

Nevertheless, the marriage provided an escape route from poverty. On Sept. 21, 1763, the couple left England for a new life in Pennsylvania. The cookbook accompanied Ellis on her voyage across the Atlantic to this New World of American food.

Left behind in London, Saffin died alone in 1765. Her well-meaning efforts to prepare her daughter for the challenges of cooking on the American frontier were mostly rendered worthless by Saffin’s ignorance of New World ingredients.

Arriving in the New World, Ellis discovered that the rolling green pastures of Pennsylvania were filled with dairy cows, while sugar prices in Philadelphia, a major port city with trading ties to the West Indies, were among the cheapest in the world. An underground network of Quaker merchants provided additional ingredients at reasonable prices. Unprecedented access to previously scarce, rationed or expensive items like sugar revolutionized Ellis’s cooking.

“She recipe for apple pie filling called for sugar to be added nine times during preparation” said Parsons, noting that until the 19th century, recipes contained no separate list of ingredients or exact quantities.

“We tend to think of our sugar-rich American diet as a modern phenomenon, but it isn’t. Eighteenth-century Pennsylvanians consumed much more sugar than modern Americans. The food culture of 18th-century Pennsylvania was dessert-centric, with the majority of calories provided by a daily intake of pies and other baked goods.”
Ellis adapted her mother’s recipes in accordance with local ingredients. From Quakers, Ellis learned to use cream cheese to make cheesecake, from Dutch neighbors she learned to preserve meat as well as make cookies. From Indians, she borrowed the practice of frying in lard.

“It was a very rich and fattening diet. It contained vastly more sugar and food fried in animal fat than was usual in England,” Parsons said.

This is vividly illustrated by a 1789 letter Parsons cites from Pennsylvanian Ruthie Wood, who wrote to her mother back home in her native England: “Our home is in a pretty lonesome place. But I have 45 pounds of sugar waiting and this is pretty fine.”

In the cookbook, Saffin and Ellis’s recipes appear as stream-of-consciousness paragraphs. “The authors’ focus frequently wandered,” Parsons said. “The recipes read like conversations, like a cook casually explaining to dinner guests how she made a dish.”

Although Saffin and Ellis were educated women, misspelled and wrongly uppercased words, and grammatical errors abound. Also, “The cookbook isn’t chronological and most recipes aren’t even dated,” Parsons said.

It was also sometimes used by other family members, notably to practice reading and writing. On page 11, where Ellis recorded recipes for gooseberry pie, dried fruit and boiled mushrooms, her younger brother, John, copied out a 1704 account of naval battles, no doubt as a writing exercise.

Saffin’s condiment recipe “To Make Catchup [sic] that will keep Good 20 Years” contains “a Gallon of Strong stale beer, one pound of Anchovies washed and cleaned from the guts half an ounce of cloves three large pieces of ginger one Pound of shallots one quart of flap mushrooms [sic].” Bearing no resemblance to modern-day ketchup, Saffin’s condiment shares more similarities — beer apart — with garum, a fermented fish sauce popular during the Roman Empire.

The ingredients of Ellis’s recipe for “Sauce for Fryed [sic] Fish” — chives, a shallot, butter and lemon — are simpler, evoking more closely what one would find in a modern American cookbook.

“Our home is in a pretty lonesome place. But I have 45 pounds of sugar waiting and this is pretty fine.”

“Bettee’s recipes were not much different from those of the eighth century,” Parsons said. “Although Ann wrote her recipes only a few decades later, she breaks with food ways that existed in Europe for 1,000 years, using ingredients in ways familiar to a modern cook.

“At first, 18th-century Anglo-American women like Ann clung to English food culture, but they quickly added indigenous ingredients and adapted recipes from other colonial women, natives and slaves,” Parsons noted. “They elevated the importance of dessert, made sugar a defining taste in American cuisine and contributed new foods of their own invention. Their recipes became more than just practical adaptations to local conditions — they became American food.”
legacy

When Irene McCulloch joined USC in 1924 as a professor of zoology, the marine research department consisted of a single 14-foot skiff, as well as a decades-old laboratory and lecture room. She quickly began efforts to update and expand the department.

Fewer than two decades later in 1940, McCulloch ultimately persuaded Capt. G. Allan Hancock, oilman, banker, ocean explorer and president of the USC Board of Trustees, to bring the Allan Hancock Foundation for Scientific Research to USC.

Dedicated in January 1941, the Allan Hancock Foundation Building, where the Hancock Institute for Marine Studies is still housed, contained modern laboratories, a library, a museum, a radio station, a campus television studio, an auditorium and an herbarium. The foundation profoundly elevated oceanographic research at USC.

A few years later, when the Boston Society of Natural History was forced to sell its collection of research materials for financial reasons, Hancock purchased it. His one proviso: McCulloch and her students would travel to Boston to personally inspect, wrap and pack each of the 80,000 items, some of which are valued in the millions of dollars today.

She retired from teaching in 1952, but McCulloch — for whom a mantis shrimp species, Tetrasquilla mccullochae, is named — continued to do research at USC.

“Irene McCulloch still came to her office on the first floor of the Hancock Building when I was a graduate student,” recalls Mary Wicksten (Ph.D., biology, ’77), a professor at Texas A&M University. “I remember Dr. McCulloch as a bent, white-haired lady who often seemed to keep to herself, but impressed everyone with her dedication to her studies.”

