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COVERING ENVIRONMENT AND SCIENCE AT A SMALL DAILY NEWSPAPER

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ABSTRACT

For this experiential project, I wrote environmental and science articles for the *Centre Daily Times*, a daily newspaper in Centre County, Pennsylvania. I reported a mixture of news, trend, feature, and profile stories. I covered the harvest of a community garden's first season; the rise of bed bug populations; the discovery of time-telling neurons; and other stories. This thesis contains the eight published articles and my reflections on the process of reporting each of the stories. I also define environmental and science reporting, briefly chronicle its history, and comment on the ethics of environmental journalism.

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CHAPTER 1: INTRODUCTION

From October 2009 to April 2010, I wrote environmental and science stories for the *Centre Daily Times*, a daily newspaper in Centre County, Pennsylvania. The paper has a circulation of about 30,000, which represents more than a fifth of the county's population.

Although the *Centre Daily Times* has a small staff and no environmental or science reporter, the Centre region has many untold environmental stories. Forest blankets more than 70 percent of the county, and farmland covers another fifth (Centre County Planning). The county is also the home of Pennsylvania State University, the state's land grant institution.

I'm pursuing a career in environmental journalism because I'm inspired by both nature and storytelling. I believe that, even in the industrial and Internet age, we humans still have an intimate, unbreakable connection with our environment. These days, that relationship may be in the form of genetically modified corn, bottled water and petroleum, but even the products of science and factories are ultimately comprised of soil, air, and water. We humans depend on Earth to survive, and yet our lifestyles often disrespect the environment. The tumultuous relationship between humans and nature fascinates me. Fortunately for a journalist, this inherent conflict always makes for a good story.

By reporting and writing the following eight articles, I explored how to communicate environmental and science news to a general audience. I wrote two profiles that humanized the scientists behind the science; two event stories that informed readers about happenings in their town; two trend stories that explored patterns within the community; and two feature stories that enlivened the Sunday edition.

This thesis contains the *Centre Daily Times* articles as they were published, my reflections on the process of reporting each of the stories, and my research on the environmental and science

beat. In this chapter, I define the beat, briefly chronicle its history, and comment on the ethics of environmental journalism.

DEFINING THE BEAT

According to *The Reporter's Environmental Handbook*, environmental journalism covers topics as varied as air pollution, biodiversity, cancer, chemical weapons, sprawl and occupational health (Greenberg). As a result, the science and environmental beat eludes a universal definition.

Every journalist on the beat seems to describe it differently. Mark Neuzil, a journalism professor at the University of St. Thomas and author of *The Environment and the Press*, defines environmental journalism as “the gathering, writing, editing and distribution of information about the interaction of people and the natural world, and issues related to the interaction” (xviii).

Professor and journalist Michael Frome infuses Neuzil's definition with a purpose. He says that the field is “designed to present the public with sound, accurate data as the basis of informed participation in the process of decision making on environmental issues” (ix).

Most perceive science journalism as a subset of environmental journalism. The Society of Environmental Journalists, a membership association of North-American professional environmental journalists, incorporates science, health, energy and climate reporting under the umbrella of environmental coverage (Society...). Relegating science assignments to environmental reporters is practical because every environmental journalist depends on scientists as sources. A journalist can't cover a story about an environmental issue without examining the hard science behind it. Consumers, religious leaders and politicians can react to an environmental issue, but only scientists can explain it.

Incorporating science within the environmental beat also makes philosophical sense. The environment is something we humans are all inevitably a part of. We are inextricably linked to the

plants and animals that nourish us, and to the sun and water that give birth to them. Science is just one species' attempt to explain the natural world, and thus should be considered a subset of the environment. In this paper, I will use the term “environmental journalism” to encompass both environmental and science reporting.

I favor Neuzil's definition of environmental journalism over that of Frome. I agree with Frome that people—especially citizens of a democracy—need information to help make informed decisions about environmental issues, and it is a journalist's responsibility to supply that information. For examples of these kinds of stories, refer to my articles “County farmers digging in” and “Bed bug colonies on the rise”, which explore the widespread use of genetically modified foods and the spread of bed bugs.

But there are also important environmental stories that don't deal with “issues.” Rather, they describe humanity's interaction with the natural world. Neither my profile about a paleontologist nor my feature story about a community garden are “issues.” They aren't controversial, and they won't directly affect public policy. But they do help us better understand our species' relationship to this place we call Earth and, in turn, to better comprehend ourselves. In the words of Richard Preston, environmental writers “take little for granted [and] remind us that there is nothing ordinary about our world” (xi). Environmental journalists not only expose humanity's negative impact on the natural world, but also chronicle our everlasting fascination with it. In the article “At season's end” I write:

Finanger said he was “absolutely charmed by potatoes.”
“You can't actually see them,” he said. “But when you overturn the earth — surprise! A golden treasure!”

Hans Finanger turns a regular potato into a treasure hunt, transforms the ordinary into the extraordinary. I hope my stories not only inform my readers about what's going on in their

community, but also encourage them to consider the environment from fresh perspectives, to add to their personal understanding of what it means to be an Earthling. I define an environmental journalist as someone who “imaginatively explores the external world of nature and the internal world of the human spirit” (Preston xv).

A BRIEF HISTORY OF ENVIRONMENTAL JOURNALISM

Mark Neuzil's *The Environment and the Press: From Adventure Writing to Advocacy* gives a comprehensive account of the development of environmental journalism. Here I generously borrow from Neuzil's guide.

Writers have been chronicling humanity's interactions with the natural world for millennia. The Old Testament—with its vivid description of floods, plagues, droughts and crop failures—can be considered a piece of early environmental writing. We can also trace the beginnings back to Roman writers like Pliny the Elder, who chronicled environmental damage and its causes in the 37-book encyclopedia *Historia Naturalis* in the first century A.D. (37). The ancient texts undoubtedly influenced later writers, including Americans.

The United States was born with the periodical press, and environmental stories peppered its early newspapers. The first paper in the American colonies, *Publick Occurrences*, contained two paragraphs about the spread of smallpox. The story, published in 1690, had a lot of the ingredients of a modern article—“public health and medicine, a local angle, 'progress' in reaction to the problem” (55).

Naturally, the definition of good environmental journalism evolved through time. In the eighteenth and nineteenth centuries, both scientists and journalists contributed to science stories, and science lectures were often published verbatim and laced with jargon (55). Until the early twentieth century, most environmental newspaper stories were event-centered, not idea-centered;

a flood would be covered, but a polluted river gradually trashed over time would often go unreported.

The two American environmental writers that most influence environmental journalists today are, arguably, Henry David Thoreau and Rachel Carson.

HENRY DAVID THOREAU

Henry David Thoreau was a nineteenth century nature writer that meshed personal experience, science and philosophy in his writing. Thoreau, who started his career writing for magazines, is best remembered for the book *Walden*, which was published in 1854. In *Walden*, Thoreau describes the two years that he lived in solitude with nature in a cabin that he built on Emerson's land. The writing is “aesthetical, ethical and spiritual” and references the writers that came before him, including Pliny the Elder (103). Thoreau's writing also encourages social reform; he advocates abandoning the commercial and industrialized world for the “transcendent spirit in wilderness” (104). Thoreau writes:

I wish to speak a word for Nature, for absolute freedom and wildness, as contrasted with a freedom and culture merrily civil – to regard man as an inhabitant, or a part and parcel of Nature, rather than a member of society. (102)

In this way, Thoreau's writing not only influenced subsequent writers, but also the social and environmental movements of the twentieth century.

RACHEL CARSON

Rachel Carson is rumored to have kept a copy of Thoreau's *Journal* at her bedside. Carson was a marine biologist turned science writer who wrote for the U.S. Fish and Wildlife Service, and for a national audience through books, magazines and newspapers. She is best known for her 1962 book *Silent Spring*, which exposed the dangers of synthetic pesticides.

Carson was a “graceful writer” that took research seriously (187). She studied scientific reports, court cases, interviews and more. With more than 600 hundred sources, *Silent Spring* was

a “journalistic synthesis of existing literature” (189). Carson scholar Priscilla Coit Murphy writes:

Overall, the effect and rhythm of the pieces were—appropriately—that of an investigative, journalistic feature, beginning with dramatic themes and anecdotes, supporting in the middle mainly through the accuracy and lucidity of Carson’s explanation of scientific phenomena, and concluding with philosophical commentary. (188)

The book, which was a top-ten best seller for six months, started a nationwide debate about pesticides and led to the banning of DDT in 1972.

Others had written about pesticides before. Carson’s book garnered so much media attention because it emphasized “the news criteria of conflict, impact and prominence” (191). Most importantly, Carson’s *Silent Spring* was timely. The ‘60s and early ‘70s were categorized by social, political and environmental upheaval. In 1962, the United States began an herbicidal warfare in Vietnam with Agent Orange, which directly killed half a million people. In 1969, oil and chemicals in the Cuyahoga River in Ohio caught fire, a visible sign of an environment on the brink. In 1970, about 20 million people protested environmental policy on the nation’s first Earth Day.

Consequently, environmental reporting grew into a beat. In 1968, there was only one environmental journalist in the United States. By 1972, there were 95, one third of which covered the environment full-time (195). In 1989, the environmental journalists organized, forming the Society of Environmental Journalists (200). Environmental stories grew more complex, focusing less on environmental disasters and more on investigative, crusading reports. In 1990, environmental stories won three Pulitzer prizes (198). Radio shows, such as NPR’s *Living on Earth*, and television series, like CNN’s *Earth Matters*, jumped on the “green” trend (206-216).

At the turn of the millennium, international terrorism and then the economy muffled the nation’s interest in the environment. Newspapers, still grappling with their business model in the Internet age, devoted less space and money to environmental coverage. Virtually no small or

medium-sized papers employ full-time environmental journalists today. Environmental blogs such as Worldchanging have sprung up in an effort to fill the news hole.

Today the future of environmental journalism is still hazy and uncertain.

ADVOCACY IN ENVIRONMENTAL REPORTING

Like all professional reporters, environmental journalists voluntarily follow the Society of Professional Journalists' Code of Ethics. Journalists should seek truth and report it, minimize harm, act independently and be accountable.

For environmental journalists, it is particularly difficult to act independently, or "be free of obligation to any interest other than the public's right to know." Environmental reporters are often accused of writing not on behalf of their readers, but on behalf of the environment. This type of activism is clearly evident in the works of Thoreau and Carson.

Michelle Nijhuis, a freelance journalist in Colorado "specializing in science, the environment and the American West," said in an interview that she has been pigeonholed into being an activist, and she strongly opposes the label. Nijhuis said that all environmental journalists constantly face a "problem of perception." All the environmental journalists she knows pride themselves on their independence, but their audience nonetheless perceives them as activists.

Nijhuis said that she looks critically at both corporations and the environmentalists that oppose them. (The environmentalists are sometimes as corrupt as the corporations, she added.) Nijhuis said that, like any good journalist, she has a reform impulse. "A crime reporter believes that crime is a bad thing, and hopes that their stories lower crime. As an environmental reporter, I believe that a clean, healthy environment is a good thing." She said that environmental reporters are perceived differently than crime reporters because "society just hasn't come to the same conclusion. It does not yet see the value in clean air and water."

