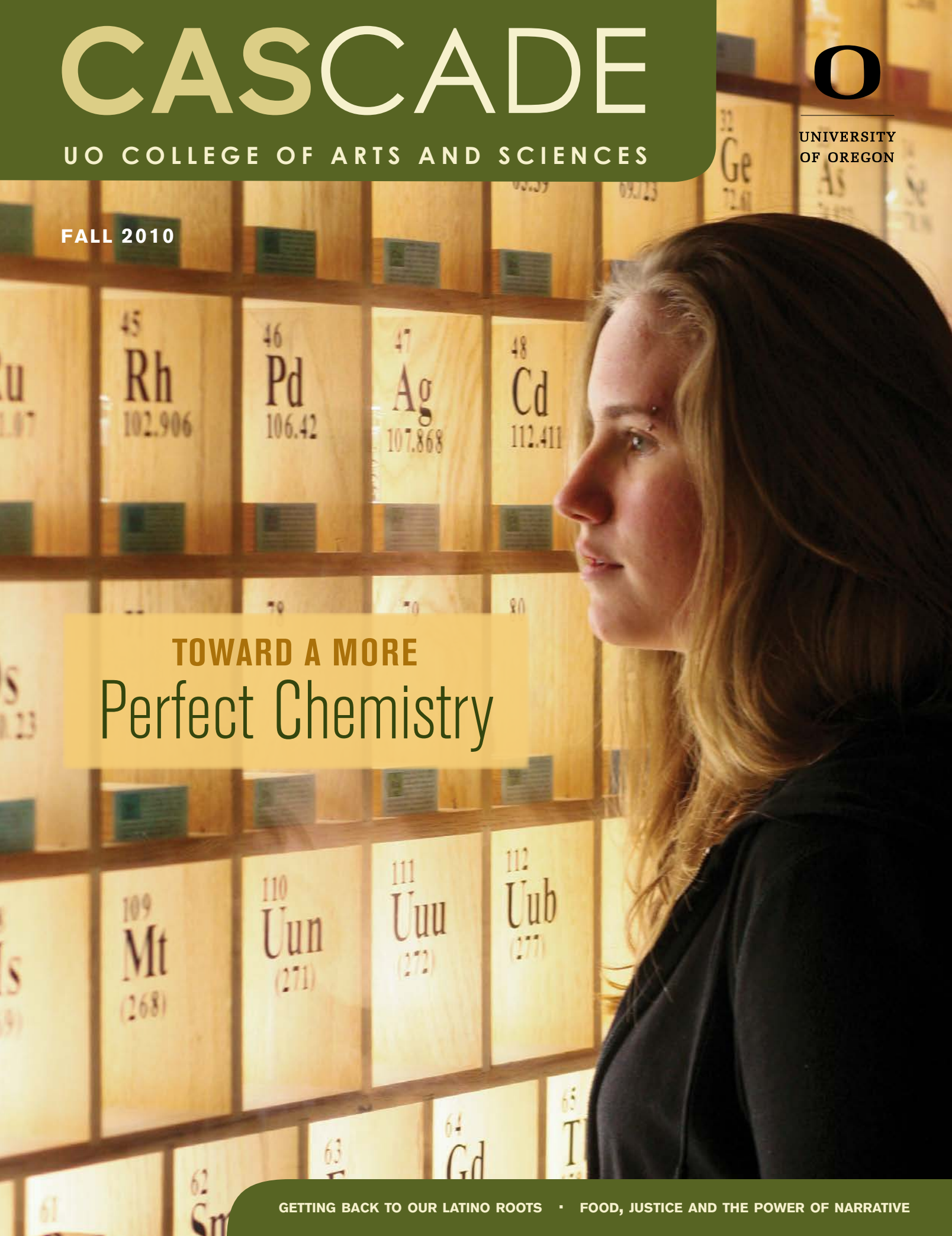
CASCADE

UO COLLEGE OF ARTS AND SCIENCES

UNIVERSITY OF OREGON

FALL 2010



TOWARD A MORE
Perfect Chemistry

GETTING BACK TO OUR LATINO ROOTS · FOOD, JUSTICE AND THE POWER OF NARRATIVE

DEAN'S PAGE

The term "interdisciplinarity" might seem like trendy jargon at other campuses, but it is part of our tradition at Oregon.

JACK LIU

Scott Coltrane, Tykeson Dean of Arts and Sciences

One of the best practices now in fashion in higher education is interdisciplinarity. But this is not a new trend at the College of Arts and Sciences. CAS has long embraced the creative potential inherent in crossing disciplinary boundaries and challenging taken-for-granted knowledge.

The UO Comparative Literature Program—which integrates scholarship from literature, languages, anthropology, linguistics and more—is the oldest on the West Coast and has been publishing the world's leading journal in the field, *Comparative Literature*, since 1949. With similar longevity, the Institute of Molecular Biology has fostered an interdisciplinary research community at the UO since 1959. The IMB unites faculty members from the biology, chemistry and physics departments to promote creative discovery and train graduate students in cutting-edge science.

More recently, faculty members from psychology, biology and human physiology have joined forces to shape new fields of study like neuroscience. Technological capacities for brain scanning, along with better understanding of biological and psychological processes, have opened up new frontiers in brain science. Psychologist Mike Posner, for instance—who was honored last year by President Obama with a National Medal of Science—has drawn from the field of biology in transformative ways. His current research deals with genetic as well as experience-related factors in the development of brain networks that manage attention and self-regulation, and his work relies on molecular genetic methods, magnetic resonance imaging and electroencephalography.

Other neuroscientists—many of whom will have labs in the new Lewis Integrative Science Building—are exploring topics ranging from infant brain development to concussion recovery to posttraumatic rehabilitation using artificial limbs. See page 24 for one scientist's investigation into how the brain hears silence.

Across campus, the UO Folklore Program not only integrates faculty members from multiple disciplines in CAS but also includes faculty experts from the School of Architecture and Allied Arts. Folklore is in the process of adding an undergraduate degree and developing a wider network of research, teaching and outreach activities that will benefit the state and the region (see page 17).

Last year, the UO added five full-time faculty members who focus on the complex interdisciplinary field of Latin American studies to support the new CAS major in the field. This year, CAS will be hiring tenure-related faculty members in the cross-disciplinary programs of environmental studies and cinema studies—with those faculty also holding joint appointments in departments such as sociology, German and Scandinavian, and East Asian languages and literatures. And we continue to develop the new (and yes, interdisciplinary) departments of women's and gender studies, international studies and ethnic studies.

So while the term "interdisciplinarity" might seem like trendy jargon at other campuses, it is part of our tradition at Oregon. I invite you to learn more about how we are building on this legacy with exciting new endeavors in this latest issue of *Cascade*.

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UO COLLEGE OF ARTS AND SCIENCES

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Food, Justice and the Power of Narrative

How Literature Informs and Influences Our Relationship to Food

Allison Carruth, assistant professor of English, focuses her work on the confluence of food, literature and global power at a time when the Slow Food and environmental justice movements are focused on transforming agriculture. In her book manuscript, *Global Appetites: Imagining the Power of Food*, she examines how writers—along with artists, activists and political leaders—have portrayed the food system since World War I, a period when the United States achieved global power in part through industrialized agriculture. As food progressives seek a sustainable and socially just model for food production and consumption, Carruth says both the problems and the answers just might be found in the arts.

Q: Why do you see a link between food production and storytelling?

A: The modern food system is not just a matter of economics, technology or science—the ways we cultivate and consume food are tied to the imagination. Whether making soup from potatoes or tortillas from maize, the process of turning raw ingredients into food is a cultural practice shaped by the narratives communities share about both agriculture and eating.

Literature, through devices like character development and metaphor, is well suited to examine the transformation of the food system over the last century. Writers weave large-scale questions about industrialization and global trade into interpersonal narratives about food. For instance, a writer can develop a drama revolving around characters who are hungry, as Samuel Beckett does in *Waiting for Godot*, and inflect that drama with the politics of food rationing during World War II.

Q: What can literature tell us about our relationship with food?

A: The literary arts play a vital role in how we understand historical transformations. In the contemporary period, there has been growing awareness about the implications of a global, industrialized food system. This awareness has been spurred, in no small measure, by writers and artists.

In fact, the literature of food has long been tied to how cultures define themselves and articulate complex ideas—about community, identity and the natural world. The ancient pastoral literary tradition, for example, depicts husbandry as a realm of work that mirrors natural cycles and counters the realities of war and politics. This tradition continues to permeate American culture, contributing to the belief that farming is sheltered from forces of modernization.

Stories of breaking bread or of shepherds tending their flocks are central to how we define the human experience. But these metaphors became less meaningful after World War I as agriculture became industrialized and as conflicts arose between the interests of global food trade and regional food traditions. From Willa Cather in the early twentieth century to Michael Pollan today, writers have traced these changes and have illuminated the political and ethical implications.

Q: You write that World War I represented a significant milestone in depictions of food. How so?

A: The war represented a paradigm shift in both farming practices and in the story of food. In the U.S., industrial agriculture modernized through the use of synthetic fertilizers and through the adaptation of war technologies such as barbed wire, which was used in trench warfare and then revolutionized ranching.

These developments in turn influenced writers. Willa Cather, for instance,

grew up in the Great Plains in the early 20th century and is best known for her representations of pioneers. But after World War I, a significant shift occurs in her writing as she turns her attention to this new relationship between war and agriculture. In her novel *One of Ours*, the protagonist suffers brutal injuries when a tractor scares his horse and sends him crashing into a barbed wire fence. This scene is one of many that explore the changing structure of American agriculture. Cather's Nebraska farmers not only make use of new technologies like the tractor, they also follow the financial news to track global commodity prices. As she and other writers illuminate, American agriculture after the Great War relies on and helps to fuel the global economy.

Q: How did the depiction of food in literature evolve after World War I?

A: Between World War I and World War II, writers such as George Orwell and M.F.K. Fisher shifted attention from industrial agriculture to new food distribution patterns. At that time, food rationing was promoted as an act of patriotism, while a new global framework emerged for providing food aid. The writers I examine question why world famine persisted at a time when U.S. food production was more prodigious and efficient than ever before.

If we flash forward to the era between the 1970s and 1990s, we find writers grappling with the implications of free trade. Toni Morrison's *Tar Baby*, for example, is set in a francophone Caribbean country and revolves around the global politics of chocolate. The novel explores how free trade—and the appetites of consumers around the world—transforms the economy and ecosystem of local communities.

Q: Why has there been this uptick in food nonfiction recently?

A: Over the last decade, we've witnessed an explosion of nonfiction about the food systems—works such as the documentary *Food Inc.*, Eric Schlosser's book *Fast Food Nation* and Michael Pollan's *Omnivore's Dilemma*. These works connect the environmental movement with the food movement, for which Pollan serves as a lightning rod. These writers have raised awareness about the politics of food in the United States.

However, there are important issues that these writers fail to address. Pollan, for instance, has focused on our overproduction of corn for animal feed and processed foods and that is an important story. But Pollan and others tend to shy away from the politics of farm labor as well as the interconnectedness of farming communities around the world. Yet these global questions are vitally important. In Mexico, for instance, farmers struggle to grow a diverse array of maize in part because genetically modified corn from the U.S. now dominates their agriculture.

Q: What can these burgeoning food movements learn from the history of food narratives?

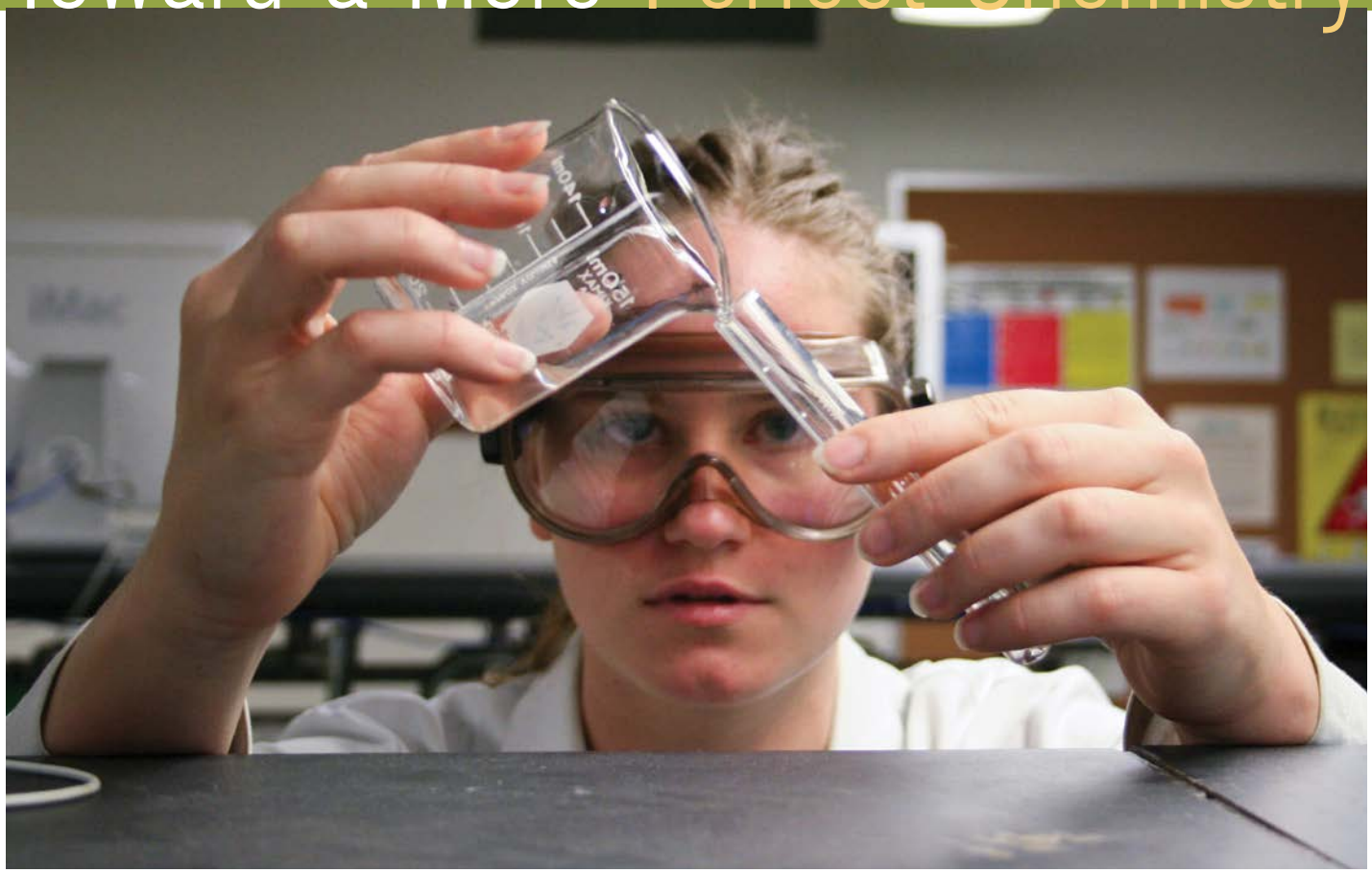
A: We need a food system that is not only ecologically viable but also socially equitable, a system that treats food communities around the world with reciprocity and with regard for regional needs and traditions.

