

art/sci

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Traces of Antiquity



COLLEGE OF
ARTS AND SCIENCES
CASE WESTERN RESERVE
UNIVERSITY

STREAMS
OF STARS

AN EXPANDED
MENU

IN PURSUIT OF
WISE GUIDANCE



2 Traces of Antiquity

Classics students and faculty members explore an ancient landscape

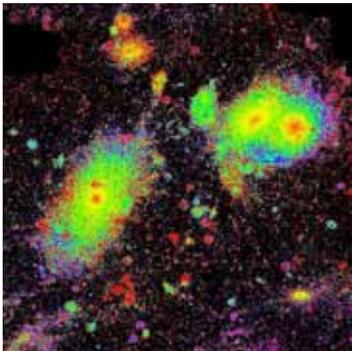
7 The Best Example

As an honor student and community volunteer, Omar Gutierrez finds opportunities everywhere



12 Streams of Stars

CWRU astronomers trace the journeys of stars pulled loose from their home galaxies



18 An Expanded Menu

Sociologist Jessica Kelley-Moore and colleagues join local residents to increase access to healthy foods



23 The Pursuit of Wise Guidance

The college welcomes Jeremy Bendik-Keymer as the Beamer-Schneider Professor in Ethics



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On the cover:
While working with an international research team this summer, classics students and their faculty mentor visited the rock-cut tombs at Termessos in southern Turkey. From left: Mélanie Fortin (Freie Universität, Berlin); Paul Iversen, Nathan Bensing, Karyn Newton and Adam Kozak (CWRU); Hagen Schlotzhauer (Universiteit Leiden, Netherlands)

Photo by Jared Bendis



An Education in Ethics

EARLIER THIS FALL, the university recognized the continuing legacy of two of its greatest benefactors. While many of our alumni already knew their story, our current students were almost certainly hearing it for the first time.

In 1971, Kent H. Smith and his wife Thelma established a private foundation devoted chiefly to supporting higher education. From the beginning, much of their largesse was directed to Case Western Reserve University.

Kent Smith's ties to the university were both personal and familial. He and his youngest brother, Albert Kelvin Smith, had studied chemical engineering at Case School of Applied Science (CSAS); another brother, Vincent, had attended Western Reserve University's law school. Their father, A. W. Smith, had been a chemistry professor at CSAS and a co-founder of the Dow Chemical Company. Heirs to his entrepreneurial spirit, the three brothers founded the Lubrizol Corporation in 1928. Many years later, Kent Smith served as acting president of Case Institute of Technology (1958-1961) and eventually as an honorary trustee of Case Western Reserve University.

The Kent H. Smith Charitable Trust, as the foundation is now known, has provided vital support to several major initiatives, including the construction of Kelvin Smith Library and the Kent Hale Smith Building. And in October of this year, its trustees announced a \$10.5 million matching gift to CWRU for construction of a new university center.

As dean of the college, I have had the privilege of working with foundation trustees **Phillip A. Ranney (LLB '61)** and **William B. La Place**. As a result, I am aware of their deep commitment to yet another philanthropic endeavor—one that honors the ethical standard set by Kent Smith and two of his associates.

In 1997, the foundation created and endowed the Elmer G. Beamer-Hubert H. Schneider Professorship in Ethics.



Cyrus C. Taylor

Elmer Beamer was Kent Smith's accountant and a leader in establishing ethical standards for the accounting profession. Hubert Schneider was Kent Smith's lawyer and the foundation's first president. Phil Ranney tells me that both men shared a conviction expressed in Lubrizol's mission statement: "Honesty, fairness and ethical behavior are a necessary part of the only sustainable path to a lasting success."

In this issue of *art/sci*, we celebrate the appointment of **Jeremy Bendik-Keymer** as our Beamer-Schneider Professor in Ethics. An exceptionally gifted and dedicated teacher, Jeremy will work with colleagues across the university to incorporate ethical concerns into the undergraduate curriculum. As a specialist in environmental ethics, he will also be active in many projects of strategic importance to the university, including the Sustainability Alliance directed by physics professor **John Ruhl**.

As you will see in his profile (pp. 23-28), Jeremy believes that an education in ethics cannot be confined to the classroom. Students develop character through their engagement with the larger world. By participating in service projects, for instance, they experience the challenges and rewards of translating their ethical ideals into action.

Appropriately, two stories in this issue highlight the civic engagement of students and faculty members in the College of Arts and Sciences. Their efforts remind me of something Phil Ranney has said about Kent and Thelma Smith: "In their giving, their main theme was helping people to help themselves." I invite you to read about members of our community who are following their enlightened example.

Cyrus C. Taylor
Dean and Albert A. Michelson Professor in Physics

Traces of Antiquity

Classics students and faculty members explore an ancient landscape



JARED BENDIS

To make an impression of the inscription on a stone archway, researchers fill the spaces in the carved surface with wet filter paper, which they extract once it has dried. The resulting impression is called a “squeeze.” From left: CWRU graduate student Karyn Newton, Mélanie Fortin of the Freie Universität, Berlin, and a staff member at the Isparta Museum



WHEN PAUL IVERSEN AND ANDREA DE GIORGI teach a summer course on classical archaeology, they turn a landscape in the Near East into their classroom. For the past two years, these assistant classics professors have taken their students to Isparta, a province in southwest Turkey that has seen 4,000 years of habitation and conquest. There, the students join a team of researchers who are mapping the terrain, collecting artifacts and revealing aspects of ancient history that have never before received scholarly attention.

Adam Kozak '13 had just declared a major in classics when he decided to spend five weeks in Isparta instead of heading home to Chicago. Working closely with Iversen, he received an on-site introduction to inscriptions—an essential primary source for understanding the Greco-Roman world. **Nathan Bensing '11**, a history major with a minor in classics, has been to Isparta twice, assuming an active role in a geological survey group.

Iversen also recruited two graduate students to the project this year. **Karyn Newton**, who is pursuing a master's degree in world literature with a concentration in classics, gathered and photographed pottery fragments and did research on ancient burial practices. **Jared Bendis (CWR '02, GRS '04)**, a doctoral student in the Art History and Museum Studies program, took thousands of photographs of this summer's expedition.

Finally, Iversen invited **Stephanie Ohtola '10**, to carry out a separate research project this summer. Ohtola, while completing a history degree and a minor in classics, had written a paper for Iversen about the lives of royal women in the Macedonian court of Alexander the Great. This summer, she studied the familial and social roles of rural women in present-day Isparta, a region that Alexander's armies occupied more than two millennia ago.



While working on the Isparta Archaeological Survey, senior Nathan Bensing (above) helped doctoral student Jared Bendis photograph ancient pottery from the Isparta Museum’s collection.

Iversen, De Giorgi and the students contributed to a larger research effort known as the Isparta Archaeological Survey (IAS). They worked alongside faculty members and students from Süleyman Demirel Üniversitesi, whose main campus is in Isparta, and with researchers from several Western European universities. IAS director Bilge Hürmüzlü, a professor of archaeology at Süleyman Demirel, cites the training that Iversen and De Giorgi provided for her students as one major benefit of a continuing partnership between her institution and Case Western Reserve University.

An Old-Fashioned Search Party

In antiquity, Isparta was a crossroads of cultures and empires. “We know, through the textual sources, that a number of ancient civilizations, well before the Romans and before

Alexander the Great, inhabited the region,” says De Giorgi. “So we’re dealing with a number of historical eras that witness a great deal of human movement across the land, and many of the movements translate into full-fledged cities.”

Before deciding which areas to survey, De Giorgi consults high-resolution satellite images of the landscape, which IAS acquired with support from Case Western Reserve’s Kelvin Smith Library. “This is how we navigate this vast landscape, how we find our bearings,” De Giorgi explains. “The imagery enables us to identify on-the-ground features such as ancient roads, a fortress, small farms

and so on. It has turned out to be essential for this type of research.”

To Kozak, the youngest member of the expedition, the survey team in action resembled “an old-fashioned search party.” Team members would form a line and sweep across a site in a systematic way, taking measurements and picking up any objects they came across—pottery fragments, metalwork, bone carvings, coins. Unfortunately, not all sites lent themselves to such inspection; the spring rains in Isparta were especially heavy this year, and in many places the earth was covered with vegetation.

“You’re walking through wheat fields and vegetable fields, and sometimes through orchards,” Newton recalls. “At first, all you’re seeing is turned-over dirt. In some places, we would walk through fields for hours and find maybe a piece here and a piece there. In other fields, it was as if someone had been out there breaking pots. There were shards everywhere.” According to Iversen, the abundance of pottery in some areas was “the signature of a settlement.”



Sophomore Adam Kozak (left) and classics professor Paul Iversen take a break from their labors in Isparta.