McCulloch spent 25 years writing her final book on a single-celled ocean organism. At age 94, she saw it to publication.

“She had published a massive monograph on the Foraminifera,” remembers Wicksten. “She was asked what she planned to do next. Her answer? ‘Write a sequel!’ ”

A trailblazing woman who in 1916 earned her doctorate from the University of California, Berkeley, McCulloch continued to conduct research at USC until a few months before her death in 1987 at age 101. Thanks in large part to McCulloch’s persistence and determination, more than 70 years after Hancock’s initial donation, marine science research continues to thrive at USC with its state-of-the-art laboratories and impressive research library, as well as numerous marine specimens. —D.K.

On Irene McCulloch’s 100th birthday in 1985, then-USC Vice President for Financial Affairs Carl Franklin described the zoologist as a “star of this university.”

Send your memories to USC Dornsife Magazine, Citigroup Center 8206, 41st Floor, Los Angeles, CA 90089-8206 or magazine@dornsife.usc.edu
World’s Most Influential Scientists

Ranking among the top one percent most cited for their subject field and year of publication, four USC Dornsife researchers earn the mark of exceptional impact.

Thomson Reuters has named four USC Dornsife researchers to its 2014 list of “The World’s Most Influential Scientific Minds.”

Based in New York City, the multinational media and information firm assessed papers indexed between 2002 and 2012 in 21 fields of study. It tracked authors who published numerous articles ranking among the top 1 percent of the most cited in their fields in the year of publication. The papers represent research that the scientific community has judged to be the most significant and useful.

Among those given the distinction was USC Dornsife Dean Steve Kay, who emphasized the collective effort to produce science with relevance through translational research.

“I am fortunate to share this honor with so many wonderful colleagues at USC,” Kay said. “Our recognition affirms our collective mission to make USC the best institution in the world for cutting-edge science and medicine.”

Upwards of 3,200 researchers worldwide are recognized in the study. The compilation is meant to attest to the power and scope of citations in determining influential research across disciplines. The USC Dornsife researchers included are:

STEVE KAY, under the “Plant and Animal Science” category. Kay holds the Anna H. Bing Dean’s Chair and a faculty post in biological sciences at USC Dornsife. He also holds posts in neurology, physiology and biophysics at the Keck School of Medicine of USC. Kay’s research has contributed significantly to the understanding of the genetic basis for circadian rhythms, which serve as the body’s clock for timing the day-night cycle.

HASHEM PESARAN, John Elliott Distinguished Chair in Economics, professor of economics and director of the USC Center for Applied Financial Economics and the Institute for New Economic Thinking, under the “Economics and Business” category. With more than 130 publications in leading scientific journals on econometrics, empirical macroeconomics and the Iranian economy, Pesaran is also an expert in the economics of oil and the Middle East.

KENNETH NEALSON, Wrigley Chair in Environmental Studies and professor of earth sciences and biological sciences, under the “Microbiology” category. His groundbreaking work in environmental microbiology includes the discovery of the regulatory mechanism quorum sensing and the isolation and identification of metal reducing bacterium.

RAY STEVENS, Provost Professor of Biological Sciences and Chemistry, and director of The Bridge@USC, under the “Biology and Biochemistry” category. The USC Dornsife alumnus arrived from the Scripps Research Institute in La Jolla, California, on July 1. Stevens is best known for determining the structure of proteins, essential work for pharmaceutical drug development. A pioneer in high-throughput X-ray crystallography, Stevens and colleagues in October 2007 published the first high-resolution structure of a human G protein-coupled receptor. —P.J.J.
Religion and Modern Science

In his award-winning new book, David Albertson examines theologians Nicholas of Cusa and Thierry of Chartres.

David Albertson traveled to Germany to study the archives of Nicholas of Cusa’s 500-year-old library for his award-winning monograph Mathematical Theologies: Nicholas of Cusa and the Legacy of Thierry of Chartres (Oxford University Press, 2014).

The book focuses on numbers and arithmetic in European religious thought, from antiquity through the Renaissance. Albertson sought to examine Thierry and Nicholas as medieval Christian authors, who translated their beliefs about God and the cosmos into a mathematical language.

“I was curious to see how their ideas might answer some of the questions we’re still thinking about in the 21st century,” Albertson said. “What is the essence of modernity, why does religion have anything to do with it and why does religion keep hanging around if it was supposedly filtered out by the mathematical science of Galileo and Descartes?”

Albertson suggests that the writings of Thierry and Nicholas represent a lost history of encounters between Christianity and Pythagorean ideas before the Renaissance. They used Greek number theory to reconceive fundamental Christian beliefs about the nature of the divine.

Thierry proposed that the purest name for the Trinity was the equation 1 x 1 = 1. Nicholas took this a step further and explained that Jesus’s body was constructed from the mathematical building blocks of the cosmos. While historians are well aware of encounters between Christianity and other Greek philosophers, such as Plato and Aristotle, no one had yet investigated the links between Christianity and Pythagoreanism — mathematical ideas crucial for the emergence of modern science.