A minority of journalists have embraced their activist role, which they see as inherent to environmental journalism. Journalist and professor Michael Frome writes:

Advocacy is a word that we have been taught to avoid. It marks a bias, something most journalists are convinced should not be acknowledged, despite the fact that it is inescapable. But my point is that we ought to be advocates for the health and safety of the planet, professionally and personally concerned with global warming, acid rain, destruction of tropical and temperate forests, loss of wilderness and wildlife, toxic wastes, pollution of air and water, and population pressures that degrade the quality of life. (ix)

Frome writes that most media are biased because they take the “inherent goodness of money” for granted. Like Nijhuis, Frome believes that a clean environment has inherent goodness.

I also value clean air, water and land more than monetary wealth. In general, American culture praises economic development and natural resource consumption. Personally, I value biological preservation and frugality. In deciding the topic or angle of a story, I inevitably infuse the article with my worldview. When I had the opportunity to choose a topic for a feature story, I wrote about a community connecting with the Earth through gardening. I could have written about a new local business or an emerging “green” technology, but I didn’t. Similarly, instead of writing about the scientific marvel of genetic engineering, I wrote about its health and environmental affects.

As I reported the following stories, I considered whether my readers perceived my biases, and whether I was acting like an advocate, journalist or both. I asked, “What is the role of an environmental journalist in our society, anyway?” As I discuss in chapter four, I decided that I am an advocate, but not in a way that goes against the values of journalism.

This project taught me that the reporting and writing of a story can always be improved upon. There will always be that question that you should have asked but didn't. There will always be a better way to write a sentence, upon revision. And there will certainly always be a deadline

that forces you to do all that faster.

In the following eight articles and essays, I reflect on my ongoing efforts to improve both my writing and my reporting.

CHAPTER 2: PROFILES AND FEATURE STORIES

AT SEASON'S END

PARTICIPANTS HARVESTING LAST OF COMMUNITY GARDEN CROP OCTOBER 12, 2009

While commuting home one autumn afternoon, I came across dozens of garden plots on the edge of campus, then struck up a conversation with a man harvesting a pumpkin. When I learned that the gardens had just opened that year and found little mention of them in the local papers, I decided to follow up on the story. My editor approved the idea, and I developed it into this front-page feature. For published layout, refer to Figure 1 in the appendix.

As the days shorten and the nights shiver, more than 120 gardeners are taking home the last crops from the first season of the Center for Sustainability's community gardens.

Together, they planted 7,000 plants in 96 plots, growing tomatoes, peppers and squash, and even some pesto, pumpkins and New England aster.

"Just getting people outside is a huge accomplishment. Getting them to experience the pleasure of little subtleties like picking a pepper — now that's indescribable," said Hans Finanger, a State College resident who was one of the first to have a plot in the gardens.

The gardens, off Porter Road on Penn State's campus, opened in April. The 10-by-15-foot plots are nestled on a slope between groves of walnut and poplar trees on the lands of the Center for Sustainability, halfway between Beaver Stadium and College Avenue.

About 50 percent of the gardeners are graduate students, 35 percent university faculty and staff, 10 percent undergraduate students and 5 percent community members unaffiliated with the university, said Franklin Egan, president of the gardens. Each gardener pays \$20 for a yearly membership.

Gardeners must renew their plots for next season by Nov. 1. The gardens will begin taking

applications for new members in January. Applications will be available online, said Nelson Debarros, vice president of the gardens.

Egan expects a big turnover. “This is a college town, and people are always moving in and out,” he said. “The hardest part of this project will be to keep the gardens stable.”

The College of Agricultural Sciences gave the gardens \$3,500, which funded a summer internship for student Seth Bomgardner and initial startup costs, such as buying shovels and chicken wire.

The gardens are the brainchild of Clare Wagner and Jackie Yenerall, former leaders of the Penn State Sustainable Agriculture Club, said Egan. Yenerall graduated from Penn State last year and works at the Vermont Foodbank.

“By reconnecting people with the very basics of food production, I hope to remind them of the value of food ... and the pleasure and pride that can come from growing and cooking it,” Yenerall wrote in an e-mail.

Egan said patience was the key to creating the gardens. The club spent a year writing a business plan and preparing the site.

Two years ago, the space was overrun by 5-foot-tall burdock weeds, said Bomgardner, a junior majoring in agricultural engineering. Last year, the club cut down the weeds, plowed, and planted field peas and oats to enrich the soil and prevent more weeds.

Now, the gardens are run by the gardeners, not the student club, Egan said. The gardeners met recently to discuss leadership roles.

Egan and Debarros are both ecology graduate students who garden at the plots.

“During the summer I couldn’t spend any less than an hour and a half at the gardens. I would spend 15 minutes working on the plot, and the rest talking to people,” Debarros said.

Finanger said he went hiking, shared recipes and canned vegetables with the other gardeners.

The garden grew “explosively” between mid-May and July, Finanger said. But not all the plants survived. The tomatoes were ravaged by late blight, a mold that thrives in abnormally wet conditions, Bomgardner said.

It was a bitter harvest for some gardeners who devoted their entire plot to tomatoes. “In our first season, we all learned a lesson,” Debarros said. “You need to diversify your plants, just like stocks and bonds.”

According to the gardener agreement, members must manage their weeds, keep their plants less than 6 feet high, and use exclusively organic methods. Most followed the last tenet, Bomgardner said, though a few gardeners applied non-organic Miracle-Gro fertilizer.

“I’m happy that my veggies are pure,” Finanger said. “I can pick them and eat them right away without worrying about chemicals.”

Debarros said three people were evicted because they “grew more weeds than plants.” They were given three notices in three weeks, then their plots were given to someone on the waiting list.

Gardeners must attend at least one free workshop per year organized by the gardens. This year, three workshops led by university professors and garden members taught how to plan and plant a plot, manage pests without pesticides and can vegetables.

Finanger, a self-employed massage therapist, tended his garden about three times per week for two hours. He read at the picnic table and played Frisbee with his wife in the fields. His poodle, Peekay, scared away the groundhogs.

Finanger said he was “absolutely charmed by potatoes.”

“You can’t actually see them,” he said. “But when you overturn the earth — surprise! A golden treasure!”

Born and raised in Saudi Arabia, Finanger moved to the U.S. when he was 15. He fondly remembers his grandparents’ Iowa farm.

“The land in Saudi wasn’t this fertile,” he said. “This brings me back to my roots.”

Egan hopes the garden continues to thrive.

“I want it to be a great opportunity for the community — especially the students — to learn from for a long time to come.”

REFLECTION: PARTICIPANTS HARVESTING LAST OF COMMUNITY GARDEN CROP

This story was trickier to report than I initially thought. I first talked to the founders and leaders of the gardens, then considered my reporting done. But when I sat down to write the story, it seemed lifeless. I was missing the human element, the personal anecdotes that enable readers to emotionally connect to the story.

I visited the gardens again and met Hans Finanger, a gardener that had a lot to say. Finanger related his love of gardening to his childhood in Saudi Arabia and the family he left behind in Iowa. Through Finanger's quotes, the reader can tell that gardening is much more than a source of food for Finanger—it's also a memory and a lifelong pleasure. I am proud of this story because of the way I intertwined Finanger's anecdotes with information about the development of the garden. It's both interesting and informative.

My first draft of the story began with a quote from Finanger. “Just getting people outside is an accomplishment...,” I wrote. My editor at the *Centre Daily Times* said that it is the paper's policy to never begin stories with quotes. Using a quote is a shortcut because it enables you to borrow someone else's creativity. At first, I was attached to my beginning and reluctant to change

it. I had to force myself to sit down and rethink the story. I decided to detail the harvesting of the crops. I like the result even better than Finanger's quote. I'm especially delighted with my personification of the night. I should try to utilize more literary techniques, like personification and metaphor, in my stories.

**A GRANT FIT FOR A 'GENIUS'
PSU PROFESSOR GETS FELLOWSHIP
SATURDAY, NOV. 07, 2009**

My editor forwarded me a Penn State press release about this MacArthur grant winner. I combed through Beth Shapiro's history online and then scheduled an in-person interview with her. Afterwards, I talked to Shapiro's students, both on the phone and outside her lecture hall after class. I researched other grant winners online. This profile and sidebar ran in the paper's Sunday Life section. For published layout, refer to Figure 2 in the appendix.

As a high school student, Beth Shapiro worked as a professional broadcast journalist. As a college freshman, she was a news director for a local radio station and a country music DJ on the weekends.

"I don't know why I did that," she says now. "I don't even like country music!"

As an upperclassman she dropped journalism for her second passion: pure science research. And as a Rhodes scholar at Oxford University from 1999 to 2002, she headed the wine club and "stumbled into ancient DNA research."

She's been studying old bones ever since.

The 33-year-old Shapiro, an assistant professor of biology at Penn State's Eberly College of Science since 2007, was recently awarded the prestigious MacArthur Fellowship.

As a MacArthur Fellow, Shapiro gets \$500,000 over five years— no strings attached.

This year's 24 fellows were nominated anonymously by their peers and chosen for their extraordinary creativity and their potential to do more. The John D. and Catherine T. MacArthur

Foundation has given the award to recognize innovators in all disciplines, from photojournalism to papermaking, since 1981.

Shapiro grew up in Rome, Ga., where her mother worked as a nurse and her father sold pianos. She attended the University of Georgia on a full-tuition scholarship. After studying at Oxford, she became a junior research fellow there in 2004.

Three years later, she moved to State College because Penn State offered “smart colleagues and opportunities to work on a wide range of topics,” she says.

Shapiro extracts DNA from extinct animals such as mammoths and from threatened species such as bison. She uses the genetic information to explain how evolution works in populations of large animals and how environmental changes — like the Ice Age or the introduction of humans into North America — influence populations.

Looking at how animals have responded in the past to their changing climate can help predict how today’s animals will be affected by climate change, Shapiro says.

She will use her grant money to do some risky experiments, which she defines as “anything where you don’t know the result before you start.”

Traditional funding sources such as the National Science Foundation, which taxpayers finance, hesitate to fund projects that involve bones or species other than those Shapiro has already tested, she notes.

But \$500,000 doesn’t go far in molecular biology. Shapiro says she just hopes it covers the cost of gathering preliminary data, which she will begin next year.

Shapiro won’t say what species she will experiment on. “In most cases, we’re still deciding what to do.”

The MacArthur award is often called the “genius grant.”

“Whether it be her humble nature, her will to answer the tough questions, or the enthusiasm that she brings to work and our lab, Beth is truly exceptional,” Justin Sloane said in an e-mail.

Sloane is an undergraduate student and researcher at Shapiro’s lab.

But Shapiro doesn’t think she’s a genius. “I’m lucky,” she says.

