

FALL 2016

acumen

The magazine of Lehigh University's College of Arts and Sciences

I Rise

Sew Jewish

Modeling Carbon

Unmatched Fortitude



CROSSING
ACADEMIC
BOUNDARIES

LEHIGH UNIVERSITY | COLLEGE OF
ARTS & SCIENCES



UP FRONT

- 01 MESSAGE FROM THE DEAN**
Learning Across the Curriculum
- 02 THE ARTS**
Quilting as Art ... I Rise ... The Chairs
- 04 THE HUMANITIES**
The Afterlives of Rape ... La Frontera ... Sew Jewish ... Philosophical Method
- 06 THE NATURAL SCIENCES**
Zebrafish and Vascular Disease ... Modeling Carbon ... Exploring the Perfect Fluid
- 08 THE SOCIAL SCIENCES**
Unmatched Fortitude ... Social Anxiety ... The Taboo of Depression

FEATURES

- 10 LINKING HEALTH, MEDICINE AND SOCIETY**
Sociologist Kelly Austin is leading a growing program that explores the intersections of health and society
- 12 CREATING A HUB FOR INTERDISCIPLINARY ACTIVITY**
College offers students and faculty avenues to work with a broad array of knowledge suited to approaching complex problems
- 16 SEIZING OPPORTUNITIES TO DO GOOD**
Carrie Rich '07 sees a world filled with opportunities and possibilities
- 18 THE SUSTAINABLE USE OF WATER**
Michael Quesada '16G examines the history and policies behind the use of Colorado River
- 20 KEEPING ZOELLNER IN THE SPOTLIGHT**
Ollie Foucek keeps a passion for the arts growing at Lehigh
- 22 GHANA INTERNSHIPS**
Subhead goes here
- 24 BROKEN COURAGE**
Jenna Pastorini '17 examines a trauma-based cultural syndrome in Cambodia

acumen

CONTRIBUTORS

EDITOR
Robert Nichols

CAS ADVISORY BOARD
Donald E. Hall, *dean*
Diane Hyland, Jackie Krasas,
Garth Isaak, Dominic Packer,
Cameron Wesson, *associate deans*

GRAPHIC DESIGNER
Kayley LeFaiver

CONTRIBUTING WRITERS
Jack Croft
Leslie Feldman
Geoff Gehman '89 M.A.
Abby Johnson '16
Jennifer Marangos
Robert Nichols
Manasee Wagh

PHOTOGRAPHERS
Douglas Benedict
Christa Neu
Kristofer Dan-Bergman

Acumen is published twice a year by the College of Arts and Sciences at Lehigh University.

COLLEGE OF ARTS AND SCIENCES
Lehigh University
9 West Packer Avenue
Bethlehem, PA 18015
www.cas.lehigh.edu

READER FEEDBACK:
Please send comments to:
acumen@lehigh.edu

© 2016 Lehigh University.

facebook.com/CAS_Lehigh

twitter.com/Lehigh_CAS

COVER IMAGE: CHRISTA NEU

PAUL LACHINE/THEISFOT.COM, DOUGLAS BENEDICT

Message from the Dean



Learning Across the Curriculum

This issue examines the impact of interdisciplinary education in the College of Arts and Sciences

Welcome to the fall semester and latest edition of *Acumen*. As this issue developed I was again excited and proud of the research and creative work taking place within the College of Arts and Sciences. The college remains a lively center of learning, and students are exposed to a wide variety of scholarship through talented, energized faculty.

Student interest in Interdisciplinary education is growing at Lehigh and the college continues to promote curricula and programs that cross traditional academic boundaries. Interdisciplinary work requires students and faculty to work with a broad array of knowledge suited to complex global problems. Many of us graduated from college with degrees from traditional academic departments, but interdisciplinary education recognizes that many of today's social, cultural, and economic challenges require that we reach for creative solutions that approach problems from numerous perspectives. Students and faculty find that interdisciplinary studies require them to stretch beyond their comfort zones and exercise flexibility in thinking through the application of a multiplicity of methods and theoretical traditions. The College of Arts and Sciences has 20 interdisciplinary programs in areas as diverse as health, medicine, and society, Africana studies, cognitive science, sustainable development, and Asian studies. Through interdisciplinary studies, students:

- Discover the value of integrating the study of various academic disciplines suited to their life-long interests;
- Become interdisciplinary thinkers who analytically and creatively embrace new ideas;
- Develop collaborative abilities while working with others who have different perspectives; and
- prepare for graduate and professional study, and for careers in new and emerging fields.

These are the characteristics that help us face the compelling issues of our day. In the following pages you will discover a sampling of the work taking place throughout the college. Sociologist Kelly Austin is leading the health, medicine, and

society program, which examines the connections between health and society. Michael Quesada '16G explores the politics and policies driving water use of the Colorado River as part of the environmental policy design program, while undergraduate student Jenna Pastorini studies a trauma-based cultural syndrome in Cambodia as part of the cognitive science program. Alumna Carrie Rich '07 took her science, technology, and society degree and parlayed it into a company accelerating the leadership development of entrepreneurs across the globe.

Interdisciplinary programs at Lehigh helps students fuse many ideas and characteristics, and they leave campus with practical skills that are immediately applicable in the workplace. I am continually motivated and strengthened by the faculty, staff and students within the college who are committed to



interdisciplinary learning. I invite you to learn more about how alumni can play a role in these types of programs. As Lehigh alumni, you can help shape the future of today's, and tomorrow's, students.

I look forward to hearing your thoughts and comments.

Donald E. Hall
Herbert and Ann Siegel Dean

ART

Quilting as Art

Quilting has a centuries-old tradition. People in nearly every part of the world have used padded fabrics for clothing and bedding. The quilt, as we know it in America, was originally a utilitarian article, born of the necessity to provide warm covers for beds. Quilting is also an art form being explored by artist Anna Chupa.

Chupa, associate professor and chair of art, architecture and design, uses a longarm quilting machine to create works inspired by Islamic architecture. She designs whole cloth quilts, where a single piece of fabric is used for the top layer, and the key decorative element is likely to be the pattern of stitching. Chupa typically produces works measuring approximately 25 inches by 36 inches.

"Instead of the traditional pieced quilt, I create whole cloth quilts from my textile designs," says Chupa. "I can use the automated process with stitchery I have designed so that every step of the process, from the fabric to the quilting, is my design."

Her tiling designs are inspired by building tiles found in southern Spain. From photographs she takes of architecture, flowers and foliage, she extracts object details and montages them into still life compositions, embedding them into tiles found in Islamic building design. Still life pattern groupings are set into the tiles, which are then arranged in a composition that is bilaterally symmetrical, but nonperiodic. Her designs reinforce lines of symmetry as a kind of interface design and define fivefold symmetries as the patterns unfold, Chupa adds.

"I take the tiles, which are flat color, and I fill the tiles with the



Anna Chupa couches a quilt using a longarm quilting machine. Her works extract object details and montages them into still life compositions.

patterns, then fill an area by digitally piecing together many tiles, producing a whole cloth quilt."

At close viewing distances, the floral forms are visible and distinct, but they dissolve into the broader context of geometric pattern at more typical viewing distances, consistent with the aesthetic of dematerialization in Islamic architecture. These tiles are created using graphic design software. Chupa then uses Art and Stitch software, which enables her

to convert these graphic elements into stitches. At that point, the stitching can be automated by the computer on the longarm machine. The machine can be used for either hand-guided or computer-guided quilting and is powerful enough to pierce the thick, sandwiched rolls of fabric backing, batting and quilt tops as the quilt is being stitched. The machine head is mounted on a 12-foot table with take-up rollers for the rest of the fabric, and Chupa moves the sewing head across the fabric.

The longarm allows her to "paint" with thread and sequins and

utilize a technique called couching. Couching gives a quilt texture by using a stitch that allows fibers to be added onto the surface of the quilt. The result is a dense surface that resembles embroidery.

Chupa sees her creative work transferring to the classroom. She envisions offering a textile course stemming from her work in the quilting studio.

"I think there's great potential to offer something that is interdisciplinary and would bring in students from other departments like theatre. We've never offered a textile course, and it will be exciting to expose students to this art form."

MUSIC

I Rise

In celebration of the 10th anniversary of *Dolce*, the Lehigh women's choral ensemble, and the 45th anniversary of women at Lehigh, the music department has commissioned a new choral work to be premiered Nov. 4 and 5 at the opening concert of the 2016-17 season in Baker Hall at Zoellner Arts Center.

Sun Min Lee, Robert Cutler Professor of Practice in the department of music and director of *Dolce*,

has commissioned Los Angeles composer Reena Esmail to create a new work: *I Rise: Women in Song*.

Supported by funding from Ronald Ulrich '67, the 20-minute work will be sung by the women of three music department ensembles—Choral Union, the University Choir and *Dolce*—under the direction of Lee.

Lee worked with Steven Sametz, artistic director of Lehigh University Choral Arts, to create a list of possible composers nationally who might be approached to create the new celebratory work.

"We interviewed many candidates, but Reena Esmail really understood why we were doing this, the music, the women's spirit in the work and the words," says Lee. "We had a good, common-sense discussion about making a new work together."

Esmail is known for composing richly melodic works. A graduate of Juilliard and Yale School of Music, and a 2011-12 Fulbright grantee to India, Esmail's work draws elements from both Western and Hindustani classical music. Her works have received honors from the American Academy of Arts and Letters and the American Society of Composers, Authors and Publishers and have been performed internationally.

Lee selected the texts of the new works, focusing on American women writers. She chose Eleanor Roosevelt, Maya Angelou and Emily Dickinson. Additionally, Arlene Geller, a Bucks County poet, wrote a commissioned poem for the work. Lee sent the texts on to Esmail and provided suggestions regarding structure and tone of the piece. From those discussions, Esmail proposed an outline for a new work in five movements for 160 women singers and an orchestra.

"I'm very excited to bring her work to Lehigh," says Lee. "She's a young, brilliant composer whose work has been performed at major venues throughout the world. We

had several conversations about the tone of the work. I wanted something that would be inspirational to the women at Lehigh. I am in my fourth year now teaching at Lehigh, and I so enjoy making music with the phenomenal women of Lehigh, so I thought this would be a great opportunity to celebrate and feature them in this new work."

Also on the program, titled *Rise Up!*, will be a work by Sametz, called *Doth Love Exist*, for the men of Choral Arts. In keeping with the inspirational theme, the program concludes with *Sunrise Mass* by renowned



Dolce, Lehigh University's women's choral ensemble.

New York composer Ola Gjeilo.

"Zoellner is a place where we continually support the creation of new music," says Sametz. "Either through our summer Choral Composers Forum, where composers from all over the country create new works, or presentation of faculty and student works or in the commissioning of contemporary composers premiering at Lehigh, our singers are part of the creative process. I'm thrilled that Reena Esmail is writing a new work for our women and that she, and Ola Gjeilo, will both be coming to Lehigh to work with our students and the community members who sing as part of Lehigh Choral Arts. So our singers will be

working with the three composers 'live' as they prepare the works for the opening concert of the season."