“I think these authors represent an alternative possibility for a kind of modernity that makes room for a more amicable relationship between religion and science,” Albertson said. “Moving from medieval to modern doesn’t need to mean moving from a religious view of the cosmos to a scientific view of the cosmos, as if the two were opposed.” —S.B.
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decoherence-free subspaces.

of controlling quantum errors,
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QUANTUM ERROR CORRECTION

The fall of the Berlin Wall.

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Viking Adult / Professor of History
Deborah Harkness concludes
her All Souls Trilogy as historian
and witch Diana Bishop and vamp-
pire scientist Matthew Clairmont
face new crises and old enemies.

THE PROLETARIAN WAVE:

New thinking about propositions.

NEW THINKING ABOUT PROPO-
SIONS Oxford University Press / Distinguished Professor Scott Soames, director of the USC
School of Philosophy, along with
co-authors Jeffrey C. King and Jeff Speaks, argue that commitment
to propositions — understood as
the things we believe and say, and
the things which are (primarily)
true or false — is indispensable,
and that traditional accounts of
propositions are inadequate.

Basic Books / Mary Elise Sarotte, Dean’s Professor of History, and
professor of international rela-
tions and history, reveals how
decisions made by underground
revolutionaries, Stasi officers and
dictatorial party bosses sparked
an unexpected series of events
culminating in the chaotic 1989
fall of the Berlin Wall.

DIPLOMACY’S VALUE: Creating

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the Contemporary Middle East
Cor nell University Press / As-
soe Professor of International
Relations Brian C. Rathbun sets
forth a comprehensive theory of
diplomacy, based on his under-
standing that political leaders
have distinct diplomatic styles
— coercive bargaining, reasoned
dialogue and pragmatic statecraft.

PARADISE TRANSPLANTED:

Migration and the Making
of California Gardens University
of California Press / Professor of
Sociology Pierrette Hondagneu-
Sotelo provides insights into the
ways diverse global migrations
and garden landscapes shape the
social world.

NEUROANATOMICAL TERMI-
NOLOGY: A Lexicon of Classi-
cal Origins and Historical
Foundations Oxford University
Press / University Professor Larry
Swanson, Milo Don and Lucile
Appleman Professor in Biological
Sciences, and professor of bio-
logical sciences, psychology and
neurology, describes every human
nervous system structural feature
that can be observed with current
imaging methods, and provides
an extendible framework for ac-
curately describing the nervous
system in all animals, including
invertebrates and vertebrates.

THE COLLAPSE: The Accidental
Opening of the Berlin Wall

DORNSIFE FAMILY

MY SILVER PLANET: A Secret
History of Poetry and Kitsch
Johns Hopkins University Press / Daniel Tiffany, professor of English
and comparative literature,
excavates the forgotten history
of poetry's relation to kitsch, begin-
ning with the exuberant revival of
archaic (and often spurious) bal-
lads from 18th-century Britain.

Nonlinear mixture models.

Nonlinear mixture models: A Bayesian approach

Imperial University Press / Professor Emeritus of Mathematics Alan Schumitzky and mathematics
lecturer Tatiana Tatarinova present Bayesian methods of
analysis for nonlinear, hierarchi-
cal mixture models, with a finite,
but possibly unknown, number of
components — methods then ap-
pied to various problems includ-
ing gene expression analysis.

Quantum Error Correction

Cambridge University Press / Daniel A. Lidar, professor of
electrical engineering systems,
chemistry, and physics and
astronomy, co-edited a theoreti-
cal review of numerous methods
of controlling quantum errors,
including topological codes and
decoherence-free subspaces.

Johns Hopkins University Press
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lads from 18th-century Britain.

George Sanchez, professor
of American studies and his-
tory, and vice dean for diversity
and strategic initiatives, was
ominated president-elect of the
American Historical Associa-
tion’s Pacific Coast Branch for the
2014–15 term. A yearlong term
as president will follow. Sanchez
also received a Diversity Visionary
Award from Insight Into Diversity
magazine.

David St. John, profes-
sor and chair of English
and professor of comparative lit-
erature, received the Phi Kappa
Phi Faculty Recognition Award
at USC’s 33rd annual Academic
Honors Convocation.

Neptune Park by Daniel
Tiffany, professor of English
and comparative literature,
was named one of the “Best
Books of 2013” by The Volta
d poetry journal.

Mark Thompson, professor
of chemistry and materials
science, received the Richard C.
Tolman Medal from the Southern
California Section of the Ameri-
can Chemical Society (ACS) for
his outstanding contributions to
chemistry and the ACS’s Award
in the Chemistry of Materials.

John Wilson, professor of
sociology, civil and environ-
mental engineering, computer
science and architecture, and
director of the USC Spatial
Sciences Institute, was select-
ed as a 2014 University Consor-
tium for Geographic Information
Science (UCGIS) Fellow.

Justin Wood, assistant
professor of psychology, won
a National Science Foundation
CAREER award for his research
into how experience shapes the
development of visual cognition
in the newborn brain.
THE SECRET HISTORY OF LAS VEGAS
Penguin Books / In his latest novel, Chris Abani (M.A., English, ’05; Ph.D., literature and creative writing, ’06) weaves a complex entanglement of outsiders, freak shows and secret government experiments into a web of mental illness, racism and sexual exploitation.