Tim Reynolds, a sophomore majoring in forestry, is in Shapiro’s 750-student introductory biology class. Reynolds says that Shapiro has a “bright personality.” “She’s great at communicating the basics.”

In part, Shapiro is still a journalist. She likes to give talks about science, especially about cloning. Shapiro says that using old DNA to bring back extinct species is difficult, expensive and still not possible. And pointless, she adds.

Shapiro asks: Why would you bring back one example of something extinct? Where would you put it? Wouldn’t it be lonely? What kind of quality of life would it have? Would it be just for our own amusement? That would be kind of mean, wouldn’t it?

Shapiro won’t be teaching at the university next semester because she is expecting her first baby, a boy, on Dec. 1. “I guess I’ll have to take some time off.”

Motherhood is “very scary,” she says. “But I’m ready to not be pregnant anymore.”

Shapiro has carried out experiments in Russia, Canada and Alaska. Two summers ago, she lived in a tent in Siberia for six weeks on treeless permafrost buzzing with mosquitoes. She researched whatever animal remains she could find within the layers of permafrost.

Shapiro likes working in the field more than in the lab. “Obviously!” she says.

“But you can’t live on field work alone. The field work is the most fun part, but the lab work is the most important part.”

GRANT WINNERS HAVE DIVERSE INTERESTS SATURDAY, NOV. 07, 2009

Since 1981, the John D. and Catherine T. MacArthur Foundation has recognized 805 fellows, ranging in age from 18 to 82 at the time of their selection. Among this year's 24 fellows are:

Deborah Eisenberg, 63, who worked as a waitress in New York City into her early 30s, then took up writing.

In 2006 she published her fourth short-story collection, "Twilight of the Superheroes."

"As with all of Eisenberg's fiction, these stories show us who we are and what we're capable of. They chronicle, and edify, our time," book critic Ben Cosgrove wrote in Salon. The grant will buy the University of Virginia English professor time for writing.

Artist Camille Utterback, of San Francisco, who creates interactive abstract projections that respond to your body using digital technology.

Technology, like cell phones and iPods, often removes us from our present and makes us unaware of our bodies, Utterback says. She wants her pieces to inspire passersby to ask, "What happens when I stick out my arm? What happens when I group together with other people in this space?"

The grant will let Utterback experiment with new sensors, lights and projection technologies without having to wait for commissions.

Mathematician L. Mahadevan, who uses complex mathematics to solve simple questions about our everyday world. According to the MacArthur Foundation, Mahadevan researches "how cloth folds when draped, how skin wrinkles, how flags flutter, how Venus flytraps snap closed."

The Harvard University professor says his children are an inspiration: "They often ask questions that you can't answer."

The grant will enable Mahadevan to try to answer some of them.

Among other 2009 MacArthur Fellows are a bridge engineer, a digital artist, an infectious disease physician, an investigative reporter, a filmmaker and an economist.

REFLECTION: A GRANT FIT FOR A 'GENIUS'

“At some basic level, all writing is about human character,” writes Richard Preston in *The Best American Science and Nature Writing*. “To follow the life of a scientist and describe the scientist’s obsessions helps to show readers why the scientific material may be important for all of us” (xvii). Science controls most aspects of our daily lives—we eat genetically modified food for breakfast, hop in our combustion-engine car, turn on the radio, and rarely think about the scientists that silently contributed to these moments.

My goal for this article was to introduce readers to a scientist. I wanted to describe Shapiro’s recent awards and research, but I also wanted to give readers a sense of how she got here, and why she cares so much about her research.

Getting this information was not easy. When I arrived at Shapiro’s office, she said she had only half an hour to talk. She religiously glanced at her clock every five minutes. It was late afternoon, she was tired and very pregnant, and the only obstacle between her and home was this journalist, me. Luckily, I had researched Shapiro’s background before I came, so I knew what questions to ask to get quick anecdotes. (Were you always a science major? What’s your favorite beverage?) My editor later asked me to add details. (What do your parents do?)

Since Shapiro was pregnant, an obvious question that the reader might have had was whether she was married, engaged or otherwise romantically involved with someone. My editor suggested that I ask her. But, since Shapiro did not offer this information, I felt uncomfortable asking. Would I have felt the need to ask a young male scientist if he was single or attached?

Maybe not. I talked about my dilemma with an editor, then decided that the information was not crucial to describing Shapiro's character and left it out.

The article ran alongside a sidebar that briefly described other award recipients. For this sidebar, I used secondhand research and email interviews. In hindsight, I wish I had tried harder to talk to the winners over the phone. The chats might have infused the story with more anecdotes and quotes, with more humanity.

PROFESSOR HAS TIMING DOWN TO A SCIENCE SUNDAY, NOV. 29, 2009

This article also stemmed from a jargon-filled press release forwarded to me by the *Centre Daily Times*. I debated whether to write about it, wondering if I could effectively explain the complex concepts to the average reader while keeping the audience entertained. I decided to take on the challenge and wrote this feature about emerging research in the overlapping fields of physics and neurology.

How do you know when to reach for a flying football? How do you sense when to start braking for a red light?

Our daily life is a sequence of actions that we time precisely. But, until now, how we keep track of time has been a mystery.

Groups of neurons, or brain cells, track time in all primates, according to a team of researchers that published its findings in *Proceedings of the National Academy of Sciences* last month.

The team is made up of a physicist — Penn State assistant professor Dezhe Jin — and two neuroscientists, Ann Graybiel, from the Massachusetts Institute of Technology, and Naotaka Fujii, from the RIKEN Brain Science Institute in Japan.

Unlike in previous timing experiments, the researchers did not instruct the subjects, two monkeys, to track time. But the monkeys did so anyway. That means that our brains are always

keeping track of where we are in time, Jin says.

Graybiel and Fujii tested two macaque monkeys over three years. They placed 20 electrodes in the prefrontal cortex and striatum of the brain, which affect movement, learning and social behavior.

Each electrode recorded the activity of one brain cell as a monkey looked at a series of lights. Like all primates, the monkey was naturally attracted to the light.

Groups of neurons in the monkey's brain consistently responded to the light at specific times. Some activated 100 milliseconds after the light came on, some 110 milliseconds, some 150 milliseconds, and so on. Together, these neurons acted like an extremely precise stopwatch for several seconds after each light event.

The team repositioned the electrodes and repeated the experiment until they gathered data for nearly 5,700 neurons. "That's a huge data set," said Jin. "But it's useless if we can't make sense of it."

To organize the data, Jin designed a computer program that sorted the neurons according to when they activated after the light.

With his computational system, Jin found 101 types of neurons. All the types were the same in all of their properties except for their timing.

But that's not how many groups of neurons the brain has, Jin says. Since the brain has about 100 billion cells, the cells tested in this experiment are a limited sample.

Knowing how timing works in a healthy brain might help us figure out why it doesn't work in the brains of Parkinson's patients, says Jin.

Parkinson's disease is a disorder of the central nervous system that causes tremors, difficulty walking, slow movement and other symptoms, says Nickie McIntire, a nurse practitioner

at Blair Medical Associates in Altoona. If researchers can cure the patients' timing problem, the patients will be able to decrease their reaction time and better control their movements, McIntire adds.

Graybiel says that the physicist in Jin complements the neuroscientist in her. Graybiel made the brain recordings, while Jin analyzed the data with his computational method. "It's just amazing what we can do when you put the two together," she says.

The research was supported by the National Parkinson Foundation, the National Eye Institute, the Alfred P. Sloan Foundation, and the Huck Institutes of the Life Sciences at Penn State.

In other research involving brain function, Jin is creating a computer model of the male songbird's brain activity during its courtship song. Songbirds, such as the Bengalese finch, have a complicated syntax. Like us, they combine syllables into phrases. Jin and his partner, Alexay Kozhevnikov, a professor of physics at Penn State, ask what determines the order of these syllables.

Like humans, the Bengalese finch has the capacity to learn language. At first, the male chicks babble when they try to imitate their father, but eventually they sing.

Kozhevnikov has tested four finches in two years, and he plans to test four more, he says. His research is funded by the National Science Foundation and the Huck Institutes of the Life Sciences.

Jin says that he can't research humans because the experiment requires the skull to be opened to insert the electrode. That's invasive and unethical, he says.

Even though his PowerPoint slides picture birds and monkeys, Jin's research is ultimately about humans. Jin hopes his research quenches our curiosity, he says.

“How your brain works, how you speak your thoughts — that’s the most fascinating thing to me.”

REFLECTION: PROFESSOR HAS TIMING DOWN TO A SCIENCE

My primary goal for this story was to wade through Jin’s jargon, to find a way to relate the scientific discovery to readers. I wrote about the science in simple terms and explained its potential impact on Parkinson’s patients. My lead attempted to connect to my audience in the form of a question. That’s a good start, but I could have made this piece more engaging.

If I could do it again, I would ask Jin more about the years that it took to collect and analyze the data. “In the end, science is not about facts and discoveries, it’s about mystery. Science is about not knowing and wanting badly to know. Science is about flawed and complicated human beings trying to use whatever tools they’ve got, along with their minds, to see something strange and new,” Preston writes (xxii). In this story I tried to catch some of the mystery with Jin’s final quote, but I could have done more. What obstacles did Jin and his colleagues face during this experiment? How did they interact with the monkeys? With each other? Since this piece was a feature, I could have written the story of the experiment as a narrative, weaving a plot with a climax and a resolution.

Next time I write a story about a discovery, I would like to take a risk and write more creatively, in hopes of better communicating the drama of science to my readers. This research is Jin’s singular passion. When he talks about it, his hands tremble, the whites of his eyes shine. But my article muffles that important aspect of the story.

SCIENTIST AND ARTIST SWITCH ROLES TO BE PUBLISHED

I found out about this couple by watching a video on the Penn State Research Web site. In the video, artist Rebecca Horwitt says, “I always thought I’d be a paleontologist. Instead I married one.” That sounded like a great story angle to me.

Since she was 5, Rebecca Horwitt wanted to be a paleontologist—a scientist who studies the past through fossils. In her first grade class, she read a book about dinosaurs “at least seventy times,” Horwitt says. She still remembers the illustration on the last page—a melodramatic depiction of a dying Tyrannosaurus Rex.

Horwitt's husband, Peter Wilf, strummed a guitar and admired Jimi Hendrix through his adolescence. He wasn't interested in paleontology until his late 20s. When his university advisor suggested that he study geology, Wilf replied that he didn't like rocks.

Horwitt, 35, never pursued a career in science, and Wilf, 46, no longer plays guitar on stage. Now Horwitt, who illustrates ancient landscapes, is the artist. And Wilf, who is an associate professor of geology at Penn State, is the paleontologist. The State College couple collaborates on projects that mesh the scientific and the artistic.

Distinct and complementary passions

Wilf and six colleagues from across the country recently published the “Manual of Leaf Architecture,” a comprehensive guide to identifying and describing the leaves of flowering plants.

Horwitt drew about 70 illustrations for the book. The manual was intended for botanists, but artists have bought it, too. “It's that beautiful!” says Wilf.

