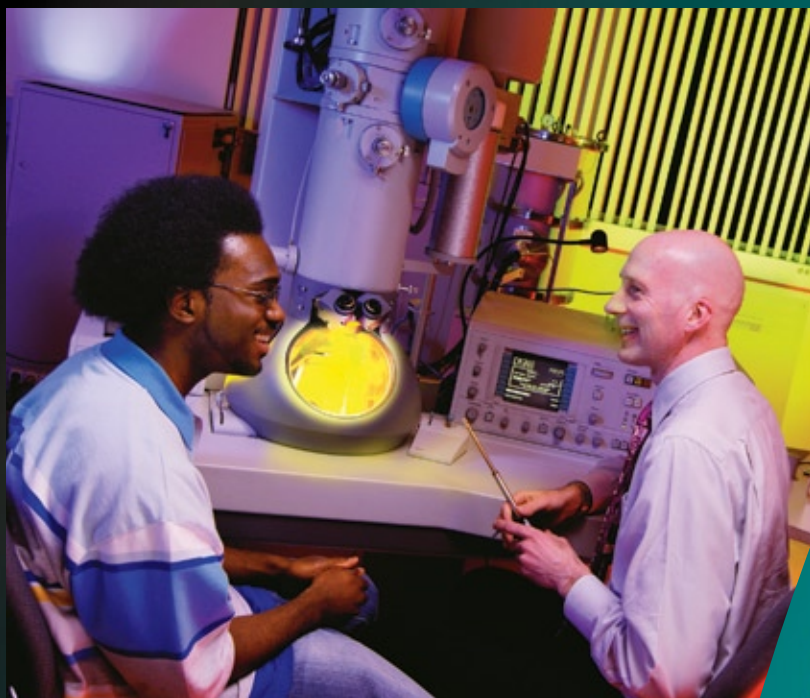


Washington State

m a g a z i n e



Whither Organic? The demands of a burgeoning organic industry *Also in this issue:* Rare matter, master craftsmen and The brave new world of recruiting



fueling the search for alternative energy

Thanks to cutting-edge research led by Grant Norton, filling up at the fuel pump could one day go the way of the dinosaur.

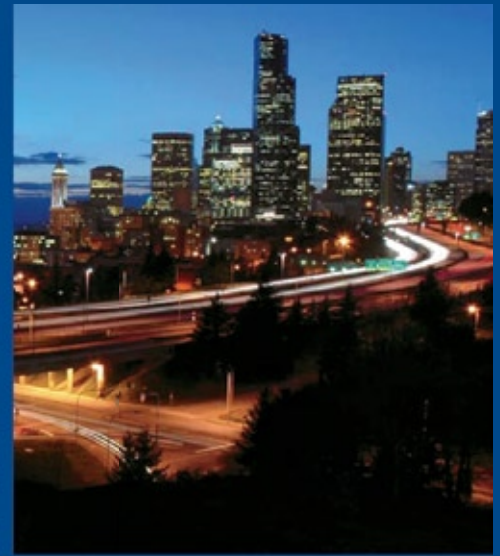
Dr. Norton and his colleagues are developing novel nanomaterials that could safely store hydrogen gas, a potentially clean—but highly explosive—alternative fuel.

Using patent-pending technology, Dr. Norton's team is building complex hierarchies of nano wires, springs, and particles that could have several applications, including hydrogen fuel storage.

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by Tim Steury

Consumers give any number of reasons for buying organic. Better taste. Concern about the environment. The health of their children. Maybe just that warm, fuzzy country feeling. But farmers are moving into organic increasingly for one reason. To make money. Organic agriculture is a major growth niche in an industry where profit margins shrink daily, and Washington has the climate—and the university—to lead the way.

- ORGANIC RESEARCH • ORGANIC MAJOR
- GETTING THE GOODIES

30 The Brave New World of College Recruiting

by Hannelore Sudermann

It's a brave—and fierce—new world of college recruiting, one with enrollment managers, target marketing campaigns, and admissions counselors who spend hours guiding individual students to apply. The schools are all seeking the same things: students with high grades and high test scores, students who will enrich the cultural mix of the student body, and students who will graduate in a reasonable amount of time.



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36 The Science Shop

by Cherie Winner

So what made Peter Engels—a brand new faculty member who started with nothing more than an empty room—think he could make Bose-Einstein condensate, a rare form of matter that is leading to advances in computing that could someday make today's computers seem as inefficient as cutting notches on a stick? First, he had experience: he got his doctorate in one of the three German labs that had done it, and then worked with one of the scientists who won the Nobel Prize for discovering BEC. Second, he'd met George Henry and seen the Instrument Shop.

- KEEPING THINGS HUMMING • CLEVER HANDS
- TO THE MOON • AND NOW, THE REALLY IMPORTANT EQUIPMENT...



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Brad Jaeckel, WSU's organic farm manager, with Julie Sullivan at the three-acre farm on the east edge of campus. The organic farm provides a training ground for aspiring organic farmers such as Sullivan and provides fresh produce to over a hundred subscribers to its CSA program (community-supported agriculture).



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Washington State Magazine

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Washington State Magazine is published quarterly by Washington State University, PO Box 641227, Pullman, Washington 99164-1227. Editorial offices are located at Washington State University, Information Technology Building, Room 2013, Pullman, Washington 99164-1227.

Board of Regents, Washington State University ©2006.

Views expressed in *Washington State Magazine* are those of the authors and do not necessarily reflect official policy of Washington State University.

Alternate formats will be made available upon request for persons with disabilities.

Washington State Magazine is pleased to acknowledge the generous support of alumni and friends of WSU, including a major gift from Phillip M. '40 and June Lighty.

TO SEND THIS MAGAZINE: *Washington State Magazine* is distributed free of charge to graduates, donors, faculty, and staff of Washington State University. With a gift of \$25 or more, you can have WSM sent to someone who is not on our mailing list. For details, go to wsm.wsu.edu/send.html or contact Sherri Peters at 509-335-1686, coug4ever@gocougs.wsu.edu.

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FIRST WORDS

An apology... I'm sure you've seen photographs of kissing other than the one we ran on our last cover. There's Alfred Eisenstaedt's of the sailor and nurse in Times Square at the end of World War II. And Robert Doisneau's photograph of a couple kissing in front of City Hall in Paris. That photograph, which first appeared in a three-page spread of couples kissing all around Paris (the city of lovers, naturally) in *Life* magazine in 1950, has since been reproduced on tens of thousands of postcards and posters and what have you. Such will probably not be the case with our last cover.

We get the occasional letter of complaint, generally in ones and twos, about an article or cover. In response to our last cover, which pictured a young couple enjoying a kiss in front of the Bellevue Art Museum, we got a couple of dozen complaints. Even out of a 140,000 circulation, that's a significant response.

At first, I honestly could not understand it. We'd intended the photograph to convey a light-hearted celebration of Bellevue's "coming of age." It had never occurred to me that what we thought was a sweet and innocent picture would strike some readers as "disgusting." Part of the problem, obviously, was not anticipating that the young man's lower lip might be seen as his tongue.

But the broader response wasn't quite so simple. Some questioned why we would put a kiss on the cover of a university magazine. What was the message of the photo? We thought it was clear, but clearly it wasn't.

The cover just wasn't what she'd expect of us, one reader told me over the phone. Her disappointment, I realize, came about because the photograph was not doing its job.

This is not, I hasten to say, the fault of the photographer. In the process of shooting the art museum and other Bellevue subjects, he noticed the young couple and snapped the shot.

But we selected the photograph as a metaphor for Bellevue's recent vitality. Unfortunately, the selection was hasty. As editor, I'm the final filter for what appears on the cover, and I failed to see the potential problem.

The French photographer Doisneau titled one of his books *Three Seconds to Eternity*, suggesting to me, among other things, that the correct capturing of a moment will establish a photograph's permanent place in our cultural memory. But it also echoes a notion that our new art director (see below) embraces, what he calls the "three-second rule." A cover photograph has three seconds to communicate its message to the viewer and potential reader. If the message is unclear, then the viewer starts assigning his or her own meaning to it. Our photograph failed that test with some of you, and for that I'm sorry.

...and a welcome. We're very pleased to have John Paxson as our new art director. John has worked in a variety of commercial and academic design positions and brings a rich portfolio of experience, ideas, and talent to the position. Most recently he was director of design services with Indiana University-Purdue University Fort Wayne. Previously he has worked at SAFECO, Eastern Washington University, and Identity by Design brand development in Spokane. Obviously, the art director has a major influence on how a magazine looks, and I know you will appreciate the look and feel that John will bring to these pages.

—Tim Steury, Editor

Only a Model

MY HUSBAND IS A WSU alumnus, and when Cherie Winner's article about models and the scientific method, "It's Only a Model" appeared in *Washington State Magazine*, I latched onto it and refused to let go! I teach general chemistry at a community college, and I am always looking for materials that emphasize the true nature of scientific theories (there is a lot of muddled, emotional thinking out there about theories). Ms. Winner's article was perfect for my classes, and I was delighted to discover the students could read the article online. It was required reading last term and, since it is still available at your Website, it is about to be required this term!

Moiria R. Frey
Chemistry Department
MCC—Longview
Lee's Summit, Missouri



The Man Who Gave Away Mountains

IT WAS WITH GREAT PLEASURE that I read [the McCroskey article].

I graduated from WSU in 1984. My father, John McCroskey Lynn, graduated in 1959, and my mother, Sally Lynn, in 1960. My paternal grandfather graduated in approximately 1936.

The article reminded me about my connections with the Palouse and how that tied in with Virgil—while at WSU I spent some enjoyable time on Steptoe Butte and loved visiting McCroskey Hall. I also won my first civil trial in Colfax while a student (I've been a lawyer now since 1987).

But the best part of the article was that which said: "That same year, 1903, McCroskey became a charter member of the Washington Outing Club, qualifying by a successful ascent of Mount Rainier, which had only recently been preserved as one of the first national parks. A series of other inspirational outings to Mt. Hood and other Northwest peaks would follow."

My father and I climbed all six major peaks in Washington. I earned my Mountaineers 6 Peak Pin one year before Mount St. Helens erupted.

Must be that pioneering McCroskey blood that keeps us going!

Kate Lynn '84

I JUST READ YOUR ARTICLE on Virgil McCroskey with great interest and enjoyed it immensely. Virgil was a wonderful friend and someone to look up to. I grew up in Tekoa, Washington, and my father, McKinley I. Roberts, had the Elk Drug there. The two pharmacies had no connection but did share the same name. My dad also graduated from the school of pharmacy at WSC, probably about 1922. Dean Dirstein was the dean of pharmacy then and was also the dean when I entered WSU in 1950. I did two years in the Navy and graduated in pharmacy in 1957. Virgil would run the Elk Drug in Tekoa while my parents would vacation in the springtime in Mexico for three weeks while I was in high school. I was a boy scout and would often times go up to Mary Minerva State Park, building trails or help getting it ready for the annual Boy Scout Camporee when scouts from the Inland Empire would descend on it each year. We would sleep on the ground at the park while working there. Virgil would tell us bear stories etc. and try to scare us. One time when the campfire was getting low he crept away and reappeared in a bear skin making sounds like a bear, and one of my friends mistakingly threw a hatchet at him. No one was hurt, but we all had a good laugh. His Buick convertible, as I remember it, was orange with some white and definitely orange leather inside. Virgil was especially good to the youth in Tekoa. Tekoa at that time was quite a bit bigger than

Oaksdale, so he used our Boy Scout troop for help at Mary Minerva McCroskey State Park. Again, thank you for the wonderful article.

Marshall Roberts

THANK YOU AND YOUR STAFF for a very good issue. The informative article about Steptoe Butte brings back memories of a 1947 trip with my wife-to-be, Betty, up the road to Steptoe Butte in a wheezing 1940 Plymouth. We return to Pullman many times always looking for the hill as a signal of a journey's end. My commendation to Andrea Vogt for her contributions to this issue.

The only exception I would comment on is a reference to our seemingly unlimited population's demand for salmon and paper or wood products. She misuses the term "scab of barren land" with clear cutting.

An apology or retraction would be in order to both Noah Webster and the loggers of the forest products industry for using a word of such hysteric proportion. I have returned on foot, by auto or helicopter and flown over many clearcuts since my youth to find birds and animals, clean water and trees. In some cases, returning to find a second clearcut of the same area, with planted trees and all the other amenities. Discrediting clear cutting is questioning nature's way of the same act with wind, insects, disease, and fire. It occurred long before scientific forestry used it as a tool to regenerate trees and produce the fiber used in your publication and this humble letter.

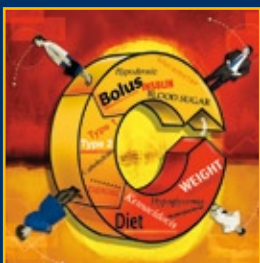
Dick Sterling ('50 For. and Range Mgt.)
Professional land surveyor and
consulting forester (ret.)

Rare Bird

KUDOS TO CHERIE WINNER for an exceptionally fine piece of expository/"creative" writing. Her "Rare Bird" article in the fall 2006 issue was a page-turner. It's uncommon to read writing by a science writer so crisp, descriptive, and appealing to

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Kathleen Hazel

COUGAR JOHN where are you?

IN 1948, A HUSKIE FRIEND of mine came to Pullman for the annual Cat & Dog fight (at that time it was not called the Apple Cup). After the game (which we won), he joined a bunch of Cougars, Huskies, and Vandals at the Plantation in Moscow for party time. Shortly, a brawl started. He said the Vandals started it!! He ducked under a table, joined by a Cougar, and they drank beer together as the bottles flew overhead. After that, his story becomes a little vague, but the partying continued. The next morning he woke up with an empty jug (so he sez) which was about six inches high, grey, and had the words "Cougar John" and the year "1948" painted in red. It was really more of a trophy than a jug. He couldn't remember when he got it, nor the name of the individual who gave it to him. He was supposed to give it to another individual, but couldn't remember his name either. He took it home and wondered what to do with it. He placed it on a closet shelf and forgot all about it until early this year. He decided to give this "Cougar John" trophy to a Cougar friend, since he had no idea what to do with it otherwise. That's how I acquired it. I have called several fraternity brothers (Kappa Sigs) and a few others, but have been unable to find anyone that knows anything about it. I am hoping that someone will read this article that has information relating to this "Cougar John" trophy. I plan to give "Cougar John" to the Washington State Lewis Alumni Center, along with as complete a story as I have been able to acquire.

If you have any knowledge of this, please call me at 425-454-9804, or e-mail me (including your number) at lorrynandjoann@comcast.net. I want your phone number so I can talk with you directly. Thanks.

Lorri Johnson '49

You must be kidding

THIS IS A COLLEGIATE publication showing some dude's tongue hanging out on a magazine cover photo? What does this have to do with WSU and scholastics? I'm appalled at this lack of taste. How gauche! I'm embarrassed & hate to say it, but you pulled a Coug...

Michelle Evans ('78 Ed.)