MUSEUMS IN THE DIGITAL AGE: Changing Meanings of Place, Community, and Culture
AltaMira Press / Susana Smith Bautista (M.A., art history, ’00) shows how the use of technology in museums should factor directly into their notion of community, local culture and place.

JERUSALEM & THE HOLY LAND: Including Tel Aviv & Petra
Moon Handbooks / Genevieve Belmaker (B.A., international relations, ’00) details everything travelers need to know about taking a pilgrimage to Israel.

WHAT EVERY MENTAL HEALTH PROFESSIONAL NEEDS TO KNOW ABOUT SEX
Springer Publishing Company / Stephanie Buehler (MPW, ’84) discusses the characteristics of healthy sexuality and explores the reasons that may underlie a therapist’s discomfort with addressing sexual issues.

101 QUIZZES FOR COUPLES:
Take These Tests to Find Out Who Really Knows Who!
Adams Media / Natasha Burton (MPW, ’09) fuels provocative conversation with questions that arouse curiosity and long-forgotten memories.

PRETTY WOMEN
BermanBraun

NIGHTS I LET THE TIGER GET YOU
Black Lawrence Press / Poet Elizabeth Cantwell (Ph.D., literature and creative writing, ’14) takes readers on a journey through the recurring dreams and disorienting patterns of personal histories and a family’s failing internal structure.

SWEETNESS #9: A Novel
Little, Brown and Company / At once a comedic family satire and exploration of our deepest cultural anxieties, the latest novel by Stephan Eirik Clark (Ph.D., literature and creative writing, ’10) questions whether what we eat truly makes us who we are.

True Tales of Survival
Buoyed by only a life vest, the young American pilot bobbed in the cold, dark waters of the Pacific Ocean. Forced to abandon his aircraft shot down by Japanese destroyers earlier that afternoon, it was now the middle of the night.

Just after sunrise, foamy phosphorescent waves began to bubble up as a destroyer bore down on him. The American sailors on deck plucked him to safety.

It was 1942 and the young airman had been stuck in Philippine waters smack in the middle of the Battle of Leyte Gulf, now regarded as the largest and most intense naval battle of World War II.

That man’s name may be lost to history, but the story of his heroic survival is captured in Douglas Keeney’s book Lost in the Pacific: Epic Firsthand Accounts of WWII Survival Against Impossible Odds (FastPencil PREMIERE, 2013). The book recounts 23 narratives of enlisted American men who endured plane crashes, being shot down or having to ditch their aircrafts in the Pacific Ocean.

Keeney, who earned a bachelor’s degree in economics from USC Dornsife in 1973 and an MBA from the USC Marshall School of Business in 1976, came upon these true tales of heroism while digging through the archives of the Air Force Historical Research Agency at Maxwell Air Force Base in Montgomery, Alabama.

“I felt like I was looking at ground zero for the DNA that courses through every rescuer, every first responder, every man or woman that went up the stairs on Sept. 11 in the World Trade Center,” Keeney said. —M.S.B.
IN THE ZONE: How to Get Over Your Obstacles and Succeed
Abingdon Press / Using the metaphor of hurdling from his own medal-winning Olympic experiences, Mark Crear (B.A., sociology, ’92) illustrates how people are able to overcome the obstacles that block the path to success.

THE PEOPLE’S GOVERNMENT: An Introduction to Democracy
Cambridge University Press / Del Dickson

THE PEOPLES’ GOVERNMENT: THE PEOPLE’S GOVERNMENT:

THE MOOR’S ACCOUNT: A Novel
Pantheon / Laila Lalami (M.A., linguistics, ’94; Ph.D., linguistics, ’97) presents the imagined memoirs of the New World’s first explorer of African descent, a Moroccan slave known as Estebanico.

JULIET’S NURSE: A Novel
Atria; Emily Bestler Books / Lois Levene
(M.A., English, ’95) reimagines Romeo and Juliet, beginning 14 years before the events in Shakespeare’s play and continuing beyond its final scene — from the perspective of the heroine’s nurse.

MOUSE’S DREAM
Kerrera House Press

WHY LEADERS LIE: The Truth About Lying in International Politics
Oxford University Press / John J. Mearsheimer (M.A., international relations, ’74) provides the first systematic analysis of lying as a tool of statecraft, identifying the varieties, the reasons, and the potential costs and benefits.

THE CRANE WIFE
Penguin Press / Based on a Japanese folk tale, the latest novel by Patrick Ness (B.A., English, ’93) imagines how the life of a broken-hearted man is transformed when he rescues an injured white crane that has landed in his backyard.

THE LAST HEIR: A Mystery
Minotaur Books / In the third installment in the Jack MacTaggart series, Chuck Greaves (B.A., psychology, ’78) intermingles equestrian show jumping, insurance claims and high-tech science in a sunny California thriller.

STUPID CHILDREN: A Novel
Nightboat / Utilizing deadpan ruminations on tattoos, the nature of coincidence, father-daughter relationships, mental illness, violence and deviant sexuality, Lenore Zion (MPW, ‘04) imbues her characters with bizarre psychological abnormalities to create vivid eccentrics.