Even as we work to support small farms, change eating practices and reduce the carbon footprint of agriculture, we might also reflect on which modern developments might be of value. While some argue for a return to preindustrial farming, I have spoken with farmers and farm workers who remind us that their work can be backbreaking and certain technologies—from the tractor to the computer—can offset these challenges.

Narratives about the history of the food system are crucial to imagining how we will grow and eat food in the future. Those narratives are found not just in literature but also in everything from murals in urban community gardens to video games developed by the U.N. World Food Program. By studying the literary history of food, we also can find alternative stories to those of industrial agriculture and perhaps develop a blueprint for future food production that is more just and sustainable than the status quo. ■

Interview by Marc Dadigan

Toward a More Perfect Chemistry



MICHELLE LEIS

UO senior Dana Garves

Once dismissed as "hippie chem," the rise of green chemistry at the UO has been a prime catalyst in a global movement toward environmentally conscious methods and results.

By Marc Dadigan

Dana Garves was fascinated with chemistry the moment her 8th grade teacher unveiled the periodic table.

As he described the first 20 elements, she was captivated by the image of electrons hurtling through space around the nucleus, like a miniature galaxy of celestial bodies orbiting and pulsating in everything she touched, even the very desk she was sitting in. "Just to think that this was the building block of all matter, it was fascinating," said Garves, now a UO senior. "I was hooked, but I didn't think I'd ever go into it as a career."

Garves was the sort of teen who would rescue unnecessarily discarded aluminum cans and plastic bottles from her friends' homes for recycling. She was raised with a mind steeped in green, a color that seemed to clash with her chemistry interests.

"I had issues with toxicity in chemistry," she said. "But in high school labs no one taught us about that. I'd be wondering why we couldn't use the chemicals we read about. I'd think: If they're so dangerous why don't we use something else?"

Nevertheless, she enrolled at the University of Oregon as a chemistry major, thinking she would probably switch eventually. On the first day of her introductory chemistry class, however, she heard two words that changed everything: "Green chemistry."

"I had no idea this place was a green chem hub, so I did some online research that day, and I was like, 'This is right up my alley!'" she said. "Now I'm so passionate about it."

It can't be said that green chemistry was born at the UO, but it certainly took a major leap forward here when UO chemists Ken Doxsee and Jim Hutchison wrote the first green curriculum from scratch. Over the past decade, green chemists at the UO have been

instrumental in its spread to universities and private industries across the country.

Chemistry is about the manipulation of matter, finding substances that will produce a reaction to create the intended final product. In this context, the principles of green chemistry seem relatively simple—use smaller amounts of starting materials, seek reactions that create as little waste as possible and be constantly conscious of how a new substance might affect the environment once in use.

But green chemistry represents a tectonic shift in the philosophy and thinking of an entire science.

A Cure for Tunnel Vision

"Through the decades, we became so amazed by what chemistry could produce that we never really talked about what happened when we used these chemicals or about the waste from producing them," said Doxsee, a UO chemistry professor. "Green chemistry says we have to think about these things."

Since Rachel Carson's seminal book *Silent Spring* first brought to light the harmful health and ecological side effects of DDT, chemists have often been the villains in modern environmental fables. From PCBs to BPA, there has been a growing list of modern chemicals proven to be highly toxic well after they have been thoroughly dispersed as products in the economy.

Chemists had tunnel vision. It was all about producing the final product, and concerns about toxicity or efficiency were largely absent, especially in the classroom.

"It used to be you could just bury it in the yard, dump it in a river or pump it through a smokestack into the atmosphere and it wasn't a big deal," Doxsee said. "We thought the Earth was big, and it would take a lot to have an effect. But we discovered the world wasn't as big as we thought it was."

Scientifically, the approach of green chemistry strives to reduce or eliminate these hazards across the full life cycle of a chemical, from its creation to its degradation back into the environment.

"If I make the product recyclable or biodegradable, I might have made an improvement, but what's the energy cost?" said Hutchison, who holds the UO's first endowed chair in green chemistry. "Did I just increase my carbon footprint fivefold in the process of producing the product? Or if I decreased the carbon, did I just make (the product) more toxic? We're looking at how every change impacts the whole cycle."

Safer Solvents

Doctoral student Doug Young cut little patches of orange peel with a razor blade and dropped them into a test tube along with some smoky crystals of dry ice, or frozen carbon dioxide.

He sealed the tube tightly and placed it into a graduated cylinder full of water, peering at it through his goggles like a painter inspecting his last few brushstrokes. After a few moments, the bottom of the tube started to roil and bubble around the peels. "This is going to be a nice one," he said.

He was conducting a trademark experiment of the green chemistry curriculum. As the pressure built in the cylinder, the dry ice turned into liquid carbon dioxide, which in turn interacted with the orange peel. This extracts limonene, a substance that gives oranges their citrusy scent and is often used in household cleaners.

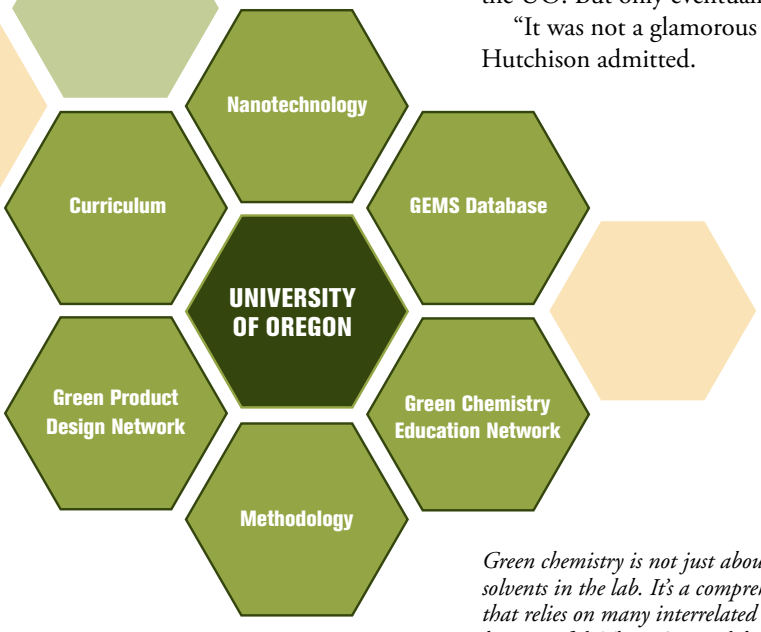
Young tapped the test tube and pointed to a small milky drop at the bottom, the limonene. "It used to be you had to use toxic solvent to do this, but by switching to carbon dioxide, you can just pour this down the sink when you're done."

While solvents are still needed to catalyze reactions, many green chemists are moving away from using more hazardous solvents, which typically leave behind messy liquid wastes.

Prior to the late 1990s, experiments like the CO2 extraction of limonene didn't exist at the UO. Chemistry professors, at the UO and around the nation, were teaching experiments that hadn't been altered or updated for decades.

But then, driven by practical concerns rather than idealism, individual faculty members started making changes in the ways they taught chemistry classes and labs—small incremental changes as well as bolder leaps forward that eventually transformed the way chemistry is taught at the UO. But only eventually.

"It was not a glamorous start," Hutchison admitted.



Green chemistry is not just about reducing toxic solvents in the lab. It's a comprehensive approach that relies on many interrelated components to be successful. The UO is a global hub for the key elements that have made green chemistry a reality.

KRYSTEN MAYFAIR

Graduate student Doug Young extracts limonene from an orange peel using carbon dioxide.

Waste Not Wanted

Deborah Exton was one of the first UO faculty members to take initial steps in a green direction.

Soon after she was hired in 1993, she was assigned to teach the general chemistry laboratory course, and began to take a careful look at the experiments in the curriculum. "With over 500 students in the lab class, I was concerned about both the quantity and the category of waste that was being produced by just this one class," she said.

She was also concerned about chemical exposure for both the students and staff. "Staff exposure is a particular concern because they are working with the chemicals 40 hours per week, unlike the students who are only in the lab for three hours per week," she explained.

Over time, she has set about revamping the general chemistry curriculum, assessing each experiment for alternatives: Could more benign chemicals be used and still demonstrate the same principles? If not, was there a safer, less toxic experiment that could take its place?

One spectrometry lab assignment typically produced 80 gallons of aqueous copper sulfate—waste requiring hazardous waste disposal—but Exton changed the procedure so all of the experiment's products could be poured down the drain with no harm to students or staff members.

Instead of copper sulfate, "we used FD&C Red Dye #40 as our colored solution and students had to determine how many glasses of Kool-Aid they would have to drink to get a lethal dose of this food additive," she said. (Answer: Lots!)

Unaware of Exton's efforts, the faculty members teaching organic chemistry began devising their own green solutions for a rather prosaic problem: lack of lab space. The organic chemistry labs had to accommodate several hundred students, and those students were required to perform many experiments under fume hoods so they wouldn't be exposed to toxic fumes. Yet there were only enough hoods for about 18 students, meaning there had to be many lab sections—the organic professor had to oversee 11 or 12 three-hour labs a week.

This became Hutchison's problem to solve, and he was still brainstorming when he walked into the department's library and saw a brand new copy of a book titled *Green Chemistry: Designing Chemistry for the Environment.* Immediately the light bulb went on.

"Some of those solvents we were using in the lab were basically like the old paint stripper that would get you lightheaded," Hutchison said. "When I saw the book, it just clicked. With green chemistry, we could make the experiments safer, make the hoods unnecessary and increase the capacity of the labs."

His colleague Doxsee had long been developing experiments and altering them to reduce his students' exposure to toxic substances. Though he didn't think of it this way, he was already upholding certain green principles. Once he heard about Hutchison's project, he signed on.

Hippie Chem

The two had one term, 10 weeks, to devise a curriculum completely counter to all that came before it. They delved into chemistry textbooks and the appropriate literature, looking for the right experiments, but found almost nothing. Some experiments fit the green criteria but didn't necessarily illustrate the appropriate principles, and vice versa.

With the help of grad students, Doxsee and Hutchison hit the laboratory and devised the curriculum by adapting existing experiments or creating some from whole cloth.

The first term the curriculum was unveiled, Hutchison arrived at the organic lecture and asked for volunteers. About 20 students agreed to be green chemistry guinea pigs, but many students harbored doubts. Some thought it wasn't real chemistry. "Hippie chem" was a term bandied about, which probably wasn't helped by one student showing up to the first green lab in bare feet. "I had to tell him to put some shoes on before he could enter the lab." Hutchison said.

Eventually all the labs were converted to green chemistry, and most doubting

"You can just pour this down the sink when you're done."

Thomases were also converted when they saw the science was basically the same.

Hutchison and Doxsee later wrote the first green chemistry textbook, as they started to see how this wasn't simply a practical space-saving solution but an important step in their field's evolution. This in turn evolved into a commitment to train their scientific peers.

"We realized the next step was to teach other people how to do this," Doxsee said. "Otherwise if they didn't understand the book they'd just dismiss it."

Green Means Cheap

Green chemistry is unlike many other environmental movements because it's extremely attractive to the very industry that in many instances gave chemistry a bad name in the first place.

The interest stems from the simple fact that green chemistry also often means cheap chemistry. Take for instance, ibuprofen, one of the most common industrial drugs. For every bottle of finished product almost three bottles worth of waste was produced before green chemists streamlined the production process. Now it's one bottle of waste for every bottle produced.

"The pharmaceutical companies are using green chemistry to redesign production methods for a lot of their drugs because many of them create so much waste, and it costs money to get rid of that waste," says Julie Haack, assistant department head and senior instructor of chemistry. "For us, that's the low-hanging fruit."