Performance times and tickets are available at www.zoellnerartscenter.org.

THEATRE

The Chairs

As part of the Philadelphia FringeArts Festival, the Idiopathic Ridiculopathy Consortium (IRC) presented Eugene Ionesco's classic *The Chairs*, Sept. 6-25 at Walnut Street Theater, with costume designs by Erica Hoelscher.

Ionesco's one-act play involves an elderly couple living in a light-house. The man has a message for the world and has invited everyone to come hear it. Many guests arrive, invisible to the audience, but with whom the couple has conversations.

"There are many layers to this play," says Hoelscher, professor and chair of theatre. "It brings in aspects of our contemporary world, particularly the difficulty we have connecting with one another. As is common in absurdist plays, these characters are abysmal failures at communicating, yet in a very tender way, what they don't say conveys meaning to the audience and strikes a universal chord."

With just three main characters, the script presented Hoelscher with costuming challenges. Design choices had to be made with a specific intent in mind, she says. "Everything has to

be perfectly fitting; nothing can be there because 'it'll do.'"

The production is a revival of a staging the IRC presented 10 years ago. "*The Chairs* really put the IRC on the map," says Hoelscher. "It was

the initial production that got the IRC a lot of attention. In recognition of this, it was remounted for the Fringe Festival."

Now in its 20th year, the FringeArts Festival is one of Philadelphia's signature fall arts events with progressive performances from artists across the globe. It features hundreds of dance, theater, visual art, music and spoken-word performances in traditional venues, but also on street corners, cars, galleries, cabarets and restaurants. The festival's performances and complementary events span a wide range of genres, often pushing limits beyond traditional artistic boundaries.

For this production, the set was repurposed to a new space.

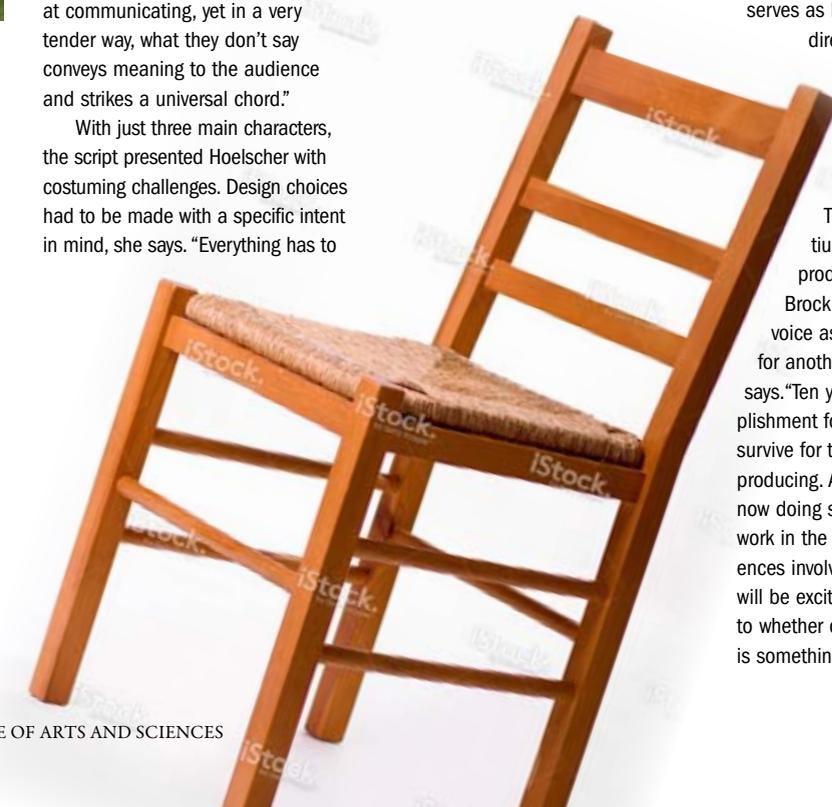
The original performances were held at Society Hill Playhouse. The original designer was brought back to make it work in the Walnut Street space, and Hoelscher designed a revised version of costumes for the play. The costumes were created in tandem with the actors' interpretations of the characters in rehearsal workshops and design meetings.

"The idea is there's a seamless integration and a process of discovery made based on experimentation with what you have available," says Hoelscher. "The process works for this play because there are only three actors, all very familiar with the absurdist genre."

Not only was Hoelscher the costume designer, but she also serves as IRC's associate artistic director, a role she assumed in 2015. Hoelscher has designed IRC productions since 2010 and has worked on many plays with Tina Brock, the consortium's co-founder and producing artistic director. Brock wanted to bring a new voice as the IRC envisions itself for another 10 years, Hoelscher says. "Ten years is a huge accomplishment for a small company—to survive for that long and be actively producing. And they're expanding, now doing staged readings, more work in the community to get audiences involved. The next few years will be exciting. It will be telling as to whether our work pans out and is something we can continue."



The Idiopathic Ridiculopathy Consortium performed at the Philadelphia FringeArts Festival.



ENGLISH

The Afterlives of Rape

Rape scenes appear in many medieval texts, from the works of Geoffrey Chaucer to less well-known texts like saints' lives and the legendary histories, legal documents and spiritual biographies. Despite the prevalence of rape scenes in these works, however, rape survivors are comparatively infrequent. Rape victims disappear from legal documents that adjudicate the violent act; virgin saints miraculously escape certain rape to suffer martyrdom instead; women commit suicide to prove their chastity; and medieval women's own, unmediated accounts of sexual violence and its meanings in their lives are vanishingly rare in the written record.

'Legend of Good Women' by Geoffrey Chaucer



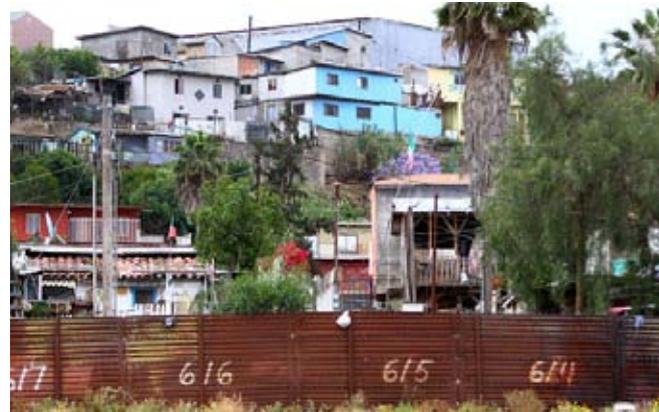
In her new book, *The Afterlives of Rape in Medieval English Literature*, Suzanne Edwards, associate professor of English and director of Lehigh's Humanities Center, investigates how medieval English literary culture from the 12th through the 15th centuries represents women's survival of sexual violence.

Despite the gaps in the written record, Edwards identifies a robust literary tradition of survival in works written in collaboration with, addressed to and read by women. For example, St. Augustine writes to rape victims after the sack of Rome, urging them to regard survival, rather than suicide, as a mark of virtue. Discourses of survival in works like Augustine's *City of God* outline language and concepts that medieval women who suffered sexual violence could use to make sense of their experience.

In the 12th and 13th centuries, letters of spiritual instruction addressed to religious women cast the survival of sexual violence as a form of redemptive sacrifice akin to Christ's passion.

This underexplored literary history of survival, Edwards contends, is an important counterbalance to the history of rape because it foregrounds women's experiences and the cultural resources available to make sense of life after sexual assault. In her book, Edwards argues that these medieval representations of survival are deeply engaged with ethical questions about the will, embodiment and community obligations to those who have suffered traumatic violence that go beyond punishing rapists.

"These medieval discourses of survival are important in the 21st century because they have an enduring legacy in contemporary conversations about rape and its aftermaths," Edwards says. "Thus, they can help us to reflect more critically on the ways that we think about survivors of sexual violence and our responsibilities to them today."



The fence dividing Tijuana, Mexico from San Diego, California.

MODERN LANGUAGES

La Frontera

The San Diego/Tijuana border is known as one of the busiest crossings in the world. Many have declared it to be a quintessential illustration of sociocultural hybridity. Yet, it is also said to have a great disparity of income between one side and the other. These observations and the ways that the border is represented by Mexican authors who challenge the stereotypes placed upon this region of the world are the focus of research by Miguel Pillado.

Pillado, assistant professor of Spanish in the department of modern languages and literatures, analyzes the work of four writers from Tijuana, how they represent the city and how their discourse about border identity differs from Mexican-American writers.

The author of the upcoming book *La Ciudad de Una y Mil Caras*, roughly translated to *The City of a Thousand and One Faces*, he examines the works of four authors he

terms *fronterizo* writers—Federico Campbell, Luis Humberto Crosthwhite, Rosina Conde and Heriberto Yépez. Each writer brings to his or her work a different view of life in Tijuana and a unique perspective of its cultural and social panorama, he says. Each creates a literary piece that shows the city from a different perspective. Yet, together they demonstrate

that Tijuana has problems such as social and economic inequality, issues that can be translated to any other large city in the world.

"We're talking about images being produced, both in Mexico and the United States, of Tijuana as a city of vice or Tijuana as a city of transit, where migrants pass to get to the United States," he says. "There is a more recent metaphor to talk about this city, and that is to talk about Tijuana as a cultural hybrid entity, an emblem of the postmodern world."

"[The writers] portray life in the community, yet they also create this identity of life on the border. And this identity they have as Mexicans living in Tijuana is very different to Mexican-American writers living just across the border. The border identity created by Mexican-Americans has become a hegemonic metaphor, but we need to take into account what is being said on the Mexican side of the border."

RELIGION STUDIES

Sew Jewish

For many people, the process of quilt making is a practical exercise, ultimately to provide warmth from the cold. But the creative process can also have spiritual connections, and Jodi Eichler-Levine has embarked on an interdisciplinary project that explores how quilting, crafting, creative writing, music and other generative parts of life are deeply interwoven with Jewish women's ethnic and religious experiences.

As part of a book project, titled *Crafting Judaism: American Jewish Women and Creativity*, Eichler-Levine is conducting interviews and participant observations nationally with Jewish women. Associate professor of religion studies and the Philip and Muriel Berman Chair of Jewish Civilization, she began to examine the subjects after discovering a large number of books about quilts and Jewish women while writing her first book, which addressed uses of the past in children's literature. She learned about the Pomegranate Guild of Judaic Needlework, whose mission is to pass needlework traditions to other generations of women and men through the sharing of knowledge and techniques needed to create handcrafted items intended for both Jewish ritual and cultural use.

Eichler-Levine is also conducting an online survey that has netted hundreds of responses internationally.