I AM THAT GIRL: How to Speak Your Truth, Discover Your Purpose, and #bethatgirl
Evolve Publishing / Motivational speaker and former Survivor: Micronesia contestant Alexis Jones (B.A., international relations, ’05; M.A., communication management, ’07) advises how to stop worrying and start living the life you truly want.

THE TRIBUTE HORSE
Nightboat / Brandon Sanderson’s latest novel reurns to the world of Mistborn as one of the most under-recognized, yet most influential theatrical luminaries of the 20th century.

A HISTORY OF HANDS: A Novel
University of Massachusetts Press / Rod Val Moore
(M.A., linguistics, ’86) Juniper Prize-winning fiction begins with the ambiguities of illness and moves on to explore both the reasonable and absurd actions of those who suffer and those who exploit suffering.

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IN JUSTICE FOUND
Kerrera House

SPANISH WOMEN TRAVELERS AT HOME AND ABROAD, 1850-1920: From Tierra del Fuego to the Land of the Midnight Sun
Bucknell University Press / Jennifer Jenkins Wood
(M.A., Spanish, ’77; Ph.D., Spanish, ’82) analyzes and translates selections from the travel narratives of 11 intrepid Spanish women.

ACT OF WAR: A Thriller
Atria / Emily Bestler Books / Counterterrorism operative Scot Harvath undertakes two dangerous missions as America faces an imminent attack in Brad Thor’s (B.A., creative writing, ’92) latest bestselling action thriller.

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Kicks for Kids

A program providing a healthy, active lifestyle for special needs children is the brainchild of alumnus Zade Shakir.

Alumnus Zade Shakir, who helps special needs kids flex their muscles, notes that obesity rates are 40 percent higher for children with disabilities.

Volunteering at Spirits in Action — USC’s annual version of the Special Olympics — Zade Shakir met Erick, a severely autistic young man who had trouble verbalizing emotions.

“Erick’s love of sport, however, was obvious. “There was genuine passion in the way he kicked a soccer ball,” said Shakir, who earned a bachelor’s degree in international relations and biology in 2014. “Speaking to Erick’s mother after the event, I realized there are very few resources for children with physical and developmental disabilities, particularly in organized sports.”

Erick inspired Shakir to found Kicks for Kids at USC. The program started in September 2013 with 30 children and 50 volunteers. Dedicated to promoting a healthy, active lifestyle for special needs children, Shakir’s organization now counts 510 volunteers and 300 players. During sessions held at the heart of the USC University Park campus at McCarthy Quad, youngsters are matched with student volunteers for one-on-one sporting activities. Children also receive a free nutritious snack and tips on healthy living.

Shakir grew up in San Jose, California, the son of immigrants from Iraq. Organized sports were a major part of his childhood.

“It really troubled me that children with special needs are excluded from these programs because of disabilities they are born with,” said Shakir, whose soccer playing skills earned him a place in the Olympic Development Program at age 11.

Adding to his resolve were statistics comparing children with disabilities to those without. Among children with disabilities, obesity rates are 40 percent higher and they are three times more likely to be bullied at school.

Now becoming a national nonprofit, Shakir’s organization may be expanded to other universities nationwide.

“I wanted to provide a place where kids like Erick could come and play without fear of being bullied or feeling left out,” Shakir said. “I’m thrilled Kicks for Kids is achieving that goal.” —S.B.
Emmanuel Caudillo said his political science and public policy courses at USC Dornsife reinforced his desire to become a policy analyst.

Emmanuel Caudillo remembers the challenges he faced applying to college as a first-generation college student. Some of the forms he found daunting, particularly the Free Application for Federal Student Aid, which determines federal, state and university-level aid for students.

Unsure how to fill out the form, Caudillo sought advice from his parents, who were just as baffled. Caudillo persevered, researching how to complete his application, and received a financial aid package crucial to funding his studies at USC Dornsife, where he earned his bachelor’s degree in political science in 2006.

Experiencing such obstacles firsthand prompted Caudillo to pursue a career in education policy.

“My passion for education stems from the challenges I faced as a first-generation college student,” said Caudillo, now a senior adviser with the White House Initiative on Educational Excellence for Hispanics (WHIEEH).

WHIEEH works to increase educational opportunities, improve educational outcomes, and deliver a complete and competitive education for all Hispanics. The largest and fastest-growing minority group in the United States, Hispanics have the lowest educational attainment levels of any group in the country.

Caudillo stays involved with the Trojan Family as a board member and scholarship chair of the USC Washington, D.C., Alumni Club. —M.S.B.
In Memoriam

CHARLES (CHARLIE) BAES JR. (Ph.D., chemistry, ’50) Oak Ridge, TN (1/26/14) at age 89; worked as a chemist at Oak Ridge National Laboratory from 1951 to his retirement at age 62; body of work on the behavior of cations in solution earned him worldwide recognition from his peers; lead author on pioneering 1976 report “The Global Carbon Dioxide Problem,” on the global carbon cycle and the impact of burning fossil fuels.

SARAH JANE BANKS (Ph.D., Spanish, ’65) Jackson, MS (3/24/14) at age 72; taught at Mary Baldwin College in Staunton, VA, then at Jackson State University from 1973 to 2010; volunteer translator for the International Ballet Competition in Jackson; assisted the Mississippi Youth Symphony; translated Spanish historical documents from early America; member of Mississippi Foreign Language Association.