Although there was no tongue, perception often is reality. We got a number of complaints about the fall '06 cover. I've addressed the issue in my column. —Editor

Remember this

I'm sure you'll receive some interesting feedback regarding the "Bellevue Cover." Just tell them...

You must remember this:

A kiss is still a kiss, a sigh is just a sigh.

The fundamental things apply

As time goes by.

And when two lovers woo,

They still say, "I love you"—

On that you can rely,

No matter what the future brings,

As time goes by.

Moonlight and love songs

Never out of date,

Hearts full of passion,

Jealousy and hate—

Woman needs man,

And man must have his mate—

That no one can deny.

It's still the same old story,

A fight for love and glory,

A case of do or die—

But Bellevue always welcomes lovers

As time goes by.

Bill Fassett

*Professor of Pharmacotherapy
WSU Spokane*

Bookin'



Terry Allen, Bookin', 2006—as seen during patina at the Walla Walla Foundry.

Bookin', by sculptor Terry Allen, is the latest outdoor sculpture to appear on campus. In 2004, the Museum of Art organized a temporary exhibition of 14 large sculptures across campus. One of them was a large bronze book by Allen, borrowed from a private collection. When a new commission became possible through the Terrell Mall Sculpture Initiative, says museum director Chris Bruce, "we immediately thought of Terry."

The result, says Bruce, is *Bookin'*, which reflects both the library and former WSU president Glenn Terrell's walking posture. Terrell, who was president of WSU from 1967 until 1985, is fondly remembered by many Cougars as the "students' president." He would often walk from the president's house to his office across what is now Terrell Mall, stopping to visit with students, faculty, and staff along the way.

Sixty-one individual donors contributed to the purchase of *Bookin'*, which was cast at the Walla Walla Foundry.

HOT STUFF: DEEP OCEAN FAUNA

by Cherie Winner

When Washington State University biologist Raymond Lee set out to study the most heat-tolerant animals on Earth, he headed, oddly, for the open ocean off the coast of Washington.

There, with the help of a remote-operated submarine, he found his quarry: inch-long worms clinging to the sides of hydrothermal vents on the ocean floor more than a mile below the surface.

The vents are holes in the Earth's crust where molten minerals seep out of the planet's interior, raising the seawater to near-scalding temperatures and creating a habitat that is home to some of the oddest, and hardest, organisms known.

Lee's special interest is extreme environments, and how animals and plants have adapted to them. He was intrigued by the vent worms, because they were reported to live at higher temperatures than any other animal—60°C (140°F)—and to tolerate brief exposure to 80°C (176°F). That was based on readings from a thermometer researchers had inserted via remote control into a worm's tube-like covering.

"As evolutionary physiologists, we're interested in all the different ways that animals have engineered to cope with their environment," says Lee.

"Extreme organisms like these have pushed the limits" of what's possible, he says.

In the case of the vent worms, Lee thought their reported tolerance of temperatures of 60°C or higher pushed too far. Most of the enzymes and other proteins critical to life stop functioning normally between 45° and 55°. Lee decided to test the worms himself, by bringing them into the lab—a task just as challenging in its way as manipulating a tiny probe via robot at the bottom of the sea.

That challenge was half the fun. Lee loves to build things. In his lab, power tools outnumber microscopes. He sketched a rough blueprint for a chamber that would let him keep vent worms at the intense pressure they're adapted to. His ideal chamber even had windows so he could film the worms' reactions to various temperatures. John Rutherford, a machinist at the College of Science's Instrument Shop (see "The Science Shop," page 36), refined the plan.

"They're very patient," says Lee of the shop staff. "They had a scratchy little drawing. John would call me up and say, 'Did you mean this? Can you come down here?' Eventually we got it all figured out."

They came up with chambers about the size of a two-pound coffee can, made of thick Plexiglas inside a heavy aluminum sleeve with portholes cut into it. With his colleague Peter Girguis of Harvard, Lee had a remote-controlled sub pull worms off their vent and bring them to the surface. The worms survived that trip, and Lee immediately placed them into a chamber and pumped up the pressure. They did fine there for several weeks—as long as the temperature didn't go above 50°C (122°F). The worms became sluggish at 52°C; at 60°C, the temperature previously reported to be their normal environment, they died within minutes.

Lee then asked whether the worms would stay in hot water

if they had a cooler choice. He went back to his lab/shop and made a longer chamber that let him heat one end and chill the other. With a thermal gradient in the chamber, the worms were free to seek their preferred temperature. They hung out at 50°C most of the time, occasionally probing the 55°C (131°F) zone but withdrawing after a few minutes. It was a dramatic demonstration that vent worms really do "like it hot"—hotter than any other aquatic multicellular animal—but not as hot as previously reported.

Now, with a new grant from the National Science Foundation, Lee is studying the physiological processes that enable vent worms to cope with such high temperatures; and he and Girguis are designing an infrared instrument that will let them read the temperature of a vent worm in its natural habitat just by pointing it at the creature.

Lee says solving the practical problems of studying vent animals, either in the sea or in the lab, lays the groundwork for the techniques we'll need to study creatures from other worlds.

"Vent organisms may be as difficult to deal with as something from another planet," he says. "It's all remotely operated. If we find something on Mars, it will be the same situation, just a longer distance."

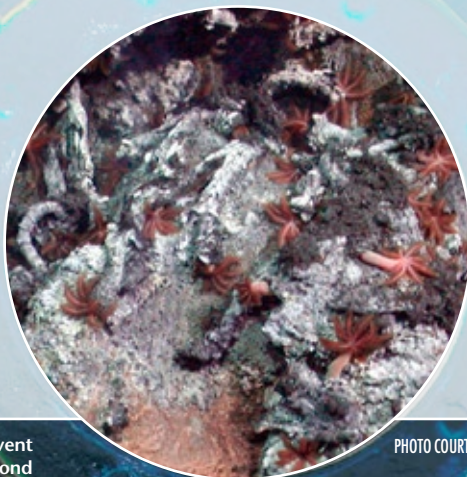


PHOTO COURTESY OF BILL CHADWICK, OREGON STATE UNIVERSITY AND NOAA'S UNDERSEA RESEARCH

Despite their delicate appearance, the red-and-white vent worms (*Paralvinella sulfincola*) studied by WSU's Raymond Lee thrive in one of the harshest environments on Earth.

From October 2005 through March 2006, I worked with ephemera in one of the great libraries of the world, the Bodleian at the University of Oxford. A cheeky person might say that “ephemera” is just a fancy term for trash. However, given the passage of time, even trash can become terribly interesting.

Printed ephemera may be items such as broadsides, chapbooks, bus tickets, menus, playbills, and lists that were not intended to survive their immediate use. As most printed ephemera were not saved, what does remain can reveal facets of everyday life that are not otherwise documented.

For example, an 18th-century British grocer’s list can tell us what was available in a given shop in a certain location at a particular period in history, how merchants ran their businesses, the prices for individual goods, how printers reproduced such lists, and so on. A collection of such lists would allow a researcher to trace changes in taste, the introduction of new products and technologies, and the development of transportation systems. One such list in the Bodleian is that of John Watkinson, Grocer, Tea Dealer in Newbrough, Scarborough (ca. 1750). Mr. Watkinson sold a range of goods: six types of sugar, morels, truffles, gunpowder, flints, five kinds of hair powder, five varieties of snuff, and a range of drugs.

During my time at the Bodleian, I focused on one type of ephemera, the chapbook. Chapbooks, according to the noted bibliographer John Carter, are “small pamphlets of popular, sensational, juvenile, moral or educational character, originally distributed by chapmen or hawkers, not by booksellers.” We know

from publishers’ records that millions of chapbooks were printed during the 17th, 18th, and 19th centuries, though the great majority have not survived.

Along with broadsides and ballads, chapbooks were some of the most widely distributed forms of popular printed entertainment. As chapbooks were so inexpensive—

John de Monins Johnson. Johnson began his professional life as a papyrologist leading digs in Egypt. When World War I prevented Johnson from continuing his work in Egypt and his poor health kept him from joining the army, he went to work at the Oxford University Press. In 1925, he became printer to the university and

Romans. The work he and his colleagues devoted to interpreting the rubbish from earlier cultures made him realize that most of the ephemera of Britain would similarly be lost if not collected.

The Johnson Collection of Printed Ephemera is extremely important because of its size—it includes over a million items—range, and depth. Johnson developed a flexible system of more than 680 subject categories. This system allowed him to incorporate other large collections of ephemera into his own.

When Trash Reveals History

The world of printed ephemera at Oxford



Chapbooks, according to the noted bibliographer John Carter, are “small pamphlets of popular, sensational, juvenile, moral or educational character, originally distributed by chapmen or hawkers, not by booksellers.”

generally a penny—and were readily available even in the most remote villages across the United Kingdom due to an elaborate network of chapmen or itinerant sellers, these publications may truly be regarded as “popular” literature.

The collection that I worked on at the Bodleian was formed by

remained in this position until his retirement in 1946. Johnson began his collecting in the late 1920s and continued until his death in 1956. He wrote that he decided on the outlines for his collection during his time in Egypt, sifting through ancient trash heaps left there by the Egyptians, Greeks, and

One of the most exciting aspects of working with the Johnson Chapbooks was the fact that the great majority—85 percent—of the chapbooks were not already in the Bodleian’s collections. This is noteworthy, given the age and quality of the Bodleian’s holdings. In 1602, Sir Thomas Bodley refounded and personally paid to refurbish and extend the library for his alma mater, the University of Oxford. Soon after, he solicited major gifts from his friends at court and negotiated an arrangement with the London Stationer’s Guild that stipulated that the guild would send one copy of every registered book to the Bodleian. The agreement, which continues today—the Bodleian is a copyright library so that every book printed in the UK is deposited there—and a tradition of major gifts over the centuries, have created a breathtaking collection of English books.

Trevor Bond is a librarian in Manuscripts, Archives, and Special Collections at Washington State University.

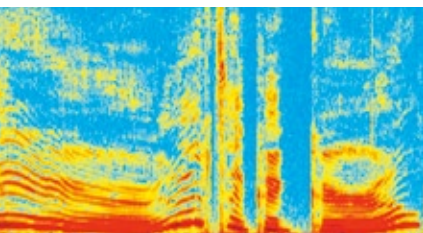
● *For more about ephemera, both at Oxford and at WSU, visit wsm.wsu.edu.*

MINDY KINGERY



Do you hear what I hear?

by Cherie Winner



A researcher at WSU Vancouver explores how the brain turns sounds into meaningful messages.

Christine Portfors is putting together a puzzle that makes a 10,000-piece pop-art jigsaw look simple. She's trying to figure out how the brain converts a complex sound such as a baby's cry into a meaningful message—and how hearing loss affects our ability to understand it.

Portfors, a neuroscientist at WSU Vancouver, combines neurophysiology—finding which brain cells fire in response to what sounds—with behavioral studies—observing what an animal does when it hears a certain sound.

Even the simplest vocalizations are dizzyingly complex. A real-time diagram of the tones in a single spoken word (left) shows dozens of peaks, each one representing a different frequency, or pitch. The inner ear starts processing all that information by separating the peaks and converting them to electrical signals. Yet, “what we hear is a real sound, a full, complex sound,” says Portfors. “We don't hear the individual tones. That's the major goal [of my work]: how do the cells in the brain combine all the different frequencies so that what we perceive is a whole sound?”

For decades, the conventional view has been that the various frequencies are processed in parallel, with information about each one conveyed along a dedicated pathway to a location in the cortex, where they are reintegrated to form the whole sound. Working with mice, Portfors is finding that the situation is much more complicated than that. Instead of parallel processing, signals split and recombine in more of a web-like arrangement.

“Probably the most important

aspect of the work I do is showing that neurons are getting connections from lots of different frequency areas,” she says. “Once you start looking for these [connections], you find them all over the place in the brain.”

Portfors has earned funding from the National Institutes of Health and National Science Foundation for her real-life approach. Most researchers in the field anesthetize their mice during the physiological tests and use synthesized, “pure” tones—easy to measure, but meaningless to the subjects. Portfors keeps her mice awake and offers them “real” sounds that carry important information, such as “help” calls emitted by pups. Female mice who hear a pup call rush to the source of the sound to carry the lost pup back to the nest. In physiological tests, they show clear, strong responses at several locations in the brain. Pure tones don't elicit the same neurological responses.

Using sounds with meaning lets Portfors investigate the loss of meaning that occurs when hearing fails. By removing some frequencies from the total sound before playing it for the mice, she mimics partial deafness and explores what parts of the sound

are needed for the mouse to understand the message. She also works with a strain of mice that lose the ability to hear high pitches, a condition that afflicts almost all humans starting at age 25.

In addition to using natural sounds, Portfors houses her mice in mixed-gender, “environmentally enriched” cages. The conventional arrangement of housing two or three mice of the same sex in a “shoebox” cage just didn't do the job, she says. Males won't vocalize unless they're in the presence of a female, and mice of either gender don't develop normal behavioral or neural responses if they don't hear the full range of sounds from other mice.

“They're growing up in deprived acoustical environments,” she says. “And then we're studying their auditory system.”

She shakes her head.

“If you're going to understand anything, you've got to come up with a way to study these processes in an animal that's awake and listening to the sound, and as a further-along goal, is actually behaving, is doing something,” she says, “instead of just an animal sitting there, anesthetized, hearing tones. That's not going to tell us how the system works.”



ISTOCKPHOTO

An equation for beauty



Math meets art in the paintings of Seattle artist Michael Schultheis. The 1990 WSU economics alumnus draws from equations and theorems in creating his layered, colorful pieces. His efforts to blend art and math won him a solo exhibition at the National Academies in Washington, D.C. in 2005.

by Hannelore Sudermann

THE PAINTER SPENDS his days on the third floor of an ancient biscuit plant in a seedy section of industrial Ballard. The building, just a block from the Ballard Bridge, houses a collection of artists, mostly ceramicists whose main-floor kiln warms the warehouse through the winter.

But acrylic paint is the medium for Michael Schultheis, 39. A climb up steep wooden stairs, and we're welcomed by Cesaria Evora's alto voice singing in Portuguese from a paint-spattered boom box. "Ah, she's wonderful," says a similarly paint-spattered Schultheis standing at the door to his bright studio.

He is in the midst of creating paintings for a fall show at the Winston Wächter gallery in New York and a January show in Seattle. And as we start the inter-

view, he spends the first 10 minutes moving canvases, hanging them in pairs and trios on the walls. "Just a little bit of gymnastics," he grunts. "I'm sorry. I should have done this before you came."

We disagree. It's fun to watch him heave the large canvases to their nails.

The galleries want big paintings. Michael likes that. Their size allows him to interact with them in the same way he would a chalkboard. That is the first level of what he does—create a type of chalkboard. Then, drawing upon a past life as a software developer who has had to step up to the board and brainstorm, he writes on them. Years ago, he would have been part of a team mapping new programs on a dry erase-board. Today he works alone,

writing out theorems, mathematical equations, and geometric shapes on canvases.