"What I'm seeing is this explosion of women wanting to talk about their creative experience," she says. "Rather than focusing on doctrinal matters, for example, of theology or Jewish law, people are doing kind of a DIY religion. The coalescence of Jewish feminism since the 1970s and broader American trends toward



Eichler-Levine sees a wave of women wanting to talk about their creative experiences.

topics such as crafting and food blogs have all created this era where making things beautiful coincides with a moment in Jewish feminism."

A large percentage of Jews are not affiliated formally with a particular synagogue or official religious movement, she notes. "That's where the future of the American Jewish community lies, not necessarily in congregational spaces, but in more informal kinds of networks. I'm finding that, with a lot of women, this work is done through informal networks of other crafters, or knitting groups, or at home writing. It's a very big part of their spiritual lives. It's important that we look outside major institutions if we are to get a strong grasp of what's happening on the ground."

PHILOSOPHY

Philosophical Method

Scottish Enlightenment figure David Hume is best known as a moral philosopher and political economist. He argued that politics and law were the formal representations of social conventions or practices created by repeated human interactions that acquired obligation because of their social utility. The true essence of international law as a product of human practical reason is the focus of

research for John Martin Gillroy.

Gillroy, professor of philosophy, is working on a three-book project to illuminate the essential qualities of the origin, persistence and future course of international law by applying what he calls the "Philosophical Policy" of pre-positivist philosophers—in this case, Hume, G.W.F. Hegel and Immanuel Kant. The author of *An Evolutionary Paradigm for International Law: Philosophical Method, David Hume & the Essence of Sovereignty*, Gillroy employs a philosophical methodology that is a combination of his own work and that of 20th century philosopher R.G. Collingwood, who wrote that when we study humanity, we need to employ different assumptions than scientific methods as they apply to nature. Overall, the three-stage argument notes that practical reason evolves in law from Justice-As-Utility (Hume) to Justice-As-Right (Hegel) to Justice-As-Duty (Kant).

Gillroy, who is also the founding director of Lehigh's environmental policy design program, says, "I like to use Enlightenment philosophers because they didn't start out wanting to specifically figure out international law, but who we are as people, how we act collectively and what role law and public affairs play in our lives. They sought complete logical arguments about human consciousness in the law."

For an origin story about contemporary international law, Gillroy concluded that Hume's approach, beginning with unconscious human passions and the rule of social convention and resulting in an international rule of law stabilized by Justice-As-Sovereignty best explained the genesis of law within the international system.

Gillroy is currently working on the second segment of his project:

The Assent of Public Order Principles in International Law: Philosophical Method, G.W.F. Hegel & Legal Right Through Recognition. Here he argues that the current dilemmas between the sovereign process of cooperation and the demands of independent principle, like that in questions of human rights, will benefit from Hegel's effort to make human freedom a core element of law.

"If we want change, we need to understand not just what international law is but what created it and how it evolves. This is what my work is about."



David Hume's writings are the focus of research for John Martin Gillroy.



BIOLOGICAL SCIENCES

Zebrafish and Vascular Disease

The tiny zebrafish is important to biological researchers. It shares 70 percent of our genetic code, is transparent, can repair its own organs and regrow lost fins. For professors Kathryn Iovine and Linda Lowe-Krentz, the fish might prove to be a chief ally in the investigation of vascular disease.

As part of a collaborative project, Iovine, associate professor of cell and molecular biology, and Lowe-Krentz, professor of biochemistry, are exploring the involvement of a heparin receptor in the vasculature of zebrafish.

Lowe-Krentz's lab is focusing on an improved understanding of the mechanisms by which heparin alters the physiology of endothelial and vascular smooth muscle cells. Her team studies signaling events in vascular cells that occur in response

to heparin treatment. Iovine's team is interested in how the bones that comprise the zebrafish fin skeleton achieve the correct size. To examine this problem, they explore the regeneration of zebrafish fins.

The project was inspired by hallway chats as Lowe-Krentz, whose work normally focuses on cell lines, was looking for an appropriate animal model. Heparin is an extracellular carbohydrate, a class of molecules that has interested Lowe-Krentz for a long time. Heparin is an anticoagulant (blood thinner) that prevents the formation of blood clots. The drug is used to treat and prevent blood clots in the veins, arteries or lungs. Less studied is the fact that heparin

also alters wound repair and inflammation in blood vessels, and heparin is used in treatment of burn victims where excessive inflammation in damaged lungs can be deadly. The zebrafish is

a widely used model organism for studying vertebrate development. One of its major advantages is the almost complete transparency of the embryos, which allows researchers to look at individual cells during development. The zebrafish is also responsive to genetics due to its relatively short generation time, typically two to three months. These two features make this organism well suited for expressing green fluorescent protein (GFP) or other fluorescent proteins using transgenic techniques.

The zebrafish is a nice system to do this because it's easy to monitor the vasculature in transgenic fish that have GFP, which labels all of the blood vessels, says Iovine. Using zebrafish allows researchers to see the blood vessels, which are easily visible in the fins.

"This is exciting because it's something that is kind of new for me in that we're starting to look at the role of other extracellular carbohydrates in regulating skeletal growth," she adds. "Because of the direction our research is going, showing that extracellular proteins and extracellular carbohydrates are contributing to controlling skeletal growth and patterning, I've become more interested in these kinds of carbohydrates."

"Linda and I have been talking a lot about what they could be doing and what role they could be playing in the way cells communicate with one another. She was thinking about bringing her work into an animal model, and it only seemed natural that we think about fish. We're doing methods I normally would do studying gene function in the fish, but we're applying it to the vasculature of the fish."

EARTH AND ENVIRONMENTAL SCIENCES

Modeling Carbon

For years, scientists have known that human activities that burn fossil fuels like coal and oil are pumping carbon dioxide (CO₂) into the atmosphere much faster than it is removed by natural processes. The concentration of CO₂ accumulation in the atmosphere is one of the reasons why average global temperatures have been climbing over the last few decades. A newly developed model developed by Benjamin Felzer examines the full carbon accounting in North America from large-scale land use changes starting in the 1700s inception of human-induced land to present.

Felzer, associate professor of earth and environmental sciences, examined the human and natural disturbances on carbon in the United States since 1700. He

Clearing land on the American Frontier, 1841



DOUGLAS BENEDETT, TO COME

looked at the transformation of the land to agriculture—both crop and pasture lands—and timber harvests. He also explored the impact of tropical storms, hurricanes and fire. Felzer modeled these disturbances to determine how these changes affect carbon dynamics as a result of regrowth and decomposition and whether the carbon lost from the inception of major human disturbance has yet been regained.

Ecosystems that are carbon sources release CO₂ (by means of respiration and decomposition), while carbon sinks absorb more CO₂ (by photosynthesis) than they release. Vegetation, soils and the atmosphere all store carbon, and this carbon moves between them in a continuous cycle. This constant movement of carbon means that forests act as sources or sinks at different times.

"If you go out today and you take measurements of these carbon fluxes in our forests, you'll find the U.S. is a pretty strong sink, and that's because forests are recovering

from past disturbances," says Felzer. "The question is, if you go back to when human disturbance started, have we recovered all the carbon lost since the disturbance started? The answer, from a modeling approach, is no. The biggest effect clearly was land use change."

If a forest fire occurs, fire burns up carbon and carbon dioxide goes up into the atmosphere. Eventually, the forest regrows and will recover the lost carbon. With storms, much of the material stays on the ground, where it will eventually decompose. Over time, things balance.

"But with agriculture, you clear land, grow the product, then

get it to market. The conversion to agriculture itself results in the immediate release of CO₂ to the atmosphere if the vegetation is burned," he adds. "Timber harvests contribute to carbon dioxide levels in the atmosphere, as some timber is burned off as fuel and some is left to decompose over the span of several years or decades."

Felzer's work suggests that these disturbances have led to a net release of carbon dioxide, even though the United States is a large carbon sink because of regrowth of new forest and removal of material that is no longer present to decompose. The model implies that the large carbon sink is primarily due to forests regrowing from past land use and land cover changes and from fertilized crop lands. Yet, in spite of the current positive carbon sink, the United States has not yet recovered carbon lost since the inception of major human disturbances.

"The data shows we're a fairly strong carbon sink, especially in the forests. But it's not in the mature forests because these forests are pretty carbon neutral or small sinks—they're generally taking in as much as they're giving off—and the data reinforces what we've known: We can only get to be a strong sink if we get the past disturbances and land use history right."

PHYSICS

Exploring the perfect fluid

For a few millionths of a second, shortly after the Big Bang, the universe was filled with an incredibly hot, dense liquid comprised of particles moving at near light speed. This mixture was dominated by quarks—fundamental bits of matter—and by gluons, carriers of the force that normally "glue" quarks together into familiar protons and neutrons and other species. A quark-gluon plasma occurs when the temperature is so

high that individual protons and neutrons comprising atoms melt, and this event is the focus of research by high energy physicist Rosi Reed.

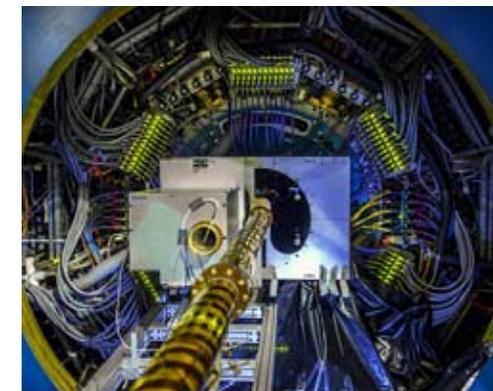
As part of an international research collaboration, Reed and colleagues at the Solenoidal Tracker detector at the Relativistic Heavy Ion Collider, in Long Island, NY, smash together heavy ions with a large amount of mass, such as gold or lead, at nearly the speed of light. The resulting collision releases energy, creating a miniscule fireball and creating a quark gluon plasma.

"The big question is how do you measure this thing?" says Reed, assistant professor of physics. "How do you learn anything about it at all, because when the collision happens, the matter exists for such an extremely short amount of time, then it explodes because it's expanding and cooling? It cools enough to where it becomes normal particles, which we can measure with detectors."

The quark-gluon plasma behaves more like a perfect fluid with small viscosity than like a gas. When two ions collide, two of their constituent nucleons sometimes collide with great energy, producing a high-energy quark or gluon. The quark or gluon will travel through the plasma, and lose energy due to interactions with the plasma. Reed studies these so called "hard probes", created in a collision of particles by nature via the strong force but moving so fast and with so much energy that they are often not completely absorbed by the surrounding quarks and gluons in the plasma. She measures the differences between heavy ion collisions versus normal proton-proton collisions, which allows scientists to learn about the strong force (Quantum

Chromodynamics), one of the four fundamental forces of nature.

Using the detector requires that each participating institution donate time and service to the collaboration. As part of this arrangement, Reed



The Solenoidal Tracker detector at Relativistic Heavy Ion Collider.

spends two weeks annually at the collider for shifts, and other time to work on building detector upgrades.