The students' work didn't end with collecting. They cleaned and labeled every artifact, took photographs and made drawings, and recorded the precise location where each object had been found. Since they were carrying global positioning devices, this last task was easier than it had been for earlier generations of archaeologists.

"When you picked up some of the pottery, it looked like a piece of clay," Newton says. "But once you washed it, some of it had a beautiful olive-green glaze. Some pieces had a blue and white glaze, and others had colors that would run from a dark red to a lighter color. You just didn't know, when you put a piece in the water, what it would look like when you took it out."

For his part, De Giorgi calls ceramics "wonderful diagnostics." From the shape and style of a pottery fragment, the material, the painting and the decoration, experts can date a piece of pottery to within 50 years of when it was made—even if that piece is 2,000 years old.

A Pile of Stones

Their first time out this summer, Kozak and Bensing discovered another kind of artifact. "We found a Roman milestone—a large, cylindrical stone about 200 pounds at least—in a pile of stones in a farmer's field," Kozak recalls. "I noticed it because of its odd shape, and Nathan noticed an inscription on the side."

When the Romans controlled the Isparta region (which in antiquity was known as Pisidia), they built a road system that the IAS is now retracing.

"At 200 pounds, the milestone hasn't gone far from where it originally was, so this gives us a solid point between two cities," Kozak says. "It shows that there was probably a road there."

The team brought the milestone to the survey house for Iversen to examine. It was badly worn and weathered, making the inscription all but invisible to the untrained eye. "I couldn't see a letter on that thing; Nate saw one," Kozak says. "For Professor Iversen, the letters just seemed to pop out of the stone."

By classifying and interpreting inscriptions—a field of study known as epigraphy—Iversen and his colleagues bring a wealth of historical and cultural details to light. Iversen cites this example from a milestone dated 312-324 C.E., discovered two summers ago:

*For our two Lords
Flavius Valerius Constantine and
Valerius Licinianus
Licinius, the Pious, Unconquered
Augusti. 4 miles from the city
of Conana.*

One of the "two Lords" praised in these lines is "the famous Constantine who made Christianity the official religion of the Roman empire," Iversen says. Both Constantine and Licinius probably donated funds to upgrade the road along which the milestone stood. The inscription also suggests that the city of Conana was large enough to be a destination of some importance. And by indicating the location of a road whose existence had been unknown, the milestone helps archaeologists understand "the economy and interconnectedness of the region" in late antiquity.

An inscription discovered this summer was carved on a funerary monument dating back to the third or fourth century C.E.:

*Quintus
to Galate
his nurse
for memory's
sake*



Paul Iversen examines a funerary stele found in an Islamic shrine in the village of Uluğbey.

JARED BENDIS

By 2012, researchers may begin excavating sites that the survey has shown to be significant.



JARED BENDIS

As participants in the Isparta Archaeological Survey, classics students and faculty members from the College of Arts and Sciences worked alongside researchers from Süleyman Demirel Üniversitesi and the Hochschule für Technik und Wirtschaft (Berlin). Both institutions provide support for the survey, as does the Turkish Ministry of Culture.

“This one is interesting because a man with a Roman name set up a funeral stele for his nurse, who had a Greek name,” Iversen says. “It is important as evidence both of slavery—undoubtedly Galate was a family servant—and of at least some affection between the young master and the slave.”

Support from Case Western Reserve University has been critical to the survey’s success, Iversen says. He has

received grants from the W. P. Jones Presidential Faculty Development Fund and the World-Wide Learning Environment, both administered by the College of Arts and Sciences. Additional support has come from the University Center for Innovation in Teaching and Education through a grant program funded by Evan W. Nord and his family. Students’ participation in the survey has been supported by the Department of Classics and the Eva L. Pancoast Memorial Fellowship.

When the IAS resumes next summer, new and returning students may continue exploring the ancient road system, or they may survey a hilltop, Kale Tepe, where a pre-Roman fortress once stood. And by 2012, Iversen says, researchers may begin excavating sites that the survey has shown to be significant, enabling students to participate in a new phase of archaeological discovery in the Isparta region. ■

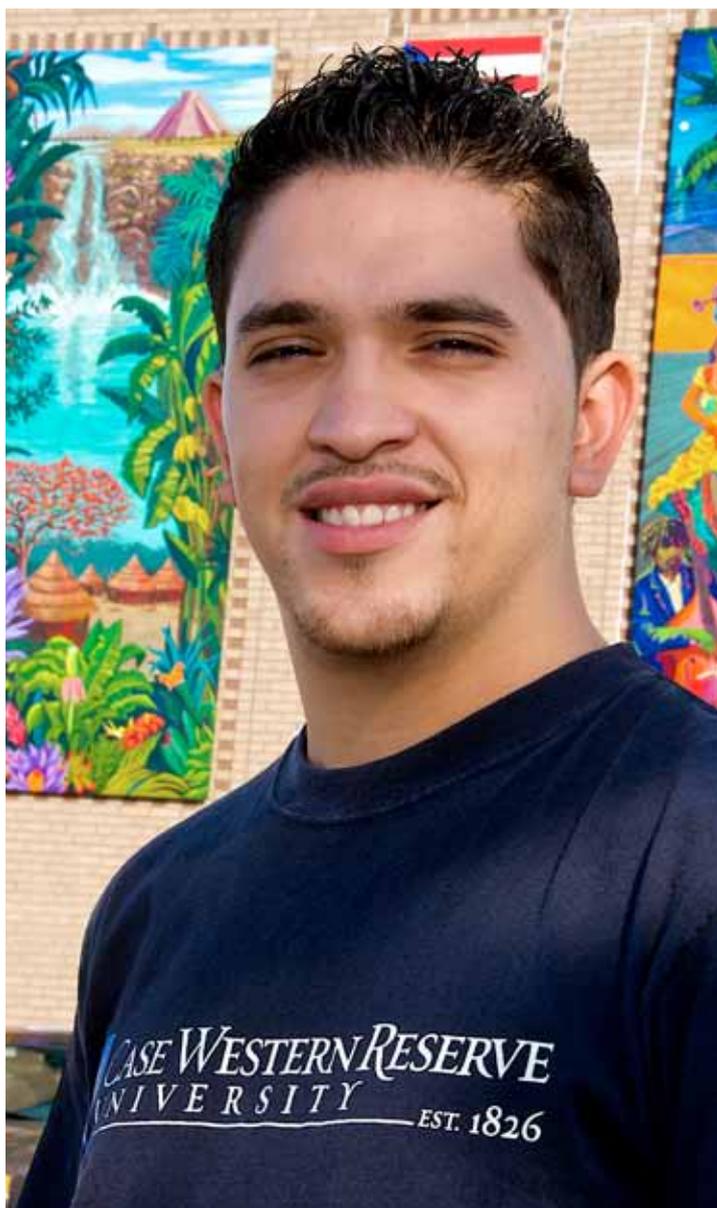
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→ hear their stories at case.edu/makeitpossible

The Best Example

As an honor student and community volunteer, Omar Gutierrez finds opportunities everywhere



DANIEL MILNER

Omar Gutierrez, a junior majoring in health science anthropology, began doing volunteer work through the Center for Civic Engagement and Learning during his freshman year.

ON AN EVENING IN LATE SEPTEMBER, cloudy but not yet dark, two young men with book bags dangling from their shoulders arrived at Esperanza, an educational nonprofit on Cleveland's West Side. At that hour, they could have been eating dinner with their families or hanging out with friends. But instead, they sat down across from each other at a small conference table and started their homework. One of them took notes on a history essay filled with unfamiliar words and phrases: *divination*, *de facto*, *forensic*. The other tackled math problems in an SAT prep book the size of a telephone directory.

A tutor wearing a Case Western Reserve University t-shirt was already at the table when they came in. He, too, could have been doing other things that evening, but he didn't seem to be thinking about them. As he answered the students' questions and asked a few of his own, he gave the impression that he had all the time in the world. Although the young men had never worked with him before, they were clearly at ease in his presence. Before the session ended, he made sure he knew their names and that they knew his.

Omar Gutierrez '12 has been volunteering at Esperanza since the spring of his freshman year. Several students he first met when they were high school sophomores or juniors have graduated and gone on to college, thanks in part to his involvement in their lives.

"I love having the interaction with students," Gutierrez says. "I talk with them about my experiences with my education, and how I ended up where I am." Like many of these students, Gutierrez grew up in an immigrant family in an inner-city neighborhood. And he struggled with the same challenges—a language barrier, peer pressure, a scarcity of educational role models—that Esperanza seeks to address with its programs for the city's Hispanic youth.