Many say the real stimulus for green chemistry began with the passage of the 1990 Pollution Prevention Act, which placed the financial burden on companies for cleaning up chemical waste, thus providing an incentive to avoid producing waste in the first place. But green chemistry is a proactive approach that inspires innovation rather than imposing new regulation, Hutchison says, and the fact that industry is embracing green chemistry is a sign they can also do the right thing.

Industry has been faster than academia to get on board.

In fact, industry has been a highly proactive force in getting on board with green. "Industry has been faster than academia," Haack said.

The UO, especially behind the efforts of Haack, is working hard to increase the spread to academia, a realm that's hardly known for its quick acceptance of change. Every summer, the chemistry department holds a weeklong workshop where it trains professors from around the world in the principles and practice of green chemistry. About 180 faculty members have been trained, and they in turn have influenced nearly 30,000 students across the country. Haack says surveys show they're also influencing their colleagues.

But the real impetus is the wave of graduate students who are seeking PhDs at major universities where they're asking for green chemistry courses. "The universities have to change to recruit these top students," Haack said.

Once professors jump the mental hurdle of changing their approach, Haack said, green chemistry is "sticky" because it engenders a new and more satisfying relationship between teachers and students.

"Chemistry was a profession where you tended to work more in isolation, but cooperation is a big part of the green ethos," she said.

Crowd-Sourced Chemistry

Haack is a catalyst for this nationwide cooperation through the creation of the GEMs (Greener Education Materials) database. It's a "living" online database through which chemistry educators can share, develop and edit various experiments and curricula. It's a sort of open-source green chemistry curriculum, which Haack hopes will not only stimulate the creation of new experiments but also incorporate input and insight from those outside the usual academic circles.

"We wanted a resource where people could cruise around and find out what's available," Haack said. "If they wanted to teach something on bonding, for example, on GEMs they could find the green experiment for that lesson."

GEMS also allows different people to help develop the materials. Instead of one person creating a lesson, sometimes as many as 10 people will be involved, which helps green chemistry expertise mushroom all the more quickly.

Haack is also using social networking to spur collaboration across disciplines via the Green Product Design Network (GPDN), an effort to lay pathways for viable green chemistry products to enter the economy.

The GPDN includes UO professors and students as well as external partners who specialize in product design, business, public relations, marketing and other disciplines that can help shape the products even as they're being conceptualized. By incorporating more disciplines in the beginning, it will help make green products more economically viable.

While some might say green chemistry is too focused on industry, Hutchison says there is so much we need to discover in order for green chemistry to flourish as a discipline that the participation of industry will advance the science that much faster.

"The toolbox of known chemical reactions is pretty full, but the green drawer, so to speak, is pretty empty, maybe 10 percent full at most," he said. "That means there's still all kinds of chemistry to discover."

His hope is that eventually green chemistry will lose its qualifier and be absorbed as the dominant theory of chemistry.

"Maybe there will be a day when we can make every reaction have high efficiency at room temperature without harmful reagents or solvents," he said. "That's mostly aspirational, but now's not the time to start putting limits on ourselves." ■

Smaller, Stronger, Safer?

The Lorry I. Lokey Laboratories lie far beneath a small grassy oasis on the UO campus, embedded in a hollowed out vault of bedrock 17-feet deep.

The scientists here don't come for the isolation, but rather for protection—from the vibration of the bustling traffic above on Franklin Boulevard and even the constant hum of climate control systems. The facility's $25 million in souped-up electron microscopes and other devices make it possible to manipulate, measure and construct nanoparticles: substances so miniscule that even the slightest tremor can disrupt an experiment.

"In size, nanomaterials are somewhere between micron scale (quarks, atoms and such) and the molecular scale," said UO chemist Jim Hutchison. "They don't really exist in the natural world, and that's part of what makes them so fascinating to research."

A nanometer is a billionth of a meter, only about ten times bigger than a single atom. A common way to envision this almost unfathomable smallness is to compare it to a human hair—which is typically 50,000 nanometers wide. The average particle being studied in the Lokey Labs might be two to 50 nanometers wide.

But they still pack a punch. Because of their tiny size, they possess unique physical properties and interact with other substances in ways bigger molecules don't. This has led to an upsurge in nanotechnology, and many are heralding it as the future of the economy. More than 700 nano products are currently in use: everything from particles that make tennis rackets and golf clubs lighter and stronger to nano silver particles that prevent hospital-borne infection.

Yet as the industry begins to blossom, there are questions whether it's doing so too quickly with too few restraints. As the founding director of the Safer Nanomaterials and Nanomanufacturing Initiative, Hutchison is at the forefront of efforts to ensure these questions about nano are answered and that action is taken before it becomes a ubiquitous technology.

Hutchison is also a pioneer in green chemistry, a revolutionary reshaping of his field into one dedicated to environmental consciousness. He co-created the very first green chemistry curriculum at the UO, and in nanotechnology he sees a way to use green chemistry to proactively prevent hazardous outcomes.

"We know that there are new properties associated with the nanoscale, so it's reasonable to assume that there are new

Greening the Curriculum

■ = UNDERGRADUATE COURSES ■ = GRADUATE COURSES

Starting with modifications to the general chemistry lab in 1996, the chemistry department has rapidly incorporated green principles into a range of courses (listed below). This is by far the most robust integration of green chemistry into a university curriculum in the U.S.

1996	1997	1999	2001	2003	2004
General Chemistry Laboratory—procedures (Deborah Exton)	Organic Chemistry Laboratory (Jim Hutchison and Ken Doxsee)	Polymers (David Tyler)	General Chemistry Lecture (Julie Haack) Organic Chemistry Lecture (Doxsee)	Chemistry of Skiing (Haack and Hutchison)	Introduction to Chemical Principles (Haack) General Chemistry Laboratory—teaching (Exton) Special Topics: Supramolecular Chemistry (Darren Johnson)

hazards," Hutchison said. "It's our goal here to anticipate the hazards, understand them and design them out of the materials."

In the lab on a day last spring, Hutchison hunkered down at a pair of monitors examining a neon blue image of a zebrafish that was captured by an incredibly powerful electron microscope. Little yellow specks, representing gold nanoparticles, were dappled around the edges of the fish.

The purpose of the experiment was to see where the nanoparticles go once they're ingested by the transparent zebrafish. Hutchison has been creating catalogues of data on how different nanoparticles interact with biological systems and if they interact in a harmful way, what factors might mitigate that.

"It makes sense from an environmental perspective as well as a business perspective to do this work," he said. "It's essential to learn what products are doing at the nano level, in order to protect the environment and society as well as manufacturers' investment in nanotechnology."

In the past, industry absorbed exorbitant costs for chemicals that turned out to be toxic well after they had become

"This is a chance to get it right from the beginning."

widely used, DDT and thalidomide being prime examples. Some are concerned that nanomaterials could produce the next horror story. Health advocates are especially skittish about their use in food products, and there is research that seems to indicate certain nano-related products could be carcinogenic.

Hutchison said the controversy most likely stems from the fact that nanomaterials are hard to characterize and structurally define. And because they are so difficult to manufacture and prone to imperfections, possible impurities or shoddy construction could be more problematic than the nanomaterials themselves.

"That's why this lab is so useful: we can define these materials in a really rigorous and pristine way," he said. "It all comes down to: how do you design the products so that they have the function you want without the detrimental properties?"

He and his colleagues are also interested in greening the production of nanomaterials. One of the lab's most commonly cited papers was written after a student found an alternative method for creating gold nano particles. This process previously required the extensive use of a toxic gas that ignited into flames when exposed to the air.

"I used to have to stand by with a fire extinguisher," Hutchison said. "Eventually, an undergraduate research student found a way to do the reaction on a workbench without any protection. It was safer and also cheaper."

It's a story that's emblematic of how the green chemistry ethos is changing chemistry, and Hutchison believes nanotechnology provides a unique opportunity for green chemistry practitioners—to show that chemists have learned from their past mistakes.

"This is a chance to get it right from the beginning," he said, "an opportunity that is extremely rare." —MD

*Visit **greennano.org** to find out more about the Safer Nanomaterials and Nanomanufacturing Initiative.*

2005	2006	2007	2008	2010
Thermodynamics (Mike Kellman) General Chemistry Lecture (Exton) Organic Chemistry Lecture (Darren Johnson) Polymer Synthesis and Characterization Laboratory (Darren Johnson)	Advanced Organic Synthesis Laboratory (Doxsee)	Statistical Mechanics and Kinetics (Kellman)	Chemistry of Sustainability (Haack, Hutchison, Darren Johnson, Tyler, Andy Berglund, Mark Lonergan) Advanced Organic-Inorganic Chemistry (Doxsee) Semiconductor Processing (David Johnson) Graduate Student Workshop on Sustainability (Tyler)	Physical Organic Chemistry (Darren Johnson)

Getting Back to Our

LATINO ROOTS

Centuries ago, explorer Balboa Vásquez de Nuñez declared the Pacific Ocean and all the lands it touched as the possession of Spain. Fast forward to the 18th century, when Juan Pérez began to explore the Northwest coast. These two Spaniards had a significant jump on Lewis and Clark, who made their much-heralded journey to Oregon at the beginning of the 19th century.

"The history of pioneer Oregon often focuses on the Anglo settlement, the old wagon and Oregon Trail narrative," said Lynn Stephen, professor of anthropology and ethnic studies. "When you add these earlier stories, it really enriches the complexity of our history."

Stephen, along with collaborator and documentary filmmaker Gabriela Martínez, have become explorers themselves, delving into the history of Latinos in Oregon, and especially Lane County. Their work is gaining prominence just as Oregon's reputation as a homogenous state is increasingly becoming a thing of the past.

In 2006, Latinos made up more than 10 percent of the population in Oregon, and the population of Latino students in public schools has grown by 200 percent in the past 10 years. Projections estimate that by 2020 nearly 30 percent of high school enrollment will be Hispanic or Latino.

Yet Stephen points out that all the talk of "changing demographics" is a little timebound.

"If you want to talk about Latino influence, you have to go back hundreds of years," she said. "Before Oregon was a state, California was part of Mexico and while the Mexican border was fluid, it came up to around Medford." In other words, Oregon was a border state.

To raise public awareness of Oregon's historic links with Latin America and the long-term Hispanic presence in the state, Stephen has been the driving force behind the Latino Roots project. This began as an ethnographic exhibit at the Lane County Museum in 2009 and this fall will expand into two undergraduate classes that will give students direct experience in documenting Oregon's Latino past. The classes are supported by grants from the Office of Institutional Equity and Diversity, the College of Arts and Sciences and the Williams Council.

In collaboration with Martínez, an assistant professor in the School of Journalism and Communication, Stephen will teach students about the history of Oregon's Latinos and then train them to conduct oral history interviews, with the aim of creating student-produced documentaries as a capstone project. A dedicated website will serve as a continually updated public archive of the materials produced by students.

Beyond the Farmworker Stereotype

The students' work will add to the existing collection of stories, photographs and artifacts that the Latino Roots team originally organized for the Lane County Museum exhibit.

For the original exhibit, graduate students assisted Stephen and Martínez as they reached out to local Latino community leaders to find appropriate subjects for oral history and video interviews, while also collecting historical information and photographs. Artifacts showcased in the exhibit included a bilingual Bracero contract that had belonged to one subject's father as well as corn grindstones, called *metates*, used to make homemade tortillas.

"We looked for people who came from different times and different parts of Latin America or the U.S.," Stephen said. "We were particularly interested in showing their contributions and to get away from the stereotype that everyone is a farm hand, cook or gardener."

Stephen and Martínez conducted a total of nine interviews, including oral histories of a Chilean couple who earned advanced degrees (see page 12), a blue-collar Mexican immigrant couple whose three children attended the UO and the owner of Plaza Latina, the local Latin American grocery store.

Martínez, who produced the video interviews for the exhibit, said she realized in producing these documentaries how much she had bought into the Latinos-as-farmworkers stereotype—despite the fact that she is a native of Peru—and was impressed by how many participants were highly educated.

Yet she was touched by the conflicting depictions of Lane County conveyed by the interview subjects—as a place that at times was hostile to their presence but at others provided a unique and vibrant place to raise their families.

Telling this more complete history of Oregon, Stephen said, can only benefit the local community.

"It's great for Latinos and for everybody to know the richness of the state's history," she said. "Understanding the deep history and hearing from today's Latino professionals can disrupt some of the polarizing narratives that keep us from valuing multiculturalism like we should." —MD

THE UNTOLD STORIES

The Latino Roots exhibit at the Lane County Historical Museum, on display in 2009 in celebration of Oregon's 150th birthday, also celebrated the underrepresented history of Latinos in Lane County. The artifacts curated for the exhibit documented the family, social and occupational lives of Latinos who have populated the county for generations. A filmed documentary, as well as written materials, gave voice to individuals who shared their personal stories of both hardship and joy, as they worked toward establishing their lives in Lane County.

The stories below of Roberto Arroyo, Selene Jaramillo and Patricia Cortez were all originally part of the Latino Roots exhibit.

LIVES FOREVER CHANGED BY THE JUNTA

Selene Jaramillo and Roberto Arroyo were born in different cities in the south of Chile, where it rains as much or more than in Oregon. Selene was born in 1968, in Valdivia, a city where the Wuilliche, German and Chilean cultures coexist. Roberto was born in 1959 in Temuco, a city marked by having the largest presence in Chile of the Mapuche culture and people. Today there are also Chileans and descendants of European colonizers living there. Both Selene and Roberto have lived in a permanent diaspora, each for their own reasons.