"Having a dedicated U.S. collider is something I should utilize fully, given that I can drive there from Bethlehem," she says. "It makes the experience that much better and I can easily take Lehigh students to the collider. We took a field trip recently and the students were able to go in and see the detectors. They learn these theoretical things in class and it's nice to see it happening in real life. I've also taken research assistants with me. It's good for them to see the work actually taking place."

High energy physics is a young field, but Reed's work has application in understanding what happened in the creation of the universe.

"If we wind back the universe, it gets hotter and denser as we go back in time. At some point in the universe's history this temperature was so high that electrons were no longer held in their orbitals, no longer neutrons and protons but quarks were unconstrained. It's really very cool to be studying something so very basic to the way the universe works."

HISTORY

Unmatched Fortitude

When Kwame Essien looks at a map of the Atlantic Ocean, his eyes are drawn to a point near the equator where the vast ocean begins to narrow like an hourglass and the continents of Africa and South America make their closest approach.

Only 1,600 miles, Essien notes, separates the edge of West Africa from Brazil. From the 16th century through much of the 19th century, countless ships crossed the Atlantic carrying people who had been captured in West Africa to the New World, there to plant and harvest crops or to toil in mines. During this time, 10 to 15 million Africans were enslaved in the Western Hemisphere, nearly five million of them in Brazil.

Essien, an assistant professor of history and Africana studies, tells the story of these pilgrims and their descendants in his book, *Brazilian-African Diaspora in Ghana: The Tabom, Slavery, Dissonance of Memory, Identity and Locating Home*. The book examines “the complexities of reverse migrations and imagining a distant ancestry over the Atlantic waters, as well as the challenge of reclaiming a ‘lost’ heritage.” The book also explores what Essien calls the “unmatched fortitude” of modern-day descendants of the early migrants, now living in Ghana, as they attempt to locate the homes in Brazil where their ancestors lived.

Other books have been written about the migration of former slaves from the New World



became the second Brazilian chief (leader of the Brazilian diaspora) in Accra, Ghana’s capital. Ferku, a freed Brazilian slave, settled in Lagos, Nigeria, moved to Accra and then crisscrossed the Atlantic before dying in Lagos in the 1930s, leaving behind an estranged wife and an unsettled land dispute. Georgina T. Woode, the current chief justice of Ghana’s Supreme Court, made a pilgrimage to her ancestors’ home in Brazil in 2011. George Aruna Nelson, grandson of João Antonio Nelson, died in 2009 at the age of 93.

“The story of the Brazilian-African diaspora in Ghana is so complex,” says Essien, “that I simplified it by

writing only about the families for whom I could find court records and other documents.”

In his book, Essien includes photos he obtained from government and family records. Most notable is a black-and-white photo on the title page of a 19th-century sailing ship. The boat is moving across the water, Essien says, offering symbolic promise to the African slaves in Brazil.

“The migrants put their trust in whoever was steering the ship to take them to the place that might be their home. The ship was the point connecting the known and the unknown. Not everyone knew where they were going, but everyone knew they had to go on, they had to leave Brazil. If they got on the ship, they might find their home.

“There were no guarantees they would find their home. Even after they made it to Africa, there was no guarantee that being there would ensure their freedom. So the boat represented a risk that people took because there was no guarantee of freedom at all in Brazil.”

PSYCHOLOGY

Social Anxiety

Social anxiety, the fear of interacting with other people that brings on self-consciousness and feelings of being negatively judged and evaluated, leads to feelings of inadequacy, inferiority, embarrassment and depression. This fear of being evaluated negatively by other people is the focus of recent work by cognitive neuroscientist Nancy Carlisle.

Carlisle, assistant professor of psychology, focuses on the processes of attention and working memory. Working with researchers at Oklahoma State University, Carlisle studied how attention and working memory of faces are altered in people with social anxieties.

Scientists know that face recognition occurs quickly, within 170 milliseconds of seeing a face. Interpretations about others are often based on facial processing—whether the person is smiling or frowning, approving or disapproving. This interpretation influences the way we relate to others around us. In a study of 40 participants, Carlisle and her colleagues measured brain responses to faces briefly presented on a computer screen. The faces either had a neutral or disgust expression. Participants needed to remember four faces for a memory test approximately five seconds later. The researchers were most interested in how the brain responses for those with social anxiety would differ from those without anxiety.

Carlisle and her team found that socially anxious individuals were more likely to devote their attention to faces expressing disgust. They were also more likely to keep the disgust faces in working memory. These effects occurred even though both disgust and neutral faces were equally important for the task. By measuring the attention and memory responses directly



from the brain, the researchers could show that these biases were present beginning around 200 milliseconds after participants viewed the faces. In contrast, individuals without social anxiety did not show evidence of preferential attention and memory to disgust faces.

“We’re definitely tapping into something that is difficult to pinpoint using behavior alone,” Carlisle says. “The brains of individuals with social anxieties seem to have biases that emerge very early on in processing faces, and this change in focus happens even when there is no reason to attend to the negative faces. This suggests that people with social anxiety experience the world in a different way and that the focus on negative expressions is outside of their control.”

Cognitive theories of social anxiety disorder suggest that biased attention plays a key role in maintaining symptoms. These biases include self-focus and attention to socially threatening stimuli. Carlisle’s work suggests these anxiety issues are shifting the early stages in which people process faces. This is a good example of how studying basic cognitive processes like attention and working memory

can inform our understanding of complicated disorders, says Carlisle.

“If a person’s brain is more tuned to stimuli that are negative, and that’s what they attend to and remember, it’s easy to see how that would reinforce issues of anxiety. If you see a crowd full of people, but your visual system pulls out the one that is negative, that will shift your perspective on the world.”

SOCIOLOGY

The Taboo of Depression

Discrepancies exist between how some African-American populations perceive depression and how depression is theorized within research and clinical settings. African-Americans are less likely to express depression and anxiety than people who are white, and these mental health issues are at the center of research by sociologist Sirry Alang ’08G.

Alang, assistant professor of sociology in the department of sociology and anthropology, hypothesized that African-Americans express their mental health concerns differently than what is found in the instruments researchers currently

use. Her research examines social factors that affect mental health and contribute to inequities and inequalities. To test her idea, she lived in a community of predominantly African-Americans in a disadvantaged neighborhood in a midwestern American city. She conducted informal conversational interviews on the streets, in parks, at bus stops, on busses, during and after church services and during community events. She participated in community activities aimed at increasing awareness of social problems that plagued the neighborhood and the resources to address them.

“Had I used clinics to speak with people, I would be speaking with people who are already different than those in the community in terms of agreeing with or buying into western psychiatry and who have access to mental health services,” says Alang, who is also a member of the health, medicine and society program. “People who are not in the clinics may have mental health issues they don’t realize, may not express them in ways that are consistent with clinical medicine, and they speak more freely about their mental health in more informal settings.

“There is still this segregation where people are cut off from resources. It affects their mental health. People think, there’s an expectation that things will always

be messed up for me, and it’s OK because I’m not supposed to care about this stuff. If I care about this stuff, people will think I’m even more messed up.”

Alang’s findings have implications for the clinical assessment of depression and for the measurement of depression in the community. The context and meaning of symptoms play an important role in determining whether experiences are indicative of depression. Mental health issues are an additional stigma because the population is already marginalized, says Alang.

“The neighborhoods are marginalized from racism, and mental health issues are added stressors in communities already dealing with poverty, poor housing conditions, lack of transportation or social isolation. It’s not that they don’t think mental health problems are real; it’s that they are already dealing with so many other life stressors and they don’t need an additional thing.

“If someone is angry, is it because they are depressed or because of their social conditions? We don’t know, but that anger is a significant thing that mental health providers and policy makers should address. We can’t talk about people’s mental health without talking about their real-life conditions and experiences. Their mental health is closely linked to the social structures they are living under.”



LINKING HEALTH, MEDICINE, AND SOCIETY

by Jennifer Marangos

Sociologist Kelly Austin is leading a growing program that explores the intersections of health and society

In many ways, Kelly F. Austin's research is all about connections and helping to create better relationships between the world's health care system and the people it serves.

An assistant professor of sociology, Austin describes herself as a "macro-comparative sociologist" who is interested in large-scale patterns



Kelly Austin

in development across nations. "Specifically, my research examines global trends in health and environmental outcomes, and the nexus between the two."

Most of her current published research, she adds, encompasses cross-national projects that use large samples from nations to see general patterns among them. In addition, she typically spends eight to 10 weeks each summer in rural Uganda.

While there, she does a mix of things, including supervising about six Lehigh undergraduate students in their research projects and local internships, as well as furthering aspects of her own research critiquing international health aid and examining patterns in diseases, like malaria.

"One project continued this past summer," Austin explains, "is focused on unmasking a hidden malaria burden in Bududa, Uganda. A large proportion of malaria cases are missed from official disease statistics in this region due to people self-treating from local drug shops, rather than being tested, treated and counted in a formal clinical setting."

For this research, Austin interviewed a mix of community members and health workers and also spent considerable time while in Uganda volunteering and working at local non-governmental organizations (NGOs) and health clinics.

Her research transfers to the classroom; Austin is also Director of Lehigh's health, medicine and society (HMS) program, which, if all goes according to plan, should also be offered as a major, rather than just a minor, in Fall 2017. It was launched in 2008, and is growing in response to a number of factors, according to Austin, such as increased student demand, enhanced faculty interest and specialization, and changes in the health sector—leading to more jobs in a variety of health fields. The health, medicine, and society field focuses on the social scientific and humanistic dimensions of health and medical care to develop an understanding of the impact of health, illness, and medicine on individuals, families, and societies. The HMS minor serves students who wish to be involved in some aspect of the healthcare industry or health policy and as well as students who are interested in communications, the pharmaceutical industry, law, business, agency work, and other careers where understanding health or healthcare is essential.

Austin began working at Lehigh in August 2012 and says she was attracted to the university because of its support for interdisciplinary research and teaching. "I really enjoy working with faculty and students from across the HMS; Global Studies; Women, Gender and Sexuality Studies; Environmental Initiative, and Africana Studies programs, as each of these touches on a key aspect of my research," she says. "I also really liked the balance between



"I also really liked the balance between teaching and research at Lehigh, and how teaching is valued alongside quality research."

A nurse demonstrates how to use a mosquito net in Western Uganda.

teaching and research at Lehigh, and how teaching is valued alongside quality research."

The classes Austin teaches include "Research Methods & Data Analysis," "Global Health," "Political Economy of Globalization," and "Environmental Sociology."

The HMS minor is currently common among students who are pre-med, often biological science or behavioral neuroscience majors. HMS is also popular among students who are interested in going on to a master's in public health programs or students who are interested in health, medicine, or healing more generally.

"Many of these students pair the HMS minor with majors in psychology, sociology, political science, global studies, English or a variety of other majors," Austin adds.