He may be alone in his studio, but in his head he shares the company of Euclid, Albrecht Dürer, and Galileo, translating their ideas into color and form in paint.

Schultheis grew up on a wheat farm near Colton, about 12 miles south of Pullman. Impelled to Washington State University by a full-ride scholarship, he studied economics in the honors program. After graduation, he migrated west to find work. He also sought night classes in math



In his Ballard studio, Schultheis arranges canvases ready for a gallery show in New York City. His subjects include cycloids, paraboloids, lunes, and even riddles. Look closely, and you can see the equations as well as the physical shapes they represent. Drawing from his past as a math and economics student and a software engineer, he starts with base colors like white, representing a dry eraseboard, or black for a blackboard, and then layers on equations, movement, and color.

at the University of Washington. He was accepted to Cornell for graduate school and, again on scholarship, studied there with plans of becoming a professor of labor economics. One of his favorite memories is of a statistics professor who would work out her equations on a chalkboard in front of the class. "She would start at one end of the board and go all the way across," he says. "Then she would go back and sort of erase and create a window through the math and write something new. You could... see the memory of the equation underneath. Then in her wonderful New Delhi accent, she would pound on the board and say, 'Isn't this beautiful? Isn't this elegant?'"

Schultheis thought, yes.

Though he loved math and economics and was following his dream, something was amiss, and Schultheis struggled with insom-



nia. He tried a drink before bed, medicine, and finally found solace in a \$2.99 watercolor paint set. He kept painting after leaving Cornell with a master's degree to return west to work as a software engineer. He tried landscapes and portraits. He tried oils, pencils, and watercolors.

But the genius idea of how to really capture his visions on

canvas hit him as he was coming across the 520 bridge after work one night, listening to an artist on NPR. She said, quite simply, you have to paint what you know. He knew analytical math, economics, statistics. "So that's where I began."

"You can see that it's all related," he says. "Math has ties to art, music, dance. Everyone

talks about left brain/right brain like we've all had a lobotomy." But math is music. A graph is art. "Einstein played the violin. Paul Klee was an insurance salesman," he says. "There is a wonderful embracing of it all."

Schultheis left his day job a few years ago and started drawing on what he knew: the blackboard and the dry erase-board. His early works were grey, white, and black. They had equations, and windows, and movement. A Seattle gallery started showing his work, and he was selling paintings and gaining positive reviews.

In 2005, he was commissioned to create a show for the National Academies—science, engineering, and medicine. He added yet more

dimensions to his work, following his curiosity into history and color palettes.

Inspired by the Academies' auditorium, which has an acoustical ceiling composed of cycloid-shaped curves, he created a series of paintings based on the cycloid, its physical shape and its mathematical formula. He also researched the history of the cycloid, noting that Galileo was working on the equation in the late 1500s, at the same time a Ming Dynasty military general named Qi Jiguang was inventing a weapon, a wheel that emitted sparks in the same form as a cycloid. The palette in Qi Jiguang's official portrait was the inspiration for the colors Michael used in the cycloid series.

The Academies exhibit opened with a black-tie reception and brought international attention in the often very separate worlds of arts and sciences. Schultheis was overwhelmed by the response. "These were all Nobel Laureates, and they were interested in my paintings," he says.

While his work has an appeal for many, those who understand the equations can look at the letters and numbers and see the graphic visualization of those ideas. "It's like reading sheet music," he says. "Some people can look at it and hear the notes. People who know math can look at my paintings and see the shapes."

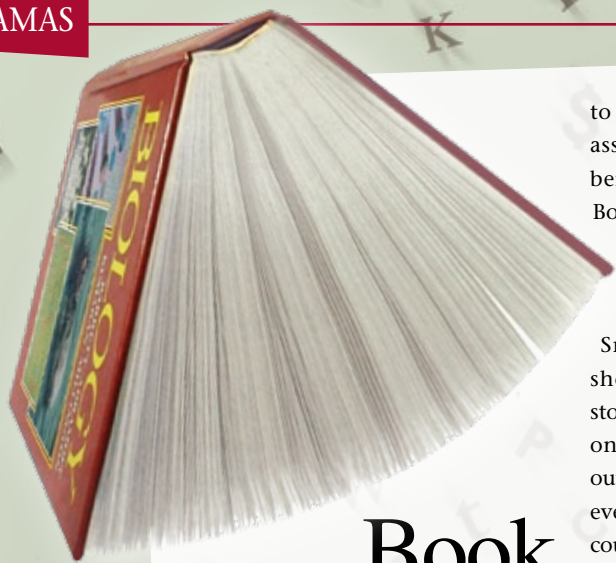
Though his studio is not open to the public, Schultheis's work can be seen around the Puget Sound area. One piece hangs on the second floor of the Westin hotel in downtown Bellevue. He also has paintings at the Seattle Athletic Club, the Tacoma Art Museum, the University of Washington Medical Center, and at the Winston Wächter Fine Art gallery in Seattle.

To view more of Michael Schultheis's paintings, visit Washington State Magazine Online at www.wsu.edu.

"Einstein played the violin.

Paul Klee was an insurance salesman."





Book Burden

It's not news to anyone that textbooks are among a student's biggest expenses. But some of us have figured ways around paying the high prices.

This fall, I coaxed my freshman sister, Kaytee, into sharing her book for the human development class we are taking together. The two of us were able to outsmart the system by buying just one heavy hardback for a steep \$90. It didn't take much to convince her: I promised she could keep it in her dorm room and explained that we were helping our parents, who usually pay for our books.

I've come a long way from my freshman year, when I bought every text, lab book, and bit of recommended reading on my professors' lists. Now I share, I borrow, and I do without. Some of my teachers encourage it. Last year, the prof in my PR class advised us to "browse the bookstore" and save ourselves some money.

It's hard not to judge a book by its price tag, especially when it's screaming big numbers at you. And to get to the textbooks at the Bookie, you have to walk by a rack offering bestsellers at 20 to 30 percent off.

Pullman has several bookstores

to choose from, and you might assume the competition would benefit the students. But the Bookie, Crimson and Gray, and Bookie, Too! all set prices that differ by just a few dollars.

Even so, my roommate, Kasi Snyder, an extreme bargain shopper, scoped out all three stores in Pullman, shopped some on Amazon.com, and checked out other online sites, before she even stepped near the checkout counter.

"The price of books is ridiculous, same as tuition," Kasi says, noting that tuition at Washington State University has gone up 14 percent in the past two years. "I can't go see movies, I can't go out with my friends, and I have a hard enough time with food. It's just more money that I don't have."

Most students are taking five three-credit classes each semester. If you figure books for each class cost an average of \$100, that's at least three months' worth of groceries gone.

That might explain why, nearly three weeks into the semester, many of my friends still didn't have all their books. Seth Lake, for example, says half his books weren't available, despite his professors ordering them in the spring.

He's still upset about a book he bought a few years ago. It was written by the professor teaching the course. Seth opened it to find an incomplete first edition—with missing pictures and partial text—which meant he wouldn't be able to sell it back at half price at the end of the semester. But that wasn't his worst problem. "My most expensive book was \$120 for an online macroeconomics course that has little to do with my organizational communications major," Seth says. His instructor required it, "... so that I could use, by

my approximation, 20 pages total of case studies, worth only a few points each for my grade. I would have rather saved \$120 and gotten half a grade lower in the class."

I'm lucky. With my communications/PR major, my books are generally less expensive than those for the science and engineering students. I recently went snooping around the Bookie to find the highest prices. *Calculus: Early Transcendentals* for Math 273 listed at \$155.90. A slim edition of *Quantum Physics* cost \$110. And *Art History* for Fine Arts 201 cost \$120. But those one-book classes are bargains compared to graduate courses like American Studies 502. Most of the books cost around \$20, but when you added all eight together, the bill came to \$175.

I'm not ready to give up hope and hand over all my cash yet. The high price of college texts has become a hot political issue. Seventeen states, including Washington, introduced bills this year to make textbooks more affordable. And on the national front, New York senator Charles Schumer is proposing legislation that would allow parents and students to deduct up to \$1,000 for college textbooks. That would make my parents happy.

Washington's bill was signed into law in March. It now requires boards of regents and trustees at the state's universities to adopt rules related to cost savings on course materials. It also urges the assigning of the least expensive course materials, and means that students don't have to buy books bundled with materials like CDs and workbooks that they may not need for their courses.

We're not helpless here. I think there's still more we can do. Until then, I guess it's best to buy most of your books... unless you have a kid sister in your class.

by Erin Thomas '07

What color is your potato?

Remember when picking a potato was easy? You had your choice: bake or boil?

Today there are dozens of decisions. Waxy? dry? fingerling? yellow? red? blue? banana?

That world of choice started in the early 1980s, when the Yukon Gold emerged from a breeding program in Canada. The yellow potato's creamy texture and buttery taste made it an instant hit. Chefs roasted it with garlic, mashed it with Gorgonzola, and paired it with the likes of duck and filet mignon.

But while our potato palate was expanding in one direction, it was narrowing in another. Shortly after Yukon Gold's debut, the Russet Norkotah sprouted on the scene. In spite of its bland flavor and mealy texture, the large, attractive tuber took over the market for baking potatoes. Mark Pavek, a horticulturist at Washington State University, says the potato is pretty, but like the Red Delicious apple, all flash and no flavor.

Pavek works with a consortium of scientists and researchers at the U.S. Department of Agriculture, Oregon State University, and the University of Idaho that has been trying to replace the Norkotah. They may now have the answer in hand: a variety known as A-95109-1. The creamy potato has the good looks of the Norkotah, but really delivers in taste and texture.

The new, yet-unnamed potato will likely be released to farmers in the next year.

Washington, the nation's second-largest potato producing state, joined the potato scene in the 1950s. Irrigation, along with long days, cool nights, and good soils, made the Columbia Basin ideal potato territory.

Most of Washington's potatoes are grown for processing—namely, for a future as a French fry. But now researchers are heading in new directions, looking for specialty varieties to meet niche demands. The French fingerling, for example, is a recent darling of menus around the country, prized for its slender size, delicate skin and texture, and, probably, the great name.

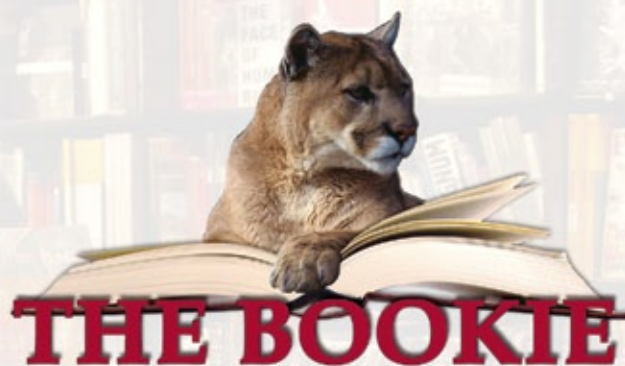
Store potatoes in a cool, dark place, but not in the refrigerator. The 40-degree temperature typical in a fridge causes the potatoes to produce sugars. Fry a refrigerated potato, and it will caramelize and turn dark instead of golden and crisp.

And while red, blue, and purple potatoes are worth a try, Pavek warns against the green ones. The color is a result of a chemical change caused by exposure to light, a sign that toxins are developing. Unfortunately many grocery stores aren't good about weeding out the greens, so it's up to consumers to protect themselves.

—Hannelore Sudermann



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The screenshot shows the homepage of 'The Bookie' website. It features a navigation bar with 'Shop Online' and 'Textbook Reservations'. The main content area includes a 'Featured Items' section with a '500 Piece Puzzle' and a 'Yacht Keychain'. There are also links to 'WSU' and 'WSU KINEX'. The footer contains contact information for 'The Bookie' and 'WSU KINEX'.

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The Sportswriter

by Hannelore Sudermann

If Janie McCauley '98 were telling this story, she wouldn't bury the lead. She'd say right away that she is the Associated Press's 2006 Sports Writer of the Year.

Add a little color, some solid quotes like, "I was surprised to get the award. There are so many good writers doing good stories all around the country," and a few action words like "dwell," "delve," and "dive," and that's where many writers would stop.

But Janie looks for the story beneath the story. She dwells on details, delves into players' personal interests, dives into their lives outside of the stadiums and ball parks.

As far back as high school in Leavenworth, Janie knew she wanted to write about sports. She and her brother would cherish their family trips over the Cascades to watch the Sonics play in Seattle. She would go to great lengths to be close to the players, shake their hands, get their autographs, and even reach out and touch their heads as they walked by the stands.

Throughout her years at Washington State University, she worked as a stringer for the local papers. Every Friday night she was out at a high school game in Garfield, or Troy, or Potlatch. Hard work and hard networking landed

her at Spokane's *Spokesman-Review* in 1998. Her fresh perspective and energy made her a darling of the sports department.

In late 2000, McCauley was hired away by the Associated Press in Seattle. It was there, covering the Mariners, that she caught the attention of the AP's national editors. She credits Ichiro Suzuki. When the star player arrived in 2001, he was mobbed by Japanese reporters. Janie kept her distance, made respectful requests for interviews, and inquired about his personal habits. "I tried to understand some of his unique rituals like stretching and massaging his feet

Associated Press's 2006 Sports Writer of the Year Janie McCauley '98 brings fresh perspective and energy to the press box with her current assignments in the Oakland area.



HANNELORE SUDERMANN

before and after the game," she says. He trusted her and gave her access, which led to some unusual stories about a high-profile player.

In 2002, the AP editors asked her to move to California. She didn't have to think long. "I love baseball. And they have two teams here." She also covers college basketball, the Oakland Raiders, some NBA, and some college football. If she wanted, she could go to a game every night.

On July 7, Janie starts her day with a workout at a gym just a few miles from the old house in Alameda that she shares with her husband, Josh. It is the eve of her 72nd baseball game of the year. When Barry Bonds was chasing Babe Ruth's home run record this spring, she didn't take a day off. "I didn't want to miss it," she says.

She aims her Honda CRV at McAfee Coliseum four hours before the first pitch, which gives her time to set up her computer, check her messages, and relish the peace of the empty stadium. After about an hour of e-mails and a phone press conference with the Giants, she heads down to the dugout for the take on the day. Standing in the midst of a dozen other reporters, all men, she leans in and listens, taking notes and occasionally biting her nail. Later, when team manager Ken Macha heads to the water cooler, she steps close for a private word.

Taking advantage of her time on the field, Janie also stops to joke in Spanish with Antonio Perez, a 26-year-old member of the Athletics. "My Spanish isn't really that great, but it gets me access to players that the other reporters don't get," she says.

In a story last year, Janie wrote about the language barriers for Spanish-speaking and Japanese players. She noted that the two groups are treated differently by the major leagues. The Hispanic players often hang together for help communicating. The Japanese have full-time interpreters. Still, both types of players are disconnected from their teammates. That piece won her an AP award for enterprise reporting.

In another story, she went to the home of Venezuela-born Omar Vizquel, a Giants shortstop who escapes the pressures of baseball through painting. One of her strengths as a reporter is an ability to look for the details that transform the players into people.