Selene lived through the experience of the military coup of September 11, 1973, when she was only five years old. In 1976, she and her brother left on a voyage with their mother Nancy, a Spanish teacher, and their father Alfonso, the captain of a fishing boat. They sailed for 23 days to reach Mexico, where they sought asylum from the violence that took over their country. Because of this, for more than 15 years Selene and her family were listed by the Chilean government as people forbidden from entering Chile. At the age of seven, she was officially labeled a terrorist.

From 1976 to 1982, the family lived in different places in Mexico, including Acapulco, Mexico City, Guanajuato and Mexicali. While in Mexico, their boat was lost, and so was the family after a divorce. Selene and her brother ended up living with their father and in 1982 they

At the age of seven, she was officially labeled a terrorist.

came to the U.S. They arrived in Chula Vista, California, where Selene attended high school and started to work with her father selling pottery. Concurrently, she worked at Sea World, taking Polaroids of children posing with a guy wearing a whale costume.

In 1991, Selene transferred to the University of California at Berkeley. In 1992 she spent a year abroad living in Sao Paulo, Brazil. In 1994, she returned to UC Berkeley to pursue a master's degree and worked for a recycling program in the city of Oakland. She lived in Berkeley until 1998. Today Selene and her brother are U.S. citizens. Their father died a few years ago and their mother returned to Valdivia.

Roberto's family also was very affected by the dictatorship in Chile (1973–1990). Many of his relatives suffered the consequences of this brutal period.

His uncle Anselmo Raguileo, an important Mapuche leader, was savagely tortured in the main concentration camp at the National Stadium of Chile, and many other relatives and friends suffered torture, were exiled or came to the uncertain end of becoming "disappeared" at the hands of the police or the military. A cousin was detained, tortured and disappeared in Argentina. His father lost his job because he refused to collaborate with the dictatorship.

In junior high school, Roberto attended an industrial-technical school for the children of workers, Mapuches and other kids who were also, like Roberto, the children of public employees.

In 1977, Roberto started to work for a resistance organization. He was 17 years old and this coincided with his first year in college, where he studied music pedagogy. These were the clandestine years. Roberto learned to forget his name and to forget the faces of his friends. Showing affection to friends was a careless action that could lead to death.

During these times, to produce art or poetry, or to sing songs, became subversive acts and Roberto joined different cultural movements and bands. As a musician, he was a member of "Schwenke y Nilo," a group in Chile's New Song movement.

ILLUSTRATION BY BEVERLY SOASEY

As an artist, he held numerous individual and collective expositions and conferences about his art in Chile, Ecuador, England, Croatia, Germany and the United States. He developed an extensive body of work on the subject of human rights, most recently under the title "Amor Contra el Olvido (Love Against Forgetting)."

Showing affection to friends was a careless action that could lead to death.

Roberto has spent most of his life since the age of 13 working as a human rights activist and investigator. This has included the search for hundreds of disappeared detainees. He has participated as a consultant in a forensic anthropology team in five exhumations of the remains of people who were massacred during the military dictatorship.

Selene and Roberto met in Chile in 1997, when she was visiting her family. Roberto left Chile and came to the United States following his heart. They first lived in Salinas, California, where Selene worked—first in an organic agriculture program and then in a health research project—with small-farmer immigrants who came from diverse places in Mexico.

In 2003, Selene and Roberto moved to Eugene so that Roberto could start a PhD program at the UO, in Romance languages. Selene found work with Lane County, and works there today in the Public Health Department. Selene and Roberto have children and grandchildren in Chile. ■

THE AMERICAN DREAM

Patricia Cortez was born in El Salvador 45 years ago. Her family was not only extremely poor, but also caught in the political violence between insurgency groups and the government. On Patricia's father's side, aunts, uncles and cousins were "disappeared" and never found; one uncle was killed outright for refusing to move from his home.

Archbishop Oscar Romero's courageous stand to end oppression of the poor inspired Patricia, her older brother and two of her cousins to join his mission in the late 1970s. She and her brother were constantly harassed and in several cases beaten by military groups. Patricia's two cousins were later kidnapped, tortured and killed. Patricia's brother is one of a thousand who disappeared during those turbulent times.

More than once Patricia was detained and interrogated for hours because she was a student organizer. She was also subjected to sexual harassment. One officer's behavior so repulsed her that she spit on him. For that, she was kicked and beaten so badly that she ultimately became sterile.

While attending La Universidad National (National University), Patricia collected signatures to help support students' rights. One day she was informed by a classmate that the police were looking for her. While in hiding, she learned that the police had gone to her parents' home and beaten her father. The knowledge that her parents' lives, as well as her own, were in danger caused Patricia to leave El Salvador. Friends had called the United States "the American dream, the land of opportunities," leading Patricia to seek political asylum here. She arrived in Pasadena, California, in 1985. Two years later, she moved to the Mission District in San Francisco and lived there for 11 years, working in many minimum-wage jobs.

In 1997, Patricia moved to Eugene and returned to school. She was aware that usually she was the only Latina present, but believes her first impression was naïve. Later, she started to experience discrimination. One time, the occupants of a passing car threw a bowl of blackberries at her, screaming, "Go back to Mexico."

Patricia enjoys meeting all the hard-working activists of Eugene, and appreciates the collective effort to build community. She has observed an increase in the number of Latinos making their homes in Lane County.

She notes, "It is a mistake to think that all Latinos living in Eugene and Springfield are from Mexico. Immigrants of Latin heritage come from many different countries, including Ecuador, Honduras, Peru, El Salvador, Guatemala, Nicaragua, Costa Rica, Panama, Chile, Argentina, Colombia, Cuba and Puerto Rico."

Patricia Cortez has persevered. She has lived with her soul mate for 13 years, and in 2004 received her master's degree in social work from Portland State University. She is dedicating her life to helping Latino youth and their families. Patricia has never been able to return to El Salvador for fear of additional violence against her parents and herself. ■

Joy Ride

An English Professor Explores Why We Love Our Cars

Since childhood Gordon Sayre has been a car fanatic, a devotion that later in life has manifested itself as a rusty 1962 Volvo V1800 occupying his garage.

"It requires a lot of expertise and tools to restore these cars, and I don't have the time," he said, adding wistfully, "maybe some day."

With the rise of Critical Mass and other bicycle movements, cars are now regularly vilified for their association with greenhouse gases and global warming, and car lovers are finding the objects of their affection increasingly under assault.

That's in part why Sayre, a professor of English, created a class on car culture, which he'll teach for the first time this fall. He was awarded a Coleman-Guitteau Teaching Professorship through the Oregon Humanities Center, which he will use to fund the development and instruction of the class.

Sayre's previous research has focused on eco-criticism and depictions of American Indians in literature, and while this new direction has some direct lineage to his earlier work, he admits the class was also inspired by a desire to combine work with pleasure.

Though critics of car aficionados might accuse them of brainless consumerism and fetishizing a mass-produced product, Sayre believes Americans' relationships with their cars can be far more complex.

"We need to understand why we love cars and then we can channel that into something healthier," he said

At the beginning of the class, students will study readings from a collection of sociologists, geographers and critical theorists who examine how America's devotion to the car has reshaped its cities and the lives of those who drive them. Sayre also plans to use a provocative thought experiment from an anthropologist, which imagines an alien being's first observation of life on Earth.

"The alien notes that the planet is inhabited by strange creatures called cars, which are fed, serviced and attended to by slaves that create vast open spaces for cars to get around," he said. "The point of the exercise is to recognize that our lives are so based around cars, we rarely question it."

Students will then study the history of the automobile in America, and the last third of the class will send them out to conduct fieldwork within car-focused subcultures—from hot rod racers to Volkswagen van enthusiasts to even the homemade hippie buses often seen trundling through Eugene.

"There are really different approaches among the collectors, restorers and modifiers; they all have their little niches," he said.

Active Listening

Visions of American troops in Iraq and Afghanistan, getting pumped up for combat by listening to heavy metal and "gangsta" rap, have become pervasive in the media.

CREATIVE COMMONS PHOTO BY RANDY ROBERTSON CC BY 2.0

Marines recharge outside a Wendy's restaurant on Camp Pendleton.

Yet "the troops" isn't a homogeneous group, always in preparation to Rage Against the Machine. Their musical affinities are as diverse as the rest of the country's, says Lisa Gilman, associate professor of folklore and English.

While acknowledging that some troops do listen to such music to motivate themselves before going out on missions, Gilman hopes to dispel flawed perceptions that this is the only type of music being played and to illuminate why aggressive genres are especially attractive to some.

Troops listen to a variety of music on their iPods, radios and stereos—while hanging out in their barracks, in Humvees on patrol, or as they work out together, to name just a few scenarios.

Gilman takes up music as her subject of inquiry because of the importance it plays in the daily lives of troops. Listening to music is one of the primary ways many troops cope with the psychological and physical extremes they face in war zones.

In fact, while conducting interviews with vets from coast to coast, including UO students, she found that music was one of the few subjects related to their combat experience that many felt comfortable discussing and, indeed, wanted to discuss.

Gilman observes that enlisted troops, due to being at the bottom of the hierarchy, have a relatively muted voice. They often have little say over how they conduct their lives during deployment or how they express themselves. They are required to dress the same. They eat what is prepared for them. They do what they are told.

"But listening to music is active, not passive," Gilman said. "It allows them to

At some car shows, the emphasis might focus on restoration, recreating the car with a historically accurate attention to detail—from the paint job to the upholstery. But at other shows, the competition might hinge on souping up vintage cars with modern engines and big racing wheels.

"It'll be interesting to see what the students find in the field, because there are so many rules in these subcultures and sometimes they're really rigid," he said. "So why is that? Who decides what's good and what's bad?"

Through their investigations, the students will have to decide for themselves whether car culture represents an artistic and creative phenomenon or is simply a symptom of conspicuous consumerism.

"There are some researchers who compare some of this work to a modern art form, as if Jackson Pollack had chosen cars as his canvas," Sayre said. "A Marxist would say the commodity has taken control of these people, but, for many of them, the car is a way to express themselves." —MD

say, 'Here's who I am,' or to ask, 'Hey, what are you listening to?'"

In this way, music is a conduit for finding likeminded individuals and for bridging differences among troops.

And it's an outlet for dealing—or not having to deal—with the realities of their situation. Particularly while listening to music on iPods and other players designed for individual listening, troops can escape from the wars, even if it's only through part of a playlist. "Plugging in your earphones is a sign to others—'I want to be alone,'" Gilman said.

Gilman plans to conduct further interviews with vets and produce a documentary that, in part, will illuminate how troops also use and create music as a form of rebellion. —AC

PHOTO COURTESY OF BE THE CHANGE

UO student Lemuel Charley, a member of the original Telling: Eugene *cast, tells his story at a special Veteran's Day performance in Washington, D.C.*

Telling: The Movie

***Telling: Eugene*—a moving, honest, heart-wrenching play** based on veterans' stories and performed by veterans—will now make its film debut, as a documentary. The documentary will explore the making of *Telling* and how it came together on the UO campus.

Directed by UO theater professor John Schmor, *Telling: Eugene* was performed in February 2008 and featured veterans and their family members, including several UO student veterans. They took the stage to tell their personal stories about military service—predominantly in Iraq and Afghanistan—and the challenges of returning home.

The play was produced by The Telling Project (TTP), which works with local communities and organizations to bring veterans' stories to the stage. TTP was created by Jonathan Wei, who, while working as the UO Nontraditional Student Programs coordinator, recognized that many student vets wanted to talk about their experiences.

"What vets at the UO (and elsewhere) experience when they return from military service is, among other things, profound isolation," said Wei. "There's a need for veterans to connect in a personal way—with themselves, each other and their communities."

After that original performance in 2008, TTP leapt into the national spotlight with an invitation to perform in Washington D.C. before First Lady Michelle Obama and Second Lady Jill Biden, among other prominent political figures, on Veteran's Day 2009. Following the D.C. performance, TTP has been contacted by more than a dozen veterans' groups, individuals and other organizations interested in creating their own *Telling* plays.

The documentary, *In The Telling,* will recount the process of creating *Telling: Eugene.* It will include original footage from the veteran interviews on which the play was based, as well as rehearsal footage and a video of the play itself, plus interviews with Schmor, Wei and UO comparative literature doctoral candidate Max Rayneard, who coauthored the original play. The second part of the narrative will document how several members of the original cast have continued their transition from military to civilian life.

The documentary is set for release in early 2011. It will be partially funded and co-produced by the Oregon Humanities Center (OHC). Additional funding will come from private sources, including veterans' organizations and various foundations.

"The OHC has been a strong supporter of The Telling Project since its inception," said Julia Heydon, associate director of OHC. "Bearing witness to student veterans' stories is a deeply important way of supporting them and welcoming them back into the society they left behind when they went to war." —AC

Cinema Studies: The Perfect Storm

We float about with our camcorders at Christmas family gatherings. We watch the evening news. We click on videos accompanying online stories. We love YouTube.

"There's hardly a life that isn't touched by the moving image," said Kathleen Karlyn, professor of English, who was instrumental in the creation last year of a new cinema studies major.

The major has taken off like wildfire.

Last fall, roughly 30 students had expressed an interest in majoring in cinema studies once it officially began in the winter. By spring term, there were more than 100 declared majors.

"We far exceeded our expectations, and we'll take in as many students as we possibly can," Karlyn said.