In terms of career paths, many HMS students become health practitioners in some way, such as physicians, physician assistants, clinical psychologists, and physical therapists. "A growing number of minors are interested in careers in public health, with many going on to get master's in public health degrees, or moving into the public health sector directly as researchers, administrative

DOUGLAS BENEDICT, TO CORRE

assistants, grant writers, etc. We have students that have gotten jobs at NGOs, health insurance companies, in pharmaceutical sales, foundations and research groups. I am always amazed at the diversity of jobs that are related to health that our alumni are placed in," she says.

Still, Austin maintains that while programs like HMS seem to be growing in popularity in public and private universities across the country, the number of them overall is still fairly limited. Few, she says, are as well-rounded as the HMS program at Lehigh.

"One thing that I have noticed in researching other HMS-like programs," she explains, "is that many programs at other institutions lack emphasis in medical humanities, and instead represent a social science major, and perhaps include one ethics elective. I am happy that our program has medical humanities offerings and faculty that include and go beyond the area of medical ethics. I am also excited that we will be gaining an additional HMS faculty member in medical humanities next year."

In addition to growing in the area of medical humanities, Austin says there is a

subset of faculty interested in community health, and she believes this will be a key area of activity and growth in the HMS program in coming semesters.

In fact, the faculty has created a Community Health Research Group (CHRG), which includes three new professors in areas of community health with cross-over in the sociology and psychology departments in the College of Arts and Sciences, as well as the College of Education.

"The CHRG just received a collaborative research grant to do a type of health-needs assessment using a method called 'photovoice' where community members take and share pictures of health challenges in their community," Austin says. This project is set to start in September 2016.

The grant includes funding for student researchers to work with citizens as co-researchers and liaisons. "The CHRG hopes this grant will represent just the beginning of funded, collaborative projects involving faculty and students at Lehigh and the local Bethlehem community," she says. ●

Creating

a Hub

for

Interdisciplinary

by Jack Croft

Activity

College offers students and faculty avenues to work with a broad array of knowledge suited to approaching complex problems

If you want to see what interdisciplinary looks like at Lehigh University, meet Kelpÿ. In Scottish mythology, kelpies were a supernatural, shape-shifting water spirit that often appeared as a horse, guarding rivers and streams. In most tellings, it was a malevolent creature, luring unsuspecting humans to a watery grave. In others, it protected water fowl and saved humans from drowning.

In the hands of Lehigh students in the interdisciplinary Sustainable Development program, Kelpÿ's shape is also undetermined—a snack chip, or perhaps a cracker, made with kelp. Its intentions, however, are universally beneficial: to boost kelp farming as a way to protect river deltas from eutrophication due to excess fertilizer runoff, thereby creating jobs to replace those being lost in the struggling fishing industry while bestowing health benefits on all who snack on it.

Yes, at Lehigh, the interdisciplinary work being done by students is more powerful than myth.

“What I like about this project is the potential to have identified such a win-win-win situation,” says Mark Orrs, director of Lehigh’s Sustainable Development program. “It’s a win for the oceans, it’s a win for the consumer, it’s a win for the fishermen who are now losing their jobs who could transition into farming kelp.”

“It’s a win for all of us because the more farming we can do in the ocean, instead of on land, the more land that’s freed up to go back to its original purposes, as opposed to being converted for human use for farming.”

The Kelpÿ project is just one of many that illustrate the synergistic energy that has flourished around interdisciplinary programs at Lehigh. It was the idea of an IDEAS—short for Integrated Degree in Engineering and Arts and Sciences—major named William Kuehne '17 and brought together an interdisciplinary team of students in the Sustainable Development program that carried over to the summer of 2015 as a Mountaintop project. The Kelpÿ team of six students, ranging from engineering to arts and sciences majors, won Lehigh’s prestigious Eureka competition for social ventures, which earned them a team from another interdisciplinary program, Integrated Product Design, to help develop their product. Prize money they won through the Eureka

competition as well as from earning the Baker Institute’s Best in Show award helped them hire a chef to create a tastier product.

So one project that was itself highly interdisciplinary advanced with a boost from four different interdisciplinary programs at Lehigh.

The growth of interdisciplinary programs led College of Arts and Sciences Dean Donald Hall to begin planning an Office of Interdisciplinary Programs and International Initiatives when he arrived five years ago. For Hall, whose background is in interdisciplinary cultural studies, it was a natural fit for his own academic passions.

“Part of the richness of what we offer in the College of Arts and Sciences is a diverse array of programs, including our interdisciplinary programs,” he says. “Interdisciplinary learning moves students outside their comfort zones, often to discover what other cultures are saying about the same problems and understand how the wealth of diversity within American culture teaches us new ways of approaching complex social challenges.”

The office, led by Associate Dean Jackie Krasas, coordinates administrative support services and fosters collaboration among the college’s 20-plus interdisciplinary programs.

“I think you see this kind of convergence of interests where students are looking for opportunities to cross disciplinary boundaries and get multiple perspectives, and faculty are interested in pursuing those collaborations outside of disciplinary silos,” says Bruce Whitehouse, associate professor of anthropology and director of the interdisciplinary Global Studies program.

Orrs, who came to Lehigh four years ago as the first director of the Sustainable Development program, says integrating interdisciplinary programs within the institution’s administration is significant and further advances Lehigh’s well-deserved reputation as a leader in the field.

Having earned a rare interdisciplinary Ph.D. from Columbia University in sustainable development, Orrs was initially drawn to Lehigh by the new Sustainable Development program being launched. But the more he learned about Lehigh, he says, the more he came to understand that the commitment to interdisciplinary studies and the application of knowledge go all the way back to founder Asa Packer.

“We had a head start, and people have not caught up, I would say. There’s a lot of institutional memory and a lot of institutional learning that goes along with that, and I think that’s why,” Orrs says. “It’s one thing to copy someone’s program on the books but quite another thing to actually institutionalize that and embed it within the culture.”

Remember those ubiquitous TV commercials from the 1980s for Hair Club for Men? They featured founder Sy Sperling telling viewers: “I’m not just the Hair Club president; I’m also a client!”

It could well be said that Krasas isn’t just the associate dean of interdisciplinary programs and international initiatives; she is interdisciplinary to her academic core.

“Interdisciplinary is, to me, a logical extension of what we mean when we say a liberal arts education,” Krasas says. “I think everybody should be interdisciplinary and have that experience of what it means to look at your field through a different lens or multiple different lenses. Or to talk with people who approach a problem from a completely different perspective. I think, increasingly, that simply reflects the complexity of the world.”

Although she has been an academic for more than two decades, Krasas, who is also associate professor of sociology and former

"I think that the kinds of issues that we face these days increasingly require interdisciplinary approaches, sort of an all-hands-on-deck approach."

director of Lehigh's interdisciplinary Women, Gender and Sexuality Studies program, says she has "never actually worked in a strictly departmental sense."

She earned her Ph.D. in sociology from the University of Southern California but also got an interdisciplinary gender studies certificate that required her to take courses in areas outside of her field, such as law and English.

"These were frightening things for me to do at the time but also turned out to be the best things I did in my graduate career," she says.

Before coming to Lehigh in 2005 as the first full-time director of the Women, Gender and Sexuality Studies program, Krasas was a faculty member of Penn State University's interdisciplinary department of labor studies and industrial relations for a decade.

"There were a couple of sociologists, we had economists, we had political scientists, historians, attorneys—and it made me a better sociologist to work there," she says. "I learned a lot of things that I wouldn't have otherwise learned. It can be an uncomfortable space, in terms of you're walking into areas that are new. I think that's exciting. I think that the kinds of issues that we face these days increasingly require interdisciplinary approaches, sort of an all-hands-on-deck approach."

Having spent her academic career working in interdisciplinary programs, Krasas brings a deep understanding of the challenges that can arise.

"As much as Lehigh is doing great work with interdisciplinarity, universities still are residually organized around departments," Krasas says. "And every time you turn around, you find something else that's a little bit odd or different or difficult for interdisciplinary programs because it comes from a time when we were organized by departments and didn't have these programs."

The interdisciplinary programs remain autonomous and do not report to the Office of Interdisciplinary Programs and International Initiatives. "I see it more as helping them to function in the world that is Lehigh and then bringing them together to collaborate and form a group of colleagues who work together across very different kinds of topics," Krasas says.

In addition to Sustainable Development and Women, Gender and Sexuality Studies, the programs supported by the office highlight the impressive diversity encompassed by interdisciplinary majors and minors in the College of Arts and Sciences: Africana Studies; American Studies; Asian Studies; Berman Center for Jewish Studies; Center for Global Islamic Studies; Classical Studies; Cognitive Science; Community Fellows; Digital Humanities; Eckardt Scholars; Environmental Initiatives and Environmental Studies; Environmental Policy Design; Ethics Series; Gipson Institute for 18th

Century Studies; Global Citizenship; Global Studies; Grants for Experimental Learning in Health (GELH); Health, Medicine and Society; Humanities Center; Latin American Studies; and Science, Technology and Society. Beyond the undergraduate components, many of the programs offer graduate student elements, while others offer interdisciplinary approaches to scholarship.

One problem common to all institutions with programs that cross departmental boundaries is how to fairly evaluate faculty who are hired into a specific department while also having responsibilities to an interdisciplinary program.

"One way that's done is through Memoranda of Understanding, so a faculty member who comes in with significant responsibilities in another unit will have one of these documents that spells out what they're supposed to be doing and how they're supposed to be evaluated," Krasas says. "We're trying to be clearer. If you're not clear about it, then faculty end up doing more. They get spread very, very thin. Lehigh is moving the institutional apparatus to reflect better how faculty actually do their work."

The Office of Interdisciplinary Programs and International Initiatives also helps organize hundreds of events every year, many of



which involve multiple programs. In March, for example, the office handled arrangements for the four-day interdisciplinary, international conference "Feminisms Beyond the Secular: Emerging Epistemologies and Politics in the 21st Century." The conference was a collaboration between the Office of International Affairs; Women, Gender and Sexuality Studies; Humanities Center; Global Studies; Africana Studies; Global Citizenship; and Religion Studies.

Hartley Lachter, associate professor of Religion Studies, who holds the Philip and Muriel Berman Chair in Jewish Studies and serves as the director of the Berman Center for Jewish Studies, says the College of Arts and Sciences has become "a hub for interdisciplinary activity."

The Berman Center for Jewish Studies, for example, sponsors a series of international conferences around the globe that bring together leading scholars from different disciplines to consider important questions. In May, the Berman Center sponsored "The Intimate Sea: Jews, Families and Networks in the Mediterranean," a two-day colloquium held at the Università di Salento in Lecce, Italy.

Some 15 scholars gathered to discuss the role that informal family networks played in Jewish life across the Mediterranean Sea and how those

networks may change the way we think about Mediterranean Jewish history and experience.

"This is a way the Berman Center can expand its international footprint, its international presence," Lachter says.

An interdisciplinary approach, he says, "is something very much at the core of how religion studies as a field works." Research and teaching in religion constantly cross disciplines into history, literature, anthropology, sociology, philosophy and other fields, he says.