JANE MERRICK BECK (B.A., nursing, ’50) Glendora, CA (1/4/14) at age 86; worked at Huntington Memorial Hospital as a registered nurse, as a pre-school teacher, then as director of the pre-school at the United Methodist Church in Glendora, where she was an active member; also member of the Daughters of the American Revolution in Glendora.

MARSHA (MARTY) JANE PREBLE CARTER (B.A., speech/speech pathology, ’41) Coronado, CA (12/31/13) at age 92; involved with the Barbara Worth Country Club Women’s Golf Association, Women’s Ten Thousand Club, PEO and a variety of bridge groups.

ELIZABETH (Betty) CLAYSON (B.A., biological sciences, ’39) South Pasadena, CA (3/28/14) at age 97.

ALFRED STUART DALE (M.A., religion/social ethics, ’59) Bellingham, WA (5/4/14) at age 94; United Methodist minister in IL, CA and WA, and missionary to Poland and Fiji; acted as provost, Central YMCA Community College, Chicago, IL; U.S. Army paratrooper and chaplain; member of Kiwanis, Methodist Federation for Social Action, Veterans for Peace, First Congregational Church, United Church of Christ and a founding member of Bellingham Friends of Cuba.

JOSEPH BERNARD DEVIN (B.A., ’60) La Jolla, CA (2/23/14) at age 75; earned medical degree at Creighton University School of Medicine, Omaha, NE, in 1964; interned at San Diego County Hospital, Hillcrest, first surgical resident to graduate from UCSD Department of Surgery; served in U.S. Navy aboard aircraft carrier Bon Homme Richard in 1970; member of Mercy Hospital Level 1 Trauma Center; after retirement, continued in part-time clinical position at Kaiser Permanente in San Diego until 2006.

S.I. (SLIDE) DAVISON JR., AKA DAVID DIAMOND (MPW, ’82) Spearfish, SD (5/5/14) at age 77; one of rock radio’s earliest legends; produced, wrote, and performed music for Columbia Records, Universal City Studios, 20th Century Fox, and Claridge Records; helped produce a No. 1 hit of 1967, “Incense and Peppermints;” served as a cannonner with South Dakota National Guard during the Korean War; served in the U.S. Army Reserve.

HARRIET KALPAKIAN DONNELL (B.A., Spanish, ’50) Ojai, CA (7/7/14) at age 78; taught Spanish at Westminster High School in Los Angeles for five years then became a private Spanish tutor while serving primarily as homemaker and mother; served as commercial real estate market research coordinator for Cushman & Wakefield; was active in the Ojai United Methodist Church, serving as lay leader.

WILFRID LAURIER (BILL) ESSEX JR. (B.A., biochemistry, ’50) Visalia, CA (2/28/14) at age 86; served as master sergeant with the 117th Medical Battalion-40th Infantry Division during Korean War; taught chemistry at Roosevelt High School in Fresno, CA; then at the College of the Sequoias in Visalia from 1955 until 1985; member of Visalia Sportsman Association and National Rifle Association; spent early retirement years as a Realtor; served as last president of the Linwood Mutual Water Company.

BERNAY KURLAND GRAYSON (B.A., political science, ’60) Santa Fe, NM (12/21/13); at age 76, passionate about all things Trojan; member of USC Associates and Cardinal and Gold; passionate about contemporary art; created the Bernay Kurland Grayson Award for Creative Excellence at the USC Roski School of Fine Arts.

EVANS ALEXANDER HANSON (B.A., international relations and economics, ’80) Dongducheon, South Korea (11/21/13) at age 35; commissioned as a second lieutenant in the U.S. Army in Field Artillery in 2000, becoming major in 2010; served two combat tours in Iraq and one in Afghanistan, earning the Bronze Star and the Defense Meritorious Service, the Meritorious Service, the Army Commendation, the Joint Service Achievement, and the Army Achievement medals; died while on active duty.

PAULINE PENA HEPNER (B.A., Spanish, ’48) Maryland (4/5/14) at age 87; born in Washington, D.C., to Spanish parents; member of the Alpha Delta Pi Sorority, taught art, geography and history at Castle Heights Elementary in Los Angeles for 38 years; selected at age 29 as one of California’s top teachers.

RICHARD C. HERR (B.A., history, ’58) Westminster, CA (5/9/14) at age 82; served in the U.S. Army during the Korean conflict for two years; practiced law for 47 years, retiring as assistant general counsel for Bank of America in 1996.

JILL WILMOTH HEWICKER (B.A., international relations, ’58) (4/14/14) at age 77; member of Alpha Omicron Pi Sorority; employed by C.J. Segerstrom & Sons at South Coast Plaza, Costa Mesa, CA; an animal lover, she enjoyed volunteer work for the City of Irvine Animal Care Center.

BUD (DOC) HOLLOWELL (Ph.D., philosophy, ’77) (5/16/14) at age 71; named Most Outstanding Player of 1963 College World Series; setting a home run record that still stands and leading his team to the National College All-American Championship; played on the 1964 U.S. Olympic baseball team in Tokyo; played and coached for the Alaska Goldpanners and the Los Angeles Dodgers organization; worked on trans-Alaska oil pipeline in 1974; earned a Peace and Freedom Citation from Alaska for assisting Chinese students and dissidents escaping after 1989 Tiananmen Square protests.