Wilf says that leaves are generally overlooked in nature. “They're so common that we merge them into this giant green blob.” The book is an attempt to explain the blob, he says.

The hardest part of conveying scientific information pictorially is deciding what is most

important, and then ignoring the rest, says Horwitt. “That's probably what I'm best at – stripping things down to their essentials,” she says.

Wilf says that many illustrations depicting the age of dinosaurs misrepresent the vegetation. Most artists fill up the background with monkey-puzzle trees, an evergreen that now grows in Chile and Argentina, “as if they were the only plants in all parts of the world for 160 million years,” which is the evolutionary lifespan of the dinosaurs.

Horwitt says that she doesn't always get her foliage right, either. (“Yeah, she does,” says Wilf.)

Wilf specializes in plant fossils and is currently conducting research in Patagonia in southern Argentina. The project is funded by the National Science Foundation.

Fossil leaves can help reconstruct ancient climates, Wilf says. In the dry steppe of Patagonia, Wilf and his team are digging up ancient rainforest leaves. The fossils tell us that what is now a semi-arid landscape with few trees was lush vegetation 50 million years ago.

The team has also unearthed prehistoric plants in South America that now only grow in Australia. “The fossils give us great insight into the deep evolutionary and climate history of the Southern land masses,” says Wilf. Millions of years ago, a thin strip of land connected South America and Antarctica, which was joined to Australia. The fossils show that plants used this land connection to migrate, especially during periods of warm climate in Antarctica.

From guitarist to scientist

As an undergraduate student at the University of Pennsylvania, Wilf studied Russian history, math and music, then graduated to work odd jobs like pizza delivery through summer. Though he graduated cum laude, Wilf jokes that college was a “wasted opportunity. I really should have worked in a coal mine or something before college to straighten me out.”

Wilf taught an eighth grade class in New Jersey for three years, where he rediscovered his interest in science. Then he was a “starving” guitarist for four years. “I played Delta blues and avant jazz and expected the world to tolerate it,” he says.

In his late 20s, Wilf’s “scholarly genes activated.” Wilf is from an academic family. His sister is a teacher with a PhD in Chinese from Harvard, his mom is a zoologist turned midwife, and his dad is a mathematician, now retired from the University of Pennsylvania. “My parents always said I’d figure it out,” Wilf says, “and I did, eventually.”

Dana Royer, an assistant professor at Wesleyan University and one of Wilf’s former students, praises Wilf for his diligence and “serious science.” And for his booming laugh.

“Even if you’ve only met him once, you remember him,” says Royer. “First of all, he’s tall. And he’s loud, in a good way. That part of him is so endearing.”

Wilf’s field nickname in Argentina is “gordo,” which means “big guy” in Spanish.

Kirk Johnson, the vice president of the Denver Museum of Nature and Science who has collaborated with Wilf for more than a decade, is also a “gordo.” The nickname not only applies to their physical size, but also to their shared approach to life, says Johnson. “We’re exuberant and aggressive. We like to charge at things, hard.”

From scientist to artist

Horwitt, who is at least a head shorter than Wilf, studied biology and geology at Tufts University. Then she worked at the Smithsonian National Museum of Natural History for two years, adding to a database about the evolution of terrestrial ecosystems.

“She actually studied first,” says Wilf. “She did it the right way.”

Anna Kay Behrensmeyer, the curator of vertebrate paleontology at the Smithsonian, says that Horwitt was “always cheerful and dedicated to her job.”

“The truth is, I was a much better doodler in the margins of my notebook than I was a scientist,” says the soft-spoken Horwitt.

Behrensmeyer saw Horwitt's animal sketches and asked her to draw reconstructions of extinct giant African pigs. “It was clear she had great talent,” says Behrensmeyer, who used Horwitt's illustrations in her presentations to explain ancient ecologies.

Horwitt's work has been featured in academic journals, including “Science” and “GSA Today,” which is published by the Geological Society of America.

Horwitt, who draws in pencil, pen and “anything that's on the desk,” never formally studied art after high school. Her first published illustration appeared in her hometown newspaper, the “Roe Jan Independent” in New York, when she was about 5. It was entitled “Snowman.”

Shared interests

Wilf and Horwitt met at the Smithsonian when Wilf was in residence at the museum as a graduate student. “The two of them became good friends, but they were quiet about this, so it was a surprise—a very happy one—when they announced they were engaged,” Behrensmeyer says.

Wilf and Horwitt have a daughter, 4-year-old Eva, and another child who is due in less than two months. In the crayon drawing posted on Wilf's office wall, Eva portrays her dad as a tall, colorful character with fairy wings.

Both Wilf and Horwitt are still fascinated by both the musical and the prehistorical.

When Horwitt accompanies Wilf to Argentina, she helps prepare fossils at the paleontological museum there. Fossil preparation is slow and meticulous work, but also meditative, say Horwitt and Wilf.

Wilf works with rocks in both his tidy fifth-floor microscope lab and in his “inglorious” and dingy basement lab in Deike Building. Armed with an air drill and earplugs, he scrapes away

excess rock from a treasured relic, bit by bit. His metal cabinets store thousands of fossils. Each fossil requires at least half an hour at the drill.

Wilf and Horwitt's home usually sounds like blues, jazz, or “anything that's well played.”

Wilf says that he and Horwitt, a fellow “hardcore music head,” have similar music tastes. He pauses, then adds, “Yeah, we're just compatible.”

REFLECTION: PALEONTOLOGIST AND ARTIST PROFILE

This article presented more challenges than a traditional profile because I had to tell the stories of two people, not just one. I interviewed Rebecca and Peter together in Peter's office. Since Peter was loud and talkative, I heard a lot from him but little from Rebecca. I wanted to give equal space to Rebecca and Peter in the article, but this was difficult to do. I left out some of Peter's anecdotes and contacted Rebecca with more questions. I think I could have avoided this problem by talking to each of the subjects separately.

I talked to several of their colleagues, who added wonderful quotes and anecdotes to the story. In this way, my reporting for this profile was better than that for “PSU professor gets fellowship,” which did not contain any compelling quotes from anyone other than the story subject.

Overall, I'm proud of this piece. If I could change just one thing, I would rewrite the ending. It's a bit too corny.

CHAPTER 3: NEWS AND TREND STORIES

PSU PROFESSOR SEES POTENTIAL OF UNLIKELY ENERGY SOURCE MONDAY, JAN. 25, 2010

I noticed a one-line advertisement for this speech in the paper. I liked that it was part of a series, giving me the opportunity to not only report on the lecture, but to also inform my readers about an upcoming event. This article was different than all the others since it was a news story done on a tight deadline. I attended the speech and wrote the piece in just a couple hours. It appeared in the paper's Local section.

Today's wastewater plants might turn into tomorrow's power plants, Penn State professor of environmental engineering Bruce Logan said Saturday.

About 3 percent of the electricity generated in the United States is used to clean water, according to the Environmental Protection Agency. Logan is using bacteria to construct microbial fuel cells that eliminate this energy need. The bacteria eat the waste in dirty water while producing supplementary electricity.

The organic matter in wastewater has almost 10 times more energy than is needed to clean water, Logan said.

Logan's talk was the first of six public lectures in the 2010 Penn State Lectures on the Frontiers of Science, with the theme "Water: the Next Frontier."

Logan said that the global demand for clean water is increasing, while the supply is decreasing because of warming due to climate change. One billion people lack adequate drinking water, he said. By 2025, a quarter of all people could live in areas with severe water shortages.

Logan's goal is "to make our water infrastructure sustainable in the next 20 to 25 years." He wants to make fuel cells more efficient at converting waste to energy. And he wants them cheaper. The latest microbial fuel cell designs cost about six times more than conventional

wastewater filters.

Logan, who wrote the first textbook on microbial fuel cells, said that he and his collaborators don't understand everything about the new technology. "But it's going to be a lot of fun to figure it out," he added.

About 200 people attended Saturday's event. Charlotte de Lissovoy, a retired teacher from State College, said that the lecture was "superb." Her friend, Nancy Harrison, said that the complimentary booklet of slides helped her follow Logan's lecture.

Logan, who directs Penn State's Hydrogen Energy Center, also commented on the future of other energy sources.

He said that the country has a lot of cellulose, which can be obtained from cover crops, grasses grown on abandoned mine lands and well-managed forests.

The nearly 1.4 billion tons of cellulose in the United States could be converted to hydrogen to power all of the vehicles in the country with hydrogen fuel cells. "Why aren't we doing that?" he asks. "I don't know!"

On Saturday, Penn State chemistry professor Karl Mueller will explore the unusual properties of the water molecule and how it interacts with other materials.

ABOUT THE LECTURES

WHAT: 2010 Penn State Lectures on the Frontiers of Science

WHEN: 11 a.m.-12:30 p.m. Saturdays through Feb. 27

WHERE: 100 Thomas Building, University Park (Feb. 6 lecture will be in 101 Thomas Building)

COST: Free

MORE INFO: Sponsored by Eberly College of Science and the Penn State Institutes of Energy and Environment

ON THE WEB: www.science.psu.edu/alert/frontiers

REFLECTION: PSU PROFESSOR SEES POTENTIAL OF UNLIKELY ENERGY SOURCE

As I mentioned in the introduction, science speeches were often directly transcribed in newspapers in the eighteenth and nineteenth centuries. That doesn't cut it anymore. “Once the field of nerds and the nerds they wrote about, the field [of science writing] has evolved, becoming at once more esoteric—because science itself has become more esoteric—and more a part of daily life” (Blum vii). My goal for this story was to summarize the speech and to eliminate any jargon that might confound the average reader.

This story was straightforward. I outlined what the speaker said, mentioned the audience's reaction, and informed readers about upcoming lectures that they might want to attend. The only challenge was condensing 90 minutes of science jargon into a few paragraphs. Instead of focusing on the physics and chemistry formulas (and there were many), I explained the invention in general terms. I also informed readers why they should care about the subject by infusing the story with several statistics. (For example, about three percent of the electricity generated in the United States is used to clean water.) I think that I did a good job conveying the message to the readers: We need clean water, and we need electricity, and here's one way to get both.

I was surprised by readers' reaction to my story on the *Centre Daily Times* Web site. Even though I mentioned climate change only briefly, some readers reacted to it strongly. One person wrote:

I thought, great idea... After his climate change comment, I thought, well this science is garbage, too. He will keep working, getting paid by our tax dollars in grants, but will never produce anything, other than theories.

The scientific community unanimously agrees that climate change is occurring, and that it is partially caused by humans (Boyce 4). The trouble for journalists is that politicians and advocacy groups make it seem like the existence of climate change is still debated. Thus, covering

climate change is inherently controversial, and that is something I must remember for future stories. Journalist Usha Lee McFarling writes, “If you plan to cover climate change, thicken your skin” (Blum 243).

I don't think I could have gone around mentioning climate change in this story, and I don't think I should have. It is unfortunate that just the phrase “climate change” turned some readers off to the rest of the story, but it is not my responsibility to please the political or social beliefs of every reader. My duty is to report the facts.