Concern, especially among parents of prospective students, that was fairly common a decade ago regarding the potential job market for graduates who pursued interdisciplinary studies is waning, Whitehouse says.

"I think there is awareness among the students and among their parents that at the end of the day, the job market is going to be extremely fluid and people are going to change not only jobs and employers, but they're going to change careers, probably multiple times in the course of their working lives," Whitehouse says. "So it pays to have a broad skill set and exposure to a variety of perspectives. As long as we focus on certain fundamentals, such as communication skills, critical thinking, the sorts of things we always identify with liberal arts education, I think our graduates are going

to be prepared for those very fluid and flexible career trajectories.

"Something I like to say to prospective students and their parents is the jobs that young people need to be prepared for today, in many cases, don't exist yet. They're not going to exist for a few more years. So with that in mind, we feel that a broad approach is quite sensible."

Whitehouse refers to Global Studies as "the Swiss Army knife approach."

"If you're going to get a single, traditional disciplinary degree, you're getting one particular tool to use on one particular problem. With Global Studies, you're getting a Swiss Army knife with multiple tools you can apply to different contexts for different reasons," Whitehouse says. "No one of those tools is probably as useful at any single task as the tool that you would get from the discipline. But we think it's more important to have a variable toolkit that you can apply to multiple issues and bring in multiple perspectives than it is to have one highly specialized tool that's extremely useful for a highly particular type of situation."

Krasas admits to being biased but says she firmly believes that interdisciplinary programs are "really excellent intellectual spaces. I think they're a lot of fun if you're a student, and I mean that intellectually. And for me as a faculty member, it's a lot of fun to be engaged with people coming from different areas. I'm so privileged to have all these very rich discussions.

"Someone's always stretching, and that's a really invigorating intellectual space to be in," she adds. "It's like intellectual candy. It really is." ●

"Something I like to say to prospective students and their parents is the jobs that young people need to be prepared for today, in many cases, don't exist yet."



SEIZING OPPORTUNITIES TO DO GOOD

Carrie Rich '07 sees a world filled with opportunities and possibilities

by Manasee Wagh



When she entered history professor Steven Cutcliffe's classroom as a Lehigh undergraduate, Carrie Rich '07 realized she was in for an unusual learning experience. Not one other student registered for the seminar-style course. Rich was surprised the course hadn't been canceled.

Cutcliffe, who was also her adviser and director of the [science, technology and society](#) program, took the success of his students seriously; he started the course that semester with a single student. He engaged Rich through lively discussions and readings and even took his teaching out of the classroom into the real world. Another student joined later, but it was still an unusually intense course for Rich.

"We used the Socratic dialogue method to learn, so I had to be on all the time, work really hard, and think and respond on the fly," recalled Rich. "Professor Cutcliffe challenged me to think differently about what education means and navigated me through thinking creatively, which has served me well professionally. He encouraged me to volunteer in the community. I volunteered at a nonprofit health center, where I learned the meaning of gratitude."

Rich counts her experiences with this course as significantly formative in her later decision to start the Global Good Fund (GGF). As cofounder and CEO, she created the company in 2012 to accelerate the leadership development of entrepreneurs across the globe using business for social good. Rich connects established business executives with emerging social entrepreneurs

to be mentored, scale their companies and ultimately address complex social issues. Underpinned by robust analysis of the global, economical, environmental and social factors that determine individual and societal health, GGF's philosophy aims to improve lives around the world.

For his part, Cutcliffe was impressed. "She was always prepared for class, [she was] a good discussant and an enthusiastic researcher," he said.

During her senior year, Rich won the Francis Shoemaker Award, given to the STS student who best demonstrates "outstanding academic achievement, qualities of leadership and potential for professional excellence."

Cutcliffe wasn't the only professor whom Rich counts as most influential. Sociology professor Judith Lasker provided Rich with untapped opportunities for health and human studies learning. "Professor Lasker helped me grow as a thinker. She gave me research that I didn't know how to do. She had high expectations and expected me to deliver. She planned a field trip to the United Nations in New York, which brought home to me the importance and intricacies of social justice issues. Real world issues," Rich says.

Art professor Berrisford Boothe inspired Rich as well. "He creates a beautiful world while championing causes that matter, all while surmounting personal hurdles that many people would find insurmountable. He gave me a sense of hope and resiliency—as an entrepreneur, you have to keep getting up," she said.

Her professors encouraged her to develop her abilities for long-term success. Even as a student, Rich says she felt she was making a difference. She stepped outside her comfort zone and joined the step team, though she was not familiar with the dance form.

"We had an absolute ball. It made me appreciate what it was like to be a minority," she said. This understanding informs Rich's work with the GGF, as many of the people it helps are living as racial, ethnic or economic minorities. Her experiences in Leadership Lehigh were also transformative, as was her service as a residential assistant. "Each opportunity taught me about leadership. I learned how to nurture other people, not just myself," she says.

After Lehigh, Rich entered graduate school at Georgetown University in Washington, D.C., to study health systems administration. While at Georgetown, she began working for Perkins+Will, an architecture and design firm, and interned with Inova Health System, a leading health organization in the D.C. region. Her work included mopping floors and folding baby laundry. She seized this opportunity to build her network. "Sometimes opportunities are masked as hard work," Rich says.

Her chance came when she was assigned to take attendance for a meeting that Knox Singleton, Inova's CEO, would join. She knew Singleton had grown Inova from one small hospital to a multi-billion-dollar organization—all while volunteering in Haiti for more than 25 years. Rich surmised that he cared about making the world a better place.

"I wondered why the CEO of a big company would want to speak with me, an intern. I figured Mr. Singleton cared about legacy, so I asked his assistant for a meeting on that topic—a topic different from what I imagined he normally talks about. I got dressed up in formal business attire and attempted to be as professional as possible. I was so enthralled by our initial meeting that I blurted out, 'Would you write a book with me?'"

To Rich's surprise, Singleton replied, "Yes," and asked her what they should write about.

Soon, it emerged that both individuals were interested in the principle of sustainability to make health care more effective.

Rich helped structure Singleton's thinking on the subject along with another co-author. *Sustainability for Healthcare Management* is to have a second edition, with Rich as one of the three co-authors.

In the meantime, Rich continued working at Perkins+Will, where she was a health care specialist. She also taught as an adjunct faculty member at Georgetown University, where she developed a Healthcare Sustainability program curriculum. One day, Singleton offered Rich a job as senior director of vision translation at Inova.

"What a dream! My job was to craft a vision for the future of health for two million Inova patients and its 16,000 employees. Once we'd crafted a vision, my job became communicating that vision. He gave me responsibility for communications and brand. He challenged me to think big, sponsored, coached and pulled me up. Mr. Singleton empowered me."

Soon, Rich was dreaming even bigger.

"I started thinking, what if we could find young people throughout the world who have a strong work ethic and care about making the world a better place but lack experience? We could pair these emerging leaders with experienced business leaders and put targeted financial capital behind the pair—what a catalyst for good that dynamic would be."

KRISTOFER DAN BERGMAN

Her concept began forming on her 26th birthday. Singleton gave her \$100, saying that instead of taking her to lunch for her birthday, she should use it for her idea. Rich approached six organizations she knew and asked each to submit a proposal for what they would do with 10 times the amount of her birthday gift if it had a sustainable social impact. Inspired by their responses, Rich wrote to her friends and family for donations, with the subject heading, "The Global Good Fund." She beat her \$6,000 goal, raising \$6,052.

Two weeks later, Rich received an email from someone who said they'd met at a conference and offered a \$1 million anonymous contribution. "Now I didn't know what to do. I went to [Singleton], and he ended up matching the gift," she said. In three months, Rich had \$2 million start-up capital for her dream of funding global good.

Though Rich loved her job, Singleton encouraged her to go beyond what felt comfortable. He supported building a board of directors and advisers that could get the GGF started. The board asked her to lead the organization.

"Today, we have a small staff, and we have supported 38 social entrepreneurs to date. Half are domestic. Half are nonprofits with sustainable revenue streams. More than half of the entrepreneurs we support are women, which is important to me," she says.

GGF has indirectly helped create 100,000 jobs in some of the most underserved communities around the world. Recently, the company opened an office in Colombia, in addition to its offices in Washington, D.C., and New York City. More than 100 seasoned and socially minded executives mentor emerging social entrepreneurs globally.

"People are looking for structured, meaningful ways to translate their business success into social significance. We're exclusively focused on growing the leadership capacity of social entrepreneurs who are at a critical inflection point, a point at which their leadership will influence whether they will have sustainable social impact," Rich explained.

Rich also teaches at George Washington University and the Amani

"I started thinking, what if we could find young people throughout the world who have a strong work ethic and care about making the world a better place but lack experience?"