But tonight Janie is simply wondering about the game. The stands come to life, as the

crowd of 20,700 arrives. There's a hot rivalry between the A's and the Angels.

As the bright afternoon cools, Janie is typing, calling out stats to the other reporters, and keeping an eye on the field where the story will unfold. And it certainly does. By the seventh inning, and as her deadline creeps closer, she focuses in. She notes that Angels pitcher John Lackey is having a very good night. When he's on the mound, no one gets on base. Eighth inning, ninth, and the game is over, with the Angels beating the A's 3 to 0. "That pitching performance was unheard of," says Janie. "I can't believe what I just saw."

The game may be over, but work isn't. Janie grabs a notebook and dashes down to the clubhouse. She's one of the few women allowed inside. "I wait

until the guys are dressed to interview them," she says. "The players notice and appreciate that."

A half-hour later, she returns to the press box with quotes from the managers and the players, including Lackey, who had no idea he was pitching so well.

Her fingers fly over her keyboard as she writes and then rewrites her lead: John Lackey's special night. At the end, after 10 p.m., she files her story, calls her editors, and starts packing up. It was a great day and a great game, she says, as she heads out to her car.

● *To read Janie McCauley's entertaining story about the odd things baseball players take with them on the road, visit Washington State Magazine Online at wsm.wsu.edu.*

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An American in Albania

In June 2006, Steve Wymer '01, former student-body president, traveled to Albania at the invitation of the U.S. Department of State to help that country in its "effort to create student representation across the country." "Since serving... as ASWSU President," writes Wymer, "I have never lost my passion for the process of student representation. I've tried to be a help to as many student leaders as possible, and I have wound up speaking at a lot of conferences around the nation, and even helped found the American Student Government Association (the only professional association for student governments) in 2003. ..."

"My studies in public relations at the Murrow School, experiences as a student leader at WSU, and my professional opportunities over the last five years in politics were great training for this opportunity. I went to Albania with the hope of providing valuable insight to the student leaders who are trying to build a representational body, but I'm certain I left having learned more than I taught."

Following is an excerpt from four updates Wymer sent during his three-week stay in Albania.

VLORA THE LAST TWO DAYS HAVE BEEN INCREDIBLE. Yesterday we traveled about two hours on a ridiculously wind[ing] road to the city of Vlora to work with students at the University of Vlora. Vlora is on the Adriatic Sea, and although the views of the water are beautiful, it is not a nice city.

Albania fell into complete anarchy in 1997 when some massive pyramid schemes destroyed the nation's entire economy. They say that a huge percentage of Albanians lost almost everything. When things crashed, the place erupted in violence, and the military and police just quit. The violence started in Vlora, and the city is known as a rebel city.

Ultimately, as... [a] fledgling democracy that was experiencing so many things for the first time, Albania's government was incapable of dealing with this situation, and Vlora still kind of gives you that sense of "tension in the air" when you drive through. One of the long-standing jokes is that Albanians are always amazed at how the city fields a good soccer team, but despises teamwork in every other way!

So, after a bit of a roller coaster ride, we arrived at the University of Vlora[]... commonly known as the most corrupt... in Albania. I'm struggling with how to describe this place. ... [J]ust imagine a university that makes the typical public school in D.C. look like a shrine, add in years of soot on the walls because students and professors smoke in the school, bad lighting, and an entire university workforce for sale. That's the short version. I was aghast at trying to help these students, because they told me that it is much easier to just give the professor \$50 and pass the test than to study. I asked them what the problems were, and they shouted problems for almost an hour. My translator went through an entire pack of cigarettes just while they answered that question. ... [A]s my translator is speaking eight inches from my face... , these students are yelling out all of their problems. This will go on for hours! As soon as I suggest some strategies to begin to make progress on an issue, someone will jump up and begin shouting about another problem. They cannot focus, and cannot reach consensus. They have corrupt teachers and administration, no text books, unfair test calendars, impending changes to the national laws about higher education that they do not understand, and so many more problems, and they are passionate about stating them.

This dynamic has made training these students one of the most difficult leadership assignments I have ever experienced. I am blown away. It's nearly impossible to examine strategies to solve issues when there is nobody for them to turn to for help. Higher education in Albania exists (it seems) to enrich those in charge of it, and they have so much work to do.

That said, the more students I meet and talk to, the better I understand the complexities of their world. It's easy to understand their passion for calling out a problem, because for so long, they were not allowed to speak of problems out loud. It was less than 15 years ago that these students would go to a market with their parents and possibly find that the potatoes were all gone for the day. If their father or mother made a fuss about having to go hungry that night, they were jailed or punished for speaking out in a communist society. As I think about that, I have to extend these students a lot of grace. Truth be told, I've already developed a love for the whole messy place and everyone I have met.

To read all five of Steve Wymer's Updates from Albania, visit Washington State Magazine Online, wsm.wsu.edu.



Steve Wymer
with the
University of
Tirana Faculty
of Arts and
Sciences student
senators

PHOTO BY LANDON YODER



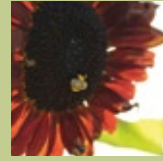
A promotional poster for Washington State University (WSU) Cougar basketball. The background is a vibrant red with a large, stylized white cougar head graphic. In the center, two basketball players are shown in action, framed by a white circular border. The player on the left is a Black male wearing a white jersey with "STATE" in maroon letters. The player on the right is a white female wearing a white jersey with "WASHINGTON" and the number "12" in maroon. Both players are looking intently at the game. Overlaid on the image is the text "COUGAR BASKETBALL" in large, bold, white and grey letters. Below the text is the WSU cougar logo.

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Whither Organic?



BRUCE ANDRE

by Tim Steury

With a new organic major and a strong history of research, WSU is a leader in organic agriculture. But is that enough to keep up with the demands of a burgeoning organic industry?



ON THE LIST of farms certified organic by the state of Washington, Brownfield Orchard is number one, having earned the designation in 1987. Certification indicates that the designated farm adheres to a set of farming practices that preclude the use of syn-

thetic fertilizers and pesticides and emphasize the development of healthy soil.

Mike Brownfield '88 returned to the family farm, at the base of Brownfield Canyon, after graduating and spending a couple of years working on an organic farm in California. Mike's great-grandfather, Oliver, had farmed land adjoining the family's current acreage. His grandfather, Floyd, grew apples in Chelan from the 1930s until 1969. After he'd taken over the orchard, Mike's father, John, grew uneasy with the toxic chemicals commonly used at the time, and turned to organic methods well before he had the state's official blessing. Some of the blocks of the Brownfields' 52 certified acres have never experienced the quick rush of synthetic fertilizer.

Even in the late 1980s, any organic farmer was still a pioneer. The tools of organic production were crude and hard to find, and the University offered little support. Markets were limited and hardly lucrative.

But if Brownfield was a pioneer, he was not alone. Across the lake to the west, Ray Fuller had gone organic even earlier.

After he'd returned to his family's orchard above Lake Chelan from Washington State University in 1980, conventional pest control just didn't make much sense to him. "You'd apply material to control one pest, and that made other pests blow up because you'd killed all the beneficial insects. So you'd apply more materials for the secondary pests.

"Plus... I was in my early 20s and knew I'd be here for a long time. Thirty or 40 years of being exposed to harsher pesticides—it's at least not healthy for you."

THE VIEW FROM Fuller's large log home is a strong contender for the most beautiful in the world. From his vaulted living room, one looks across his orchards and over Lake Chelan. But the setting provides more than just a beautiful view. The Chelan area has long been known for its high-quality fruit, primarily apples, pears, and cherries.

The lake is the biggest factor, says Fuller. "The colds don't get as cold, and the hots don't get as hot."

Although organic agriculture at the time was considered more fringe philosophy than practical horticulture, Fuller recognized opportunity. Spurred by Rachel Carson's *Silent Spring* and J.I. Rodale's organic evangelism, demand was growing for food not raised with large amounts of synthetic pesticides and fertilizer.

Whereas Fuller markets all of his fruit wholesale through a packing house, Brownfield markets much of his directly, which helps him weather market downturns. But the future organic market is very rosy indeed for both approaches.

Well over 10,000 acres of Washington tree fruit are certified organic, and that acreage is increasing rapidly. Washington has more than 40,000 acres of organic farmland altogether and is expected to double organic production within the next few years.

Organic food currently claims about 2.5 percent of the American food market and is growing at a healthy rate of 20 percent a year. Two and a half percent does not seem particularly significant, until you translate that into dollars. Americans spent \$15 billion on organic food and beverages in 2004.

They give any number of reasons for buying organic. Better taste. Concern about the environment. The health of their children. Maybe a warm, fuzzy country feeling, what Michael Pollan calls "supermarket pastoral." But farmers are moving into organic increasingly for one reason. To make money. Organic is a major growth niche in an industry where profit margins shrink daily.

SHIFTING A MAJOR chunk of his small fruit production to organic was purely a business decision for Steve Sakuma '70, head of the family-owned Sakuma Brothers. The Sakuma Brothers grow a thousand acres of blueberries, raspberries, strawberries, blackberries, some other berries, and a few apples just outside of Burlington in Skagit County. About 15 percent of their acreage is certified organic. They also run a nursery in California that produces about 100 million strawberry plants a year. Sakuma Brothers is entirely vertically integrated. In other words, they do their own processing as well as growing.

Sakuma Brothers employs about 700 people on its Burlington farm and processing plant and another 750 on its nursery. Even though Sakuma calls its operation "medium-sized" compared to the corporate giants in California, it's a good example of where organic is headed in the United States.

Facing page: Julie Sullivan. WSU's organic major includes a summer practicum on its organic farm, which provides experience growing, harvesting, and marketing organic produce. **Above:** Mike Brownfield '88 with his son, Benjamin. **Below:** Sign-post for Brownfield Orchard. Washington is the nation's largest producer of organic apples, providing about 40 percent of the total.



In his office one day in June, Sakuma and Greg McKay '86, the organic crop manager, and farm manager Jim Riggan bring me up to date on the business of organic. These guys are no hippies.

"Farming is not for the meek and the mild," says Sakuma. "It's all about capital.

"To us, ... [organic is] just diversity. You've got the conventional market and the organic market. You don't want to be totally in one. You need to be in both. The trick is to find what that balance really is."

The Sakumas ventured into organics through a partnership with Small Planet Foods, formerly Cascadian Farms, the first organic food processor in the Pacific Northwest.

Cascadian Farms was started in the early 1970s by Gene Kahn, a former organic farmer in Sedro Wooley who eventually discovered that he was better at marketing than farming.

"We watched him from a distance," says Sakuma, "and our observation was this guy was never going to make it." McKay and Riggan laugh. I get the feeling they've heard this story before. Kahn sold Small Planet to General Mills in 2000 for a reported \$70 million.

"He was never going to be able to grow organic strawberries in the state of Washington, just because of the weather. We proved to be right.

"But he proved to be right that organic was an option out there."



GEORGE BEDNAN

After Ray Fuller '80 (pictured above) returned to his family orchard, he recognized the potential of the growing demand for food grown without synthetic fertilizer and pesticides combined with the superb growing conditions of his land above Lake Chelan (pictured below).

Once he'd realized organic's potential, Kahn tried to persuade Sakuma to grow berries for him. But the Sakumas were leery.

"We had this conversation with him for a couple of generations."

Finally, in 1998, Kahn asked them what it would take to get them to grow for him.

"Basically, our response was, 'You take all the risk, and we'll do the farming,'" says Sakuma. "He said, 'Okay.'"



Once they'd worked out a custom farm rate plus 20 percent profit ("If we didn't harvest a berry, it wasn't our problem, it was his"), the Sakumas started growing organic berries.

And what they found out was, "Organic farming, at least in blueberries, wasn't as difficult as we thought."

Still, it requires a different way of thinking.

"We're still learning," says Riggan. "It's harder than just going out and spraying. With conventional you can let the pressure build a little bit and get away with it. But organically, you need to be on top of it season-long."

Farming today is more than just growing a crop, says Sakuma. All of successful farming, at least non-commodity farming, is about being keenly tuned into the market.

"The practices our family might have used 50 years ago won't work today. We're focused on a whole different set of rules. A lot of those rules right now are driven by the consumer. We'd be fools not to be able to read that and say, 'What are they asking for?'"

MANY CONSUMERS, however, aren't all that clear what exactly it is that they're asking for. In spite of the dramatic growth, mention "organic" to the average consumer, even one contemplating the organic apples at a dollar a pound more than the conventional ones, and you're going to get confusion.

In *The Gift of Good Land*, Wendell Berry refines a definition that reaches back to the organic movement's roots, echoing the

sentiments of founder Sir Albert Howard: "An organic farm, properly speaking, is not one that uses certain methods and substances and avoids others; it is a farm whose structure is formed in imitation of the structure of a natural system; it has the integrity, the independence, and the benign dependence of an organism."

Fundamental as Berry's definition might be, it bears little relevance to how the designation is used to sell groceries. Further, some would argue that the current federal organic standards established by the USDA have little to do with Berry's ideals. The organic standards are prescriptive, and increasingly, any relation to values is only implied.

In the marketplace, organic has largely come to mean only what it is not—synthetic fertilizers and pesticides.

Recognizing a cash cow, large corporate food companies have embraced organic production, buying up small organic producers and applying industrial agricultural techniques to what was formerly a small-scale, more value-driven way of growing food.

Organic has become big business.

But in spite of a lot of purist hand wringing, adoption of organic standards by industrial agriculture can hardly be bad. If organic practices are actually better than conventional practices, then organic practices on giant corporate farms can only be an improvement, right?

Well, yes. And no. Questions surrounding organic ag become

JOHN CLEMENT



Organic research

The basics are the same. Whether “organic” or “conventional,” plants need water, light, and nutrients. But growing crops organically can be dramatically different from conventional methods.

Mention organic wheat to an east-side farmer, for example, and you’ll probably get a bemused grin. Copious amounts of synthetic nitrogen are generally thought essential to produce correspondingly copious yields. And then there are the pests and weeds, problems enough with conventional chemical tools.

Stephen Jones, a winter wheat breeder and Crop and Soil Sciences researcher, is coordinating a number of projects concerning organic production of wheat, ranging from selection of suitable varieties to efficiency of nitrogen intake. Jones has been crossing modern wheat varieties with 163 varieties grown from the 1840s through the 1950s, varieties not grown with the aid of heavy nitrogen input. He is looking for genetic traits that better enable plants to compete against weeds and more efficiently mine the soil for nutrients.

Carol Miles, a horticultural scientist at the Vancouver research station, is working



Whither Organic?

more meaningful and interesting when placed within the context addressed by John Reganold in his Distinguished Faculty Address last spring—“The Sustainability of Organic Agriculture”—in which he subjected organic ag to more exacting criteria. Basically, can it feed a much larger portion of the world?

Not to spoil the story, but yes, says Reganold, it can. And it will leave the environment, and maybe human health, in a lot better shape in the process.