Mentors like Gutierrez have a powerful impact on their “near peers,” says Victor Ruiz, the organization’s executive director. “They can say to them: *You know what? I’m doing it; you can, too.*” It’s a message Gutierrez conveys even to students who may not know the full extent of his achievements.

Countless Hours

In 2008, as he was about to graduate from a magnet high school in Dayton, Ohio, Gutierrez was awarded a Gates

Millennium Scholarship to attend the university of his choice. The scholarship covers the entire cost of his undergraduate education and would carry him through to a PhD if he wanted one. (At this point, though, he is planning on a medical degree instead.) When he enrolled at Case Western Reserve, he worried about “coming into college from an inner-city school and being unprepared for the level of work that you suddenly get thrust into.” But Gutierrez proved himself academically by the end of his first semester, and

this year he received a “3.5 and Up” award from the Office of Multicultural Affairs (OMA), which honored him at its 2010 Unity Banquet.

Since declaring a major in health science anthropology, Gutierrez has engaged in biomedical and social science research addressing health disparities within the United States and around the world. In addition, he has devoted countless hours to organizations and initiatives across the university. When the Office



Twice a week, Gutierrez works with high school students in a leadership development program at Esperanza.

Top, from left: Ariana Latimer, Kayla Mendez, Angelica Southwick, Yadira Cortes, India Eaton, Omar Gutierrez, Victor Ruiz Jr., Digna Lewis, Jennifer Sanchez, Eliza Semidei. Bottom, from left: Arelis Latimer, Jean Caraballo, Erica Rivera, Kiara Kuratomi, Rafael Jose Castro

of Undergraduate Admission hosts events to recruit students from underrepresented minorities, Gutierrez steps to the microphone. He has planned cultural and community service activities for the student group La Alianza, and he has assumed a leadership role in virtually every service program conducted by the Center for Civic Engagement and Learning (CCEL).



ERIC BENSON

Last May, in recognition of his “significant contributions to campus life, scholarship and community service,” he received OMA’s Stephanie Tubbs Jones Award.

Even Gutierrez’s friends and supervisors do not know everything he is involved in. “Omar doesn’t broadcast what he does,” says Angela Lowery, CCEL’s student service coordinator. She recalls a conversation with a colleague in the admission office: “Somehow, Omar’s name came up, and she said, ‘Oh, he helps us so much with our diversity panels.’ And I thought, ‘He’s never mentioned any of that to me!’

“He’s one of those people who is always there for us,” Lowery adds. “Many times we have last-minute situations come up, a need for a student representative to go request funding for a program of ours, and he is always willing and able to do that. It’s mysterious to me; I don’t know how he manages to find the time. He is the best example we have of a student who got engaged early on and

Gutierrez was honored for academic excellence at this year’s Unity Banquet, sponsored by the university’s Office of Multicultural Affairs.

has stayed connected on all kinds of levels. He’s really one of our models.”

A Cascade of Events

Gutierrez has lived in the United States since he was seven years old. Born in Mexico City, he came to this country with his parents and two older siblings, joining relatives who had already settled in Ohio. Two months after his arrival, he started kindergarten along with a cousin who had been born in the United States. Unlike Gutierrez, she was fluent in English as well as in Spanish.

“I remember going to class and not knowing what anybody was saying; it was like hearing all these noises,” Gutierrez says. “And we felt really alone, because we were the only two non-American students, period—there were no other foreign students in the class. Kids would pick on me because I couldn’t speak English. By the time the school year was over, I must have been a little traumatized, because I

was scared to speak Spanish in front of anybody who wasn’t Mexican. I didn’t even say I was Mexican.”

That summer, Gutierrez was determined to learn English. “I remember going around and refusing to speak Spanish to anybody, and using the little bit of English that I

knew,” he recalls. “I picked up a lot from my cousins. The next year, I ended up getting the highest grades in the class.”

Still, Gutierrez says, it took years to overcome his fear of being seen as non-American. “We had other Mexican students come into our school who were in the same position that I was in before,” he says. “The teacher would know that I knew how to speak Spanish, and she would try to match us up. But I would do everything to avoid it. That’s kind of sad, now that I think about it.”

By the time he reached middle school, Gutierrez was no longer at the top of his class. “I had a hard time maintaining my schoolwork,” he recalls. “I was very unfocused; I was hanging around with the wrong people. But eventually, around my junior year of high school, there was a cascade of events that led me to contemplate: ‘What am I doing with my life? And what is really important to me?’ I actually started looking ahead to college, and I worked really hard to get myself prepared to make that transition.”

When Gutierrez visits his younger siblings, he sees the difference it makes that *they* have a college student in the family.

Gutierrez was aided in his efforts by a parishioner at his church. Yvette Kelly-Fields, director of development for the Dayton Urban League, stepped forward and became his mentor. "She made me a binder with a list of things I should think about—financial aid, schools I should start researching, what majors interested me," Gutierrez says. "We sat down once a week, looked online and picked out scholarships that I could get. And at the top of the list was the Gates Millennium Scholarship, because it was the biggest and the one that could help me go to some other place. I was looking to go somewhere else, somewhere far from the city, and that scholarship would give me the ability to do so."

Supported by the Bill & Melinda Gates Foundation and administered by the United Negro College Fund, the Gates Millennium Scholarship Program makes awards to 1,000 minority students nationally each year. Candidates must demonstrate not only academic excellence, but also dedication to community service. So Kelly-Fields connected Gutierrez with the Urban League's tutoring program, where he began volunteering two or three days a week.

"I kept putting more hours in, because it was really engaging," he says. "I even got an award for the impact I was having with the kids." In addition, he joined an Urban League service group called Youth Forum, which enabled him to work on community projects along with other motivated students.

When Gutierrez discusses his mentor's influence, he recalls her practical advice and the start she gave him in community service. But more than anything else, she convinced him that a college education would change his life. For years, he and his friends had been told that education was important, but they didn't believe it. Part of the trouble, he says, was "a disconnection between what we were doing in school and what it was supposed to prepare us for. It was like learning random information; it was never anything that seemed valuable to us, anything that seemed like it would help us in the long run." Since no one in their families had gone to college, the opportunities that people kept talking about didn't seem real to them.

Now, when Gutierrez visits his younger siblings, ages 13 and 8, he sees the difference it makes that *they* have a college student in the family. (In fact, they have two; Gutierrez's older brother, Manuel, is a senior at Wright State University.) "When I talk to them, I always ask, 'What do you want to do?' My little brother is always messing with me: 'I want to be a doctor, and I *also* want to be an astronaut.' The fact he is even bringing up those ideas is phenomenal. And he knows that in order to do something like these big grand ideas, he has to go and get an education."

As an undergraduate, Gutierrez has been an active seeker of opportunities. In the spring of his freshman year, he applied to CCEL's Civic Engagement Fellowship program and became one of eight first-year students placed as volunteers in community organizations. That is how he discovered Esperanza. As a sophomore, he spent an "alternative spring break" in a Nicaraguan village, where he and 13 other CCEL students helped parents build a kitchen for an elementary school and participated in activities with local children.

Each summer, Gutierrez devotes himself to science. In 2009, he was selected to participate in the Minority Health and Health Disparities International Research Training Program, funded by the National Institutes of Health (NIH). He spent 12 weeks at Cornell University's biomedical research center in the Dominican Republic, conducting chemical assays of indigenous plants to determine whether they have medical uses. The goal of such research is to help countries produce their own pharmaceuticals, instead of importing more expensive drugs from abroad.

This year, Gutierrez was awarded a summer fellowship in the Medical Scientist Training Program at the University of California, San Diego. He participated in seminars on health disparities and shadowed doctors from UCSD's School of Medicine. On the research side, he worked on a new imaging tool that scientists can use to examine heart development and disease in an animal model—the zebra fish. "We made the zebra fish heart glow bright green, so that we could

better study it," he explains. In his spare time, he went surfing, a sport he first learned in Nicaragua. "It was a different type of water—cold, comparatively—but it was really fun."

Back on campus, Gutierrez is involved in an NIH-funded project at the Frances Payne Bolton School of Nursing, where a research team is developing tools to teach minority patients to communicate effectively with their doctors. By engaging in a computer simulation of an office visit, these patients will learn to express concerns about their health, get their questions answered and obtain the information they need to manage chronic conditions.

Gutierrez was recruited for the project, known as Electronic Self-Management Resource Training to Reduce Health Disparities (eSMART-HD), by research associate Lisaann Gittner. During their first interview, he offered ideas from his study of cultural anthropology and discussed his commitment to health disparities research. Afterwards, Gittner called principal investigator John Clochesy, Independence Foundation Professor of Nursing Education, and said, "We need to hire Omar."