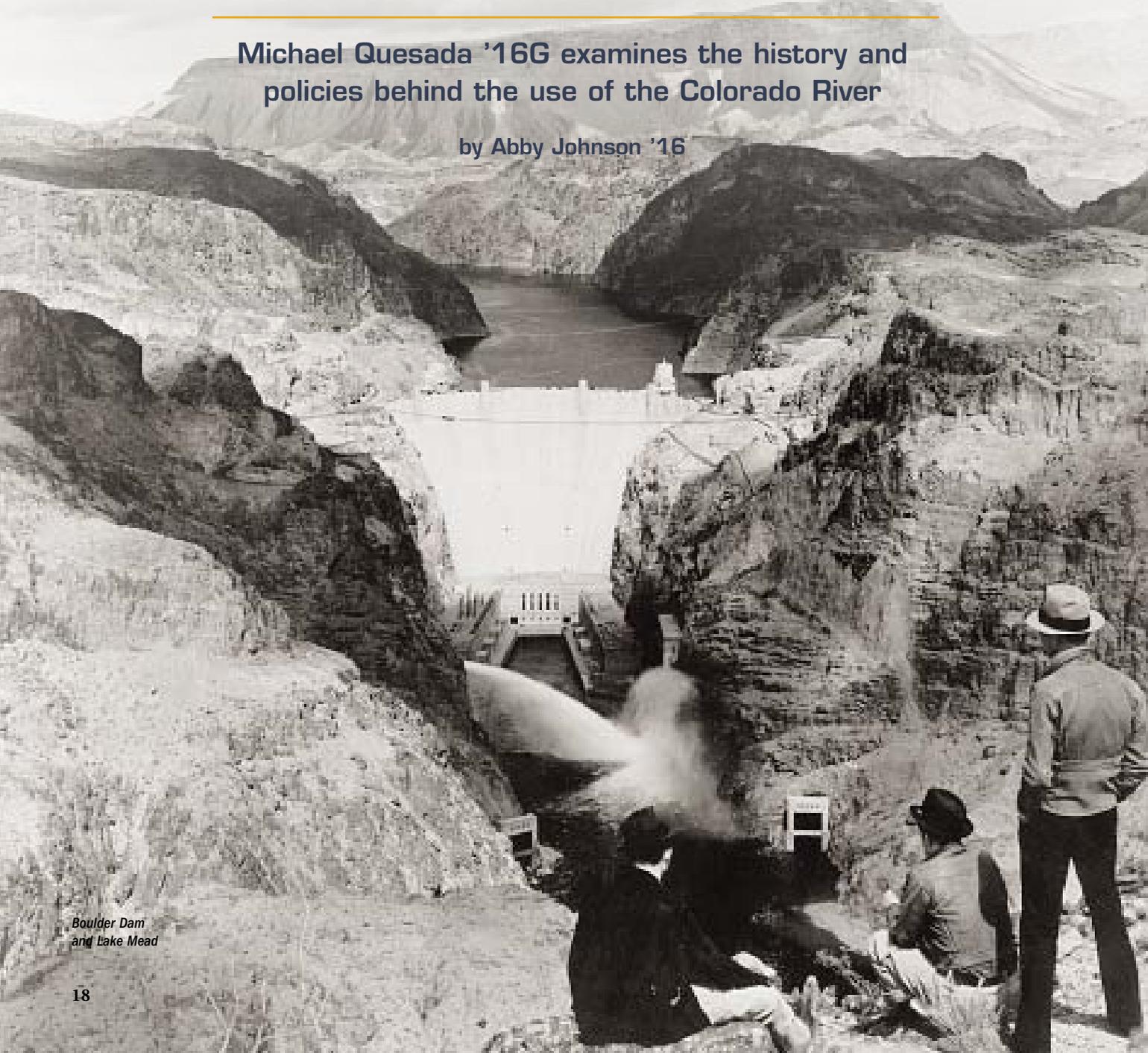
Institute in Kenya and writes for media outlets, including *Forbes*, *Entrepreneur* and *Huffington Post*. She sits on the boards of several companies and organizations and has been lauded for her achievements. She received the EY Entrepreneur of the Year award, POLITICO Women Who Rule award, Washington Business Journal 40 under 40, Entrepreneur.com Top 30 Start-ups to Watch, Stevie Award for Women in Business, Asian Social Innovation CEO of the Year, Social Enterprise Alliance 50 under 40 and Impact100.

When a new challenge enters her life, Rich thinks of the children's story *Harold and the Purple Crayon*. Harold draws what doesn't exist. "It helps me remember that there is always an opportunity to design something great if it adds value and makes a difference in the world," she said. ●

THE SUSTAINABLE USE OF WATER

Michael Quesada '16G examines the history and policies behind the use of the Colorado River

by Abby Johnson '16



Boulder Dam and Lake Mead

Growing up in parched southern California, water has always intrigued Michael Quesada '16G. Having completed his master's degree in environmental policy design in August, Quesada used his background in social sciences and humanities to analyze the influence of market theory on the laws that govern the Colorado River Basin.

With a bachelor's degree in history and a minor in political science, Quesada graduated from the University of La Verne in 2011 and worked for a few years before deciding to explore his interest in the natural world. Today, Quesada is part of the environmental policy design program, which provides an intensive study of the theoretical roots that structure policy related to the environment and how to evaluate policy processes and outcomes.

Market theory addresses the use of market presuppositions and principles to allocate and conserve environmental resources. Quesada's master's thesis focused on prior appropriation, a specific tactic representative of the broader market strategy that is used by Western states to allocate water. This allocation system determines water rights based on a first-come, first-serve basis.

This doctrine reflects market-based assumptions, as it allows the market to control water allocations by viewing people as consumers who engage with one another to convey their preferences. Quesada describes the system as having a hierarchical structure in which those with the most senior rights are guaranteed to receive their share of water first in relation to those with junior rights.

"Historically there has been minimum intervention at the state level because states let the market drive itself," Quesada says. "This helps facilitate people's wants, which means those who are able to use the water get it. Others can claim rights to a source, but only after the upper-level population have taken their share."

Prior appropriation is at the core of the Law of the River. Established in 1922 through the Colorado River Compact, the law now consists of various compacts, federal laws, international treaties, regulations, and court decisions. Quesada examines the effects of prior appropriation to determine the doctrine's ability to distribute water in a manner that is beneficial to humanity and nature. The theory underlies the practice, he says, so the two must be analyzed together in order to evaluate the

system's success. Research must go beyond the letter of the law and it must look at what the law represents according to Quesada. This is the difference between law and policy design, a concept he says often confuses people.



Michael Quesada

"We're not willing to make the improvement ourselves. So we need to make policies that will force us to do it."

"The law part is about finding the 'what is.' Policy design is about finding the 'what should be.' Policy design forces you to envision what law ought to look like, search for and identify normative theories that will enable you to actualize that vision, and work towards transforming the chosen normative theory into actual law."

For Quesada, the "should be" is an allocation system that balances both humanity's and nature's instrumental and intrinsic values.

"Lawmakers always push for conservation or technological innovation or increased storage capacities at reservoirs," he says. "But these approaches are weighed heavily towards humanity's instrumental needs. We need to take a more balanced approach if we intend to continue using the Colorado River Basin and wish to restore its ecology."

Increased efficiency is another approach that Quesada dismisses. While it has the potential to increase water supply for all, overpopulation prevents a rise in efficiency; the extra water saved is offset by usage from the increasing number of people dependent on The Basin.

In fact, overpopulation is Quesada's main concern and his research finds it to be the biggest threat to natural resources.

He says that The Basin's carrying capacity has been nearly surpassed, if not already, as a result of population increase. "You can't continue to have population growth and still have a sufficient water supply when there's only a finite amount of it."

Quesada's solution is similar to that of China's: a one-child policy to curb population growth, a solution that he admits is provocative, controversial and highly unlikely to be enacted in the United States. It's a dramatic change but, he believes, a necessary one.

"Our lifestyles have an impact on the earth," Quesada says. "So we need to make changes if we want humanity to survive."

But we are our own obstacle, Quesada adds. We have a tendency to suppress what we know is necessary and act on our wants instead. He argues that people make excuses to not make changes by telling themselves that change isn't critical. Until we acknowledge that dramatic changes are required, any attempt to make them will always fail.

Unfortunately, our water supply is depleting faster than our desire to fundamentally change. Strict, enforceable policies are crucial in making our behavior less harmful to the environment. Quesada questions our ability to change our own behavior, and he says it is one of the reasons he has such a strong interest in policy design.

"We're not willing to make the improvement ourselves," he says. "So we need to make policies that will force us to do it." After leaving Lehigh, this is exactly what he plans to do.

"I want to work for a nonprofit organization or a research institute that is focused on crafting policy that catalyzes fundamental change and benefits humanity and nature."

Sincere improvements are important to Quesada because of water's intrinsic contribution to our well-being and nature. It's a responsibility that we all share.

"Everybody needs water," he says. "So everybody needs to do their part." ●

Keeping Zoellner in the SPOTLIGHT

Ollie Foucek strives to grow the arts at Lehigh

by Leslie Feldman

By day, Oldrich "Ollie" Foucek '72, is an attorney with Norris McLaughlin & Marcus, P.A. in Allentown, PA. In his free time, he serves as chair of the fundraising committee for Lehigh University's Zoellner Arts Center.

The Center opened in 1997 as the home to Lehigh's music department, the department of theatre, the art galleries and the guest artist series, all of which share the same technical, marketing and administrative staff, venues and equipment. The building houses three theatres: the 1,000-seat proscenium Baker Hall, the 300-seat Diamond Theater, a 125-seat black box theatre, as well as a two-story art gallery, state-of-the-art recording studio, and several large classrooms.

"This year, the Arts Center is celebrating its 20th anniversary, which coincides with the University sesquicentennial," says Foucek. "So, intending to capitalize on all that positive energy, we've booked multiple Grammy, Tony and Emmy Award nominee, Vanessa Williams, to give us a performance to remember. We have every expectation that she'll light up the stage and wow the audience on October 8th."

Foucek explains that Zoellner Arts Center has an advantage in that it's connected with Lehigh University; but the budgetary pressures on the Arts Center are similar to a free-standing performing arts space. Nonetheless, Foucek believes "the future of Zoellner is bright, and personally, I am as excited about the promise of Zoellner and what it means both to Lehigh University and the Lehigh Valley as I was 20 years ago."

Although Foucek admits to having no musical talent, he has always been impressed by those who can emotionally move an audience. His involvement with the arts beyond simply being an audience member started shortly after he returned to the Lehigh Valley. In the early '80s he helped organize and served on the board of Touchstone Theater. Touchstone's artistic leader was, and still is, Bill George, a fellow Lehigh classmate and fraternity brother.

"My experiences on Touchstone's board exposed me to others in the local arts community and gave me an understanding of the organizational and operational challenges facing non-profit arts organizations.

Shortly after getting involved with Touchstone, I had the opportunity to join the board of Pennsylvania Stage Company, a professional, regional theater with a performance space in Allentown. I became President of its board and ultimately learned the hard lesson that, regardless of the quality of its performances (and the quality was fantastic), running a non-profit arts organization is not at all different from running any other business enterprise. It requires a lot of revenue and community support."

Foucek did not grow up in an artistic family. Having grandparents who were Czech immigrants, being able to design and build something concrete was perceived as valuable to self and society. His father studied engineering before enlisting in the Army Air Corps during WWII and his mother was a draftsman for many years before completing her studies and becoming a civil engineer. "I was encouraged to become an engineer. I grew up on Long Island and my family also had a summer home in the foothills of the Poconos. So, when it came time to look at colleges with strong engineering programs not far from home, Lehigh was first on the list. I applied early decision and was accepted early in the fall."

Foucek found that the ease with which an undergraduate can switch majors, and even colleges, is one of Lehigh's enduring qualities. Another peculiar strength, he found, is the requirement that freshmen engineers take courses in the humanities. So, for Foucek, that meant that once he realized he was performing appreciably better in freshman English and American history than in calculus, chemistry and physics, he transferred to the College of Arts & Sciences at the end of freshman year.

"The decision to major in American Studies was driven largely by my experiences with the faculty teaching American literature and American history. I was particularly influenced by David Amidon, Roger Simon and Joe Dowling in history and Jim Frakes, Bob Harson and Jack DeBellis in English. The small class size and ready access to the faculty were particular attractive to me."

Foucek's decision to apply to law school happened after his junior year. Until then, he had thought of pursuing graduate studies in history and teaching at the college level. However, he says that Dr. Dowling cautioned that getting a teaching position, even with a degree from a top-rate graduate program, was going to very hard," because it was the height of the Vietnam War and many young men enrolled in doctoral programs sought to extend their student deferments by getting teaching jobs. "So, after considering my options, Case Western Reserve University Law School in Cleveland, Ohio, was where I was headed."