A soil scientist, Reganold established himself as someone to watch in the late 1980s with a study, published in *Nature*, that compared two adjacent farms on the Palouse. One farmer had switched to what are now considered conventional practices, applying pesticides and fertilizers since 1948. The other farm, at the time considered organic, had been managed without synthetic fertilizers and minimal pesticides since it was first plowed in 1909. The organic farm used conservation tillage and a complex crop rotation. The conventional farm followed a simple two-year rotation.

“Because of the differences in farming methods,” Reganold and his collaborators wrote later as part of an article on sus-

tainable agriculture in *Scientific American*, “the soil on the [organic] farm contained significantly more organic matter, nitrogen and biologically available potassium than that on the conventional farm. It had a better capacity for storing nutrients, a higher water content, a larger microorganism population and a greater polysaccharide content. The soil also had better structure and tilth and 16 more centimeters of crop-nourishing topsoil.”

But the most significant finding was that even though the yield per acre on the organic farm was 8 percent lower than on the conventional farm, it matched the yield average of the area.

ALTHOUGH ORGANIC YIELDS do tend to be lower, primarily because they have less nitrogen available to them than is provided by synthetic fertilizer, more sophisticated practices have greatly narrowed the gap. Reganold participated in another dramatic study in the late 1990s with WSU horticulturist Preston Andrews, graduate student Jerry Glover '01, who is now a scientist with the Land Institute in Kansas, and ag economist Herb Hinman.

The researchers compared organic, conventional, and integrated plots of apples in the Yakima Valley. Integrated practices combine the best of organic and conventional. The six-year study found that all three systems produced similar yields. “The organic and integrated systems had higher soil quality and potentially lower negative environmental impact than the conventional system... our data indicate that the organic system ranked first in environmental and economic sustainability, the integrated system second and the conventional system last.”

But there's one more, very intriguing difference that came out in their study. The organic apples were also the sweetest. Andrews and Reganold have been pursuing the observation that many organic proponents make, but is difficult to verify scientifically, that organically grown food tastes better. This is further complicated by other factors, most notably freshness.



ROBERT HUBNER



ROBERT HUBNER

with Jones on seed selection in wheat. She is also evaluating vegetable and fruit varieties best suited to growing organically. (See "In Watermelon Heaven," WSM Fall '06.) The seeds themselves, no matter what variety, present a challenge to organic growers. Conventional growers use various fungicides to protect the seeds upon planting and ensure greater germination. Lindsey du Toit, a seed pathologist at the Mount Vernon NWREC, is working with Miles and plant pathologist Debra Inglis to find better organically acceptable seed treatments.

David Granatstein works with others to track economic trends in organic production and marketing in Washington. The result of their annual survey is a report available at csanr.wsu.edu/organic/organicstats.htm.

Many other faculty researchers and graduate students are working on organic farming issues, ranging from orchard understory management to pest control.

For more information, visit the Center for Sustaining Agriculture and Natural Resources Website, csanr.wsu.edu/organic. Progress reports on organic research projects are available at csanr.wsu.edu/organic/organiccropprogress05.htm.

Will an organically grown apple imported from New Zealand taste better than a conventionally grown apple picked from a tree in Yakima? Most likely not.

But Andrews and Reganold have been able to get a more accurate evaluation by comparing fruit grown both organically and conventionally, but under otherwise identical conditions. Neil Davies, in the College of Pharmacy, with whom Andrews and Reganold have collaborated, has found significantly higher levels of antioxidants and other phytochemicals in organically grown fruit (see sidebar, p. 29). Andrews speculates that the difference is likely related to differences in taste.



ROBERT HUBNER

Facing page: Greg McKay '86 joined Sakuma Brothers as its organic crop manager last year. **Above:** "Farming's a market-driven business," says Steve Sakuma '70 (pictured left), inspecting berries with his brother, Richard. To keep their 1,000-acre berry farm competitive—and in the family—the Sakumas have followed that market by moving steadily into organic production.

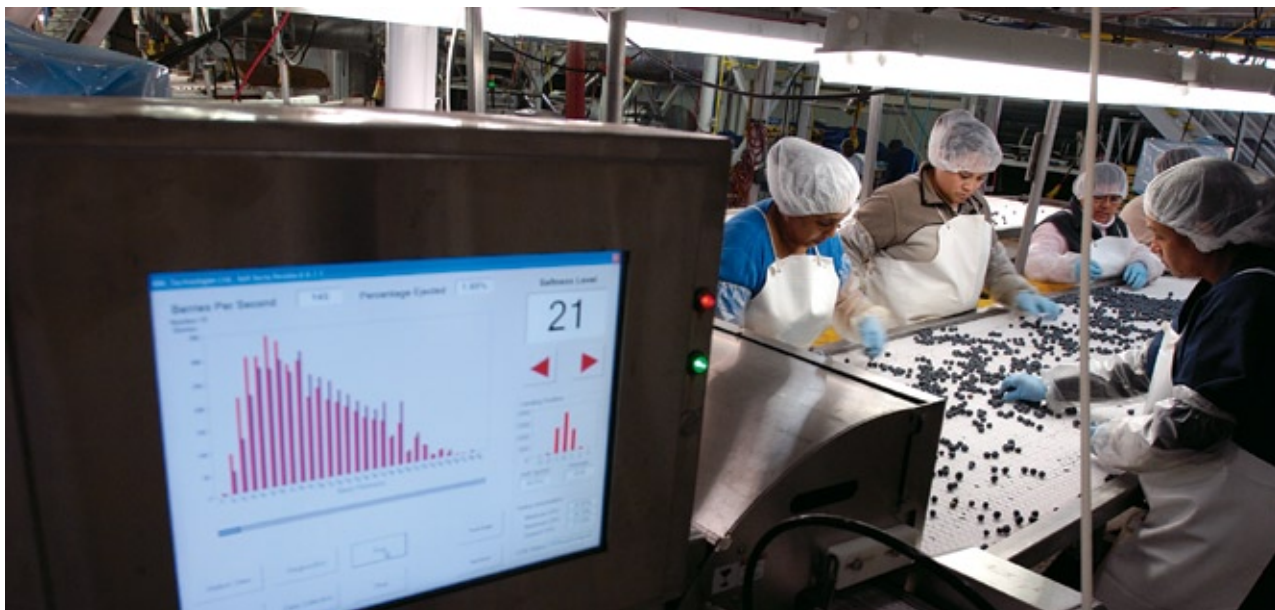


ROBERT HUBNER

Comparative studies with both apples and strawberries offer some striking differences. Fruit size of organically grown crops was smaller, no surprise. Again, they have less nitrogen readily available. However, the organic apples were firmer and stored better, organic strawberries were sweeter, organic apples had higher antioxidant activity, organic strawberries had higher polyphenol content, and the organic fruit in general was preferred by the consumer taste panel.

Studies by Andrews, Reganold, and many others at WSU and elsewhere offer tantalizing scientific glimpses of a movement that is being driven partly by science and partly by consumer perception.

Although the science is backing up earlier claims about organic methods, much is still unclear. Even the federal standards that determine what is "organic" are largely based on tradition and negotiation rather than science, says David Granatstein, extension educator with the Center for Sustaining Agriculture and Natural Resources. For example, there is really no scientific reason for a three-year certification period. And



ROBERT HUBNER

the requirement that raw manure not be applied within certain periods ignores the fact that there are no such restrictions in conventional production.

CLARIFYING THE SCIENCE behind the standards, exploring the nutritional and sensory differences, and prescribing agronomic practices all offer a wealth of research potential for the University. However, a white paper released last spring by the Cooperative States Research, Education, and Extension Service concedes the widespread criticism by farmers and organic

increased institutional support. Its recommendations were basically ignored.

A large part of the problem of acceptance by both the government and the land-grant universities was the implied criticism of conventional agriculture. If organic agriculture was so great, then conventional agriculture must be inferior.

Larry James walked a fine line as interim dean of the College of Agriculture during the mid-1990s, a period when skepticism about organic ag from conventional ag in the state, as well as from the old guard in the college, was at its strongest. James left Pullman to become chancellor at WSU Tri-Cities, then returned in 2005 as associate executive vice president.

"I was surprised, when I came back, at John's stature," says James, referring not only to Reganold's standing within the college, but also to his being selected for the Distinguished Faculty Address. James agrees that such a choice would simply not have been possible only five years ago, when the college and University gave organic research only a reluctant and tepid endorsement.

Indeed, Reganold's selection indicates something of a sea change in attitude.

Dave Granatstein, who was an organic farmer himself before he joined the University, concurs.

"There's a different dynamic going on," he says. "Crops and soils is the center of gravity of sustainable ag, particularly in the graduate students. But not just the grad students."

Organic major

Starting this fall, undergraduates can major in organic agriculture, one of five majors in a new agricultural and food systems degree. Washington State University is the first university in the country to offer such a major.

The aim of the new major is to give students a broad understanding of agricultural systems and the diversity of Washington agriculture, says coordinator Cathy Perillo.

A demanding curriculum will give students a solid grounding in basic sciences and communication skills as well as specialized training in organic practices.

The major includes a summer practicum on WSU's organic farm, located on the east edge of campus. Students will get experience growing, harvesting, and marketing organic produce.

For more information, visit world-class.wsu.edu/2006/organic.

advocates that land-grant universities, Extension, and the USDA have been reluctant, if not downright obstructionist, in providing the research and support that it readily gives conventional agriculture.

One of the first USDA overtures to organic agriculture was the 1980 *Report and Recommendations on Organic Farming*, coordinated by study team leader Robert Papendick at WSU. Having examined 69 organic farms in 23 states, the report concluded that organic farming was viable and warranted

ACYNIC MIGHT SUGGEST that the warmer embrace of organic agriculture by the University is simply a response to corporate ag's needs. If General Mills and Wal-Mart are getting into organic food, then the University better get in line for the research bucks.

Regardless of institutional motivation, the fact of the matter is that organic agriculture has evolved, rapidly, from a counterculture ideology to a mass-market phenomenon, and the University is rising to the occasion. One must not forget that

WSU is not just jumping on the bandwagon now; research in organic agriculture has been going on at WSU for almost 30 years. At least 50 people at WSU are conducting research related to organic production.

The amount of such research, however, also indicates another trend. Increasingly, organic vs. conventional is not necessarily an either/or proposition. In response to consumer concerns and scientific evidence, many agricultural pesticides are much “softer” than they used to be. In Washington orchards, “integrated pest management,” an environmentally friendly approach to controlling pests, which was adapted for apples by WSU scientists, has become the norm. Mating disruption, an organic tool, is widely used by apple growers to control codling moth, Washington’s most serious apple pest.

Chelan orchardists Fuller and Brownfield are in decidedly high spirits over consumer demand for a practice that they believed in before it was widely accepted. The next few years look very good for the organic fruit grower, says Fuller. In fact, he and Brownfield believe that the whole Washington fruit industry should take advantage of that demand.

“I think the whole state should raise their apples organically,” says Fuller. “It would be a marketing coup. We’ve got such a leg up on every place else in the world. The climate is perfect for it.”

Indeed, central Washington’s hot, arid summers create a perfect climate for organic fruit growing. Compared to other areas, disease and insect pressure are minimal, a major reason Washington is already the leading organic apple producer, by far, in the world. The learning curve involved in the transition to organic is no longer near as steep as it once was, says Fuller.

Whether or not the rest of the industry will recognize the economic virtue of producing organic Washington fruit remains to be seen. Meanwhile, organic producers throughout the state are smiling. ●

Facing page: Organic IQF (individually quick-frozen) raspberries provide Sakuma Brothers’ highest profit margin. **Below:** WSU, whose roots in organic research reach back to the 1980s, has become a leader in organic research and education.



BRUCE ANDRE

Getting the Goodies

by Cherie Winner

Organic foods don’t just contain less “bad stuff”—pesticides, herbicides, and fungicides—than conventionally grown foods.

In many cases they also contain more “good stuff”—naturally occurring chemical compounds that may have tremendous health benefits for the people who eat them.

That’s the focus of a hot new area of research nationwide and in the lab of Neal Davies, a Washington State University pharmaceutical chemist.

“Foods are natural delivery systems for phytochemicals,” says Davies. “When you sit down for your Thanksgiving dinner, you’re ingesting thousands of different chemicals.”

Most of those chemicals, although present in tiny amounts, have potent anti-inflammatory, anticancer, or antibacterial activity. Some “micronutrients” score high on all three.

While all fruits and vegetables contain micronutrients, Davies’s group has found that a food grown under organic conditions often contains more of the helpful compounds than the same food grown by conventional methods. Researchers believe that’s because organically grown plants, not being coddled with all sorts of chemical “help,” must provide their own protection.

“If they’re under attack, they release these natural antioxidants, natural anticancer, antifungal, and antibacterial compounds as a defense mechanism,” says Davies. “So then when we ingest it ultimately, we also have these defense compounds.”

Davies says it makes sense that conventionally grown crops would contain smaller amounts of the compounds. By fertilizing them heavily, we push them to put more energy into rapid growth and less into producing compounds that they don’t need, since we battle the insects, weeds, and infections for them.

His team tests compounds for their ability to kill cancer cells and bacteria, and their ability to prevent or relieve problems such as colitis in lab rats. Almost everywhere they turn they find a new experiment to try. Davies’s group has tested organic and conventional lemonades (organic is much better), different varieties of tomatoes (some are higher in key micronutrients than others), and the peel, pulp, and juice from apples, among other things.

The Washington state attorney general’s office has funded Davies and his colleagues to test several over-the-counter vitamin E supplements. They found that two of the products they examined contained a different form of vitamin E than claimed on the label—a form that lacks the anticancer activity that is a big reason many consumers buy the product.

Jaime Yáñez, a Ph.D. student in Davies’s lab, has mixed feelings about such supplements. While good ones provide a high concentration of important micronutrients, they don’t offer the rich mixture found in whole foods.

“They are good for you,” Yáñez says. “But when you buy a nutraceutical tablet, you’re going to have maybe 15 or 20 compounds. When you eat an apple or some blueberries, you’re talking about more than 5,000 compounds that you are eating.”

Besides, he says, “All these compounds that you can buy are actually natural. I mean, where do they come from? Fruits. So why not eat the fresh fruit? It’s cheaper; it’s natural; and it’s good for you.”

Not to mention, it tastes better.

GETTY IMAGES





The Brave New World of College Recruiting

Recruitment used to mean visiting high schools and mailing out applications. Today, with fierce competition for Washington's top students, recruitment is a complex program of target marketing, scholarships, campus visits, and the close attention of admissions counselors.

JULIA PASZTOR has had her pick of schools.

The Everett teen, born in a refugee camp to Hungarian parents, graduated third in her class at Mariner High School with a GPA of 3.91. She speaks German. She was a class officer. And she is an accomplished equestrienne—English style.

An admissions counselor with Washington State University noticed the brown-haired Julia her sophomore year, when she stopped at his table during a college fair. “Her interests were right in line with WSU,” says Kris Baier '98. And she was enthusiastic about finding the right college.

Julia attended her first college fair as a freshman. The recruiters just looked at her and asked, “Are you lost?”