Gutierrez joined the team as it was collecting data on patients' experiences with the health care system. He proposed holding a focus group at Esperanza, where he translated the participants' comments and asked follow-up questions. Later, he was fully engaged in the process of analyzing the data, identifying issues that the simulation would address and writing a script for the virtual office visit.



DANIEL MILNER

In a recent video celebrating its community partnerships, Esperanza devoted a segment to its relationship with CWRU's Center for Civic Engagement and Learning. The video included an interview with Gutierrez. "It was a no-brainer to pick Omar," says Jessica Gonzalez, Esperanza's director of operations.

During meetings that sometimes went on until midnight or later, this script became more and more complicated. Each time patients were asked a question, the software had to present them with several responses to choose from. And each response, in turn, led down a different conversational pathway. As the team struggled with the wording of the responses and debated how many to offer at various points, Gutierrez wasn't afraid to speak up, even if he was the only undergraduate in a roomful of PhDs.

"It was getting late one evening, and we were all getting a little punchy," Gittner recalls. "Omar thought we were going in the wrong direction on this one pathway, and he just wouldn't let

up until we heard him. We were at the point where we were just fatigued and ready to stop. But Omar said, 'No, you're doing a disservice here; this pathway needs to keep going.' He wanted to give the patients more choices; he wanted to include the breadth of things that people would actually say. And when we reflected on it, we realized that his idea was great. He was helping us make the script more real, so that people would see themselves in the simulation."

Dedicated to Something

CCEL director Elizabeth Banks describes Gutierrez as "surprisingly even-keeled." He shows up at 8 a.m. to take charge of a volunteer site for a Saturday of Service, makes a presentation to entering students, or drives a group of fellow tutors to the West Side without seeming overburdened. "The other students are so jealous that he's never stressed about his schoolwork," Banks says.

Gutierrez thinks they have the wrong impression. "Last year, I was doing entirely too much," he admits. "I was going over to Esperanza; I was taking a good number of classes and taking leadership roles in these other civic groups. So a lot of times, I found myself really stressed out. Three o'clock in the morning, I would be trying to get some work done, because the entire day I was gone doing all these other things. But I think that once you're dedicated to something, you'll find the time to do it. Because, in reality, it's just time that you would normally use to just sit around." Sitting around may be the only activity he hasn't fitted into his schedule. ■

Streams of Stars

CWRU astronomers trace the journeys of stars pulled loose from their home galaxies

by Trudy E. Bell

HEATHER MORRISON/DANIEL MILNER BACKGROUND/VASILY BELOKUROV AND THE SLOAN DIGITAL SKY SURVEY



Astronomy professor Heather Morrison, in front of the famous "Field of Streams" image made by Vasily Belokurov of the University of Cambridge, England, from Sloan Digital Sky Survey data. The orange region below her shoulder is part of a stream of faint stars from a dwarf galaxy being ripped apart by the enormous gravitational field of our Milky Way. Morrison and her students are searching for such streams of stars around our galaxy.

UNTIL RECENTLY, ASTRONOMERS WERE CONVINCED that virtually all stars were urban dwellers, so to speak, existing in vast cities of stars called galaxies. Rather like human cities on the earth, galaxies vary widely in size, shape and color. Some, like our own Milky Way, are large, beautiful spirals, populated by stars young and old. Others, shaped like footballs, cigars or spheres, are more like old-age homes, having no gas and dust from which new stars can form.

But today, we know two things that complicate this picture. First, large galaxies, with their enormous gravitational fields, sometimes attract stray, dwarf galaxies and rip them to pieces. As a result, stars that once lived in a relatively small city may whirl into the outer halo of the larger galaxy, eventually becoming part of the distant suburbs of an immense metropolis. Second, massive galaxies sometimes collide, partially tearing each other apart and leaving long trails of stars streaming in intergalactic space.

In two independent research projects, astronomers at Case Western Reserve are revealing details about the stars affected by these violent processes. Professor **Heather Morrison**, mining data from a digital sky survey, is studying distant stars in the outer halo of the Milky Way to deduce how many were pulled loose from smaller galaxies. Meanwhile, **Chris Mihos**, professor and chair of astronomy, has concluded from telescopic observations that in the nearby (cosmically speaking) Virgo Cluster of galaxies, 20 to 30 percent of the stars have been wrested from their home galaxies and are now permanently stranded in the space between them.

From Halos to Streams

In August, Morrison received a major three-year grant from the National Science Foundation (NSF) to explore the outer halo stars of the Milky Way, in part to determine how many

small galaxies have been dismantled and incorporated into its halo.

“Most of my career I’ve spent studying the mysterious halo stars of the Milky Way,” Morrison says. Having started out with basic questions about those stars, her group is now in the forefront of research into the outer halo.

Since the early 20th century, when telescopes became big enough to study galaxies in detail, astronomers have been puzzled by the fact that spiral galaxies have two distinctly different populations of stars. Bluer stars appear in the dense, bright, flat main disk of the galaxy (our sun is a disk star), while redder stars appear in a large, sparse, dim halo around the entire galaxy, including well above and below the main disk.

The star colors are significant. Spectroscopic analysis revealed that the redder halo stars were composed of hydrogen and helium, while the bluer disk stars also contained many heavier chemical elements, including iron, carbon and oxygen—elements that astronomers lump together and call “metals.” From the spectroscopic evidence, mid-20th-century astronomers concluded that the Milky Way’s metal-poor halo stars must be the oldest in the galaxy, formed when the universe was mostly hydrogen.

But why would a galaxy’s oldest stars be found only in the halo? That question had intrigued Morrison since she wrote her dissertation in the early 1980s. To find out more, she set out to identify and map the halo stars, using observatory photographs that had sampled parts of the heavens in various directions.

In 1993, halo stars captured the attention of all the world’s astronomers when a graduate student at the University of Cambridge, mapping the velocities of stars around the center of the Milky Way, happened to discover a stream of stars on

the opposite side of our galaxy. This star stream, composed largely of stars that looked like halo stars, indicated that a dwarf galaxy was on the far side of the Milky Way, hidden behind the brilliant stars and dust of the galactic center. Astronomers realized that the Milky Way's gravitational field had generated tidal forces within this tiny galaxy, in much the same way that the moon causes ocean tides on the earth, and that these tides were strong enough to tear the dwarf galaxy apart.

This star stream is enormous. "If you stand in a dark farm field in July looking south, you will see the Milky Way arching over your head across the whole sky from south to north," Morrison explains. "What we call the Milky Way is actually the plane of the main disk of our galaxy. Now, if your eyes could see stars 100,000 times fainter, the star stream of the dwarf galaxy being ripped apart would appear to be about the same width and length as the Milky Way itself, but at right angles to it. Basically, the streaming stars are in a polar orbit up and over the disk of our galaxy."

Excited when she first heard the announcement, Morrison began to wonder: Was that grad student's discovery a fluke, or might there be other star streams around the Milky Way from other hapless dwarf galaxies that had strayed too close and been torn asunder? How many of the Milky Way's halo stars came from such events, compared to those that had formed in place? What

Heather Morrison and Paul Harding have been awarded the status of "Architects" of the Sloan Digital Sky Survey.

could the speed and directions of the halo stars' movement reveal about possible dismantlings? Answering such questions would require identifying and mapping halo stars across the entire heavens, not just in selected directions.

That is why, in 2005, Morrison began analyzing data from the Sloan Digital Sky Survey (SDSS), a monumental survey of the entire northern heavens above and below the plane of the Milky Way's disk. The SDSS is funded by the Alfred P. Sloan Foundation and 22 U.S. and international organizations. In September of this year, Morrison was awarded the status of an SDSS "Architect" in recognition of her association with the survey and her important work.

Halo stars are so faint and few—only about 0.1 percent of visible stars—



For research on the Milky Way's halo stars, astronomy professor Heather Morrison, graduate assistant Zhibo Ma and undergraduate Bill Janesh are mining data from the Sloan Digital Sky Survey.

DANIEL MILNER



DANIEL MILNER

Astronomy department chair Chris Mihos (right) collaborates with observatory manager Paul Harding to study the tidal tails left by colliding galaxies in the Virgo Cluster.

that “most of the stars we see in the sky are disk stars,” Morrison says. Moreover, “stars don’t wear handy little signs saying ‘I am a disk star’ or ‘I am a halo star.’ So we must identify halo stars indirectly—for example, by their colors or the chemical elements in their spectra, and by their velocities.” Data from the SDSS makes this kind of indirect identification possible.

Thus, for their current research, Morrison, graduate assistant **Zhibo Ma** and undergraduate researcher **Bill Janesh ’11** never set foot inside an observatory dome or lay hands on a telescope. Instead, they spend their days in front of computers, culling through the masses of spectroscopic data. The

NSF grant will make it possible for her team to identify and study most of the Milky Way’s halo stars visible from the northern hemisphere, using the two latest collections of images and data just released by the SDSS.