Lehigh not only provided Foucek with a wonderful academic experience, allowing him to acquire a depth of knowledge in a core humanities curriculum that has proved very valuable, but it also challenged him to interact with a wide variety of people, consider diverse opinions and seize leadership opportunities. "Each relationship formed at Lehigh, including those with faculty and administrators, impacted me positively and allowed me to grow as a person."

Once out of law school, Foucek chose to work for a law firm in Allentown: Tallman, Hudders & Sorrentino. That was over 40 years ago

and, while that firm has gone through some transitions since then (the most significant, a merger with New York and New Jersey-based Norris McLaughlin & Marcus), he continues to work with some of the same people he began his career with and, amazingly, some of the same clients.

"The Lehigh Valley has grown in population and influence over the past four decades; but, with respect to the practice of law, it has remained compact and intimate," says Foucek, who practices business law. "Over the years, many of my clients have become friends. Likewise, I consider the other lawyers in my firm to be part of a professional family, where we help one another out inside and outside the office. I've had the good fortune to work on matters involving many different legal issues. That has allowed me to keep learning and to stay motivated."

Foucek lives in Allentown with his wife, Andrea, a retired school psychologist. They have two daughters, both Lehigh alums, Alexis, '05 and Arielle, '09. Along with his Lehigh volunteer responsibilities (which have included 10 years on the Board of Trustees and a term as

President of the Alumni Association), Foucek chairs the Allentown City Planning Commission, is on the Executive Committee of the Greater Lehigh Valley Chamber of Commerce and the Board of the Allentown Neighborhood Improvement Zone Development Authority (ANIZDA) and is secretary of his golf club.

Like he told his daughters when entering Lehigh, "students should take some time to appreciate fully all that Lehigh has to offer before making some conscious decisions about how best to spend their precious time." He says that includes deciding on a major (and perhaps minors) and what extracurricular activities they'll participate in. "Also, Lehigh, by virtue of its size and culture, offers the opportunity for a student to develop mentoring relationships that are invaluable not only during the student's time on campus, but long afterward; and, those relationships should be sought out and cultivated."

For more information about how you can give to Zoellner or the arts at Lehigh, please contact Kelly Stazi, director of development, at kbs415@lehigh.edu or 610-758-2824. ●



DOUGLAS BENEDICT

Feature

Feature

Broken Courage

Jenna Pastorini '17 examines a trauma-based cultural syndrome in Cambodia

by Robert Nichols

More than 1.7 million people – nearly a quarter of Cambodia’s population – were killed by execution, disease, starvation and overwork under the Khmer Rouge’s brutal rule from 1975 to 1979. Some 40 years later, the resulting trauma permeates much of the country’s culture. Cognitive science major Jenna Pastorini '17 is attempting to better understand subsequent Cambodian mental health issues as part of a cross-cultural study exploring beliefs surrounding post-traumatic stress disorder (PTSD).

The study is a perfect dovetail for Pastorini. Cognitive science students must write a senior thesis incorporating two of the program’s six academic pillars. As part of her

health issues. Cambodian-born Sothy Eng, professor of practice in the College of Education, provided Pastorini with a variety of connections across the nation, such as at Royal University of Phnom Penh.

“I met with [Nongovernmental Organizations (NGOs)] to develop a baseline working in Cambodia. You have to understand how interwoven everything is. I needed to learn about the government, the policies and the ground-level realities of genocide. I needed to really get a grasp on these factors to begin to understand how they impact mental health.”

Pastorini has previous experience with Khmer culture. She toured the kingdom in the winter of 2015 as part of Lehigh’s Global Citizenship program where she met with members of Transcultural Psychosocial Organization (TPO), an NGO. TPO is Cambodia’s leading NGO in the field of mental health care and psychosocial support. There she learned of baksbat. Similar to PTSD, people

with baksbat experience anxiety and depression, yet the disorder possesses enough features to be recognized as a formal cultural trauma syndrome distinct from PTSD.

“Cambodia suffered a horrible loss and they’re still living in the devastation that occurred,” says Pastorini. “Baksbat is an attempt to put a name on what the people are



suffering from because their symptoms weren’t properly recognized in the parameters of PTSD. People who experience baksbat are withdrawn from society, cannot find it within them to speak up and do not want to be tuned in. You just want to be passed by. It was something I heard in conversation sometimes, but it was rarely addressed as a mental illness.”

The recipient of GELH and Strohl grants, Pastorini anticipates returning to Cambodia during the break between semesters to continue her research. She hopes to collect data from students at Royal University on PTSD-related issues, then compare the data to PTSD-related information she is collecting from Lehigh undergraduate students.

“I went to Cambodia expecting that nobody would be using the word PTSD, that the only word people would be using was baksbat. Interestingly, baskbat is a verb, not a noun, which makes a huge difference. We don’t say, ‘I am PTSD.’ We say, ‘I have (PTSD).’ I got such an interesting array of answers from Cambodians.”

Pastorini’s work involved meeting with government officials, staff at a children’s hospital and officials from Caring for Cambodia. At the end of her trip, Pastorini discussed her work with Sotheara Chhim, TPO’s executive director and a renowned

Khmer mental health researcher, who coined the term baksbat.

“Baksbat is not something that’s commonly talked about because most everyone suffers it,” she says. “Everyone has a story, so they don’t really look to care for people’s repercussions because everyone suffered the repercussions. It’s such a different collectivist perspective than America, which is so individualist. It was interesting to see that difference. Many people had never heard of baksbat as a mental illness, so there was this discrepancy between what I was expecting to hear and what I actually heard.”

Aspiring to be a psychiatrist, Pastorini hopes to attend medical school after graduating from Lehigh. She says she also envisions possibly returning to work for an NGO in Cambodia.

“The Cambodian government allocates 0.02 percent of its health budget to mental health. There isn’t easy access for people suffering from mental illness. There is also a lack of psychiatric education and the overall idea of mental health illness is still new. A large population of Cambodians don’t yet know how to recognize it. They do not know there are resources for them, if there are any. The government isn’t putting them in a place to easily access that help.”

Pastorini hopes to fill that gap.



Jenna Pastorini

project, Pastorini spent four weeks this past June in Siem Reap and Phnom Penh to gain an understanding of the context and issues surrounding trauma in Cambodia’s cultural context. Two Lehigh faculty serve as Pastorini’s mentors. Jessecae Marsh, assistant professor of psychology, pursues research in the beliefs surrounding mental



You are among almost 20,000 Lehigh alumni from the College of Arts and Sciences and we want to hear from you!

Have you relocated?

Changed jobs?

Reached an important milestone or achievement?

Please update your information at mylehigh.lehigh.edu

We also invite you to become involved!

- Volunteer opportunities
- Networking
- Mentoring CAS students or providing internships
- Sharing your thoughts about acumen
- Supporting CAS initiatives with a gift to mylehigh.lehigh.edu/CAS

TO COME: ONARF HAVANNA/GETTY IMAGES

LEHIGH UNIVERSITY

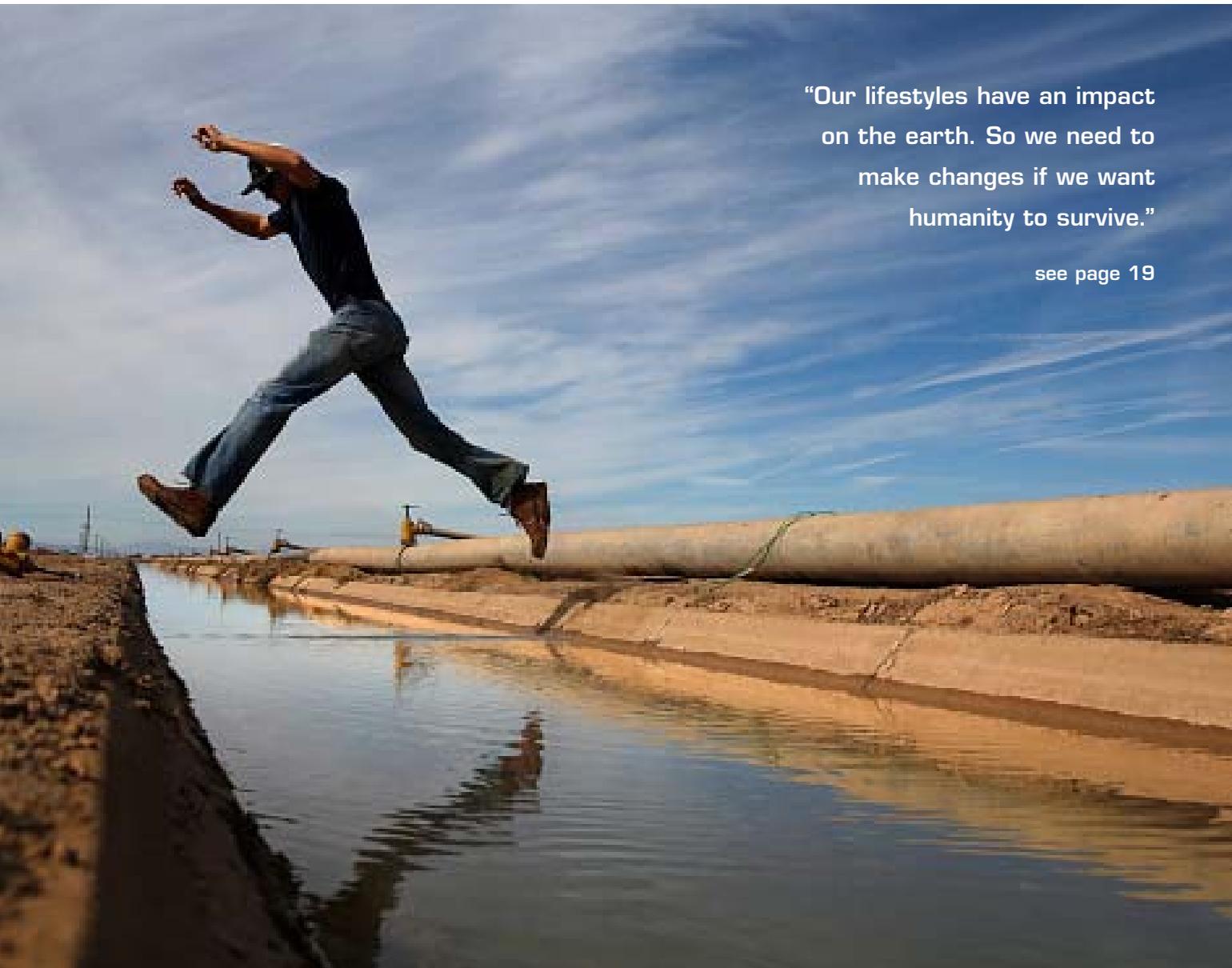
College of Arts and Sciences
9 West Packer Avenue
Bethlehem, PA 18015

LEHIGH UNIVERSITY



Non-Profit Org.
US Postage
PAID
Permit No 250
Reading, PA

DON BARTLETT/GETTY IMAGES



“Our lifestyles have an impact
on the earth. So we need to
make changes if we want
humanity to survive.”

see page 19