By the time she was a sophomore, they regarded her more seriously. And in her junior year, it became a series of courtships. She caught the eye of Randolph-Macon College, a private school in Virginia. The school wooed her and even flew her across the country to visit. Other schools sent her applications, regular e-mails, and occasional phone calls.

Julia is a Washington Achievers Scholar. The honor means that on top of her other scholarships, she gets money from the Bill and Melinda Gates Foundation in a program developed to help children from low-income families pay for college.

She's got her future all figured out. She wants an affordable college experience away—but not too far—from home. She'd like to study animal science and eventually become a large-animal veterinarian.

Kris Baier saw her as a good candidate for WSU. He explained what she would get in Pullman and answered her questions about essays and references. After Julia considered dozens of schools, she made WSU her first choice.

COLLEGES AND UNIVERSITIES are spending thousands to recruit students like Julia. According to one recent survey, public schools spend about \$75 per student recruited. Private schools pay in the range of \$2,000 per student.

They send out reams of material, personalized letters, and weekly e-mails. They call the student at home, work with the counselors at school, and even throw get-togethers at the homes of wealthy alumni.

It's a fierce new world of college recruiting, one with enrollment managers, target

marketing campaigns, and admissions counselors who spend hours guiding individual students to apply. The schools are all seeking the same things: students with high grades and high test scores, who will enrich the cultural mix of the student body, and who will graduate in a reasonable amount of time. In short, students like Julia.

Six years ago at WSU, student recruitment was all about making the numbers. The admissions office focused on getting enough enrollees to fill the freshman and transfer openings and enough to get the full state allotment for educating them.

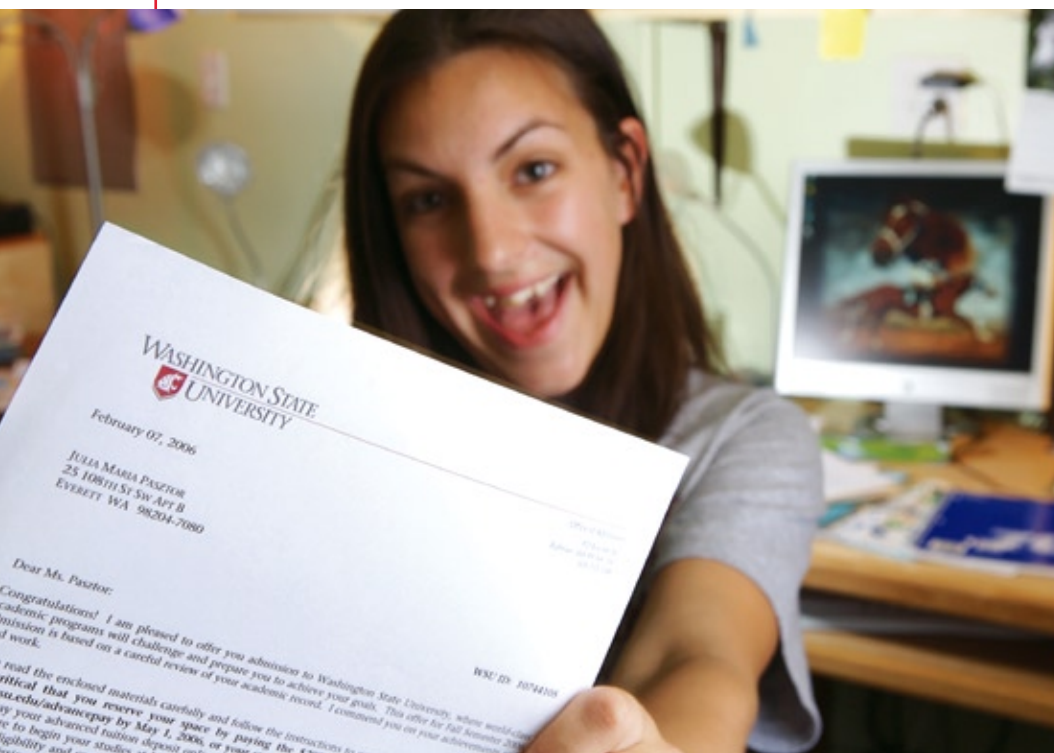
Back then only one student recruiter worked on the west side of the state. Admission was based solely on an index

A new admissions director was hired, counselors like Kris Baier were recruited, and representatives of WSU visited every high school and community college in the state, as well as some in Oregon and Idaho. At the same time, WSU's marketing department was recasting the University's image from a party school to one that was strong on research and high on academic standards. Under the tag line, "World Class, Face to Face," glossy images of educators and ethnically diverse students as well as information about WSU's academic programs and campus life went to every high school student and every counseling office in Washington. Along with a series of television commercials, a strong team of admissions recruiters, and a few good football seasons, the fresh

Ballard, Garfield, and Franklin, and Tacoma's Curtis.

These efforts have paid off with a surge in applications, helped in part by an increase in the population of graduating high school seniors. By 2005, the average GPA for incoming freshmen had risen to 3.45—and the University was turning away qualified students to avoid overcrowding.

The "World Class, Face to Face" campaign has changed what people think about WSU, imparting a reputation that it's no longer an easy school to get into. Today the school is targeting students with GPAs of 3.60 or higher, SAT scores of at least 1,200, and ACT scores of 26. It does this with special programs and marketing materials directed specifically at the top student and his or her field of interest. It also uses carrots like the Regents Scholars program, for which students with high GPAs have to be nominated by their high school principal.



MATT HAGEN

that factored together GPA and SAT test scores.

At that time, WSU was underenrolled. The school had received money from the state for students who didn't end up attending, money that had to go back to the state coffers. Though Washington's second largest school, WSU was second or third choice for most applicants.

It was time to rethink how WSU was attracting students.

campaign helped the University change its reputation.

Now WSU targets its recruitment efforts at 250 Washington high schools with the goal of bringing in an ethnically and economically diverse, high-ability student body. The schools have high SAT scores, first-generation college students, and good ethnic mixes. Among them are Julia's Mariner High, Burlington-Edison, Snohomish, Seattle's

WHILE 2005 was a banner year, the fall of 2006 was another story. By mid-summer it looked as if WSU's enrollment would be lower than the previous year's. A look around the state reveals that WSU's biggest competitor for Washington students, the University of Washington, tacked on several hundred new slots for freshmen. The move may have affected not only WSU, but several other state schools.

While there is a greater pool of students looking for colleges, the competition for the good ones has grown more heated, especially in this new era of enrollment management. The practice of recruiting and enrolling students who meet a school's goals and standards started with exclusive, private colleges and universities decades ago. Seeking to expand their student population beyond the well-heeled East Coast, the Ivy Leagues sought bright students like Julia from the far corners of the country. In the past 10 years nearly every college and university has adopted some kind of enrollment management program. The reasons are many, including the fact that higher GPAs and test scores of incoming students mean higher rankings.

"I don't even know if I'd be able to get in, this day and age," says Lindsay Fiker, a career counselor at Burlington-Edison High School. Fiker earned her bachelor's from WSU in 1975 and a master's degree in education in 1977. She says her grades would have met WSU's rising

standards. And he and his colleagues live in the communities they cover. One of Baier's colleagues, Melissa Usegi, who manages the Asian American and Pacific Islander outreach, serves on the board of the High Point Youth Center in south Seattle. They're always looking for ways

may be running up applications to 10 or more. In the past, students would work for weeks on applications; now they can apply online in an evening.

Those are the students who are expected to apply. Another segment of Washington's high school students, though, don't have parents who attended college and may not have imagined themselves at a university. WSU is now struggling to reach those students and help them understand what it takes to be prepared for college.

Two years ago, at a WSU African American Alumni Alliance meeting, a retired Seattle high school principal named Robert Gary offered to round up local African American high school students and bring them across the Cascades. The University wasted no time taking him up on his offer. Last April, Gary brought 38 students via a chartered motor coach to the University's Spring Preview. The new program allows potential WSU students to attend classes, live on campus, and rub shoulders with future classmates. Abi Bamidele, a junior at Thomas Jefferson High School in Auburn, was seatmates on the bus with Hanna Halwas from Roosevelt High School in Seattle. Once they got to Pullman, they were dazzled by the hundreds of students and chaperones packed into

“WSU now targets its recruitment efforts at 250 Washington high schools with the goal of bringing in an ethnically and economically diverse, high-ability student body.”

standards, but she thinks her math SAT scores would not.

She had her great awakening to the business of target recruiting a few years ago at a conference for high school counselors. There she and one other counselor from a public high school found themselves swamped by private and boarding school advisors hungry for tips on how to groom students for elite colleges and universities like Yale, Stanford, and Princeton. "It was big business for those selective schools," she says.

FIKER IS ONE of the lucky counselors. Because of budget constraints, many of our state's public high schools don't have full-time college and career counselors. And for many advisors and counselors, issues of health, pregnancy, and poverty take priority over finding a college.

As high school counselors are becoming less involved in college choices, recruiters have stepped forward, taking on the tasks of advising and essay reading. "Now it's almost a completely different job," says Kris Baier.

Besides having six coworkers west of the Cascades, Baier is crossing paths with recruiters from around the country who, like him, are haunting the halls of the local high schools. They're all hunting for the same thing—students who are ready for college and who have the grades, abilities, and scores, but who might not be thinking of their schools.

To stay ahead, WSU's counselors go beyond the high school halls. Baier reviews senior projects for the Everett School District. He volunteers as a chaperone at events for top high school stu-

to work into their communities and make connections with high school students and their families, she says.

One sure hit has been sending current WSU students to their home high schools to talk about WSU. Another is putting WSU recruiters in classrooms to offer advice on how to write a college essay. "It's much more than saying, 'Here's the school,'" says Baier. "Pullman is about relationship building."

Sometimes the relationships are already there. Steve Cotterill, director for career and technical education at Snohomish High School, has an office nearly dedicated to WSU. Three of its four walls are covered with t-shirts, team posters, flags, signs, and pompoms. "I'm always collecting," says the 1977 WSU graduate. When students wander in to look at the booty, "we have peanuts and we talk about college," says Cotterill.

The advisor tells them it's a completely different world from when he finished high school. "I probably would have stopped at graduation if it wasn't for a teacher enrolling me into college," he says. "He saved my life for sure." Now he sees students who get regular come-to-college e-mails and application packets, whose parents are coaching them through their paperwork and flying them around the country to see campuses, who are applying not to just four or five schools, but





the large CUB ballroom. They listened intently as a student speaker extolled the beauty of the 600-acre campus, the success of the Smith Center for Undergraduate Education, the fancy new student recreation center, and life in Pullman with academics attached.

Then came the tours. Hanna and Abi headed to classrooms, while others adventured through laboratories and the veterinary hospital. One group had to stop for a Dalmatian in slippers in the hospital hallway. Justin John, a senior at Burlington-Edison, was agog. His father, Greg, was too. "The school is well rated, well ranked," he says, adding that it seems like a good fit for John.

"WELL RANKED." That's something University administrators love to hear. Rankings play an important part in recruitment efforts. WSU, like most of its peers, is tethered to the *U.S. News and World Report* rankings, an annual report established in 1983. A higher score in the rankings means an increase in applications for the coming year. "How can you not pay attention to that?" says Mary Gresch, WSU's associate vice president for strategic communication and marketing.

Critics say that list and many of the other published ranking systems are homogenizing higher education. Hundreds of major colleges and universities are scrambling to meet often brief and superficial criteria in hopes of moving up closer to Harvard on the list. In doing so, they're all focusing on the same things:

reputation, graduation rates, and alumni giving, which are important to the *U.S. News and World Report's* ideals, but don't fully reflect the quality of the education a student might receive.

Many schools, including WSU, are turning to paid consultants, like Noel-Levitz, for help improving student enrollment and increasing application numbers, as well as the GPAs, of applicants. That too may have a homogenizing effect, at least in the ways the schools are reaching out to future students, admits Vicki McCracken, who heads WSU's enrollment management program. The trick is to use the University's niche assets, like its research programs, to attract the best students for whom WSU is the best fit, she says.

What most rankings don't measure and the consultants don't coach is the student experience. That's where the National Survey of Student Engagement (Nessie) comes in. WSU, along with seven other Washington schools, participates. Unlike the *U.S. News* rankings, this survey focuses on the students. It asks about course work, advising, and faculty contact, to provide a picture of what the student is getting out of the school.

Unfortunately, most schools that participate in the Nessie don't make their results public.

The Nessie results for WSU can be easily found in an independent consultant's report on the University's Website. In WSU's most recent Nessie survey, seniors described a favorable experience on par with their peers around the country, but first-year students aren't reporting the same amount of faculty contact and supportive campus environment described at other schools. There is also a high level of attrition at the end of the sophomore year, the report notes.

The University is taking steps to change the early undergraduate experience, says Gresch. New tools like Freshman Focus, a residence-hall-based program that places students with similar interests in the same housing and classes, will create a supportive environment that will help the students adapt to the rigors of college and living away from home, she says. The University also has a reputation for involving undergraduates in research, something many students say they're looking for when they choose WSU.

RAISING ACADEMIC CRITERIA for incoming WSU students has met with some criticism, especially from alumni families who hope to send their children to their alma mater, but fear they can't, because their grades aren't up to the new standards.

Julia Pasztor is the oldest of four children and the first in the family to go away to college. She has urged her younger brothers to start thinking about college their first year of high school and to have a short list of potential schools by the end of their sophomore year.



AMIT HAGEN

Lindsay Fiker recently had a student whose brother was admitted to WSU a few years ago with a 2.70 GPA. He thought he could do the same and didn't heed her advice to work on his GPA. "He didn't get in," she says. "At my last meeting with him, he was still working with the appeals process. The world has changed."

But it's not just about grades and test scores anymore, say the admissions counselors. WSU is more selective, but not as hard to get into as many people think, says Vicky McCracken. About 75 percent of the students who apply to WSU get accepted, she says. And the remaining 25 percent aren't necessarily denied. Many start an application, but never complete it, often because they have been accepted somewhere else.

“It’s much more than saying, ‘Here’s the school’... WSU is about relationship building.”

Next year the application will offer even more variables, with a six-question resume instead of a single essay. The idea is to get a more complete picture of the student, including any personal or economic difficulties and whether he has the skills to seek help and find a solution. In short, the answers will tell whether a student has the skills to succeed at WSU, says Wendy Peterson, director of WSU admissions.

Knowing how important an essay can be, Julia Pasztor started early and wrote several versions. Last September, when many high school seniors were just starting to think about college, Pasztor had already started applications to her top

them to her bedroom ceiling. Her top choices lived in a file above the computer she shares with her brothers in the all-purpose room that once was the family garage. There she would take breaks from the paperwork to play with her three younger brothers or to organize her riding gear. Sometimes she would call Baier with questions about her application to WSU's Honors College, or about whom to ask for letters of recommendation.

The whole effort of planning and applying for college was driven by Julia herself. Her parents, who own a landscaping business, just watched and encouraged.