COUNTY FARMERS DIGGING IN GROWERS DIVIDED OVER USE OF MODIFIED, TRADITIONAL SEEDS FEBRUARY 21, 2010

I had already researched the international issue of genetically engineered foods, but I was curious to learn about how it plays out in Centre County. I thought my readers might be interested, too. By localizing the issue of genetically engineered foods, I wanted to inform my readers about their food and local economy, which largely relies on agriculture. When I pitched the idea to my *Centre Daily Times* editor, she said that she did not know much about the role of bioengineering in food. I wrote this article on the assumption that the readership was also unfamiliar with the worldwide debate surrounding genetically modified foods. This trend story ran in the Sunday Business section. For published layout, refer to Figures 3 and 4 in the appendix.

In 1961, 20-year-old Jerry Brown bought 667 acres in Ferguson Township for \$25,000 and planted his first season's crop of corn and soybeans.

In the white house down the dirt lane off of West Gatesburg Road, he and wife, Shirley, raised one daughter, three sons and eight grandchildren.

For nearly half a century, Brown has woken up at 3:30 in the morning to milk his cows. He has planted “all the fields you can see out the kitchen window” and, in the process, has accumulated 18 tractors, including one from 1951.

Last year, 31-year-old Sunil Patel moved in down the road and planted a 1.5-acre organic

garden, off which he fed the 65 members of Greenmoore Gardens. Patel, who planned to study anthropology in graduate school before he discovered his love for the land, worked 13 hours per day June through October, stopping to eat bursts of pizza and cookies in his single-bedroom home.

The Browns are the norm, and Patel is the anomaly of Centre County agriculture, down to the seed.

During the past decade, farmers have been thrown into an international debate. They must decide between genetically modified seeds and traditional seeds. About 90 percent of Centre County farmers, including the Browns, choose technological innovation over tradition.

Genetically modified plants are manipulated in the lab to contain at least one gene, or biological trait, from another species. The new trait makes the plant tolerant of herbicides or resistant to certain pests or viruses. According to the U.S. Department of Agriculture, genetically engineered crops have been “widely and rapidly” adopted nationwide since their introduction in 1996. In 2009, 91 percent of soybeans and 68 percent of corn grown in the U.S. was genetically modified to be herbicide resistant.

The Browns have always used Pioneer brand corn seeds.

“They work,” Jerry said. “I stick with them because I try to use the best.” Pioneer — which is now owned by Dupont, the second largest seed maker in the world after Monsanto — has changed since Brown first bought the seeds five decades ago. Pioneer began to genetically engineer its kernels in the early 1990s.

Though popular, genetically modified plants are controversial, and a growing group of local organic farmers, such as Patel, are avoiding the new technology. Ted Jaenicke, a professor of agricultural economics at Penn State, estimates that the organic sector in Pennsylvania is increasing by about 20 percent per year.

Organic produce does not contain genetically modified traits or chemical herbicides or pesticides.

Pennsylvania is the third largest producer of organic produce in the nation, surpassed only by California and Washington, according to the 2008 USDA Organic Survey.

Patel buys organic seeds from Fedco, a cooperative of “conscientious seed growers” in Maine, he says. Genetically modified seeds are insect-resistant, which enables farmers to use less pesticides, said Gregory Roth, a Penn State agronomy professor.

“I hate using chemicals,” Brown said. “It’s dirty and expensive.”

Brown buys corn seeds that are “triple stacked,” which means that they have three engineered traits. They defend against the corn borer and the corn root worm, a type of beetle that causes farmers \$1 million in damage each year, according to the USDA.

The seeds also control weeds by tolerating the popular chemical herbicide RoundUp, which Roth says is environmentally safer than other herbicides, such as atrazine, because it doesn’t stick around as long in the soil.

Mary Barbercheck, an entomology professor at Penn State, said that it’s possible to control pests and weeds while avoiding both genetically modified seeds and chemicals. Farmers can rotate crops, choose resistant varieties through traditional breeding, and plant polycultures instead of monocultures, she adds.

Roth said that the long-term effects of genetically modified agriculture are “mostly positive.”

“But I can appreciate that there’s some uncertainties,” he added.

Seed debate continues

The effects of genetically modified seeds on ecology and human health are still unknown,

said Barbercheck.

According to a study published in the International Journal of Biological Sciences last month, rats that were fed genetically modified corn were more likely to experience organ failure, especially in the kidney and liver.

The study, which was partly funded by the environmental activist organization Greenpeace, analyzed data gathered by Monsanto.

Penn State researchers, led by biology professor Andrew Stephenson, published a study in the Proceedings of the National Academy of Science in October that showed how genetically modified organisms can introduce unintended consequences. The team studied wild squash and a genetically engineered squash that is resistant to three viruses that plague the plant.

As predicted, the genetically modified squash resisted the viruses, while magnifying the disease in the neighboring wild species.

Then something peculiar happened.

Cucumber beetles, which transmit wilt disease to squash, migrated from the wild squash to the genetically modified squash in hoards because they preferred the plants unaffected by the virus. Ironically, the trait that enabled the genetically modified squash to resist a deadly virus attracted the deadly pest.

Consumers are as divided on genetically modified products as farmers and scientists.

“Genetically modified is OK,” said Krishna Botla, of State College, while buying produce at WeisMarkets. “I look for the better prices.”

At Weis, organic broccoli costs \$5.32 per pound. Non-organic costs \$1.99 per pound. Since genetically modified products are not labeled in the United States, non-organic produce may or may not contain genetically modified traits.

Elaine Meder-Wilgus, the owner of Webster's Cafe in downtown State College, bought two shares from Patel last season.

Meder-Wilgus said that she got "gorgeous produce like delightful kale, squashes, potatoes, corn and lettuces of all varieties."

"It strikes me as odd when people call pesticide-laden food 'regular,' " Meder-Wilgus said.

John Floros, a Penn State food science professor, said consumers base their food decisions on emotions, not on science.

"How do you think we feed the nearly 7 billion people on this planet?" he asked.

"Biotechnology is one of the tools that we need to make it happen."

But Barbercheck said the United States is already producing excessive food. "Our food shortages are a matter of economics and politics," she said. "We need to learn to distribute, not grow more."

Patel sees a solution locally, not globally.

"If the world takes a downturn as far as people's access to food, we need to make ourselves stronger right here, right now."

Patel added that genetically modified crop supplies are vulnerable because they rely on a host of chemicals and fossil fuels to grow.

Engineered traits will continue to be developed, Roth predicts. Seed companies are researching how to make plants resistant to drought and cold. In the future, genetically modified foods will be tastier and more nutritious, he adds.

But Roth is uncertain about whether farmers will continue to buy genetically modified seeds because of rising prices. Brown pays \$180 to \$240 for 80,000 seeds. Ten years ago, the seeds cost less than \$100, according to the University of Wisconsin's agronomy department.

About five years ago, genetically modified seed companies began selling triple-stacked, which contain three modified genes instead of just one.

The farmers pay more for the triple than single stacked, but they don't necessarily get more. "We've been growing bore-resistant corn for 10 years. Do we still even get bores? Do we need to buy protection against them?" Roth asked.

Love of the land

Brown said farming in central Pennsylvania is not a profitable business. "The best farmers might come up with 3 percent profit. Most of us stay in the red eight years out of 10."

Brown invests \$19.50 in every 50 quarts of milk that he produces. He sells it to Land O'Lakes Inc. for \$15.50. Brown sells about one-third of his soybeans and less than half of his corn to a granary 65 miles away. "The rest I put through my cows," he says. Brown borrows \$100,000 each year to put out a crop, including \$17,000 for seeds.

Every October, Brown travels West in his pickup, alone. He hikes through Yellowstone, visits the red sequoia trees of California, and stops to talk to farmers across the nation.

"I find the same thing countrywide," he said. "Struggle. Every farmer is in debt."

"The only reason you stay here, is that you love what you're doing. You love the land. You raise a family here." Patel didn't balance his account last season because he was paid a salary by a local landowner to farm the land. But his garden seems to be flourishing.

This year, Patel plans to nearly double his farm to 2.5 acres and feed more than 100 members. For \$700, members will get a weekly share of crops during the six-month growing season.

The organic farm has a waiting list of members.

Agricultural economist Ted Jaenicke said it's unfair to compare the economics of a farm

growing genetically modified crops to one growing non-modified crops, since the farms differ in size. Farms growing modified crops tend to be bigger because farmers can expand them with new tools without much additional labor. The technologies are a big investment, which often leads to bigger debt.

Genetically modified crops are easier to manage, said Barbercheck. “I can’t imagine that most farmers would give that up. (Genetically modified) will continue to grow, but organic will be a great opportunity for farmers to take advantage of select markets.”

A few miles apart, in separate kitchens, Patel and the Browns plan their crops for next season.

When the ground thaws, Patel will sow more than 100 varieties of plants, including berries on his freshly terraced hillside. The Brown sons — Ron, Tim and Chris — will plant more than 7 million kernels of Pioneer corn out of a tractor cab.

Patel said he won’t trust genetically modified crops until they’ve stood the test of time. Jerry Brown said he’ll continue using Pioneer until there is strong evidence against it.

REFLECTION: COUNTY FARMERS DIGGING IN

Genetically modified crops are an obvious story subject because they are inherently controversial. According to *The Reporter's Environmental Handbook*:

Genetically modified crops have been called a lightning rod for a host of environmental, social, and political concerns. The controversy surrounding these products involves fear of new technology, distrust of government, hostility toward large multinational corporations, anxiety about food safety ... The issues are as complex as the technology, and the solutions are far from clear. (Greenberg 196)

Before writing this story, I reported it for weeks. I spent an afternoon with an organic farmer, and then another afternoon with a conventional farmer. I was surprised by how similar the farmers were. They both deeply respected the land. I began to understand not only what they do,

but also how each of them perceives what they do.

I worried about appearing biased in this story since I strongly believe in buying organic and local foods. I made sure to match each pro-organic quote with a pro-GMO quote.

In my first draft, I led with an anecdote about Jerry Brown and introduced Sunil Patel halfway through the story. Sunil represents only a minority of farmers, and therefore does not deserve to be juxtaposed with the majority, I reasoned. I was afraid of appearing biased by mentioning the organic debate early in the story. As a result, my story was disorganized and hard to follow. The fact is, there are tensions between organic and conventional farmers, and that is what this story is about. On my adviser's suggestion, I reorganized my story and juxtaposed Patel and Brown in the lead. Now the story flowed nicely.

In general, I received favorable response to the story. My *Centre Daily Times* editor wrote “You made a subject that could have been pretty dry interesting by contrasting the two farmers.” Greg Roth, a Penn State professor who tests genetically modified plants, said in an email, “I think you did a good job of providing a balanced discussion on the topic, rather than the one-sided polarizing reporting that seems common in the media today.” I think that most journalists strive to be unbiased, and I disagree that one-sided reports are common, but I do appreciate that Roth did not subject my story to that stereotype.