Classes are drawn from an eclectic range of academic departments and challenge students to critically examine the role that the moving image—film, video, television and emerging digital forms—plays in our lives.

Karlyn, who is also the major's director, says it's the only program of its kind between the Bay Area and Vancouver, B.C. It is unique in that it introduces a production element within the context of the intellectual depth that a liberal arts education provides.

The major's creation comes at a time when the Oregon film industry is seeing significant growth, accounting for more than 4,000 jobs and output of more than half a billion dollars per year. And the bigger picture is the overall transformation

of moving-image industries across the globe, driven by technologies racing ahead in an increasingly connected world.

Let's Take This Show On the Road

The University Theatre ended its season last spring on a stellar note, with sold-out performances of *Annelie In the Depths of the Night*. And now the *Annelie* company has taken the show on the road, with performances for rural schools.

Annelie is based on a Dutch children's fable by Imme Dros. Wistful and poetic, the play explores the confusion of childhood and the messiness of real life, along with love and loss, fear and courage.

In September, *Annelie* will be performed for more than 20 elementary and middle schools across rural Oregon—from Enterprise in the Wallowas to Vernonia in the northwest "knob"—thanks to funding from the Jeannette Drew Foundation.

"It's rare for young kids in rural schools to have the opportunity to see stage plays," said *Annelie* director John Schmor, a UO theater arts professor. "There just aren't many theaters like there are in larger cities."

Schmor also cowrote the original music for the play with UO junior Jameson Taylor. Taylor was also musical director and choreographer.

Annelie was adapted for the stage by Jennifer Schlueter, UO assistant professor of theater. This was the first-ever American stage adaptation of the Dutch fable. For the rural tour, the script has been reworked into a 45-minute version.

In the imaginative tale, Annelie is staying with her grandmother because of problems her parents are having, though these remain unknown. She waits for her parents to return and copes with her family uncertainties by journeying into the depths of night, where she keeps company with characters such as the Moon and Mouseking. Along the way she meets tap-dancing mice, a greedy Frockwoman and a loveable hedgehog.

"Annelie is sifting through a very complex change in her life within this very beautiful and imaginative world she's created," said Schlueter.

It's a story that many children—and adults—can relate to, said Schmor. "You never lose those early years," he said. —AC

This interconnectedness is a central feature of the major, which has a strong international focus. The new program includes classes on media from around the world, including Japan, China, Russia, India and Latin America.

The major is a collaborative effort among the College of Arts and Sciences, the School of Journalism and Communication, the School of Architecture and Allied Arts and the UO Libraries.

"It's been the perfect storm of people collaborating on the major," said associate professor of English Michael Aronson, himself a key contributor to the creation of the major and the program's associate director. —AC

UO Film Festival Debuts

This past May the UO launched Cinema Pacific, an annual film festival that each year will feature films from Pacific Rim nations during the five-day event. This year's festival, organized by Richard Herskowitz of the UO Arts and Administration program, included a special focus on Korean cinema, in addition to films from Japan, Australia and the West Coast of the U.S.

Through the innovative use of new media, in addition to film screenings and art exhibitions, the festival is designed to foster dialogue and discussion among participants, industry professionals and the general public.

One of the featured events this year was the UO Adrenaline Film Project, which matched up 36 budding filmmakers, drawn from both the UO and the community, with movers and shakers in the industry to produce short films in just 72 hours.

Cinema Pacific is sponsored by the UO Arts and Administration Program and UO Academic Extension, with support from the cinema studies program, University Relations and the UO Erb Memorial Union Cultural Forum. —AC

Preserving Our Folk Culture Legacy

Native American artwork, traditional Latino dance, stories from Oregon loggers and fishermen—this is just some of the stuff from which folklife is made.

And now, with the creation of the Oregon Folklife Network (OFN)—whose hub will be located at the UO—the state's rich legacy of folk culture will be digitally documented and preserved in a central location accessible to all.

The OFN's activities will include:

- A survey of folk artists across the state
- A folk artist apprenticeship program
- A traveling exhibit of art produced through the apprenticeship program
- An interactive, online map that will guide viewers to information, photographs and video footage of folklife in locations across Oregon

One of the OFN's main functions will be the archiving of folklife materials, including the digitization of some materials that will then be available electronically. This digital archive will be one of only a few of its kind nationally.

The OFN will foster greater collaboration among researchers and folklorists, breathing new life into an area of the arts that is traditionally among the most underfunded, said Lisa Gilman, UO associate professor of English and folklore and director of the UO folklore program.

The formation of the OFN also underscores the UO's dedication to service. "One of the university's missions involves reaching out to underserved and underrepresented cultures and communities. Having the OFN here helps facilitate this," said Gilman. "It will also expand the university's collection of materials relating to Oregon immigrants, tribes and people from other cultural backgrounds."

The OFN's immediate predecessor was the Oregon Folklife Program, housed at the Oregon Historical Society. When this program closed in 2009 due to lack of funding—leaving no statewide organization responsible for folk art curation and programs—a group of stakeholders gathered to determine the future of public folklore programming in Oregon.

Together they decided that the UO would be the best place to establish a re-envisioned organization because of its strong academic infrastructure as well as the resources available through the Knight Library and the Randall V. Mills Archives of Northwest Folklore. The new name, Oregon Folklife Network, reflects a collaborative model, which brings together the UO, state arts agencies and arts, heritage and cultural nonprofits.

Gilman was one of the three principal figures at the university instrumental in establishing the OFN. She is joined by Doug Blandy, associate dean of the School of Architecture and Allied Arts, and James Fox, head of the UO Libraries Special Collections and the University Archives.

The Oregon Cultural Trust has made a $50,000 grant in support of the OFN, with additional external support from the Oregon Arts Commission. Internal UO funding comes from CAS, AAA, the UO Libraries, the Office of the Vice President for Research and Graduate Studies and the Office of the Senior Vice President and Provost. —AC and LR

A Diet to Help Us Fit Into Those Genes

Junk Food and Genetic Dispositions

Each of Darwin's finch species had a bill adapted to its diet, with short and long beaks allowing different finches to eat different parts of the prickly pear. But what if the crew of Darwin's ship, the *Beagle*, had introduced the birds to a nonnative diet like, say, CornNuts?

Josh Snodgrass, assistant professor of anthropology, is working on the hypothesis that the introduction of a novel diet can actually influence how we evolve. He's especially interested in how the modern human diet—based on industrialized food high in sugar, salt and fat—is meshing with our genes. His research is focusing on indigenous cultures that are relative newcomers to Fast Food Nation.

"People seem to think that once we stopped being hunter-gatherers and developed a more stable means of sustaining ourselves that evolution just stopped working on us," Snodgrass said. "But that's hardly the case."

Two cultures he has studied—the Shuar people in Ecuador's Amazon and the Yakut (Sakha) horse herders of Siberia—have only in the past decade started eschewing the traditional life and transitioning into a modern one, complete with a more Western diet. As evidence, Snodgrass shows photos of a grocery store from Siberia, where the people traditionally herded cattle and reindeer. The store's shelves are stocked with glossy packages of Cheetos, potato chips and Nestlé chocolate mix (left). On an adjacent shelf is a paltry collection of meager fruits and vegetables (right).

Snodgrass's ability to track these populations in real time as they have transitioned from one diet to another is starting to provide intriguing insights as to how the human diet intermingles with physiology and genetics.

"The Siberians seemed to have evolved to have a high metabolic rate to help deal with the extreme cold," he said. "But just in the last five years we've seen a drop in their metabolic rate, an increase in their obesity rate as well as preliminary indicators for diabetes."

Of course, the introduction of less healthy, nontraditional foods is happening in many places, but Snodgrass says there's evidence the medical effects vary from community to community, quite possibly because of genes. Something about the Siberians' genetic makeup, for example,

Christianity's Rise From Communism's Ashes

During the Communist era in Russia and China, religion was quite literally swept from public life.

What fascinates Karrie Koesel is just how quickly religion has resurfaced in the past two decades—even faiths such as Pentecostal Christianity that had only a small prerevolutionary presence in both countries.

"They had really wiped it away," said Koesel, an assistant professor of political science. "Synagogues, churches and temples were torn down or even converted into museums, grocery stores and swimming pools. Religion was considered a threat to the Communist mission, 'the opiate of the masses.'"

But religion was hardly eradicated. Instead it went underground.

While the end of Communism in Russia and the beginning of economic liberalization in China has hardly led to an eruption of "religiosity," it's fair to say there's been a slow, consistent resurgence. Russia in particular, even more determined than China to make a firm break from its Communist past, has dedicated state resources to rebuilding churches and mosques across the country.

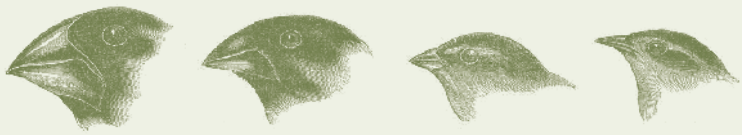
Pentacostalism has experienced surprising growth in recent decades.

For her doctoral work at Cornell University, Koesel spent 14 months in China and 10 months in Russia conducting fieldwork. She interviewed local government officials and organized religious groups, observing how the two interacted in countries where religious freedom is often unevenly applied.

"Most of the stories in the Western media focus on religious suppression," she said. "But what I found was unexpected. I found a lot of cooperation between religious and state actors."

Both countries are somewhat inconsistent in their policies, suppressing some religious groups while supporting others, and Koesel's research has focused on exploring what causes these differences. Sometimes all it takes for a religious group to gain recognition is a little back scratching.

In China and Russia, for instance, all religious groups have to be registered, which is an easy way for government to curb or encourage different faiths. In one Chinese community that Koesel observed,



seems to predispose them to hypertension and stroke with a more salt-rich and carb-heavy diet.

In Ecuador, the Shuar people had long lived as hunter-gatherers, hunting monkeys and foraging for other foods available in a land known for its prodigious biodiversity. Now many villagers are eating primarily rice, pasta and other carbohydrate-rich foods instead of their traditional high-protein diet. Snodgrass's research has found increasing levels of infectious diseases such as malaria and respiratory illnesses. However, other variables that result from development, such as deforestation and sanitation problems, may play as much a role as the diet.

Whatever the causes may be, Snodgrass hopes his research results will eventually be used by the local community to adopt healthier lifestyles. "In Ecuador, it could be as simple as making sure kids have eggs to eat or raising awareness about the importance of exercise," he said.

The task for Snodgrass is to take the mountain of data being collected through interviews and health clinic surveys and figure out how all these factors are interrelated. There are some scientists who wonder if perhaps returning to a Paleolithic diet would be the healthiest strategy for all of us, but Snodgrass is looking for simpler short-term solutions.

"Our focus is to understand what this dietary transition means to health and then advocate public policies that can make things better," he said. —MD

JOSH SNODGRASS

the local government viewed a particular Christian church as foreign-based superstition and refused to register them. But that changed when the church pooled its resources to help pave a road into town, a project the local authorities didn't have the money to fund.

"After that happened, the government posted a sign over the big main gates saying that Christians are welcome in the village," she said. "I saw a lot of instances of this type of collaboration."

For her next project, Koesel will be focusing on Pentecostal and charismatic Christians in Russia and China, religious communities that have experienced surprising growth in recent decades despite distrust by the governments. Pentecostals practice a charismatic brand of Christianity that emphasizes the role of the Holy Spirit in religious experience, which can manifest itself as speaking in tongues, faith healing and prophesy.

"In China the government is often suspicious of them at first because their services can be pretty intense," she said. "But the relationship tends to improve once they realize that Pentecostals don't have a political agenda. In fact, they're usually supportive of the state."

A relatively modern form of Christianity, Pentacostalism has been spreading widely across the globe, including China and Russia. Koesel is among 16 scholars from around the world recently awarded $3.5 million in grants to study this phenomenon. The project is being sponsored by the Center for Religion and Civic Culture at the University of Southern California and the John Templeton Foundation.

"Pentacostalism seems to draw a certain type of Christian. In Russia, it's a very young crowd of middle-class college students," she said. "In China, it should be interesting to learn more: Why are some turning away from Buddhism and leaning toward the charismatic churches?" —MD

Gender's No Man's Land

After her superlative performance in the 2009 World Championships, South African sprinter Caster Semenya was forced to undergo gender testing when competitors expressed doubt she was actually a woman. Semenya was exonerated, but the case had a familiar, accusatory tone, says Elizabeth Reis, professor of women's and gender studies. "There was a theme there of deception and fraud," she said.

The results of the sprinter's test were not made public, but Reis thinks the sprinter might have an intersex condition—a situation in which there is incongruity between a person's outward appearance and their genitals, hormones, chromosomes or internal reproductive anatomy.

About one in every 2,000 people is born intersexed, said Reis. In her recent book, *Bodies in Doubt: An American History of Intersex*, she traces the evolution of how intersex individuals have been perceived and treated by society and doctors from the 17th century to modern time.

In the 19th century, when records of intersex individuals became more prevalent, doctors were preoccupied with intersex individuals "deceiving" a same-sex person into intercourse, Reis said. The medical concern turned surgical in the 1950s, when doctors at Johns Hopkins began performing "corrective" surgeries on young intersexed infants. Many patients suffered later in life when they discovered the nature of the surgery, Reis said.

Although some intersex conditions can be considered true medical ailments, many only cause concern because the affected person's body doesn't fit into one of society's two discrete gender categories, she said. Now there is growing consensus that such surgical decisions should be left till later in the intersex person's life, when they can decide for themselves. "Many are saying these surgeries just bring more trouble down the line than they're worth," Reis said. —MD

Tea Party Aligns with Oregon's Anti-Tax Landscape

The Tea Party began as a fractious, anti-government grassroots movement, as reviled by pundits on the left as it was revered by certain commentators on the right.