But identifying which stars are halo stars is only the beginning. Their orbital motions and velocities “preserve all kinds of information about where they come from and what happened to them in the past,” Morrison says. “From that information, we hope to run the movie backwards, so to speak, to see how many other dwarf galaxies may have been tidally ripped apart as they fell into the Milky Way.” She smiles: “We’re going to find more star streams!”

A Wide Field of View

Meanwhile, Mihos, just down the hall from Morrison, is working on what started as a completely unrelated line of research.

Over time, throughout the universe, “there has been a constant dance of galaxies being pulled together by gravity to form galaxy clusters,” Mihos says. “I began to wonder whether one could use a telescope to look for relics of this process.”

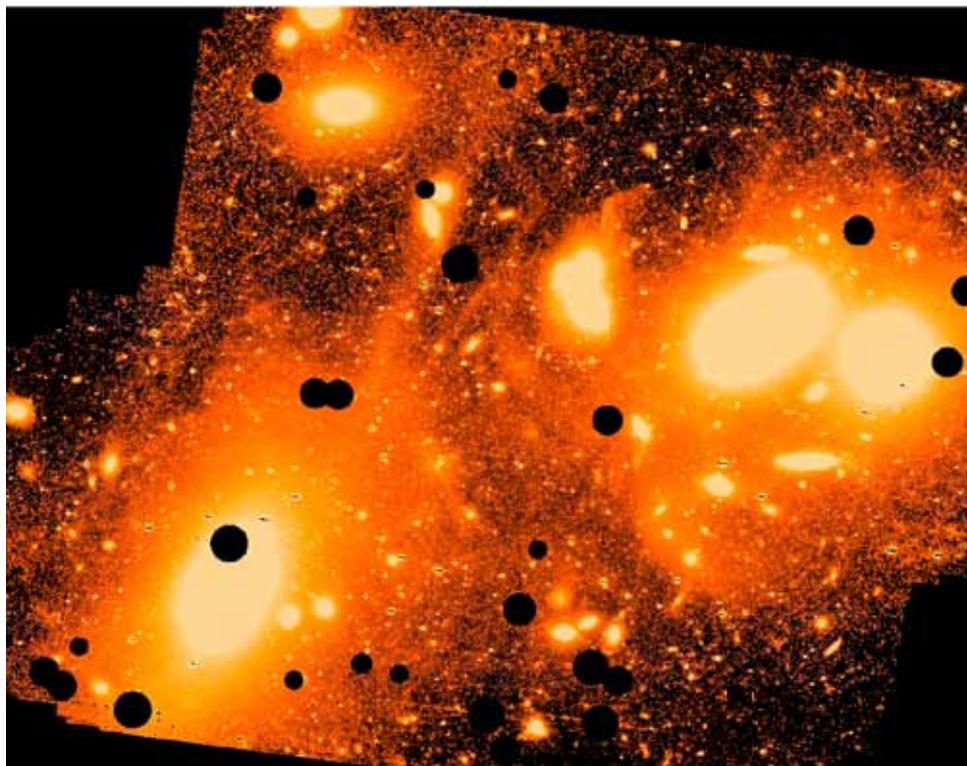
He had an idea of what such relics might look like. Many photographs show that colliding galaxies pull stars and gas from each other in tidal tails

that can be much longer than the diameter of either galaxy. Suppose that in a cluster of hundreds of galaxies, collisions were happening all the time. "Might there be tidal tails all over the place, with streams of stars from different collisions getting mixed all together?" Mihos asks.

The cluster of galaxies nearest to us is the Virgo Cluster, some 1,500 galaxies gravitationally bound into one system. It is so big that if one could look up and see those galaxies with the naked eye, "they would extend over an area in the sky 12 full moons—6 degrees—across," Mihos says. For this reason, he would need a telescope with an unusually wide field of view.

This wasn't the only challenge Mihos faced. Although the Virgo Cluster is quite close to us in cosmological terms—a mere 800 million light-years away—it is far too distant for even a large ground-based telescope to see individual stars and conduct spectroscopic analysis of the starlight. So Mihos relies on a clever trick. "We can't see individual stars, but we do see their integrated light as a kind of glow around each galaxy," he explains. Long photographic exposures would reveal whether the glow extends far out from the galaxies, including in any relic tidal tails. Mihos also hoped the color of the glow would indicate the types of stars in those tails.

To capture such ultrafaint features, however, the telescope would have to be located at an extremely dark site,



CHRIS MIHOS

Using the Burrell Schmidt telescope, Chris Mihos's research group has taken long-exposure images of diffuse light in the Virgo Cluster. From these images, Mihos concludes that roughly a quarter of the stars in the cluster may be outside of galaxies.

and researchers would need exclusive access to it for at least six weeks each spring, when the Virgo Cluster is high in the night sky.

Fortunately, Case Western Reserve owns a wide-field telescope in a dark site: its vintage Burrell Schmidt telescope, now at Kitt Peak National Observatory in Arizona. This telescope has been heavily modified by observatory manager **Paul Harding** to increase the sensitivity of the telescope's camera and allow it to detect faint star streams. In work funded by NSF, Mihos's students and Harding take several hundred images of the Virgo Cluster over many weeks, each with an exposure time of about 15 minutes. These images are then digitally combined to create one ultralong exposure, which captures the faint light of any stars between galaxies.

The long-exposure images have indeed revealed a tracery of tidal tails throughout the Virgo Cluster. In fact, "it seems that as many as 20 or 30 percent of the stars in the Virgo Cluster may exist outside of the galaxies," Mihos says.

The colors of the tidal tails drifting across the cluster imply that, like the Milky Way star streams Morrison is researching, they consist mostly of older red, metal-poor stars. Observes Mihos, "That's a satisfying bit of confirmation that what is going on here in the Milky Way is similar to what is going on in the rest of the universe." ■

Science journalist Trudy E. Bell was a Presidential Fellow in Spring 2010, leading the SAGES seminar "Political Hype vs. Science Fact: Evidence, Risk, Preferences, Values, and 'Spin.'"

Something old, something new

"It's the little telescope that could," declares Chris Mihos of the Burrell Schmidt telescope, located at Kitt Peak National Observatory in Arizona. Although the telescope will turn 70 in 2011, and although its 24-inch aperture and 36-inch mirror are now considered modest, it is a pioneer in intergalactic research.

The largest of its type when built by Warner & Swasey Corp. in 1941, the Burrell Schmidt telescope, with its special wide-field design, can image large portions of the Virgo Cluster at once. Originally mounted on Taylor Road in Cleveland, it was later moved to Chardon, Ohio, but neither site proved suitable for astronomical observation. To escape city lights and thick clouds, the telescope was moved in 1979 to Kitt Peak, above 7,000 feet, where it now enjoys some of the darkest, clearest, steadiest nights in the U.S.

Still, the "little telescope" required significant modification to meet Mihos's research needs. The modification was possible, he says, "thanks to the ingenuity of our observatory manager, Paul Harding. He's our Schmidt whisperer!" Harding has also made important scientific and technical contributions to the Sloan Digital Sky Survey, for which

he was honored as a survey "Architect" this fall.

In addition, several of Mihos's current and former students have done heavy lifting in the research. **Craig Rudick PhD '10** figured out how to measure and represent the colors of the star streams in the Virgo Cluster; **Steven Janowiecki '08** collected extensive data with the telescope and analyzed it afterwards; **Colin Slater '09** improved the images of the Virgo Cluster by developing techniques to remove unwanted reflections of light from foreground stars in the Milky Way.

"The project takes six solid weeks of observing time every year," Mihos says. "There is no way we could get that amount of time on a national telescope. But



The Burrell Schmidt telescope was the largest of its type when it was built almost 70 years ago.

it shows what fantastic cutting-edge research can be done by smaller, older instruments."



To create this image of the Burrell Schmidt, Steven Janowiecki '08 set up his camera on a remote scaffold. During a three-minute exposure, he walked back inside the observatory and rotated the dome so that its opening swept across the telescope. The net result is a "cutaway" effect, giving the appearance of no dome in front of the telescope at all.

An Expanded Menu

Sociologist Jessica Kelley-Moore and colleagues join local residents to increase access to healthy foods



MIKE SANDS

Jessica Kelley-Moore (left) is partnering with Gladys Walcott and other community gardeners to promote healthy eating in urban neighborhoods.

IF ONLY MORE AMERICANS WOULD EAT RIGHT, as doctors and public health officials continually urge them to do, rates of chronic disease in the United States would be much lower than they are today. Deficient and unbalanced diets are implicated in a long list of illnesses, including diabetes, hypertension, heart disease and cancer. But in a society overrun with convenience foods and junk foods, unhealthy eating habits are hard to break.