The story started a conversation about how genetically modified plants affect our community. One of the comments on the *Centre Daily Times* Web site mentioned the author's interest in honeybees and his or her concern about the affect that genetically modified crops will have on insect populations.

However, I did receive a complaint from one of Sunil Patel's landowners. In an email she wrote:

[T]he article was a bit misleading in that it made it sound like this is Sunil's farm. The farm was first planted in the season of 2007 (we started taking members in 2008) and Sunil joined us as farm manager in 2009. He is a very good manager and has made many valued contributions to the farm, but he is employed by the farm and the farm existed prior to his arrival.

In my defense, I did mention that it was not Patel's property in the story. When I initially contacted the farm, the landowners suggested that I speak to Patel. However, I do understand how the landowners could have perceived it as misleading since they were not mentioned until the second half of the article. I forwarded the email to my editor, and the *Centre Daily Times* printed a clarification a few days after the article was published.

In hindsight, I should have talked to the owners of the farm. Even if they did not say anything that was worth including in the article, a conversation would have made them feel part of the story. I also should have mentioned earlier in the story that Patel was not the owner of the land. All of my facts were correct, but it was the way in which I organized the facts that misled the reader. By concentrating only on balancing the opinions of Patel and Brown, I forgot that this story affected other people, too.

BEDBUG COLONIES ON RISE IN COUNTY MARCH 5, 2010

Perhaps inspired by Rachel Carson, I planned to write a story about pesticide use on Penn State's campus. But I got this story instead. My editors and I agreed that this story about the rise of bed bugs populations was more timely and relevant to our readers. It was front-page news.

The old saying "Don't let the bed bugs bite" isn't just a good-night wish, but an uncomfortable reality for an increasing number of Americans.

Bedbugs are making a comeback, nationally and locally.

Penn State Housing has been tracking the change. Since 2006, there have been 22 reported cases of bedbugs on the University Park campus, including nine this academic year, said David

Manos, assistant director of housing for East Halls dormitories. Manos, who joined the housing department in 1991, knows of no incidences of bedbugs on campus before 2006, he said.

Bedbugs were nearly wiped out in the United States after World War II due to the widespread use of pesticides such as DDT. But now that experts use less toxic chemicals, the bugs are multiplying, said Ed Rajotte, an entomology professor at Penn State.

Bedbugs, which are wingless, reddish-brown and about the size of an apple seed, feed on human blood like a mosquito. They are mostly active at night.

Bedbugs are hitchhikers that easily move from one place to another in baggage, furniture and clothing, said Manos. They can live up to 18 months without feeding. In State College, they have infested not only dormitories, but also hotels and apartments.

That's why bedbugs are a community issue that needs to be addressed cooperatively, Manos said.

Penn State Housing, in collaboration with about 10 local landowners, recently formed the Centre Region Bedbug Coalition. The coalition's goal is to educate both on-and off-campus tenants about how to quickly identify and report bedbugs, said borough health inspector Kevin Kassab.

"There's no shame in having (bedbugs)," Kassab said. "But the problem only gets worse if you ignore it."

To check for bedbugs, examine the entire bed, including the folds of the sheet and the seams of the mattress, Manos said. Look for dark blood spots about the size of a pencil point. If you suspect you've already been bitten, check your skin for itchy red bumps.

Bedbugs are not a serious health concern, and they are not known to transfer diseases, Rajotte said. But they can be psychologically draining. The Web site www.bedbugregistry.com

tracks bedbug alerts nationwide, including seven from the State College area over the past few years. The site, however, does not vouch for the accuracy of reports made there.

To treat bedbugs, Rajotte recommends to “never do just one thing, but attack with multiple tactics.” Once the bugs have been identified, quarantine the infected rooms.

Wash and dry all soft objects, such as clothing and blankets, using hot water. Bedbugs die when heated to 113 degrees.

Be wary of over-the-counter pesticides, Rajotte said. Overuse of common pesticides has made some bedbugs resistant to them.

“If you have a major infestation, contact a professional pest control service, which has access to a much wider array of chemicals,” he added.

Penn State practices Integrated Pest Management, which encourages pesticide use only as a last resort, said Rajotte, coordinator of the program.

Penn State treats infested nonwashable belongings, such as laptops and other electronic equipment, by placing them in a “hot box” made from a 4- by 8-foot Styrofoam insulation that houses electric heaters, Manos said. Occupants are asked to shower.

Penn State limits its chemical use to the pesticides Bedlam and Phantom and the alcohol-based aerosol product Sterifab. According to BASF Chemical Co., the two pesticides are slightly toxic to humans when inhaled and very toxic to aquatic and terrestrial animals.

In preparation for spring break next week, Penn State Housing is posting fliers in dormitories and bathrooms to warn students to check for bugs when traveling internationally, where the bugs are more prevalent.

“The best deterrent isn’t chemical,” Manos said. “It’s educational.”

REFLECTION: BEDBUG COLONIES ON RISE IN COUNTY

I started this assignment by researching pesticide use on Penn State's campus. When I couldn't find a story there, I surveyed the local school districts about their pest problems. I found out about a 2002 act passed in Pennsylvania that forced all public schools, K to 12, to implement a pest management plan. I tried to make this into a story, but ultimately never did. The act did not significantly change the schools' pest management habits, no one seemed to have strong feelings on it, and the latest statistics on pesticide use in schools were from 2005. The story felt old and boring.

During the reporting process, I talked to Ed Rajotte, an entomology professor at Penn State. Rajotte mentioned that Penn State was battling bed bug problems due to the decreased use of pesticides. I researched the issue further and found out that the rise of bed bug colonies is now a national issue. I also discovered that the story was timely. Community leaders had just formed the Centre Region Bed Bug Coalition. Spring break was coming up in a week, which meant that bed bug incidents were likely to increase at Penn State as students brought back the bugs from their travels through countries where the bugs are more widespread. In addition, this story was powerful because it directly affected readers where they spent a third of their life—in bed.

Once I had the idea, writing and reporting the story was easy. I found the cause of the bugs, how readers can identify the bugs, and how readers can treat the bugs. As a result, I learned that it's fine to change the subject of your story during the reporting process. Being open to new story ideas can sometimes lead to a much more compelling article.

In the original draft that I sent to my editor, I included the following paragraphs:

The Web site www.bedbugregistry.com tracks bed bug alerts nationwide. There are seven reports from State College, including one from a traveler that stayed at the Nittany Lion Inn in 2008.

Last month a resident of Executive House Apartments on Waupelani Drive wrote on the

site, “I am seeing bugs crawl out of cracks in the walls and from electrical outlets. My next door neighbor was treated four times by [Orkin Pest Control Services] already and no relief! ... I have a baby and I can't have her living like this.”

In response, the *Centre Daily Times* editor said:

I'm inclined to take out the reference to the Nittany Lion Inn and to the Executive House Apartments and just give people the ... web site if they want to look it up. At the least we would need to call both for comment if we included them, and there's no knowing how accurate either report is, so I don't think it's worth it.

It would have been unethical to accuse the hotels and apartment buildings of having bed bugs without letting them verify and comment on the online reports. My editor reminded me that I can't trust everything I find on the Internet.

PENN STATE | FOREST RESOURCES BUILDING STRUCTURE CRACKS AS GRAVEL SWELLS AT PSU BUILDING THURSDAY, MAR. 25, 2010

I got this story idea by overhearing a cluster of professors and students gossiping as they entered the Forest Resources Building. The local media hadn't broken the news yet. My adviser and editor enthusiastically encouraged me to pursue the story. This news article also made the front page.

Swelling gravel under Penn State's Forest Resources Building is causing the first floor to rise by up to an inch and the drywall to crack, said Mike Messina, director of the School of Forest

“The foundation is completely stable and the building isn't sinking,” said Messina.

The building was constructed in 2006 at a cost of about \$30 million. It was funded with a combination of state money, university dollars and philanthropic contributions.

The Office of Physical Plant is still evaluating the cause of the problem, said Lisa Berkey, director of design and construction at OPP. About five classrooms and teaching laboratories show visible signs of damage, she added.

The building's ground floor is supported by a concrete slab that was poured directly on gravel, said David Gold, emeritus professor of geology at Penn State and a consultant to OPP. The

gravel replaced the soil that was excavated to build the foundation.

Gold said he suspects that gypsum is forming in the gravel, causing the subsurface layer to expand and to put pressure on the concrete floor. Gypsum forms when calcium and sulfur react in the presence of oxygen and water, much like rust forms when iron reacts with air and moisture, Gold said.

The source of the sulfur could be pyrite or some other mineral, and Gold said tests are being done to determine what components of the gravel allowed the gypsum to grow.

“The building was built in compliance with all appropriate testing,” said Berkey.

The construction manager on the project was Gilbane Inc., a firm headquartered in Rhode Island with offices in Philadelphia and Harrisburg. Among other projects Gilbane has been involved with at Penn State are the Smeal College of Business and the Food Sciences Building, according to the firm’s Web site.

When contacted at its Harrisburg office, Gilbane referred questions about the Forest Resources Building to the Office of Physical Plant.

OPP will most likely remove the ground floor and excavate the gravel under the concrete slab. If that happens, excavators small enough to fit inside the building, would be used. Alternatively, OPP could repair the cracking in the concrete without disturbing the gravel, Berkey said.

To accommodate Penn State’s fall semester class schedule, repairs won’t begin until January. Messina said that classes will be moved to the Life Sciences Building during repairs.

“Moving a lecture is easy, but moving a forestry or wildlife lab, with all its equipment and specimens, is a problem,” he added.

Berkey said that OPP has not estimated repair costs. She did not say who would pay for the

renovations. Messina said the School of Forestry will not be paying for the repairs.

REFLECTION: STRUCTURE CRACKS AS GRAVEL SWELLS AT PSU BUILDING

First, I called the director of the School of Forest Resources, and he confirmed the rumor that I overheard on campus. I then thought about whether or not I should write the story. Although this story does have an environmental element—the composition of the gravel is causing it to swell—it does not neatly fit into the category of environmental reporting. But both my editor and my adviser assured me that I should pursue the story. Professional environmental journalists rarely write just environmental news. Ron Seely, an environmental reporter for the *Wisconsin State Journal*, writes:

[Y]our time isn't always spent doing just science reporting. The science reporter gets no exemption at the *State Journal*, for example, from having to pitch in and help compile the annual business tab or cover a local county board race or work the Saturday general assignment beat once a month. (Blum 54)

My first draft of this story contained less than 300 words. I left many questions unanswered. My editors asked:

- Why are the repairs not going to begin until January?
- What kind of disruption is this going to cause the School of Forestry? What offices, classrooms, etc. are on the first floor? What is going to happen to them while the repairs are being made?
- Who is going to pay for the repairs?
- Who was the contractor that built the building? Is the contractor involved in planning the repairs, and has that company worked on other university buildings?
- Can anyone provide more detail on what would be involved in digging up the floor and excavating the gravel?