But in this polarizing time, it appears the Tea Party, once considered to have little ideological coherence, is gaining enough force and focus to have a considerable effect on the polls come this November.

"The GOP is waking up and realizing it's time to take them seriously," said UO political science professor Joe Lowndes. "The Tea Party will definitely transform GOP messaging and tactics in a lot of states. Whether it helps Republicans win seats is another question."

Whatever the impact, it will vary from state to state, from city to city, Lowndes added, as a reflection of the varied influence and character of the movement around the country.

Lowndes's research has focused on American conservatism, and the Tea Party represents a new and unanticipated wrinkle. "The right has never taken to the streets before. This is historically novel," Lowndes said.

And that's not all that doesn't necessarily align with the historical narrative. "While they're harkening back to this mythical idea of what the original Boston Tea Party was about," Lowndes explained, "they're still somewhat inconsistent in their rhetoric."

Sandra Morgen, UO anthropology professor, and two graduate students, Jen Erickson and Patrick Hayden, have attended meetings and rallies since the Tea Party grabbed national headlines in 2009 when the media descended in droves upon its Tax Day events.

The researchers had already been collaborating on an ethnographic project focusing on tax activism in Oregon, and the Tea Party demonstrations were a boon to data collection but also a bit of a shock.

"We were used to going to any place where there was public discourse about taxes, but at the Tea Party rallies the anger was particularly intense, and the anti-tax messages were infused with rage against President Obama," Morgen said.

Since then, Morgen has been analyzing Tea Party blogs and websites in the context of the longer history of tax activism in Oregon. She says the Tea Party movement may be a new political player, but its message draws on older conservative ideas about taxes and government, as well as racially and class-coded messages about

CREATIVE COMMONS PHOTO BY SAGE ROSS CC BY-SA/2.0

who does and should benefit from public spending. "Hardworking" taxpayers are juxtaposed with "undeserving" recipients of government programs.

"The other side is then portrayed as comprised of greedy public employees, tax-and-spend liberals and welfare recipients who are leeching away the money," she said. "Somewhere they lost the notion that taxes help pay for common public goods like schools and public safety."

The ethos of the Tea Partiers can vary according to geography, and Morgen said she did sense a distinct Oregon identity.

"The strong libertarian core to the movement builds on the existing anti-

Revisiting Welfare Reform

Lynn Fujiwara has made it her mission to critique the long-term outcomes of 1990s welfare reform.

In her recent book, *Mothers without Citizenship: Asian Immigrant Families and the Consequences of Welfare Reform*, she chronicles the narratives of immigrants affected by the loss of welfare aid, many of whom felt the policy put their lives at risk.

At issue is the Personal Responsibility and Work Opportunity Act, passed under President Clinton in 1996. As part of the Republican Party's "Contract with America," the law reduced access to aid, required welfare recipients to work and instituted time limits on eligibility.

In addition, the bill aimed to stem the flow of illegal immigrants, whom conservative lawmakers believed were being lured across the border by an overly indulgent welfare system.

According to Fujiwara, an assistant professor of women's and gender studies, the welfare system was first instituted in the 1930s as a means to allow working, typically white mothers the opportunity to stay at home with their children.

"It was thought that mothers needed to be at home to raise good citizens. It was part of good nation-building," she explained. "But when President Johnson opened up welfare access to people of color in the 1960s, perceptions started to change."

As the dole became more diverse, welfare recipients came to be stereotyped as irresponsible single mothers, lazy immigrants and inveterate sluggards, Fujiwara says. But feminists argued that the real issue behind the "welfare trap" was a cycle of poverty—induced by a broken economic system that made it difficult for low-wage workers to survive—not a lack of personal responsibility (as the title of the 1996 legislation implies).

According to Fujiwara, these reforms were particularly damaging to the immigrant psyche because it made legions

tax landscape in Oregon," she said. "In Oregon, they have entered a political terrain well sown by organizations with deep pockets, funded by large corporations and some very wealthy conservative ideologues."

While the Tea Party has been criticized for lacking an identifiable ideology and sometimes displaying a loose grip on the facts while defending some of its positions, it appears the movement is starting to get its act together, said Lowndes.

When he attended the Tax Day rally last April, he noticed much of the racial rhetoric had dissipated and the focus centered clearly around an anti-tax, anti-regulation leitmotif. Recent surveys have also painted a clearer picture of the people involved with the Tea Party, he said: Mostly white, well-educated, middle- to upper-class citizens who are frustrated with the bailouts and government in general.

"This is not a working-class response, but a response by people who're feeling the loss of their privilege. And they're responding with a zealous attachment to individuality," he said. But it's a response, he said, somewhat at odds with America's fundamental symbolism.

"It's a bit paradoxical. They're embracing this political belief in liberty expressed through radical individualism," he said. "And yet they're draping themselves in the flags and the founding symbols that bind us together collectively." —MD

of immigrant families afraid to apply for aid to which they might rightfully be entitled.

In her book, Fujiwara weaves together her analysis of what she argues is a draconian policy along with heartfelt stories of the real-life immigrants she interviewed. "When they realized they were going to lose the aid that was keeping them afloat or providing the medical care they needed, they went into despair," she said.

For her next project, Fujiwara will be investigating what she sees as a similarly devastating law—the Illegal Immigration Reform and Immigrant Responsibility Act of 1996—which expanded the government's ability to deport illegals with criminal records. —MD

What a Real Healthcare Overhaul Would Look Like

The 2,500-page healthcare reform bill has been the subject of great debate since the president signed it into law last March.

The bill represents a vast overhaul of the medical insurance system in the U.S., but does not grapple with fundamental problems of healthcare costs that date back more than a century, according to James Mohr, UO professor of history.

The underlying fee-for-service system of health care was established in the 19th century, driven by basic principles of supply and demand, Mohr observes. Physicians recognized the advantage of having a self-regulated monopoly of the healing trade and, through professional licensing, they were able to restrict their own supply, thereby justifying an increase in costs to patients.

But the arrangement rested—and continues to rest—on a fundamental paradox: Physicians have a vested interest in people getting sick because they are paid to make people better and, generally speaking, the more expensive the treatment, the more the doctor makes.

"By the 1920s," Mohr said, "the high cost of seeing a doctor had already become a national problem."

Three congressional bills in the early 1900s aimed at reforming this system were struck down largely through the efforts of the well-organized American Medical Association (AMA). It viewed any form of government oversight as a threat to physician autonomy, not to mention physician salaries.

The fee-for-service system became even more expensive when large, for-profit medical corporations and medical supply companies became involved, leading to the advent of high-priced tests and costly procedures. But the use of these costly services by some have priced an increasing number of others out of the market.

Ironically, the system that originally evolved to protect physicians' interests has also eroded a good deal of the autonomy they once enjoyed.

"They are now up to their throats in bureaucratic paperwork, answering to several insurance companies at once in different ways, practicing defensive medicine, having no time to spend with patients and not being paid at all for service to poor patients," Mohr explained. "Moreover, many of them have been forced to join corporate practices simply to have a life. In short, many have lost the independence once associated with their profession."

As a result, "now you have a bizarre situation, where both the public and the doctors have become co-victims of a system that is spiraling out of control," Mohr said.

Because the recent healthcare overhaul legislation did not address these structural problems—in other words, did not challenge the basic incentives that feed rampant overtreatment and unnecessary expenses—it was not opposed by the AMA.

But Mohr sees some potential for optimism in the growing number of group practices where doctors are salaried and thus able to employ less expensive and more holistic approaches to patient care without affecting their income.

"I think doctors would welcome incentives to care for people according to demonstrated best practices, rather than thinking always about the bottom line," he said. —AC

So Much For the Rational Rationale

The Psychology of Economic Decision-Making

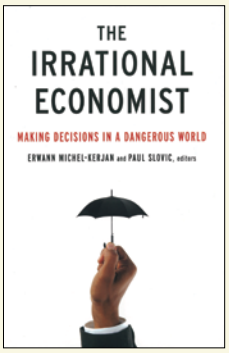
Before the financial meltdown and the subprime mortgage fiasco, the field of economics was enjoying an unparalleled time of mass consensus, according to Paul Krugman, the *New York Times* columnist and Nobel Prize-winning economist.

Seduced by their elegant math, most economists believed that market forces had been tamed, and those who had doubts still believed any hiccups could be corrected by the Federal Reserve.

Turns out they were extremely wrong.

A new anthology, *The Irrational Economist*, coedited by UO psychologist Paul Slovic, argues that economists' misjudgment of people is as much to blame for the downfall of the market as their misjudgment of the markets themselves.

"Economists have long held that those who participate in the market are rational because, if they weren't, the markets would take advantage of them, and they'd lose money," said Slovic. "But psychologically we know our feelings can breed bizarre things when it comes to decision making."

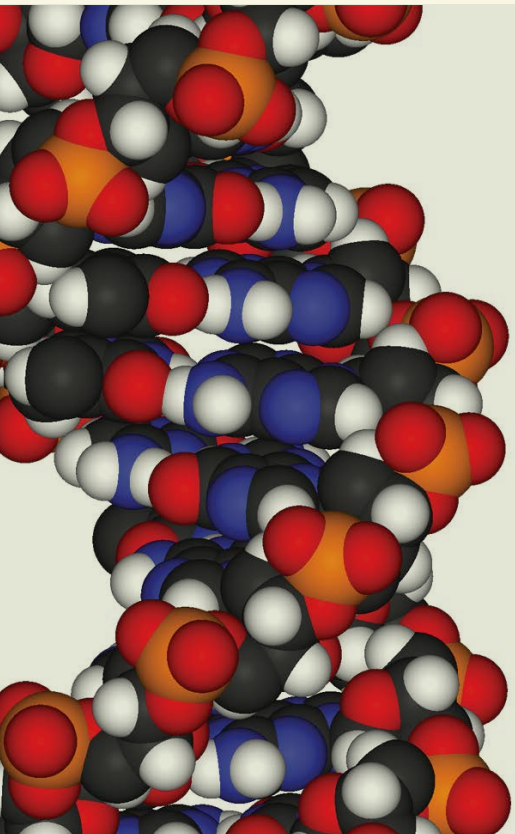


Believing that markets induce people to act rationally, economists have long ignored empirical studies by psychologists who have analyzed the idiosyncrasies of the human mind, he said. Slovic, for example, has famously examined why people muster far less sympathy for cases of genocide than for tragedies affecting a single person. In his chapter in the book, "The More Who Die, the Less We Care," Slovic explains why this is the case when it seems more rational to have more sympathy for larger body counts.

"Our brains just weren't designed to process crimes on that scale with such huge death tolls," he said. "This sort of nonrationality has been observed for decades, but until recently it's been ignored by economists."

The title of the book is thus not a bit of name calling but rather a description of the editors' vision of future economists: those who include the study of human decision-making in their evaluation of markets. The book is comprised of 30 chapters written by authors from around the globe who have studied and advocated for the blending of psychology and economics. Chapters range from the nitty-gritty "Neuroeconomics: Measuring Cognition and Brain Activity During Economic Decision Making" to the sociological "Superstition: A Common Irrationality?"

Psychologists' ideas about economics started to gain wider recognition in 2002 when Israeli psychologist Daniel Kahneman won the Nobel Prize for his work in behavioral economics, Slovic said. Since the financial crisis, it's only gained more momentum. "It's a real revolution that's about to happen," Slovic said. "Economics has to be informed by carefully observing behavior. You can't just understand markets by dreaming up assumptions about how humans behave." —MD



Speed Splicing

It's a large but rather inconspicuous box, tinted a cerulean blue and resembling something like a space-shuttle refrigerator.

But looks aren't everything when it comes to the UO biology department's high-tech $500,000 genome machine, which is capable of decoding DNA at a speed that was once unfathomable.

"You give it a little DNA and it'll give you a sequence," said UO biologist Eric Johnson. "The older machines used to read eight sequences at a time, and this one does 150 million at a time."

It's a technological leap forward that will accelerate our growing map of the world's genetic codes, from salmon to the tiny bacteria that dwell in our digestive tract, and will open the door to new and profound discoveries.

Whereas the Human Genome Project took nearly a decade, billions of dollars and dozens of scientists working in concert, now with the genomics machine, a single genome can be sequenced by a lone scientist in a few months at a fraction of the cost.

Johnson's work often involves sequencing chunks at thousands of strategic points on a particular DNA strand. He does this several times to get an accurate read, and while this doesn't reveal all the nuances, as would a full genome sequencing of the entire strand, it can be used to identify the species of a particular sample or even help fine-tune the outcomes of propagation.

"We have used it to help identify the species of a whale from some of its tissue,"

Nature's Masters of Disguise

TOBIAS POLICHA

Graduate student Tobias Policha has long had a dual love affair with plants and the open road. He satisfied both of these passions last spring and winter on a five-month stint in a remote cloud forest reserve in the Ecuadorian Andes, where he studied one of nature's most fascinating cases of deception.

The cloud forests in Ecuador are internationally famous for their stunningly diverse species of orchids, which thrive in the moist and balmy terrain. One of these flowers, the Dracula orchid (right), is the object of Policha's doctoral research.