She has always been an independent child with a penchant for animals and the outdoors, says her mother, Szofia Pasztor. She remembers a day when toddler Julia vanished from their apartment. After tearing through the complex calling her name and then summoning the police, the Pasztors found their first-born back home and hungry after several hours of watching fish in a nearby pond.

It's no wonder she wants to go away for college and be on her own, says Szofia; she's been doing that all her life.

In making her choice, Julia didn't look much at college rankings. And she didn't look to her peers. In fact, her friends discouraged her from applying to WSU, saying that any student would choose the UW over WSU. Julia said she applied to both schools to prove her friends wrong.

Instead, she looked at graduation rates and at where students who attended WSU went for postgraduate studies. And she spent a lot of time asking questions of Kris. She was interested in the student experience, one of living on a campus away from home, one of independence in a college town. In August, she packed her bags and headed to Pullman, eager to find her new home in Stephenson East, wondering what the next four years will bring.

"I want to really get on my feet," she says. "I want to get away. Be with friends. And really experience college." ●



ROBERT HUBNER

Last year, WSU started using a comprehensive application, which included room for teacher references and a personal essay. Sometimes when the grades are the problem, those references vouching for the student's ability to thrive in a university environment will tip the scales. Before a student is turned away, her file is very carefully reviewed. The Office of Admissions looks for patterns, for example if the grades started out low and improved during the junior and senior years, says McCracken. Admissions officers also look at whether the student took challenging classes in high school.

three. "Once school starts, it's really hard to do your homework and apply for college," she says.

Randolph-Macon really tempted her, being so different and so far away, but after her visit, she realized it didn't suit her. The University of Washington was a good option, but maybe was too large and too close to home.

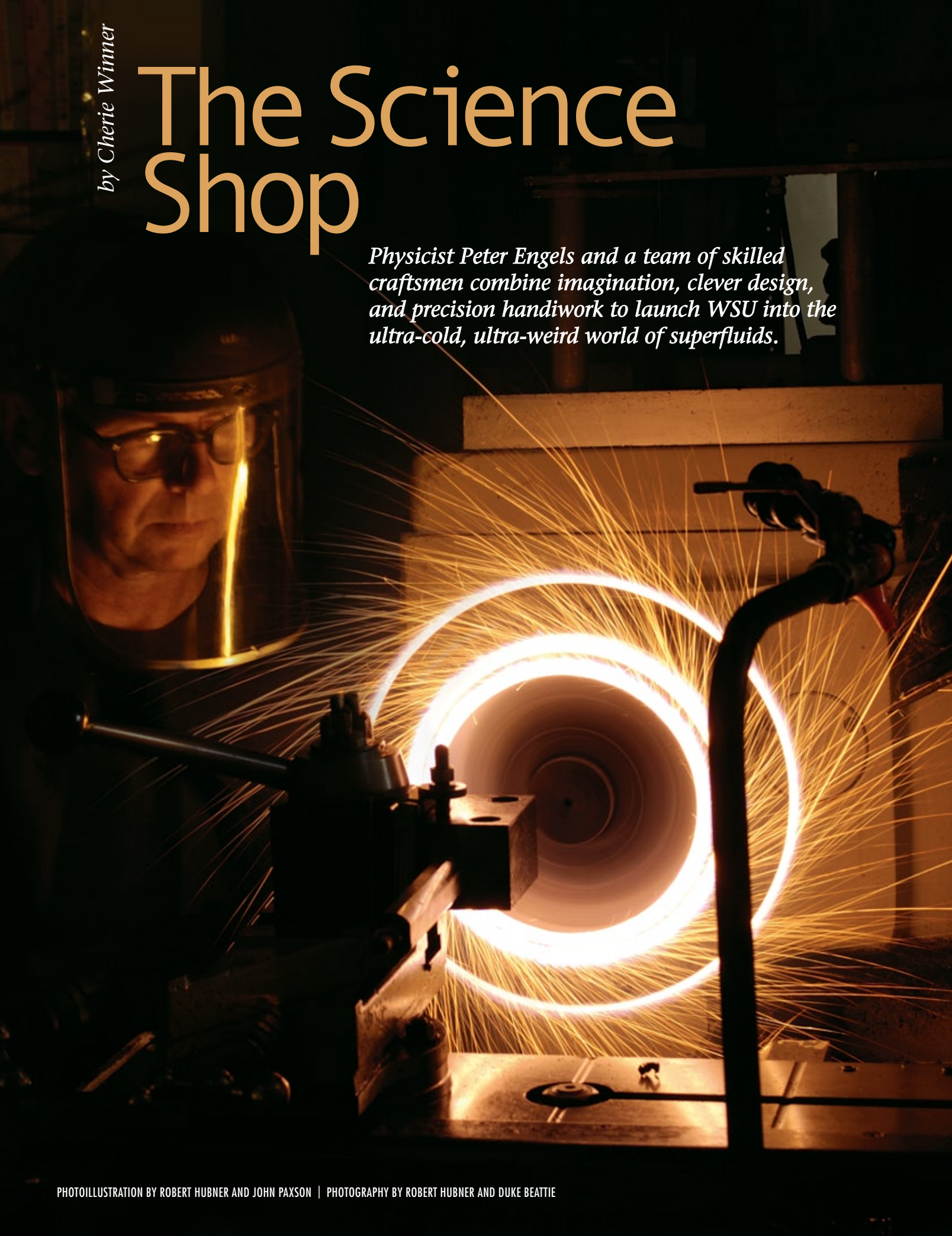
And Washington State University, the school with which she had the most contact thanks to Kris Baier, intrigued her, especially with the courses she could take to prepare for vet school.

Julia took their recruitment posters and those from other colleges, and tacked

by Cherie Winner

The Science Shop

Physicist Peter Engels and a team of skilled craftsmen combine imagination, clever design, and precision handiwork to launch WSU into the ultra-cold, ultra-weird world of superfluids.





SHORTLY AFTER Peter Engels arrived at Washington State University in the fall of 2004, he took a sketch of a lens bracket to a machine shop in the basement of Webster Hall.

“Can you make this?” the young physicist asked.

“Yeah,” said Instrument Shop supervisor George Henry.

“Can you make it for less than 72 cents?”

Two years later, Henry laughs as he recalls the exchange. “I said, ‘Yeah...’ And we did. And from that point on it just went—whoosh!”

That was the beginning of Engels’s quest to build a machine that would produce Bose-Einstein condensate (BEC), a rare form of matter that is leading to advances in computing that could someday make today’s computers seem as inefficient as cutting notches on a stick.

BEC had been made before. The first time was in 1995, by groups working independently at the University of Colorado and MIT. But even now, five years after those scientists won the Nobel Prize in Physics for their accomplishment, BEC remains devilishly hard to produce. Only a few dozen labs worldwide have ever done it, none of them in the Pacific Northwest.

So what made Peter Engels—a brand new faculty member who started with nothing more than an empty room—think he could make BEC?

First, he had experience: he got his doctorate in one of the three German labs that had done it, and then worked with one of the Colorado Nobel Prize winners.

Second, he’d met George Henry and seen the Instrument Shop.

“When we interview people, we take them through tech services,” says physics and astronomy department chairman Steven Tomsovic. “They always come away impressed.”

A support department in the College of Sciences, Technical Services is not a supply house or a maintenance operation. With five shops—instrument, electronics, software, media, and graphics—it’s a creative unit in its own right; and it’s at the heart of much of the best research being done at WSU.

"In physics, it's almost impossible to imagine someone doing cutting-edge experiments not having to design a whole bunch of stuff," says Tomsovic. "If you want to do something different, then almost by definition of it being different, the machines can't be there already."

That's not new; the questions scientists can ask have always depended on the tools that are available to them. Anton von Leeuwenhoek's simple microscope

revealed the microbes teeming in a drop of water; the electron microscope made it possible to explore the insides of cells; and the Hubble telescope opened the vast deeps of space to our gaze.

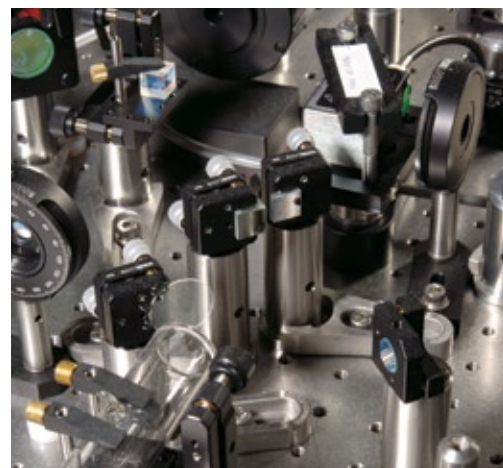
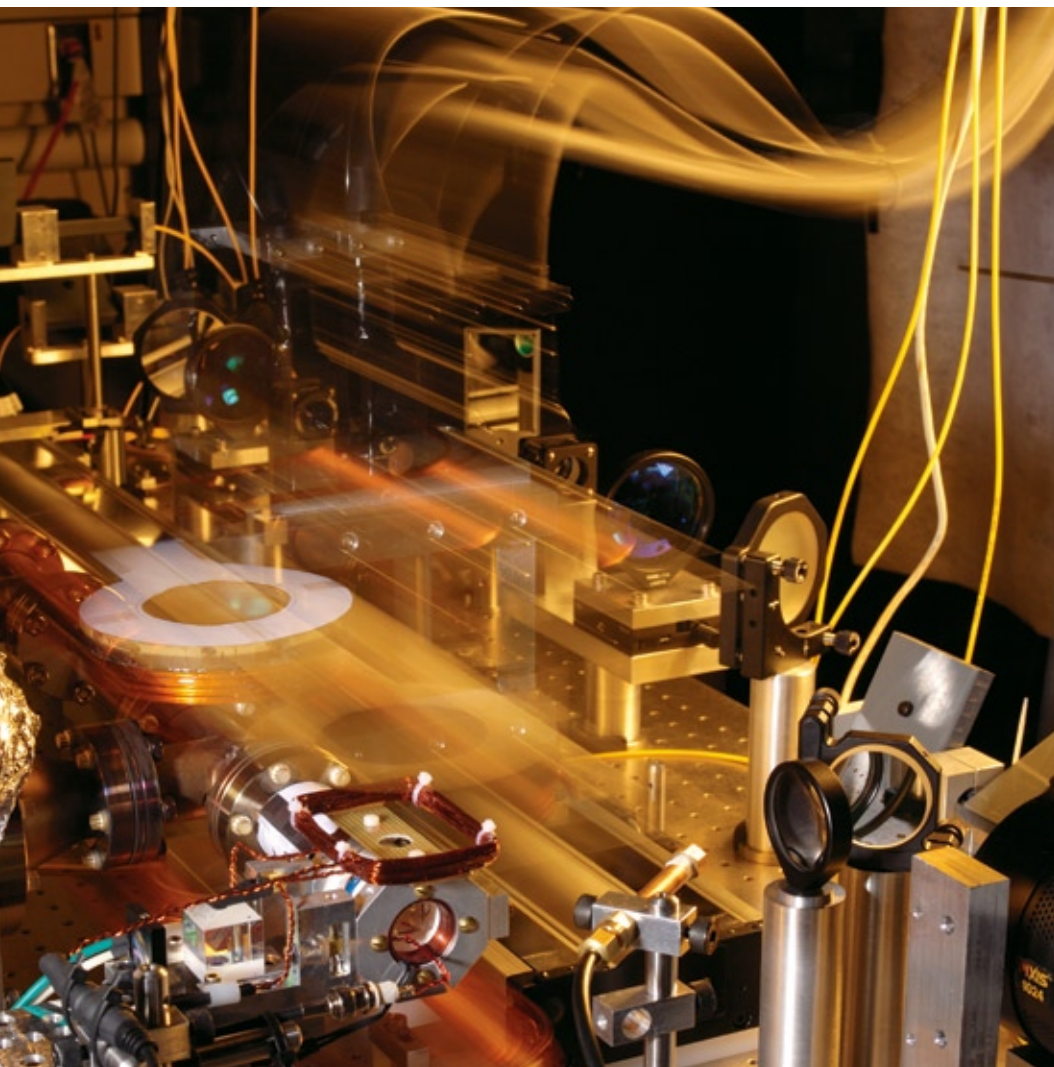
Engels likewise is on a scientific threshold. Bose-Einstein condensates were named for physicists Satyendra Nath Bose and Albert Einstein, who in the 1920s theorized that at temperatures very close to absolute zero (about -459°F), gaseous

atoms would condense into a new form of matter—a "superfluid"—in which they would behave like waves instead of like particles. It was a speculation both fascinating and frustrating, because it couldn't be tested. There was no way to generate temperatures that low.

"People first thought it was something that just exists in theory, it doesn't exist in reality," says Engels. "So then the race was on: how do we get these ultracold temperatures?"

It took about 70 years and the development of laser cooling techniques to move BEC from the realm of theory to the realm of experiment; and achieving ultracold temperatures remains the main obstacle to making BEC.

For his machine, Engels needed parts that let him manipulate lasers and



Above: Peter Engels's BEC machine in action: A disc-shaped magnet delivers ultracold atoms to a high-vacuum chamber (at lower left of photograph.) **Right:** An array of mirrors and lenses directs six laser beams into Engels's magneto-optical trap. **Facing page, left to right:** A velocity block made for the Institute for Shock Physics (ISP), which is the Instrument Shop's single largest customer; shop supervisor George Henry; components for an ISP assembly.

generate an extreme vacuum. It was a project just made for the folks at tech services. Shop director Lorie Druffel shows me around the instrument and electronics facilities. The Instrument Shop is clean and quiet the day I visit. The staff—supervisor Henry, John Rutherford, Lauren Frei, Dave Savage, and Steve Watson—are taking inventory before the end of the fiscal year. They have the best selection of pipes, rods, and plates of various metals, woods, and synthetics in the region, says Henry. At one side of the shop are desks where the staff design parts and assemble small items. The main floor of the shop is crowded with big machines, some of which I recognize—a drill press and a lathe—and two of which I don't. They're bigger than a VW Beetle, and have sliding

doors almost large enough to step through. These are the CNCs, or computer numerical control machines. The shop first got small versions of CNCs five years ago. Today the “Beetles” do most of the machining here.

While the CNCs are run by computers and machinists, the parts they make still begin as an idea in a researcher’s mind.

“Sometimes we do the solution and the problem-solving with them, and other times they know exactly what they want,” says Druffel. Researchers come in with everything from a vague notion, to a sketch on a napkin, to detailed blueprints. Everything—even the detailed plans—gets a thorough review before going into production.

It’s an evolving process in which scientist and shop crew discuss everything

bolts, lenses, and lasers, which were cheaper to buy than to make, and which were, well, standard. Engels holds up a small clamp. “It’s kind of a waste of their time to make something like this,” he says. “They should be doing custom work.”