I could not definitively answer some of these questions. OPP and the School of Forest

Resources would not say who was going to pay for the repairs or give more details about the expected renovations. Regardless, I should have included this in my initial draft. It's just as important to admit what you don't know as it is to report what you do know.

I was surprised by how important this story was to the readers. Thirty-seven people commented on it on the Web site. After the nationwide health care reform, it was the second most popular story that day.

CHAPTER 4: CONCLUSION

This project gave me the opportunity to experience what it's like to be a journalist on the environmental beat at a small daily paper. I practiced preemptively answering all the reader's questions, infusing my writing with humanity, finding a good story, and communicating with sources. I learned that the beat is flexible, and that stories often evolve into something unpredictable. I adapted to taking criticism, both from editors and readers, and analyzed the feedback in my reflections.

This project has also introduced me to the historical trends and characters that still influence environmental journalists today. Most likely, I will never quote Carson or Thoreau in my stories, but their philosophies and writing styles undoubtedly influence the way in which I communicate today's environmental stories. When I decided to write a story about pesticide use on campus, I considered Carson's *Silent Spring*.

This experience also encouraged me to examine an environmental journalist's role in society. Am I an advocate for the environment? Yes, of course. I hope that my story about the development of the community gardens inspires readers to grow a few heads of lettuce this spring. I hope that my readers consider the health and environmental effects of genetically modified foods. My worldview, which places environmental concerns above economic issues, impacts what stories I write (when I have a choice). Just as a business reporter writes about the economy and hopes that inflation lingers around a healthy two percent, I write about the environment and hope that air, land, and water pollution plummet. As long as each of my stories fairly portrays all sides of the issue, I consider myself a journalist with a worldview that can diversify and enrich a paper's content.

I also learned the value of analyzing my work. Journalism is categorized by deadlines.

Once the deadline has passed, it seems pointless to pour over your published story. It's cemented in history, black on white. It's yesterday's news. Anyway, there's another deadline to attend to.

But without looking over your work, it's hard to recognize your strengths and pitfalls. By reading over a few months of stories, you begin to recognize tendencies and patterns. For example, I end with quotes more often than not, and I rarely use figurative language. That's something that I'll keep in mind for next time, when the story will be different, but the process of gathering and communicating the information much the same.

APPENDIX: PHOTOGRAPHY AND LAYOUT

CENTRE DAILY

MONDAY, OCTOBER 12, 2009 www.centredaily.com 50 CENTS

BALD EAGLE AREA

Basic education funding
Gov. Ed Rendell's proposal: **\$8.17 million**
Earlier Senate GOP proposal: **\$6.64 million**

Accountability block grants
Rendell's proposal: **\$335,133**
Actual: **\$335,133**

BELLEFONTE

Basic education funding
Rendell's proposal: **\$8.21 million**
Earlier Senate GOP proposal: **\$6.69 million**

Accountability block grants
Rendell's proposal: **\$459,342**
Actual: **\$459,342**

PENNS VALLEY

Basic education funding
Rendell's proposal: **\$4.57 million**
Earlier Senate GOP proposal: **\$3.71 million**

Accountability block grants
Rendell's proposal: **\$218,348**
Actual: **\$218,348**

P-O

Basic education funding
Rendell's proposal: **\$11.47 million**
Earlier Senate GOP proposal: **\$9.14 million**

Accountability block grants
Rendell's proposal: **\$385,028**
Actual: **\$385,028**

STATE COLLEGE

Basic education funding
Rendell's proposal: **\$6.43 million**
Earlier Senate GOP proposal: **\$5.43 million**

Accountability block grants
Rendell's proposal: **\$348,619**
Actual: **\$348,619**

STATEWIDE COMPARISON

Basic education funding:
2008-2009 **\$5.2 billion** 2009-2010 **\$5.5 billion**

Dual enrollment payments:
2008-2009 **\$10 million** 2009-2010 **\$8 million**

Pre-K Counts:

School districts receive state funding increase

The Pennsylvania budget signed Friday night provides all five Centre County school districts with more state and federal funding in the 2009-10 school year, according to figures released by the state Department of Education this past weekend. Lawmakers agreed to use additional federal stimulus money to increase the state's basic education funding appropriation — which is the main revenue source

districts receive from the state — by \$300 million, or 5.74 percent. However, all five Centre County school districts are receiving smaller percentage increases.

Funding for some programs will remain flat, like accountability block grants, which aim to improve educational practices, initiatives and academic performance targets.

— Ed Mahon

Centre County school districts	2009-10 estimated basic education funding	Dollar increase from 2008-09	Percent increase from 2008-09
BEA	\$8,002,772	\$281,804	3.65%
Bellefonte	\$8,046,959	\$267,062	3.43%
Penns Valley	\$4,478,635	\$167,550	3.89%
P-O	\$11,217,673	\$592,348	5.57%
State College	\$6,434,044	\$126,157	2.00%

Source: Pennsylvania Department of Education

Participants harvesting last of community garden crop



For the COT/Natalya Stanko

The Center for Sustainability community gardens off Porter Road on Penn State's campus opened in April. More than 120 gardeners grew lots of tomatoes, peppers, pumpkins, squash and more.

At season's end

By Natalya Stanko
For the COT

As the days shorten and the nights shiver, more than 120 gardeners are taking home the last crops from the first season of the Center for Sustainability's community gardens.

Together, they planted 7,000 plants in 96 plots, growing tomatoes, peppers and squash, and even some pesto, pumpkins and New England aster.

"Just getting people outside is a huge accomplishment. Getting them to experience the pleasure of little subtleties like picking a pepper — now that's indescribable," said Hans Finanger, a State College resident who was one of the first to have a plot in the gardens.

The gardens, off Porter Road on Penn State's campus, opened in April. The 10-by-15-foot plots are nestled on a slope between groves of walnut and poplar trees on the lands of the Center for Sustainability, halfway between Beaver Stadium and College Avenue.

About 50 percent of the gardeners are graduate students, 35 percent university faculty and staff, 10 percent undergraduate students and 5 percent community members unaffiliated with the university, said Franklin Egan, president of the gardens. Each gardener pays \$20 for a yearly membership.

Gardeners must renew their plots for next season by Nov. 1. The gardens will begin taking applications for new members in January. Applications will be available online, said Nelson Debarros, vice president of the gardens. Egan expects a big turnover.

See Garden, Page A3

AFGHANISTAN

Obama plays down dangers

By Jonathan S. Landay, John Walcott and Nancy A. Youssef
McClatchy Newspapers

WASHINGTON — As the Obama administration reconsiders its Afghanistan policy, White House officials are minimizing warnings from the intelligence community, the military and the State Department about the risks of adopting a limited strategy focused on al-Qaida, U.S. intelligence, diplomatic and military officials told McClatchy Newspapers.

Recent U.S. intelligence assessments have found that the Taliban and other Pakistan-based groups that are fighting U.S.-led forces have much closer ties to al-Qaida now than they did before Sept. 11, 2001, which would allow the terrorist network to re-establish bases in Afghanistan and would help Osama bin Laden export his radical brand of Islam to Afghanistan's neighbors and beyond, the officials said.

McClatchy Newspapers interviewed more than 15 senior and midlevel U.S. intelligence, military and diplomatic officials, all of whom said they concurred with the assessments. All of them requested anonymity because the assessments are classified and the officials weren't authorized to speak publicly.

The officials said the White House is searching for an alternative to the broader counterinsurgency strategy favored by Army Gen. Stanley McChrystal, the U.S. military commander in Afghanistan, and Gen. David Petraeus, the head of the U.S. Central Command.

White House officials, they said, have concluded that McChrystal's approach could be doomed by election fraud, corruption and other problems in Afghanistan; by continued Pakistani covert support for the

Figure 1. I took the photo of the pumpkin while visiting the community gardens. The smaller image is a file photo.

CENTRE DAILY TIMES
CENTRE LIVING

www.centredaily.com

SATURDAY, November 7, 2009

SECTION C



Beth Shapiro, an assistant professor at Penn State's Eberly College of Science, was recently awarded the prestigious MacArthur Fellowship, which included a \$500,000 grant over the next five years. The fellowship recognizes innovators in all disciplines anonymously nominated by their peers.

Winners have diverse interests

By Natalya Stanko
For The CDT

Since 1981, the John D. and Catherine T. MacArthur Foundation has recognized 805 fellows, ranging in age from 18 to 82 at the time of their selection. Among this year's 24 fellows are:

◆ Deborah Eisenberg, 63, who worked as a waitress in New York City into her early 30s, then took up writing.

In 2006 she published her fourth short-story collection, "Twilight of the Super-heroes."

"As with all of Eisenberg's fiction, these stories show us who we are and what we're capable of. They chronicle, and edify, our time," book critic Ben Cosgrove wrote in Salon. The grant will buy the University of Virginia English professor time for writing.

◆ Artist Camille Utterback, of San Francisco, who creates interactive abstract projections that respond to your body using digital technology.

Technology, like cell phones and iPods, often removes us from our present and makes us unaware of our bodies, Utterback says. She wants her pieces to inspire passersby to ask, "What happens when I stick out my arm? What happens when I wear sunglasses with other people in this space?"

The grant will let Utterback experiment with new sensors, lights and projection technologies without having to wait for commissions.

◆ Mathematician L. Mahadevan, who uses complex mathematics to solve simple questions about our everyday world. According to the MacArthur Foundation, Mahadevan researches "how cloth folds when draped, how skin wrinkles, how flags flutter, how Venus flytraps snap closed."

The Harvard University professor says his children are an inspiration: "They often ask questions that you can't answer."

The grant will enable Mahadevan to try to answer some of them.

Among other 2009 MacArthur Fellows are a bridge engineer, a digital artist, an infectious disease physician, an investigative reporter, a filmmaker

A grant that's FIT FOR A 'GENIUS'

PSU professor gets fellowship

By Natalya Stanko
For the CDT

As a high school student, Beth Shapiro worked as a professional broadcast journalist. As a college freshman, she was a news director for a local radio station and a country music DJ on the weekends.

"I don't know why I did that," she says now. "I don't even like country music!"

As an upperclassman she dropped journalism for her second passion: pure science research. And as a Rhodes scholar at Oxford University from 1999 to 2002, she headed the wine club and "stumbled into ancient DNA research."

She's been studying old bones ever since.

The 33-year-old Shapiro, an assistant professor of biology at Penn State's Eberly College of Science since 2007, was recently awarded the prestigious MacArthur Fellowship.

As a MacArthur Fellow, Shapiro gets \$500,000 over five years — no strings attached.

This year's 24 fellows were nominated anonymously by their peers and chosen for their extraordinary creativity and their potential to do more. The John D. and Catherine T. MacArthur Foundation has given the award to recognize innovators in all disciplines, from photogrammetry to papermaking, since 1981.

Shapiro grew up in Rome, Ga., where her mother worked as a nurse and her father sold pianos. She attended the University of Georgia on a full-tuition scholarship. After studying at Oxford, she became a



For the CDT/Natalya Stanko

MacArthur Fellowship recipient Beth Shapiro, seen in her office at Penn State, won't be teaching next semester because she is expecting her first child.