The Dracula orchid apparently has adapted to its home by mimicking small native mushrooms. Not only do the lips of the flower visually resemble the fungi but the flowers also emit a scent that is chemically similar to the mushrooms'. Policha's hypothesis is that the Dracula orchid, and possibly other orchids, have evolved in this way to attract mushroom flies and thus increase their chances of pollination.

"Deceptive pollination strategies are quite common in the orchid family, but it's pretty unusual that they imitate a mushroom," he said. "But just because there's mimicry doesn't necessarily mean there's an evolutionary advantage."

To prove his theory, he and his research partners hiked through steep, muddy terrain several hours a day to reach the sites where both mushrooms and orchids flourish. Once there he collected a trove of data by spending hours observing how many flies visited particular orchids and fungi, collecting hundreds of specimens (600 mushrooms and 300 flies) and extracting fragrance samples that will allow him to analyze the odor of the flora.

He hopes to have analyzed all of this by the next field season in January. Preliminary results have shown distinct chemical similarities between at least one orchid and mushroom pair.

Policha also theorizes that the chemical makeup of the flowers attracts very specific visitors and pollinators, which could explain why many species persist within very strict boundaries.

The privately owned forest where he is conducting his research is a five-hour mule ride from the closest town. Known as La Reserva Los Cedros, it is home to innumerable species of birds and other fauna, including the critically endangered brown-headed spider monkey. Policha hopes that his work with the orchids will help validate the superlative uniqueness of the forest's biodiversity and keep it protected from mining and logging interests.

"You have to inspire people," he said. "And these orchids are unique and intriguing. Maybe with greater understanding they could be the poster flowers for conservation efforts." —MD

he said. "And we're helping a company breed plants that are more nutritious and drought resistant."

Assistant professor Bill Cresko's lab uses the machine to pinpoint the places on a DNA strand that are influenced by natural selection. In particular, he has been looking at the DNA of the threespine stickleback in an effort to understand how it evolves in new, adverse environments.

"Identifying the genetic basis of evolution is one of biology's holy grails, and it will help us understand, for example, how organisms will or won't adapt to global climate change," he said.

Other scientists are working on unraveling full genomes. Doctoral student Mike Miller, for instance, has received funding to sequence the genome of the steelhead and other salmonids, such as the Chinook and coho salmon. He believes his research can aid efforts to restore dwindling salmon populations.

"The hatchery fish are raised in a passive environment that selects for traits not conducive to surviving in the wild," he said. "With a sequenced genome, we can help select for the traits that'll keep the fish alive once they're released."

The machine slices up the DNA sample into a multitude of tiny pieces and analyzes each individual segment's chemical makeup. DNA consists of two strands that are woven together with four different proteins.

The protein maps of each DNA piece are then projected onto a small monitor as small dots, the resulting image resembling a milky gossamer mass.

It requires several terabytes of computer space to record and store all these images, and biologists like Johnson use databases and computer scripts to analyze the voluminous amounts of data.

"It spits out a bunch of complicated chunks," Johnson said. "It does this quickly but then you have to spend a lot of time putting it all together. The data are like the pieces to a jigsaw puzzle."

The companies that make the genome machines are quickly spawning next-generation machines every few years, much like Apple and its iPhones. Because of this rapid iteration, Johnson says he can envision a future when there will be personalized genome sequencing, biopsy sequencing and any untold number of uses.

"There are important ethical questions we'll have to answer as this develops," he said. "But the technology should also really increase our knowledge of how to treat illnesses that are hereditary with gene-based therapies." —MD

How the Brain Hears Silence

Say you're at a cocktail party with a friend, and the room is bustling with the bouncy noise of various conversations. Somehow your brain can siphon all that into a constant din and focus solely on what your friend is saying. "Not even the most sophisticated computer is capable of that," said UO psychologist Mike Wehr.

"Our brain has some special hardware dedicated to that task. And we think we have discovered a small part of it."

Wehr's research team recently discovered that sound is processed by two different neuron channels in the brain: one for processing when a sound appears and the other for when it goes silent. In other words, there are neurons in the brain solely designated for registering the disappearance of sound, a specialization of neuron labor that scientists hadn't previously known existed. "This is particularly important in understanding speech, because finding the beginning and ends of sounds is vital in chopping what's said into meaningful components," Wehr said.

Wehr believes the brain developed separate channels to more precisely differentiate the words in a conversation, which involves short sounds strung together with very brief pauses. It's probably less necessary for dual channels like these to process, say, an opera singer holding a long, high note.

Wehr and two undergraduates made the discovery by monitoring the activity of the neurons and synapses in the brains of rats, which they bombarded with millisecond bursts of digitally created tones. Outside stimulation can excite neurons and make them "fire," as Wehr puts it, or it can inhibit the neurons from reacting. When Wehr noticed certain neurons involved with hearing were only doing one or the other, it made him think there might be separate channels.

Eye-Catching Art

Clay Kent sat down and rested his chin in a little brace that was at the end of a three-foot-long pole. At the other end was a computer monitor displaying a grid of sparkling green dots.

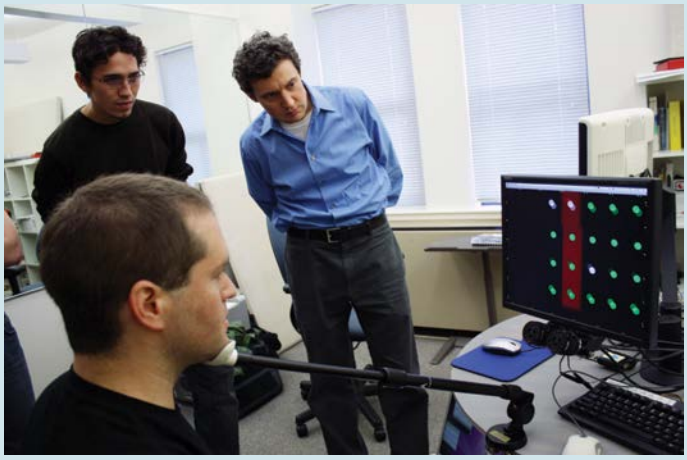
Though he looked like he might have been undergoing some kind of *Clockwork Orange*-style brainwashing, Kent, an undergraduate in digital arts, was actually creating music.

The restraint was meant to keep his head in position for the sensitive eye-tracker technology, which used a pair of infrared cameras to monitor Kent's eye movements. The grid he was viewing was actually a tone matrix, each dot representing a different variation of preprogrammed melodies.

As Kent moved his gaze from dot to dot, the matrix moved accordingly, and a pleasing, variegated harmony of chimes suffused the room.

"I designed this thinking a guitarist could at some point create accompanying music just by moving his eyes," he said. "Of course, the eye tracking would have to be more sophisticated, but it could work."

Kent designed his program as one of several students in associate professor Anthony Hornof's eye tracking class, a computer and information science course that was opened to digital arts students for the first time last spring.



MARC DADIGAN

Undergraduate Clay Kent (seated) demonstrates his "eye music" program for digital arts instructor John Park (left) and computer science professor Anthony Hornof.

With eye tracking, Hornof sees the opportunity to explore the confluence of art and technology, a chance to dabble in the poetry of science. "Science and art can't progress simply through rational thought," he said. "There needs to be intuition, emotion and feeling that guides decisions."

The revolutionary eye tracking technology has been around since the late 1990s but there's recently been a surge in research and experimentation with it, Hornof said. Primarily, it's been seen as a technology that could benefit the profoundly disabled, people whose movements and ability to communicate might be so restricted that their eyes represent one of the few active ways they can interact with their environment.

One of Hornof's experiments was called EyeDraw, an innovative and intuitive program in which users can use their eyes to create art by placing "stamps" of animal shapes and lines on a blank computer canvas.

After a year of collecting data from the rats, he concluded that sound enters the ear, separates along two channels in the brain and then meets up at the auditory cortex, where the sound's meaning is deciphered.

"The next step will be to test different parts of the pathway that sound takes through the brain, closer to the auditory cortex," he said. "Down the road, I could foresee this line of research improving hearing aids that would accentuate discrete sounds with digital technology."

These improved aids would sharpen the "edge" of sounds, the visual equivalent of drawing thick outlines around the shapes of a fuzzy image. —MD

Mike Wehr will be among dozens of UO researchers whose labs will be located in the new Lewis Integrative Science Building, slated for completion in 2012. The facility will be home to a wide spectrum of brain research initiatives as well as green nanotechnology and solar energy. Visit ***iSci.uoregon.edu*** *for more details.*

"Eye tracking could be used in schools for speech language pathologists or to help kids with motor impairments to better communicate," he said. "We're still finding new ways to use eye movements as we analyze them in real time."

In collaboration with doctoral music student Troy Rogers, Hornof has created a more sophisticated version of Kent's project, in which sound is also tied to a user's eye movements. The wrinkle is that there is sometimes a conflict between a user's desire to use his or her eyes to see something and the desire to create an appropriate sound.

And as anyone who has attempted to manipulate Kent's tone matrix can tell you, it's an unusual experience to consciously control your own eye movements when you're so used to moving them instinctively.

"It's a really interesting way to approach a work of art," said Brendan Veale, another undergraduate digital arts student. "But it's a strange feeling, manipulating things with your eyes." —MD

Is Newberry Likely to Erupt?

GEORGE SLAD

The internal lives of volcanoes are still an unrelenting enigma for scientists. Their interior structures, the ways that magma systems operate, the factors leading to eruptions—all are fertile grounds for research.

And there are few peaks of more interest than Newberry Volcano, located 20 miles outside Bend, which some believe could possibly erupt. It has also been considered a site for controversial geothermal power extraction since the 1980s.

Emilie Hooft, an assistant professor of geological sciences, is determined to see beyond Newberry's rocky veneer and to understand just where magma lies within the volcano.

It was long thought that magma was stored in large brimming reservoirs far beneath the surface, but recent research suggests magma is far more diffuse, often located in small subterranean fissures and pockets, Hooft said.

"Part of the project is to figure out where the magma is located and that will tell us if Bend needs to worry about another eruption," she said. "Newberry last erupted 1,300 years ago, which, geologically speaking, is very recent."

To do this, she's trying to expand and hone an old technology, seismic tomography, which uses sound energy waves to see inside volcanoes almost like a CAT scan looks inside a human being. At Newberry, Hooft and her team used timed explosions at eighteen different points near the volcano and measured the speed of the resulting waves as they passed through the peak.

The more solid and strong the rock, the faster the waves travel, while loose rock, rubble or magma causes waves to travel more slowly.

The waves are actually too big to pick up small areas of loose rock—or slow blobs as Hooft refers to them. After hitting the slow blobs, the distorted waves reform and "heal" themselves as they travel further away, obscuring the data. But successful detection of these areas is vital to gaining a complete picture of the volcano's internal workings.

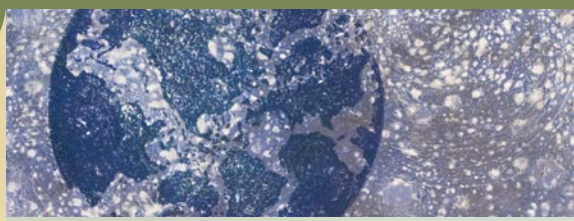
To address these problems, Hooft is working to perfect a new method, examining the data from the fainter and muddier—but potentially more telling—secondary waves.

"Imagine ripples in a pond reaching the edge and then bouncing back across," she said. "That's what secondary waves are like."

These waves are sensitive enough to pick up smaller geological anomalies within the volcano. However, because they're traveling across the volcano while the "pond" is still full of ripples, it can be harder to trace their trajectory, Hooft said. To extricate these secondary waves requires that mountains of data be collected and analyzed.

Hooft believes all this data crunching will pay off, and that secondary waves, once perfected, could provide a clear window to any volcano's magma system.

"At some point, we could go to any volcano to figure out if there's magma down there and if it's a hazard," she said. "We could figure out why different volcanoes behave so differently." —MD



What Can You Do With a Degree in the Humanities?

When Steve Jobs introduced the latest iPhone last June, he made a statement that points straight to the value of the liberal arts—and especially the humanities—in the 21st century.

"We're not just a tech company," said Jobs, "even though we invent some of the highest technology products in the industry. It's the marriage of that plus the humanities or the liberal arts that distinguishes Apple."

We would agree with Jobs that entrepreneurial, innovative thinking is exactly the kind fostered by an education that emphasizes not only the mastery of specific subject matter but also the ability to synthesize ideas, analyze alternatives and effectively express and support a line of reasoning. As scholar Dan Edelstein stated in a recent issue of *Liberal Education* magazine, "The entire reward system of the humanities . . . favors those students who either make a convincing case for an unusual argument, or an unusual case for a convincing argument."

As the pace of technological change—and societal change at large—continues to accelerate, intellectual flexibility and resourcefulness will only increase in value. Many young people will enter careers that did not exist when they were undergraduates. Others will carve out career paths that uniquely express their interests and abilities. Here are snapshot profiles of several CAS alumni who have forged their own way with a degree in the humanities.

Secret Agent Man

James Angell '81

BA English

As an undergraduate, the study of literature and anthropology suffused James Angell with a wanderlust that took him from New Zealand and Europe to Southeast Asia.

"It was as if the learning process never stopped when I traveled," he said. "I would go to famous archaeological sites like Angkor Wat, and just delve into the culture, the history and language of wherever I went."

Although Angell long assumed he'd become a professor, his love for travel eventually led to becoming "sidetracked" by a government career abroad.

He works for the U.S. State Department as a diplomatic security officer in Frankfurt, Germany, where he runs an office of about 50 American employees with top-secret clearances.