This is especially true for people living in poverty. Residents of disadvantaged neighborhoods are at high risk of developing chronic diseases, and experts agree that unhealthy food choices are largely to blame. Yet until recently, says sociologist **Jessica Kelley-Moore**, the reasons for those choices haven't received the attention they deserve.

For instance, it is impossible to find a full-service supermarket in many urban neighborhoods. The primary food outlets are corner stores that rarely sell fresh produce, lean meats, lowfat milk or whole-grain breads. While some residents can travel to other parts of town to buy groceries, this isn't an option for everyone. From Cleveland's Central neighborhood, for example, no city bus runs to any major supermarket. And since more than two thirds of the residents lack private transportation, they can't drive out to Giant Eagle to stock up on foods that aren't available close to home.

Sociologists call neighborhoods like Central "food deserts." But as Kelley-Moore points out, the scarcity of healthy foods isn't the only issue. A mother who wants to prepare nutritious meals for her family may not know where to begin. Her children may prefer burgers or buffalo wings. Besides, buying fast food may be the only way she can keep within her budget.

The lesson here, says Kelley-Moore, is that you can't understand people's food choices without knowing the social context in which they live. And from the history

of failed efforts to promote healthy eating in poor communities, she draws a further conclusion: If you want to develop a successful intervention, you can't come in with some generic program and treat the residents as mere clients. Instead, you must involve them in the process. A community-based, participatory approach offers the best hope of creating sustainable programs that will bring about lasting behavioral changes.

With these principles in mind, Kelley-Moore, an associate professor of sociology, is leading a five-year study that aims to expand healthy food access in four local communities. The study is the core project of the new Prevention Research Center for Healthy Neighborhoods, created last year by the CWRU School of Medicine with a grant from the Centers for Disease Control and Prevention (CDC). The CDC funds 37 prevention research centers around the country, all seeking ways to close economic, racial and ethnic disparities in health outcomes.

Elaine Borawski PhD '92, associate professor of epidemiology and biostatistics, is the center's co-director as well as a co-investigator on the core project. Although she is now a faculty member in the School of Medicine, Borawski has a doctorate in sociology from the College of Arts and Sciences. Both she and Kelley-Moore came to the project with experience studying food access in urban neighborhoods, and their shared recognition of how social factors shape dietary choices has made them natural collaborators.

"It's pretty hard for people in urban neighborhoods to be healthy when they just don't have the options that the rest of us in the suburbs have," Borawski says. "And when you look at the food environments, you really do see the disparity. You realize this is just wrong—and it's wrong that it's been overlooked as long as it's been."

You can't understand people's food choices without knowing the social context in which they live.

A Mix of Interventions

When the core project was launched last spring, researchers began collecting baseline data on food availability in the Central neighborhood and in East Cleveland. They conducted audits of grocery stores, corner stores, convenience stores and gas station markets. They visited restaurants and produced an inventory of social services such as food pantries and Cleveland Foodbank drop-off sites. They also walked the neighborhoods in search of less obvious food sources, documenting what Kelley-Moore calls “the informal food economy.” (In Central, their most surprising find was a mobile phone store that sells corned beef sandwiches on the side.) All of these findings have contributed to the team’s understanding of each neighborhood’s “total food environment.”

Although she has studied food deserts before, Kelley-Moore admits that she was dismayed by some of the audit results. In all of East Cleveland, only two stores sell fresh chicken breasts.

In Central, only three out of 16 stores carry lowfat milk or at least two varieties of fresh fruits. “We’ve got the data to that level of specificity,” says Kelley-Moore, “and it will break your heart. We actually found that for shelf-staple healthy foods, such as canned green beans, it was better to go to a chain drugstore than to any corner store in either of the neighborhoods. We never would have suspected that.”

In its next phase, the core project will create working groups in Central, East Cleveland and two other neighborhoods. Consisting of researchers, residents and representatives of community organizations, the working groups will select an area within each neighborhood as an intervention zone, making sure to include a K-8 school, at least one community garden, a corner store and a community center. Once the zones are established, each group will develop plans to increase the availability of healthy foods, educate residents about nutrition and raise community awareness through social marketing campaigns.

Kelley-Moore notes that many of the resources needed for the intervention plans—people, expertise, facilities—are already in place. “Our organizational partners, which include the Cleveland and Cuyahoga County Boards of Health, often have effective programs around healthy food access and nutrition education,” she explains. “But until now, they haven’t had the flexibility

to customize these programs for a specific neighborhood.”

The core project is distinctive in another way as well. Most healthy foods initiatives have been conducted at a single venue, such as schools or community centers, to serve a specific population, such as children, young mothers or senior citizens. In contrast, says Kelley-Moore, the core project aims to reach all the residents of the intervention zones by coordinating programs at multiple sites. For example, while corner store owners receive advice and assistance to expand their produce sections, community gardens may boost demand for fresh fruits and vegetables by offering classes in food preservation. A logo identifying healthy foods in the school cafeteria may reappear beside nutritious snacks in a community center. The mix of programs in the intervention zones will vary according to the resources, needs and priorities of each neighborhood.

As plans are implemented in the Central neighborhood and East Cleveland, two other communities will initially serve as control groups. In the next phase of the study, however, these communities will establish intervention zones as well. Researchers will evaluate the core project’s impact in all four neighborhoods by assessing changes in healthy food availability, people’s shopping habits and their knowledge about healthy eating.



MIKE SANDS

Molodian Price (left) and Charissa Murphy inspect their harvest at the "East Cleveland Grows" community garden.

Local Knowledge

During the first months of the project, Kelley-Moore and her team were in the field, talking with residents and learning the social dynamics of each neighborhood. "Why would you work with *that* corner store?" residents in one community asked them. "Nobody shops there." In Central, they learned that E. 55th Street functions as a social boundary, and that residents on each side rarely cross the street to shop. Such local knowledge will be invaluable as the working groups decide where to locate the intervention zones.

Introducing the project to each neighborhood is a gradual process, Kelley-Moore says. It requires building relationships with a community's "gatekeepers"—formal and informal leaders who can help the researchers connect with local residents. This past summer, for instance, a local nonprofit invited Kelley-Moore's team to a meeting of residents and officials from the Cuyahoga Metropolitan Housing Authority (CMHA). The topic of the meeting was an innovative community gardening program in one of Central's housing complexes.

At events like this, Kelley-Moore doesn't try to sell her project: "We actually spend most of the time listening," she says. In the course of the meeting, some older women said that their children, and now their grandchildren, rely on convenience foods because they never learned to cook. These women volunteered to do cooking demonstrations as part of the core project.

Kelley-Moore took their proposal to another organizational partner, the Ohio State University-Extension (OSUE), whose Cuyahoga County office supports community gardens and nutrition education programs. OSUE has offered cooking classes before, but always with its own teachers. Now, it is trying a different approach. The women from Central will receive training in healthy food preparation and then offer demonstrations in CMHA's certified kitchens.

The core project has also joined forces with the Cleveland-Cuyahoga County Food Policy Coalition. The coalition has been calling on the Regional Transit Authority (RTA) to reinstate

several bus routes that were dropped earlier this year to cut costs. Using data from the project's food audits and conversations with residents, the coalition demonstrated that the elimination of these routes has reduced healthy food access for people living in neighborhoods like Central.

Because of the flexibility of the research design, Kelley-Moore can respond whenever new opportunities for collaboration present themselves. When she learned, for instance, that local foundations would consider funding community gardens, she started talking with the gardeners about how to apply for grants. One of her partners in this effort, Gladys Walcott, is the leader of the "East Cleveland Grows" garden, where residents produce a rich variety of vegetables. Whatever portion of the harvest they cannot use themselves, they give away to family and friends, schools and churches.

Community gardeners like these are a civic asset, says Kelley-Moore. "They become great advocates for other people's gardening, for gardening



MIKE SANDS

Sociology graduate student Melinda Laroco Boehm (right) confers with Kelley-Moore, her dissertation advisor. Laroco Boehm has been awarded a two-year fellowship to pursue her research with the healthy foods project.

on school property, for bringing more fresh fruits and vegetables into the neighborhoods. And when other residents walk by and see the gardeners at work, they may well stop and think to themselves, ‘People around me are *doing* things.’” By their example, community gardeners convey the message that residents can act collectively to improve their lives.

Through their participation in the core project, Kelley-Moore hopes that increasing numbers of community members will develop habits of cooperation and mutual trust, expand their social networks and become effective advocates for their own interests. These are all forms of “social capital,” she explains, and their significance extends beyond the project’s immediate goals. In addition to making healthy foods more widely available, a neighborhood with a large stock of social capital will have the capacity to address other longstanding community problems.