FREDERICK (FRITZ) KELLOGG (M.A., history, ’58) (4/23/14) at age 84; taught Russian history and Eastern European studies for 46 years, one of them at the University of Arizona, published author of books and articles on Romanian History; served as managing editor of Southeast European Research scholar in Romania from 1960-61 as part of the U.S.-Romania Cultural Exchange; a longtime supporter of Tucson’s opera, musical and dramatic theater, and ballet.

WESLEY (WES) ALAN KLEIN (B.A., economics, ’63) Anaheim, CA (3/14/14) at age 75; founded Alan’s Jewelers in Tustin in 1986 with his wife, Darlena; a licensed pilot, also enjoyed cycling, riding his Harley Davidson and playing the saxophone, ukulele and piano.

GUS KUNELIS (B.A., Slavic languages and literatures, ’56) (4/24/14) at age 79; graduated Phi Beta Kappa and Magna Cum Laude with honors; served as chief medical resident at LAC+USC Medical Center; upon completion of his cardiology fellowship, he moved to Orange County, CA, where he began a three decade medical practice; established one of first Coronary Care Units in Orange County; founded the Fullerton Cardiovascular Medical Group.

PATRICIA ELIZABETH (PATTI) LINGENBERG (B.A., East Asian and languages and cultures, ’49) Battle Creek, MI (3/13/14) at age 87; president of Alpha Omega Pi Sorority; worked in advertising, moved to Battle Creek in 1957, where she became an active member of the local community, helping with youth activities, volunteering at Community Hospital and as a board member of the Family and Children Services Agency; founding partner of the Gift Gallery, a business specializing in fine china.
A photo of Deborah Kolodji is shown in the upper right corner. A column of text is to the left, discussing the art of haiku. The text mentions Deborah Kolodji, who leads the Southern California Haiku Study Group at the USC Pacific Asia Museum in Pasadena, and highlights her passion and role in promoting haiku. The article includes a haiku by Kolodji and a few examples of haiku from other poets. The text ends with a quote by Kolodji: "Haiku helps you take little mental snapshots of your world," and a statement about her dedication to the art of haiku. The column is titled "The Art of Haiku."
Bakus published many research and review articles, including in *Science and Nature*. He authored several books, including *Coral Reef Ecosystems* (John Wiley & Sons, 2007) and *Books on the natural history of California, Oregon, Nevada and Catalina Island*. He was a fellow of the American Association for the Advancement of Science.

**Edward Blum**, professor emeritus of mathematics, a specialist in scientific computation, parallel computing and numerical analysis who taught at USC Dornsife for more than 40 years, has died. He was 90.

Blum died from natural causes at his home in Brentwood, Los Angeles, on Feb. 22 following a battle with cancer.

Blum created a computer language and was an important force in the development of interdisciplinary research at USC Dornsife. He held a joint appointment at USC Viterbi School of Engineering. In 2010, he helped establish and fund USC’s Center for Applied Mathematical Sciences (CAMS) Graduate Student Prize for Excellence in Research.

A pioneer in cluster computing, Blum developed a patent for a method of connecting computer workstations in clusters to perform parallel-distributed processing.

**Arnold Dunn**, professor emeritus of biological sciences, who taught at USC Dornsife for 47 years and served as president of the USC Faculty Senate and an associate dean of the USC Graduate School, has died. He was 85.

Dunn died of natural causes on April 17 at an assisted-living facility in Pasadena, California, surrounded by family.

From 1962 to 2009, Dunn was a professor of cellular and molecular biology. He was among the first to use the isotope tritium to study glucose metabolism, researching insulin and other hormones that regulate metabolism. He published more than 80 scientific articles.

In 2004, Dunn received a Faculty Lifetime Achievement Award from USC for his outstanding contributions as a scholar, teacher, mentor and colleague.

**Peter A. Berton**, Distinguished Professor Emeritus of International Relations, who in the early 1960s established the Asia Pacific area studies program at USC Dornsife, has died. He was 91.

Berton continued his involvement for the next nearly six decades, until shortly before his death at his Beverly Hills, California, home on March 28. In 2004, he had been diagnosed with leukemia.

A week before his passing, Berton was completing his last book, about the Japanese Communist Party. He was the author, co-author or editor of more than 100 publications in six languages, printed in the United States, Japan, Korea, India, Australia, Israel, Germany and Russia.

**Robert F. Erburu** (B.A., journalism, ’52), the last chairman of Times Mirror Co., the parent company of the Los Angeles Times until 2000, died May 11 in Santa Barbara, California. He was 83. Erburu had Alzheimer’s disease.

In 2005, Robert and his wife Lois Erburu received the Dean’s Medallion for exemplary leadership. A founding member of the USC Dornsife Board of Councilors, he endowed the Robert F. Erburu Chair in Ethics, Globalization and Development, which was held by Abe Lowenthal of international relations.

**Norman Levan**, professor emeritus and a former chief of the Department of Dermatology at the Keck School of Medicine of USC, died at his home in Bakersfield, California, on May 25. He was 98.