"I'm basically entrusted with the secure delivery of classified materials to U.S. embassies and consulates in some 100 different countries," he explained.

He's been stationed in Germany for two years. Since joining the Foreign Service in 1993, he and his family have also lived in South Korea and Bangkok, Thailand.

At the UO, Angell majored in English, focusing on American and Russian literature, but initially found work as an archaeologist in the Bay Area after graduation.

He finished a master's degree in English at San Francisco State and planned to continue on with a doctorate. But he was looking for better pay and some extra passport stamps and decided to apply for the Foreign Service.

Though he's lived and worked abroad for several years, his interest in literature hasn't subsided. His writing has appeared in several publications, including *Foreign Service Journal*, and he sated his academic appetite by teaching composition and 100-level English for the University of Maryland's University College in Bangkok

"I've always toyed with going back and teaching in the states," he said. "But I'm happy with the path I've chosen and the places it's taken me."

A Life Worth Living

Skye Fitzgerald '97

MFA, Theater Arts

When Portland filmmaker Skye Fitzgerald learned of impoverished Cambodians risking their lives to dismantle bombs so they could sell the leftovers to scrap-metal dealers, he knew he couldn't stand by silently.

In 2005, he founded SpinFilm (www.spinfilm.org) to help raise awareness—and hopefully influence public opinion—for human rights issues such as this."I find I am often motivated by individuals and specific, concrete injustices," he said.

After securing a Fulbright grant to study these Cambodian "village munitions harvesters," he produced the documentary, *Bombhunters*. The U.S. Department of State has credited the film with influencing legislation in Cambodia that has led to a 50 percent drop in munitions harvester casualties.

While shooting the film, Fitzgerald met a Cambodian woman who was publicly attacked by a group of men who doused her with nitric acid, leaving her permanently disfigured. Her story inspired Fitzgerald to produce the award-winning documentary, *Finding Face*. The film has enhanced awareness about the increasing prevalence of violent acid attacks.

Fitzgerald's latest project, *Peace Commandos*, traces the efforts of organizations that work to disarm militant societies. The documentary focuses on the Democratic Republic of Congo, where 4.5 million people have died within the last ten years as a result of armed conflict. According to Fitzgerald, it is one of the most underreported humanitarian crises in the world.

Fitzgerald is fond of quoting a mentor's observation: "A liberal arts education is not designed to learn how to make a living, but how to make a life worth living."

"Seeing how I have helped positively influence others' lives through filmmaking is my ultimate reward," he said.

Did Not Plan to Be a Planner

Shanda Pettibone '02

BA, English

The saying, "everything's bigger in Texas," rings particularly true for Shanda Pettibone.

At 32, Pettibone is already at the top of her game as a pro sports event planner in the Lone Star State, having built a fast-rising career coordinating large-scale events. Currently, she's working on the 25th anniversary "Taste of the NFL" fundraiser for the 2011 Super Bowl.

But this was not a career that was on her radar in college. "It is the ultimate irony for someone who plans events: that the one area I didn't plan for has become my life's work," she said.

Having grown up in a sports family—her father is Jerry Pettibone, former head football coach at Oregon State University—sports have always been an integral part of her life. In fact, Shanda was recruited by the University of Oklahoma to play soccer before a career-ending injury. After transferring to the UO, her passion for literature and writing led her to the English department.

"Knowing how to communicate effectively through the written word is the lynchpin for everything I do," she said.

Her responsibilities range from booking events to coordinating all logistical elements (budgeting, staging, security) to cultivating local and national media. She has planned events for the Dallas Cowboys, San Antonio Spurs and Denver Broncos, as well as the 2008 Men's Senior Open and concerts for the likes of AC/DC and Miley Cyrus.

"I credit the UO for encouraging me to think outside the box, for challenging me to do my utmost every day and for believing that it really doesn't ever rain in Autzen Stadium," she said.

Cracking the Code

Holly Rasmussen '88

BA, Romance Languages and Political Science

Sometimes the word "grammar" can elicit not-so-fond memories of diagramming sentences in high school English class.

But for Holly Rasmussen, who has gone from studying Spanish and French at the UO to working as a software engineer, grammar is key to understanding not only natural languages, but artificial ones, too.

"Natural and artificial languages are much more similar than many people realize," she said. Both have units of meaning and rules for manipulating and arranging those units to achieve a communications goal.

But it has hardly been a straightforward path from one language domain to the next. Like many humanities graduates, Rasmussen is a "lifelong learner" whose professional and academic career has taken many unforeseen turns.

After graduating from the UO, she began graduate work in political science at Portland State University (PSU). During this time, she began working at a law firm, where she became fascinated by the power of computers and the Internet.

So she shifted her graduate studies, "returning to my roots in languages from my studies at the UO," she said. "Only this time I studied artificial languages."

She earned an MS in computer science at PSU, by which time she was working at Intel, which led to her current position at US Bank. Professionally, she develops software for ATMs; on the side, she develops iPhone and iPad applications for children.

The most important skills she honed at the UO were analytical thinking and the ability to consider alternatives—both of which she credits with helping her "think outside the box" in terms of career options.

Lessons from Russia

Greg Sautter, '93

BA, Russian

As an assistant city attorney in Minneapolis, Greg Sautter defends and sues on behalf of his city on a wide range of cases. But to do so, he has to understand his city. And as Minneapolis's population grows increasingly diverse, this requires an ability to connect with people from other cultures.

Sautter developed that knack, he says, as an undergraduate when he studied abroad in Russia. He later went to law school at Georgetown, but his experiences as an expat remain seared in his mind.

"When you're in a society that isn't yours, you develop an empathy and understanding for what's foreign around you in your own society," he said.

In 1992, Sautter, who was also a cadet in the UO's Army ROTC program, studied abroad at St. Petersburg State University where he bunked in a dorm with a Russian veteran who had fought in the Soviet war in Afghanistan. Sautter learned from his new friend about the traumatic experiences many Russian soldiers suffered, including abuse at the hands of their comrades, whose hazing of younger soldiers was often violent and cruel.

Fascinated by these stories, Sautter eventually focused his Honors College thesis on the experience of Soviet-Afghan war veterans, analyzing the folk songs and poetry the soldiers shared with each other.

Spurred by his Russian experience, Sautter continued to travel abroad during his military career, working as an Army judge advocate in Korea, Germany and Kosovo. He traveled to Kosovo to defend soldiers who'd been accused of crimes, but found himself one of the few Americans able to connect with the Serbs, who could understand his Russian.

"NATO had just kicked them out of their homeland, so they were suspicious of Americans," he said. "It was neat to gain their trust. It was those kind of experiences that have influenced me ever since."

Profiles by Anne Conaway and Marc Dadigan

But Wait, There's More—Online

Visit the Cascade website—cascade.uoregon.edu—for online extras.

TELL US YOUR STORY: Apple chair Steve Jobs attributes his company's success to the inspiration of the liberal arts—what about you? How has your liberal arts education influenced your personal and professional life? Follow the links to both the iPad and iPhone 4 intros, where Jobs makes these claims, and tell us what you think (read the story, page 26).

LEARN MORE ABOUT THE SAFER NANOMATERIALS AND NANOMANUFACTURING INITIATIVE. Find out more about the merger of green chemistry and nanoscience, and how scientists are striving to "get it right from the beginning." Learn more, too, about the Green Product Design Network, the GEMS database and the Green Chemistry Education Network (read the story, page 4).

HEAR WHAT TWO IRAQ WAR VETERANS HAVE TO SAY ABOUT THE MUSIC THEY LISTENED TO WHILE DEPLOYED. The interviews, conducted by folklore professor Lisa Gilman, reveal that some troops do indeed listen to rap or heavy metal before and after missions, but many also decompressed with balladeers like Norah Jones (left) or Frank Sinatra (read the story, page 14).

WATCH THE SPECIAL VETERANS DAY WASHINGTON, D.C., PERFORMANCE OF *TELLING*. UO students and former students took the stage for this high-intensity performance, directed by theater arts professor John Schmor. The cast and crew were personally acknowledged backstage by Michelle Obama (read the story, page 15).

READ AN EXCERPT FROM *THE IRRATIONAL ECONOMIST*. How does our reaction (or lack thereof) to genocide in Darfur relate to the stock market collapse? Download the essay, "The More Who Die, The Less We Care," by UO psychologist Paul Slovic to learn about the phenomenon of psychophysical numbing (read the story, page 22).

MARVEL AT DIGITAL ART PROJECTS PRODUCED BY EYE MOVEMENTS. Students in Anthony Hornof's eye-tracking software class have produced works that are literally eye-catching, using software that tracks the viewer's eye movements to manipulate images and sound (read the story, page 24).

FOLLOW US ON FACEBOOK. The UO College of Arts and Sciences now has an easy-to-find Facebook address: facebook.com/UOCAS. We invite you to follow us by clicking on the "like" button on our page.

Photo credits: Steve Jobs—Creative Commons photo by gizmodo, CC BY-ND/2.0/DEED.EN. Norah Jones—Creative Commons photo by Giggs Huang, CC BY-ND/2.0/DEED.EN

College of Arts and Sciences—Did You Know?

The College of Arts and Sciences is the academic heart of the University of Oregon. It provides a nucleus of liberal arts studies through degree programs in humanities, social sciences and natural sciences.

CAS enrollment. **12,406**

Undergraduate degrees awarded in 2009. . . . . **2,524**

Graduate degrees awarded in 2009 . . . . . **331**

Percent of UO undergraduate degrees awarded by CAS **66%**

Percent of UO PhD degrees awarded by CAS. **67%**

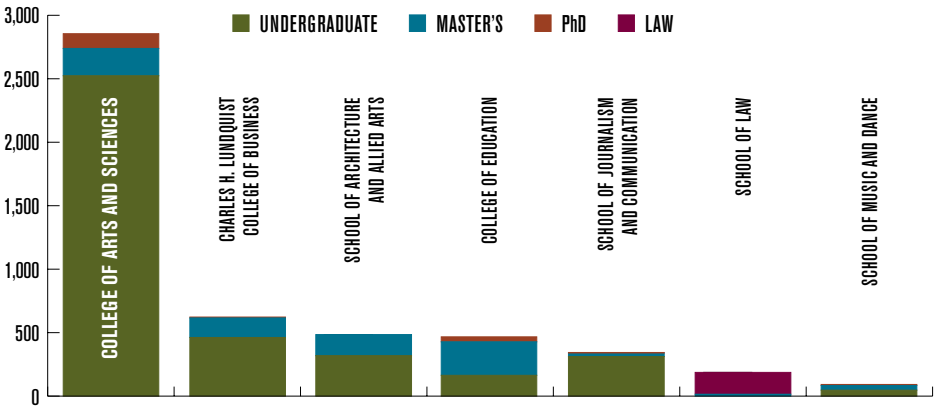
Number of living alumni **88,331**

Number of faculty members. **526**

Number of academic departments and interdisciplinary programs **40**

Number of degree programs **50**

UO Degrees by Academic Unit, 2009



Ten Most Popular Majors in the College of Arts and Sciences

1. Psychology
2. Political science
3. Biology
4. Human physiology
5. Sociology
6. Economics
7. English
8. History
9. Environmental studies
10. Spanish

Faculty Honors and Awards

Current and emeritus faculty members

- **33** Guggenheim Fellows
- **29** Fellows of the American Association for the Advancement of Science
- **15** National Science Foundation Career Awards
- **8** American Academy of Arts and Sciences Members
- **5** National Academy of Sciences Members
- **1** MacArthur Fellow
- **1** National Medal of Science

CAS Degrees

(Excluding certificates, minors, and specializations)

- Anthropology BA, BS, MA, MS, PHD
- Applied physics MS
- Asian studies BA, MA
- Biochemistry BA, BS
- Biology BA, BS, MA, MS, PHD
- Chemistry BA, BS, MA, MS, PHD
- Chinese BA
- Cinema studies BA
- Classics BA, MA
- Comparative literature BA, MA, PHD
- Computer and information science BA, BS, MA MS, PHD
- Creative writing MFA
- East Asian languages and literatures MA, PHD
- Economics BA, BS, MA, MS, PHD
- English BA, MA, PHD
- Environmental science BA, BS
- Environmental studies BA, BS, MA, MS
- Environmental sciences, studies, and policy PHD
- Ethnic studies BA, BS
- Folklore MA, MS
- French BA, MA
- General science BA, BS
- General social science (PROPOSED) BA, BS
- Geography BA, BS, MA, MS, PHD
- Geological sciences BA, BS, MA, MS, PHD
- German BA, MA, PHD
- History BA, BS, MA, PHD
- Humanities BA
- Human physiology BA, BS, MS, PHD
- Independent study BA
- International studies BA, BS, MA
- Italian BA, MA
- Japanese BA
- Judaic studies BA
- Latin American studies BA
- Linguistics BA, MA, PHD
- Marine biology BA, BS
- Mathematics BA, BS, MA, MS, PHD
- Mathematics and computer science BA, BS
- Medieval studies BA
- Philosophy BA, BS, MA, PHD
- Physics BA, BS, MA, MS, PHD
- Political science BA, BS, MA, MS, PHD
- Psychology BA, BS, MA, MS, PHD
- Religious studies BA, BS
- Romance languages BA, MA, PHD
- Russian and East European studies BA, MA
- Sociology BA, BS, MA, MS, PHD
- Spanish BA, MA
- Theater arts BA, BS, MA, MS, MFA, PHD
- Women's and gender studies BA, BS

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