Three years later, she moved to State College because Penn State offered "smart colleagues and opportunities to work on a wide range of topics," she says.

Shapiro extracts DNA from extinct animals such as mammoths and from threatened species such as bison. She uses the genetic information to explain how evolution works in populations of large animals and how environmental changes — like the Ice Age or the introduction of humans into North America — influence populations.

Looking at how animals have responded in the past to their changing climate can help predict how today's animals will be affected by climate change, Shapiro says.

She will use her grant money to do some risky experiments, which she

undergraduate student and researcher at Shapiro's lab.

But Shapiro doesn't think she's a genius. "I'm lucky," she says.

Tim Reynolds, a sophomore majoring in forestry, is in Shapiro's 750-student introductory biology class. Reynolds says that Shapiro has a "bright personality." "She's great at communicating the basics,"

In part, Shapiro is still a journalist. She likes to give talks about science, especially about cloning. Shapiro says that using old DNA to bring back extinct species is difficult, expensive and still not possible.

And pointless, she adds.

Shapiro asks: Why would you bring back one example of something extinct? Where would you put it? Wouldn't it be lonely? What kind of quality of life would it have? Would it be just for our own amusement? That would be kind of mean, wouldn't it?

Shapiro won't be teaching at the university next semester because she is expecting her first baby, a boy, on Dec. 1. "I guess I'll have to take some time off."

Motherhood is "very scary," she says. "But I'm ready to not be pregnant anymore."

Shapiro has carried out experiments in Russia, Canada and Alaska. Two summers ago, she lived in a tent in Siberia for six weeks on treeless permafrost buzzing with mosquitoes. She researched whatever animal remains she could find within the layers of permafrost.

Shapiro likes working in the field more than in the lab.

"Obviously," she says.

"But you can't live on field work alone. The field work is the most fun part, but the lab work is the most important part."

Natalya Stanko is a journalist

Figure 2. I took the smaller photo of Beth Shapiro in her office. I also provided the *Centre Daily Times* a link to a professional high-resolution portrait of Shapiro, which the paper used for the larger photo.

BUSINESS

Jet service lands in Mo Valley

There's all sorts of things happening in Philipsburg these days. A new library is in the



works, on Front Street a cafe and bookstore is getting ready to open and, most recently, a Scottsdale, Ariz.,

company touched down in the Moshannon Valley when it moved its operations to Philipsburg. Called JetHub, the company provides charter flight service around the world by connecting businesses or other travelers with its network of aircraft operators. The company says it has more than 2,500 charter aircraft in its network and can fly to almost any airport.

Kevin Lippert, who owns JetHub, said he moved the business's offices east to be closer to two employees who reside in Osceola Mills. The company's new offices are in the Moshannon Valley Regional Business Center in Rush Township. Paul Springer, president of the Moshannon Valley Economic Development Partnership, which operates the business center, said he was pleased to have the company relocate there.

"It's not every day that a business located in Arizona sets up a new office in the Philipsburg area," he said. "It is just terrific to have this business located in our business park."

Realtors auction set

Friday marks the second annual Centre County Association of Realtors benefit auction for their American Dream Housing fund.

It's a unique event — after all, how many benefit auctions include the sale of a home? And this year it's benefiting not just one but two good causes, with a portion of the funds raised going to Housing Transitions.

Housing Transitions is in the process of raising money for an \$800,000 expansion of Centre House, a shelter for homeless individuals and families in State College.

The American Dream Housing Fund will be used to provide no-interest down payment assistance to first-time homebuyers in the region.

See Bits of Business, Page C9

County farmers digging in



Jerry Brown, above, and Sunil Patel, below, represent different sides of a fundamental debate among farmers: whether to use genetically modified seeds or traditional seeds.

The Browns are the norm, and Patel is the anomaly of Centre County agriculture, down to the seed.

During the past decade, farmers have been thrown into an international debate. They must decide between genetically modified seeds and traditional seeds. About 90 percent of Centre County farmers, including the Browns, choose technological innovation over tradition.

Genetically modified plants are manipulated in the lab to contain at least one gene, or biological trait, from another species. The new trait makes the plant tolerant of herbicides or resistant to certain pests or viruses.

According to the U.S. Department of Agriculture, genetically engineered crops have been "widely and rapidly" adopted nationwide since their introduction in 1996. In 2009, 91 percent of soybeans and 68 percent of corn grown in the U.S. was genetically modified to be herbicide resistant.

The Browns have always used Pioneer brand corn seeds. "They work," Jerry said. "I stick with them because I try to use the best."

Pioneer — which is now owned by Dupont, the second largest seed maker in the world after Monsanto — has changed since Brown first bought the seeds five decades ago. Pioneer began to genetically engineer its kernels in the early 1990s.

Though popular, genetically modified plants are controversial, and a growing group of local organic farmers, such as Patel, are avoiding the new technology. Ted Jaenicke, a professor of agricultural economics at Penn State, estimates that the organic sector in Pennsylvania is increasing by about 20 percent per year.

Organic produce does not contain genetically modified traits or chemical herbicides or pesticides. Pennsylvania is the third largest producer of organic produce in the nation, surpassed only by California and Washington, according to the 2008 USDA Organic Survey.

Patel buys organic seeds from Fedco, a cooperative of "conscientious seed growers" in Maine, he says.

Genetically modified seeds are insect-resistant, which enables farmers to use less pesticides, said Gregory Roth, a Penn State agronomy professor.

"I hate using chemicals," Brown said. "It's dirty and expensive."

Brown buys corn seeds that are "triple stacked," which means that

they have three engineered traits. They defend against the corn borer and the corn root worm, a type of beetle that causes farmers \$1 million in damage each year, according to the USDA.

The seeds also control weeds by tolerating the popular chemical herbicide RoundUp, which Roth says is environmentally safer than other herbicides, such as atrazine, because it doesn't stick around as long in the soil.

Mary Barbercheck, an entomology professor at Penn State, said that it's possible to control pests and weeds while avoiding both genetically modified seeds and chemicals.

Farmers can rotate crops, choose resistant varieties through traditional breeding, and plant polycultures instead of monocultures, she adds.

Roth said that the long-term effects of genetically modified agriculture are "mostly positive."

"But I can appreciate that there's some uncertainties," he added.

Seed debate continues

The effects of genetically modified

seeds on ecology and human health are still unknown, said Barbercheck.

According to a study published in the International Journal of Biological Sciences last month, rats that were fed genetically modified corn were more likely to experience organ failure, especially in the kidney and liver. The study, which was partly funded by the environmental activist organization Greenpeace, analyzed data gathered by Monsanto.

Penn State researchers, led by biology professor Andrew Stephenson, published a study in the Proceedings of the National Academy of Science in October that showed how genetically modified organisms can introduce unintended consequences. The team studied wild squash and a genetically engineered squash that is resistant to three viruses that plague the plant.

As predicted, the genetically modified squash resisted the viruses, while magnifying the disease in the neighboring wild species.

Then something peculiar happened.

Growers divided over use of modified, traditional seeds

By Natalya Stanko
For the CDT

In 1961, 20-year-old Jerry Brown bought 667 acres in Ferguson Township for \$25,000 and planted his first season's crop of corn and soybeans.

In the white house down the dirt lane off of West Gatesburg Road, he and wife, Shirley, raised one daughter, three sons and eight grandchildren.

For nearly half a century, Brown has woken up at 3:30 in the morning to milk his cows. He has planted "all the fields you can see out the kitchen window" and, in the process, has accumulated 18 tractors, including one from 1951.

Last year, 31-year-old Sunil Patel moved in down the road and planted a 1.5-acre organic garden, off which he fed the 65 members of Greenmoore Gardens.

Patel, who planned to study anthropology in graduate school before he discovered his love for the land, worked 13 hours per day June through October, stopping to eat bursts of pizza and cookies in his single-bedroom home.



Patel is among a minority of Centre County farmers who don't use modified seeds.

Cucumber beetles, which transmit wilt disease to squash, migrated from the wild squash to the genetically modified squash in hoards because they preferred the plants unaffected by the virus. Ironically, the trait that enabled the genetically modified squash to resist a deadly virus attracted the deadly pest.

Consumers are as divided on genetically modified products as farmers and scientists.

"Genetically modified is OK," said Krishna Botla, of State College, while buying produce at Weis Markets. "I look for the better prices."

At Weis, organic broccoli costs \$3.32 per pound. Non-organic costs \$1.99 per pound. Since genetically modified products are not labeled in the United States, non-organic produce may or may not contain genetically modified traits.

Elaine Meder-Wilgus, the owner of Webster's Cafe in downtown State College, bought two shares from Patel last season.

Meder-Wilgus said that she got "gorgeous produce like delightful

See Crops, Page C9

www.centredaily.com



For the CDT/Natalya Stanko
Shirley Brown and her husband, Jerry, have farmed in Ferguson Township for decades.

Local farmers take different approaches

Crops, continued from C10

\$15.50. Brown sells about one-third of his soybeans and less than half of his corn to a granary 65 miles away. "The rest I put through my cows," he says. Brown borrows \$100,000 each year to put out a crop, including \$17,000 for seeds.

Every October, Brown travels West in his pickup, alone. He hikes through Yellowstone, visits the red sequoia trees of California, and stops to talk to farmers across the nation.

"I find the same thing countrywide," he said. "Struggle. Every farmer is in debt."

"How do you think we feed the nearly 7 billion people on this planet?" he asked. "Biotechnology is one of the tools that we need to make it happen."

But Barbercheck said the Federal Reserve is also a

Figure 4. The story "County farmers digging in" continued on to the previous page, C9. I took this photo of Shirley Brown while crossing the farm with her in an all-terrain vehicle.

BIBLIOGRAPHY

- Blum, Deborah, Mary Knudson, Robin Marantz Henig, eds. *A Field Guide for Science Writers*. New York: Oxford University Press, 2006. Print.
- Boyce, Tammy, and Justin Lewis, ed. *Climate Change and the Media*. New York: Peter Lang, 2009. Print.
- Centre County Planning and Community Development Office. "County Fact Sheet." *Centre County Government*. 2008. Web. 31 March 2010. <<http://www.co.centre.pa.us/planning/data.asp>>.
- Frome, Michael. *Green Ink: An Introduction to Environmental Journalism*. Salt Lake City: University of Utah Press, 1998. Print.
- Greenberg, Michael, et al., eds. *The Reporter's Environmental Handbook*. New Jersey: Rutgers University Press, 2003. Print.
- Neuzil, Mark. *The Environment and the Press: From Adventure Writing to Advocacy*. Evanston, Illinois: Northwestern University Press, 2008. Print.
- Nijhuis, Michelle. Personal Interview. 9 March 2010.
- Preston, Richard, ed. *The Best American Science and Nature Writing*. New York: Houghton Mifflin Company, 2007. Print.
- Society of Environmental Journalists. Web. 1 March 2010. <<http://www.sej.org>>.

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