In addition to a distinguished career in medicine, Levan was a philanthropist who focused on giving to educational institutions. He gave generously to USC, establishing the Norman E. Levan Chair in Medical Ethics and endowing the USC Levan Institute for Humanities and Ethics, housed in USC Dornsife.

Levan earned his bachelor’s in literature at USC Dornsife in 1939. He served in the U.S. Army Medical Corps during World War II and practiced medicine for more than 70 years.

**Distinguished Professor of Philosophy and Linguistics James Higginsbotham**, Linda MacDonald Hilf Chair in Philosophy, and world-renowned expert in generative grammar, linguistic semantics and the philosophy of language, has died.
Michael B. Preston, former USC vice provost for strategic initiatives, professor emeritus and former chair of political science, has died. He was 80.

An expert on racial and ethnic politics, Preston died July 27 in Los Angeles, three weeks after being diagnosed with pancreatic cancer, his family said.

At the time of his death, Preston was finishing a co-authored book titled *California Diversity in State Politics*. His legacy is filled with teaching, service and mentoring.

In the late 1980s, Preston started USC's first course on black politics and later led a key initiative shared by USC Dornsife and the Office of the Provost to recruit minority and female scholars. From 1989–95, Preston served as chair of the Department of Political Science and had served as director of the Center for Multiethnic and Transnational Studies at USC Dornsife.


To honor Preston, a scholarship has been established to benefit undergraduates in political science studying urban politics or civil rights. For more information, contact Maureen McNulty at mcnultym@usc.edu or (213) 740-4994.
IN MY OPINION

All Grown Up

The Trojan Guardian Scholars program helps Lucero Noyola connect with her true inner power.

During my adolescence, my dad was never around; my mom was really dedicated to us, working full time at a school cafeteria to provide for our family. Consequently, entering middle school, my siblings and I had a lot of autonomy. My brother began having his older friends over to our house and they introduced us to drugs, ditching and fighting, which influenced our behavior in school.

I was on probation for having been involved in a fight and had regular court dates. Entering high school, my identical twin and I were perceived as trouble. At one point, I was accused of something I did not do and was suspended. I entered the juvenile justice system at age 13.

After juvenile detention, I felt the world was unjust. I saw authority figures as corrupt and stopped caring about detention as a consequence. I felt tagged a criminal. People looked at you expecting you to fail. I felt it would be easier to live my life as a self-fulfilling prophecy than become someone in a place where no one becomes anyone, where most people make their living from minimum wage jobs meant to be a transition into the workforce. After a few episodes of recidivism, I entered a group home at age 16.

I was pregnant with my beautiful daughter Aurora when I began working at El Pollo Loco. I knew I could not support my baby and myself on a minimum wage job. Despite having a newborn, at 18, I entered college.

I attended East Los Angeles College full time and worked part time. I was in the honors program and I had a high GPA, but never considered transferring to a private university. Then a close friend suggested it, so I applied. Knowing that I had to raise funds if I was going to make this happen, I began applying for scholarships. I was excited when I was accepted to USC, but that brought a whole new set of hurdles.

Transferring to USC, I scrambled trying to find transitional housing, where my daughter and I could live for at least 18 months. I was also looking for a stable day care center and speaking with Greater Avenues for Independence (GAIN) supervisors, who no longer wanted to support me at USC because GAIN did not collaborate with private universities. I was finally accepted into a transitional housing program, and GAIN agreed to refer me to a subsidy agency for child care. With some hurdles surmounted, I arrived at USC and faced more challenges.

With no CalWORKS offices on campus, I ran around student services looking for a department or someone who could help me with the paperwork required to receive support services from GAIN. Worried about losing my benefits and still without funds to purchase books, I was invited to a Trojan Guardian Scholars (TGS) program meeting. They asked us, “How can we help you?” Within a week, they created forms recognized by GAIN, and I was able to proceed as a student.

TGS has supported me in everything. I would never have considered attempting to study abroad until Dr. George Sanchez told me it was possible. He connected me with the people to whom I should apply for resources and helped me find the right opportunity. This past Summer, I traveled to the United Arab Emirates through a Problems Without Passports course. It will count toward my major and help me in my quest to become an academic.

I’m telling my story to raise awareness about someone who may not have had enough guidance or support growing up and made mistakes because of it, so that I can help other struggling youths see that change is possible. Trying to come back from mistakes, trying to be someone you have always wanted to be, is very hard and it is programs like TGS and the larger support of the USC community that have helped me make that happen.

Majoring in psychology and sociology, Lucero Noyola is in the Department of Psychology honors program. She is a research assistant for the Values, Ideology and Morality Lab and a mentee in the First-Generation College Student Mentor Program.
The Pitch

Interested in helping talented undergraduates craft their elevator pitches as they prepare for the job market? Make a difference in the lives of USC Dornsife students by serving as a mentor or offering a summer internship at your company or business. Get involved with USC Dornsife’s exclusive Gateway Internship and Second-Year Inquiry programs. To learn how you can be a partner, visit dornsife.usc.edu/gatewayinternships and dornsife.usc.edu/second-year-inquiry or call (213) 740-1628.
Life Moment

CALEB FARRO '11 (SEE PAGE 15)