In Their Own Words

For **Melinda Laroco Boehm**, an advanced doctoral student in sociology, the core project marks the formal beginning of her research career. Early this spring, she received a Minority Health Fellowship from the Association of Schools of Public Health (ASPH) and

the CDC’s Prevention Research Center program. Only four such fellowships were awarded nationally in 2010.

During the next two years, Laroco Boehm will conduct focus groups and qualitative interviews in the intervention zones. Her goal is to supplement the quantitative data from the audits by learning how residents *perceive* their local food environments. What do they think about the availability of healthy foods in their communities? From their perspective, what are their neighborhoods’ food assets and unmet needs? Laroco Boehm is also interested in knowing where residents buy healthy foods and how they get to those places.

The focus groups will help the research team assess the core project’s interventions. “We’ll actually hear from the residents which programs are working the best, and what factors make some interventions more successful than others,” she says. “And that will help improve interventions in the neighborhood after that one.”

Laroco Boehm developed her fellowship proposal after studying interviews from the project’s pilot phase. As she read the transcripts, she realized how much she could learn by hearing residents describe their food environments in their own words. “I get off work at 10,

and I like to get something to eat,” one resident said. “Everything except the McDonald’s is closed. So if I want to get something, that’s all I’ve got near my house.” This resident also noted that “better neighborhoods” have grocery stores that stay open longer.

For her dissertation, Laroco Boehm is examining how people living in food deserts can prevent and manage type 2 diabetes. She formulated her research question by talking with health professionals in her family—her mother is a physician, and one of her sisters is a clinical pharmacist.

“It is so disheartening to see older people come in with a chronic illness that could have been prevented if they’d had the proper education, nutrition and food-buying behaviors,” she says. “What people don’t understand, sometimes, is that prevention of disease is so much cheaper than treating a disease.”

Laroco Boehm continues, “Just because you live in a certain neighborhood, and are of a certain ethnicity or race, doesn’t mean you have to get diabetes when you’re older.” She could have said the same of any chronic illness. Everyone involved in the core project is determined to prove her point. ■

The Pursuit of Wise Guidance

The college welcomes Jeremy Bendik-Keymer as the Beamer-Schneider Professor in Ethics



This fall, philosopher Jeremy Bendik-Keymer is teaching a course on science and engineering ethics. In Spring 2011, he will offer a SAGES seminar titled "Vocation and Life."

DANIEL WILNER

THE ELMER G. BEAMER-HUBERT H. SCHNEIDER PROFESSORSHIP IN ETHICS was created with one overriding purpose: to give the teaching of practical ethics a prominent role in the undergraduate curriculum. An administrative leader as well as a scholar and teacher, the Beamer-Schneider Professor is based in the philosophy department but works with faculty members across the disciplines, encouraging them to integrate discussion of ethical problems into their courses.

This kind of collaboration comes easily to **Jeremy Bendik-Keymer**, who assumed the professorship this fall. Since earning his doctorate from the University of Chicago in 2002, Bendik-Keymer has helped to weave ethical inquiry into a freshman humanities curriculum and an international studies department. By bringing students from philosophy and social science courses together, he has fostered dialogue about the formation and realization of ethical ideals.

In keeping with his belief that "the point of ethics is to *act*," Bendik-Keymer also engages students in service learning projects, both in their own communities and around the world. He sees such projects as opportunities to "experiment with becoming a better person." In the process, students become aware of ethical problems and test their own capacities for ethical decision making. The most meaningful classroom discussions of practical ethics, Bendik-Keymer says, occur when students return from these experiences and reflect on them together.

As philosophy department chair **Laura Hengehold** notes, Bendik-Keymer is well prepared to build connections across the university. His primary research area is environmental ethics—a field in which the natural sciences, the social sciences and the humanities all have something to contribute. He has also written on education, human rights and the responsibilities of democratic citizens. This fall,

Bendik-Keymer inherited not only his grandfather's penchant for moral argument, but also his refusal to assume the worst about human nature.

he is teaching a course on science and engineering ethics that was first offered by his predecessor, Beamer-Schneider Professor Emerita **Caroline Whitbeck**. Having spent four years on the faculty of a university in the Middle East, he has thought deeply about globalization and the future of higher education.

For these reasons, Hengehold says, Bendik-Keymer will be a particular asset to Case Western Reserve at this moment in its history. "As the university pursues the internationalization, ethics, sustainability and social justice elements of its strategic plan, I expect that people in many departments will be looking to him for ideas."

Our Relation to Life

As Bendik-Keymer sees it, philosophy is simply "the pursuit of wise guidance—for personal life, family matters, work or politics, to name a few examples. And its great achievement isn't found in oracular pronouncements, but in the development of mature, open-minded human beings."

The theme of "wise guidance" recurs when Bendik-Keymer speaks about his family. His parents are both educators. Esther Bendik, an early childhood teacher, founded one of the first rural Head Start programs in upstate New York. In her earlier years, she was also a singer and actress. David Keymer started out as a history professor and then became a university administrator. An actor as well (his stage credits include the title role in *King Lear*), he is a reader of "everything in arm's reach," including philosophy and poetry, natural history and popular science.

He grew up with "talk happening around the dinner table," Bendik-Keymer says. "In my family, we love good food, so the table would fill with experiments and staples in cooking, under a lamp suspended from the ceiling. In that circle of light, we'd talk about the day, its meaning, politics, art, books, music, family, troubles, ties, hopes, local events, school, work and more. In my family, philosophy came from the fact that we are all passionate people with interests, and we love to talk about them and discover our relation to life."

Later, while he was in graduate school, Bendik-Keymer became involved in research on early childhood education; he contributed to a study of preschool programs where youngsters decide, through dialogue with their teachers, what they will learn. He has acquired stage experience of his own in music and theater, and he regards his love of



This family photograph from 1942 reminds Bendik-Keymer of his Ohio roots. Back, from left: his maternal grandparents, Andrew and Sue Bendik, and their daughter Evelyn. Front, from left: daughters Esther, Irene and Eleanor. When Bendik-Keymer gave a lecture at the Baker-Nord Center for the Humanities in April 2010, his Aunt Evelyn, now 81, was in the audience.

philosophy, literature and the natural world as a kind of inheritance. He remembers sitting with his father beside a mountain lake and discussing all of the authors who deserved the Nobel Prize but never received it. And it was his father who started him reading philosophy by suggesting Sir Thomas More's *Utopia* as a possible topic for his first high school research paper. "Knowing me as he does," Bendik-Keymer says, "he thought it was a book I might like."

Many of Bendik-Keymer's ethical ideas also stem from his upbringing. "I had to respect basic moral

boundaries and develop a work ethic of personal responsibility," he recalls. But he also says of his parents, "They gave me freedom to find my beliefs and passions."

This, too, was something of a family tradition. After earning her teaching degree in her early 20s, Esther Bendik decided to leave her native Ohio and try breaking into musical theater in New York City. Her mother was dubious at first: Why not teach school and just sing in church on Sundays? But her father gave her his blessing.

When Bendik-Keymer came to know them, his grandparents lived in the Cleveland area, where his grandfather worked as a machinist. The son of Slovak immigrants, Andrew Bendik, Jr., was born in southern Ohio, in a town called Ideal. To help support his younger siblings, he left school at age 15 and went to work in a coal mine—a job he kept for the next 25 years. Bendik-Keymer remembers him as a pious man who rose before dawn each morning to sing Lutheran hymns but who "had his own ideas about God and religion." He rejected the doctrine that children are born in sin. He didn't think it was immoral to dance with a woman other than his wife, and to those who insisted otherwise, he replied, "How do you know what is in my mind?" Bendik-Keymer inherited not only his grandfather's penchant for moral argument, but also his refusal to assume the worst about human nature.



DANIEL MILNER

Soon after he arrived on campus, Bendik-Keymer met with Phillip A. Ranney (left) and William B. La Place (right), trustees of the Kent H. Smith Charitable Trust, which created and endowed the Beamer-Schneider Professorship in Ethics.

When he encourages his students to take their education seriously, when he calls on them not to succumb to cynicism or apathy, Bendik-Keymer has his grandfather in mind. "There are billions of people living now who wish they had an education," he says. "The least that I, or any college student, can do is to be responsible, to pitch in, in a world where most people work at less than their capabilities."

Forms of Conscience

Utopia aside, Bendik-Keymer didn't study formal philosophy until, as a high school senior, he spent a year as a Rotary exchange student in France. He arrived at the Lycée Corneille in Rouen with a small library of European literature in his suitcase, and was soon adding French novels and poetry collections he discovered in bookstores. "But around me," he recalls, "people were taking philosophy and sitting to talk in cafés." Before long, he joined

the conversation. Later, as a freshman at Yale University, Bendik-Keymer balanced his interests, becoming a poet in a residential college but also taking four philosophy classes in his first year.

"For a paper on Descartes, instead of writing five pages, I wrote 17," he says. "And for my final political philosophy paper, instead of writing five pages, I wrote 42. I was completely and utterly hooked."

Later, as a graduate student delving into the history of ethics, Bendik-Keymer became intrigued by the different ways in which the idea of conscience had been defined in Western thought. In much modern philosophy, a person of conscience is typically described as someone who lives up to his or her norms of conduct. From this perspective, conscience is primarily a matter of integrity—of keeping faith with oneself.

But this view has a serious limitation, Bendik-Keymer notes. Some people cause great harm to others, yet their consciences are clear; acting “in the name of some norm,” they become blind to other people’s needs and interests.

And so, beginning in the 18th century, influential writers on ethics turned their attention to a different form of conscience. To them, a person of conscience was someone who recognized his or her connection to other human beings, who was mindful of them and related to them with empathy, compassion and respect. Integrity was still important, but now it meant acting in accordance with one’s awareness of our common humanity. To have a conscience, Bendik-Keymer says, was to be called by “the spirit of brotherhood inside us.”

Having traced this historical shift, Bendik-Keymer took his analysis one step further. What, he asked, does a fully developed conscience tell us about our obligations to the rest of life, and to the ecological systems on which life depends? What is an ethical stance toward the environment?

To answer these questions, he argued, we have to consider all the ways in which human life is bound up with the earth. As creatures that evolved on this planet, we rely on its air and water and other systems for our survival. But we also develop ways of life and cultural traditions that are intimately tied to particular landscapes. We think and express ourselves in metaphors derived



ISTOCKPHOTO

Bendik-Keymer wrote about the ethical dimensions of the Deepwater Horizon oil spill in May 2010, even as oil was coming ashore on the Mississippi Gulf coast.

from nature. We experience a variety of powerful emotions as we encounter the diversity and abundance of life.

To Bendik-Keymer, these examples suggest that our identity and well-being are more profoundly dependent on nature than we often realize. As he puts it, we are “greener than we think.” From this, he concludes that our relationship with the earth must be central to any description of what it means to flourish as a human being. It provides one reason for thinking of respect for life as a virtue. And it helps us recognize the ethical issues posed by environmental destruction.

Bendik-Keymer had this relationship in mind earlier this year when he responded to news that a disabled well was spewing millions of gallons of oil into the Gulf of Mexico. On May 28, in one of a series of “Earth Thoughts” he

has been writing as a daily exercise over the course of a year, he asked his readers:

Can you wrap your head around that—all the fishermen, all the coastlines, the teeming ocean bottoms, the life that would migrate through, the breeding and hatching grounds, the birds depending on the ocean life—all of that? And then wrap your head around human culture, around the communities and visitors who depend on the teeming Gulf life for their rituals, their sense of beauty and meaning?

By focusing moral attention on the possible impact of the spill, Bendik-Keymer sought to counteract the “thoughtlessness” that led to it in the first place. But such an exercise is only the beginning, he says. Next comes the work of practical ethics: thinking creatively about institutions, policies

and individual choices, so that we can find ways to translate the voice of conscience into action.

Unseen Possibilities

In recent years, Bendik-Keymer has devoted much of his thinking to one institution in particular: the university itself. Ethical study, he believes, should be part of a “broad, innovative education aimed at helping students think for themselves, develop a holistic picture of their role in life and become lifelong learners.” But how does a research university go about providing this sort of education? And how can a professor in ethics best contribute to its mission?

Bendik-Keymer had an unusual opportunity to test out answers to these questions. In 2004, he joined the faculty of the American University of Sharjah (AUS), an independent, coeducational university in the United Arab Emirates. Founded in 1997, the university was still defining itself when Bendik-Keymer arrived, and he took an active role in developing curricula and obtaining accreditation for the international studies department in which he taught. Because the university enrolls students from 70 countries, many different ethical outlooks and traditions were represented in his classroom.

It was at AUS that Bendik-Keymer developed an idea that he calls “cross-class questioning.” In his course on environmental ethics, his students

“I thoroughly enjoy finding ways to make philosophy part of public life, part of everyday life.”

had concluded that it was irrational for human beings to continue consuming natural resources and polluting the environment as they had for the past half-century—that such behavior made “no good sense for themselves or their descendants.” But they didn’t have a good explanation for why individuals and societies persist in such behavior.

Then Bendik-Keymer noticed that an environmental sociology course was meeting at the same time, so he brought the two classes together. His students asked what sociologists can tell us about the factors driving production and consumption in contemporary economies. But it turned out that the sociology students had questions, too: “They wanted to know what we thought our responsibilities should be when it came to protecting the environment.”

During his four years at the university, Bendik-Keymer wrote his first book, *The Ecological Life: Discovering Citizenship and a Sense of Humanity*. But he also found time to organize activities all over campus. He initiated reading groups and coordinated a video art project that was later exhibited at the Tate Modern in London. When he noticed that students weren’t gathering

for intellectual discussions outside of class, he began holding weekly “conversation circles” on the steps of the university’s main building. Then he designed courses around the topics the students had raised.

Acting on his belief in service learning as a mode of ethical study, he assisted a group of student volunteers who traveled to Dhaka, Bangladesh. There, they worked in a program that houses and educates the city’s poorest children while providing job training for their parents. In another project, he prepared undergraduates for a Model United Nations at Harvard University. The following year, the undergraduates turned around and created a Model U.N. for high school students from Sharjah and Dubai.

Finally, Bendik-Keymer sparked conversations beyond the university about environmental ethics. He wrote a column, “Down to Earth,” for one of Dubai’s daily papers and hosted a talk show on *Dubai Eye Radio*. “I thoroughly enjoy finding ways to make philosophy part of public life, part of everyday life,” he says.

As he carried out these different projects, Bendik-Keymer found it rewarding to work outside the limits of a conventional academic career. “I broke free of a view that says that the possibilities are already laid out and that you have to follow them,” he explains. “I found that there are unseen possibilities that radically open up one’s perception of the world and fill one

“I want the professorship to develop a reputation for ethical work in a broad and real sense—work that is actually relevant for people in our community.”

with the satisfaction of having done something undeniably useful and real.”

Ethical Work

In his first year as the Beamer-Schneider Professor, Bendik-Keymer’s primary goal is to build relationships. Even before he arrived on campus this fall, he was calling in to meetings of the Sustainability Alliance, directed by physics professor **John Ruhl**. The alliance brings together faculty members from the sciences and humanities, engineering, medicine and management. In addition to promoting research, it works with campus facilities, the University Farm and the Office of Student Affairs to foster dialogue and engagement around sustainability issues. “I look forward to helping the alliance move Case Western Reserve toward a rich and pervasive culture of sustainability—a sine qua non of 21st-century universities,” Bendik-Keymer says.

“I plan to meet with a range of departments, alliances and programs that I might serve or that have something to teach me,” he continues. “These include student life programs—they need not be narrowly academic.” And he is

equally committed to outreach beyond campus. Ultimately, he says, “I want the professorship to develop a reputation for ethical work in a broad and real sense—work that is actually relevant for people in our community.”

Part of this work will involve having students learn practical ethics through service. Bendik-Keymer plans to take them “out into Cleveland and Northern Ohio, and overseas, starting with the

United Arab Emirates and Bangladesh,” where he can draw on his existing contacts. In these settings, students will gain “a nuanced understanding of social reality and human values.”

In his view, this approach to ethics couldn’t be more timely. “We are in an age when undergraduates seek experience-based education, service learning and a sense of integration with a way of life—not just a

textbook,” he explains. Yet he also sees his proposal as reflecting an ancient theme in Greek philosophy.

In the *Nicomachean Ethics*, Aristotle notes that just as “men become builders by building houses, harpers by playing on the harp,” we acquire virtues by practicing them. And he further says that ethical inquiry is of no use unless it achieves a practical aim: “The purpose of our examination is not to know what virtue is but to become good.”

Bendik-Keymer often reminds himself of this line and quotes it to students. It expresses an idea that will guide his approach to undergraduate education at Case Western Reserve. ■



DANIEL MILNER

Describing his teaching style, Bendik-Keymer stresses the importance of discussion. “I almost never lecture,” he says.

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The Office of the Dean hosted the first annual All-College Welcome (Back) Picnic. Faculty, staff, undergraduates and graduate students from the college's 22 academic departments gathered on the Case Quad to enjoy live music and lunch on a beautiful autumn day.