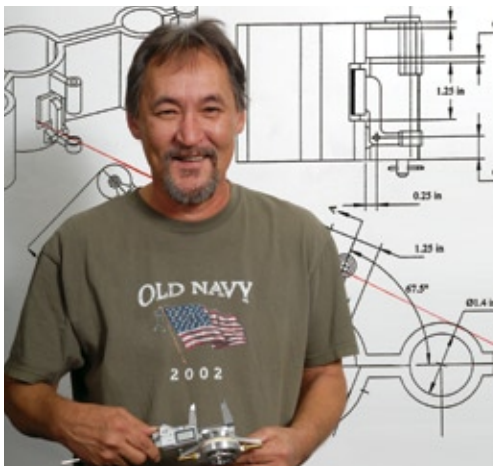
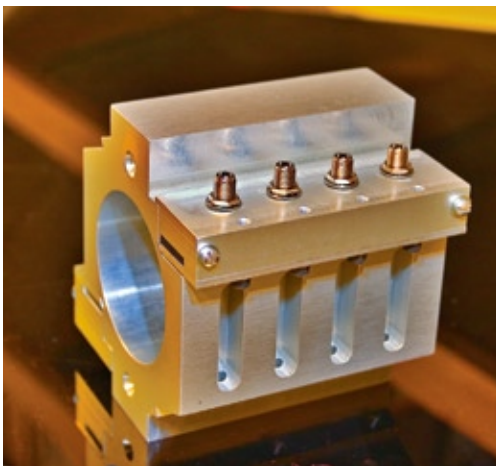
There was plenty of that. Engels and the shop staff designed more than 200 parts for the machine. They used an AutoCAD, or computer-aided design, program that shows exactly how a CNC will shape a raw piece of stock into the desired form. It spells out which tools will be used, in which order. And if something about the design isn’t workable—if a material isn’t strong enough, or cuts are too deep, or holes are set too close together—the virtual piece will break. The designers will know, without wasting time on the shop

Do the craftsmen miss the good old days? What about the satisfaction of making things entirely by hand?

“Well, yeah, working with the hands is the satisfying part—up to a point,” says Rutherford. “After you’ve been in the trade for 30 years or so... It’s OK to make parts every day, but it’s OK to let the machine do it too, you know?”

That’s especially true of “multiples”—more than one of a given part. Making multiples with a CNC is more accurate than making them by hand, and a lot quicker.

Henry picks up a white block about the size of a paperback book. It looks like plastic, but it’s solid nylon. It’s been milled and drilled in a precise pattern. A few dozen more just like it are in a pile



from the overall dimensions of a part to what material would be best to use. That’s a big advantage over hiring an outside shop, which would require a detailed plan to start with and which would be less likely to make suggestions about such things as which grade of stainless steel to use for a given research application.

“We talk with them,” says Henry. “Especially foreign students. They know what they want, but it’s kind of hard for them to express what they want. So we’ll sit down and talk and draw and back and forth, and finally come up with a part.”

Engels knew what he wanted, from his earlier work with BEC machines. He ordered about 300 parts from outside sources—standard items such as screws,

floor, that they need to adjust the plan. As Henry says, “If it doesn’t work here, it’s probably not going to work out there.”

Some shop members are especially good at certain things; Henry’s great at finding and sealing leaks in vacuum chambers, and he calls Rutherford “a master welder. He’s fantastic. All of us can weld, but not like that.” Still, the shop does not work like an assembly line, with each person doing only a few kinds of tasks.

“People in here are craftsmen,” says Rutherford. “We’ve got to be able to do it all. Typically in industry, the machinist wouldn’t be doing the program. He’d be setting up the machine, he might... put the part in, change the part, and put the tools in; but he’s not drawing or developing the method, the program.”

waiting to be picked up by someone in shock physics.

“To make each one of these by hand, you’d be there forever,” he says.

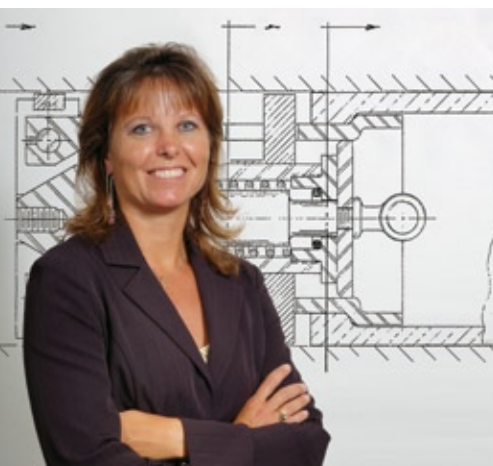
Most of the parts they made for Engels were one of a kind. His machine uses a two-step process to reduce the movement of atoms, thereby reducing their temperature. It starts with atoms that are a gas at room temperature. Any one of several elements will work; Engels uses rubidium, a metallic element related to potassium. He bombards the atoms with lasers from six directions. Atoms caught at the point where the beams intersect will slow down—and get cold.

“We usually think an atom is a kind of a massive thing, and a photon is a kind of light,” says Engels. “If you stick your hand

out in the sunshine, you don't really feel any recoil down. You feel the energy, it's getting warm, but you don't feel any recoil. But it's there."

At the atomic level, he says, individual atoms do recoil when they are struck by light of just the right wavelength. With beams coming at them from six directions, the atoms resemble ping pong balls confined in an ever-shrinking box; they bounce off one photon only to hit another and then another, eventually coming to near-rest in the center of the "magneto-optical trap," or MOT, as it is called.

The MOT confines the atoms enough to lower their temperature to within a few thousandths of a degree above absolute zero. That's a few degrees colder than the deep reaches of space, but still far too warm for the atoms to condense into



BEC. At this point, Engels says, lasers no longer help. Cooling the atoms the last few fractions of a degree needed to reach BEC requires strong magnets, an ultrahigh-vacuum environment, and a clever design.

Once the atoms are caged by the laser beams, they are held in place by a powerful magnet. Each atom carries a minute magnetic moment, like a tiny bar magnet. That gives Engels a handle on them. When he slides the magnet along a rail, the atoms follow, all the way from the MOT, through a glass tube, to a chamber connected to the ultrahigh-vacuum pump.

Engels compares the next step of the operation to cooling a cup of coffee by

Keeping Things Humming

In contrast to the tidy Instrument Shop, every surface in the Electronics Shop is piled with *stuff*: wires, tools, knobs, dials—endless bits and pieces of metal, plastic, and glass, long since separated from their parent machines.

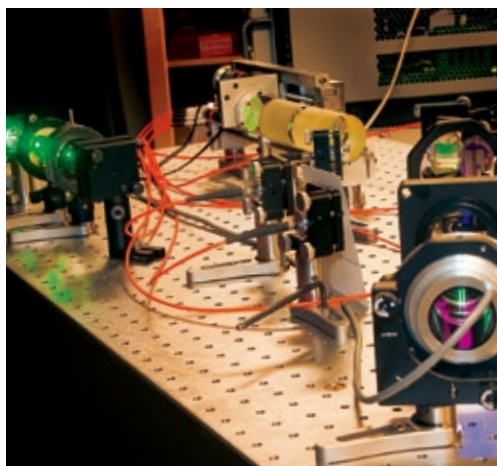
"It looks like junk," says Technical Services director Lorie Druffel, "but it's actually very important junk."

"You know, campus is a hundred years old, so there's some equipment out there that's that old," says Electronics Shop supervisor Duke Beattie. "We usually have parts for it, as you can tell."

In the past few months, Beattie and shop members Duncan Vanderwall and Fred Schuetze have repaired a broken wire in a glass condenser that would have cost \$600 to replace; an automatic water sampling device that had been shotgunned by vandals; and numerous pieces of old computer equipment.

One of their ongoing tasks is keeping the Instrument Shop humming; since the CNC machines rely on computers, their maintenance requires more than bolt-tightening and an occasional drop of oil.

"We couldn't do this if we didn't have electronic back-up," says machinist



Clever Hands

As Engels's story shows, experimental physics requires clever hands as well as a sharp mind. To help students gain manual skills, George Henry and his staff teach a course in machining, and there's a student shop just off the main shop for their use.

They developed the class a few years ago, when the small shop started having problems with students breaking equipment and leaving work areas messy.

"Now, before you can go in there, you have to take this course and certify," says physics chairman Tomsovic. "There's a punch code on the door, and they can tell who went in there."

Collin Atherton with his "graveyard" of early attempts to make magnetic coils.





Fred Schuetze (rear) and Duke Beattie design and build a wide range of electronic equipment.

John Rutherford. "If you don't have that, it's no use buying this [equipment]. If you can't have anybody to support it, you're out of luck."

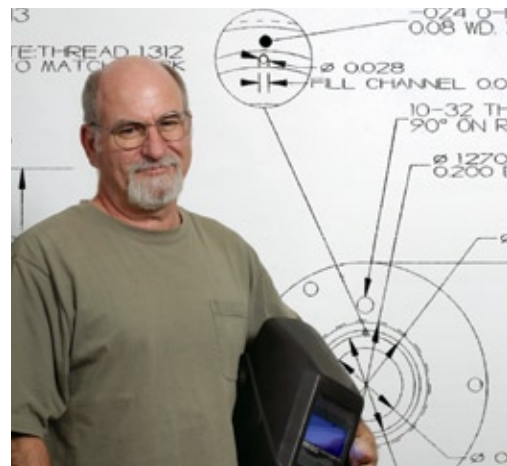
Beattie and his crew also do a lot of original work, designing and

building equipment such as the control panels for Peter Engels's BEC machine. Beattie opens a drawer of one of three tall filing cabinets in the shop. All three are crammed with neatly labeled file folders, one for every project the shop has made. This week, he's tracking down the plans for a device that used sensitive microphones, strapped to a tree, to listen to the fluid moving inside the tree. The researcher who commissioned it several years ago is now at the University of California, and wants to make another one of the devices from Beattie's blueprint.

blowing over it. Blowing removes the hot-test molecules—the ones that are bouncing around the most—leaving cooler ones behind. The average temperature of the coffee drops. In Engels's machine, electromagnetic radiation "blows" over the atoms, and the vacuum suctions off the most active ones. Those that remain cool down even more. If things go well, they get cold enough to form BEC.

This is a crucial step, possibly the one most difficult for researchers to achieve. The vacuum system must be absolutely leak-proof and free of surface contaminants. This may also be the part of the project where Engels really lucked out: vacuum systems are one of George Henry's very favorite things to build.

The shop has made dozens of vacuum systems, ranging from relatively low-



Left to right, from facing page: Technical Services director Lorie Druffel; laser beam array; optical lens holder; section of an ultrahigh vacuum system at WSU Tri-Cities; components for ISP instruments; machinist John Rutherford.

If somebody doesn't clean up after themselves, or does something unsafe, George can say, "I'm taking your privileges away."

Now, he says, "students get important training in a safe environment, and the opportunity to make sophisticated equipment."

Junior Collin Atherton took the course, and has developed other skills while working in Engels's lab. One of his jobs there was to wind copper wire on a cylindrical core to create a magnet for the BEC machine.

"When he first gave me the task to make these coils, I was, 'Yeah, OK,'" recalls Atherton. It turned out to be a lot harder than he expected. He slides open a drawer crowded with failed attempts. "You can see our drawer, our 'graveyard.' I finally got a few, and then we realized they were too big. It's such a small part of the machine, but it took a while to do."

Being good with their hands is so important to budding physicists, that professor Tom Dickinson rates it on par with brains and enthusiasm. Each year, 20 to 30 undergraduates apply to work in his lab. He has space for just eight. To decide who makes the cut, he looks beyond their grades in physics and math.

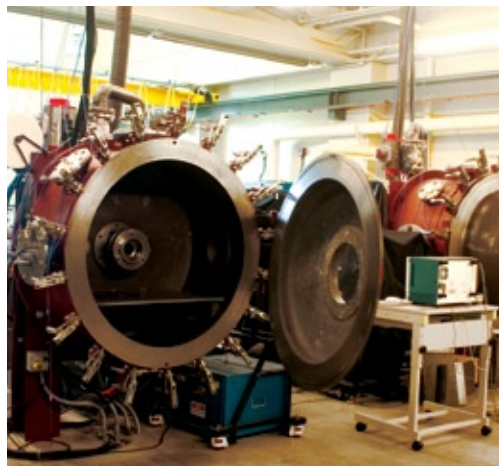
"I ask them what they've built," he says.

To the Moon

Rumor has it that Instrument Shop supervisor George Henry once worked on parts for the *Apollo* moon missions. When asked about it, he says he started his career at Boeing, working in research and development, rather than production, right from the start.

"After my transfer from Boeing Field to the Kent Space Center, I did in fact manufacture developmental and test parts for the rovers," he says. "These were designed by NASA and Boeing engineers.

"I would never know for a certainty if any of my efforts landed on the moon, but I do like to think so."



Wang, a research associate professor working with Lai-Sheng Wang, says, "We persisted, and George took the challenge."

So far, the two instruments the shop has made for the Wang lab have provided data for nearly 100 published papers, including reports in the renowned journals *Nature* and *Science*. Each instrument cost Wang just a few thousand dollars.

It seems the more complex a project, the bigger the savings by using tech services rather than an outside source. Since they are subsidized by the College of Sciences, the WSU shops are blisteringly competitive. The instrument and electronics shops charge researchers within the College \$16.75 an hour and those in other colleges at WSU \$39 an hour. By contrast, hourly rates run \$75 to \$115 at the University of Washington and \$200



And now, the really important equipment...

Making equipment for ground-breaking research is dandy, but to get a true measure of how important the Instrument Shop is to the Pullman campus, visit the WSU Creamery.

"Ferdinand's would close without us," says George Henry with a laugh. "They'll call up, 'I've got this emergency, I gotta do it right now!' John and I will say, 'OK, get it over here, we'll get it done for you.'"

One time, a whole shipment of cheese cans turned out to be a tad too large. Rather than having rounds of Cougar Gold shifting inside the cans—which might make customers think the cheese had been downsized—the creamery hired the shop to make a new cheese cutter that would produce larger-diameter rounds.

Engels's vacuum apparatus, as high-powered as it is, was not the toughest assignment the Instrument Shop has had. That distinction belongs to large vacuum chambers in the lab of Lai-Sheng Wang at WSU Tri-Cities.

"The first one, when he came up to ask if we could make it, I really, really wanted to make it," says Henry. "But couldn't. It made me uncomfortable to say, 'No, we can't make it,' because I knew that the guys out here could do it, we just didn't have the machinery." He says Wang ended up buying a system from an outside firm for more than \$100,000.

When the shop obtained the CNCs a few years later, Henry was able to say yes to a new request from Tri-Cities. Xue-Bin

at commercial shops. The fees help pay staff salaries and operating expenses, and are the sole source of funds to purchase major equipment such as the CNCs.

For Engels, paying the bill was relatively easy. Assembly of the machine, on the other hand, was "chaotic." He and physics major Collin Atherton added pieces as they became available. For parts that came from outside sources, that meant seemingly endless delays. They waited six months for the power supply to arrive.

Finally, on May 4, 2006, Engels and Atherton flipped a switch, adjusted the laser beams, and waited. The machine hummed. Temperature in the MOT dropped. The magnet slid on its rail—and on a computer screen, a bright, pencil-

shaped image flared into existence. They had made BEC.

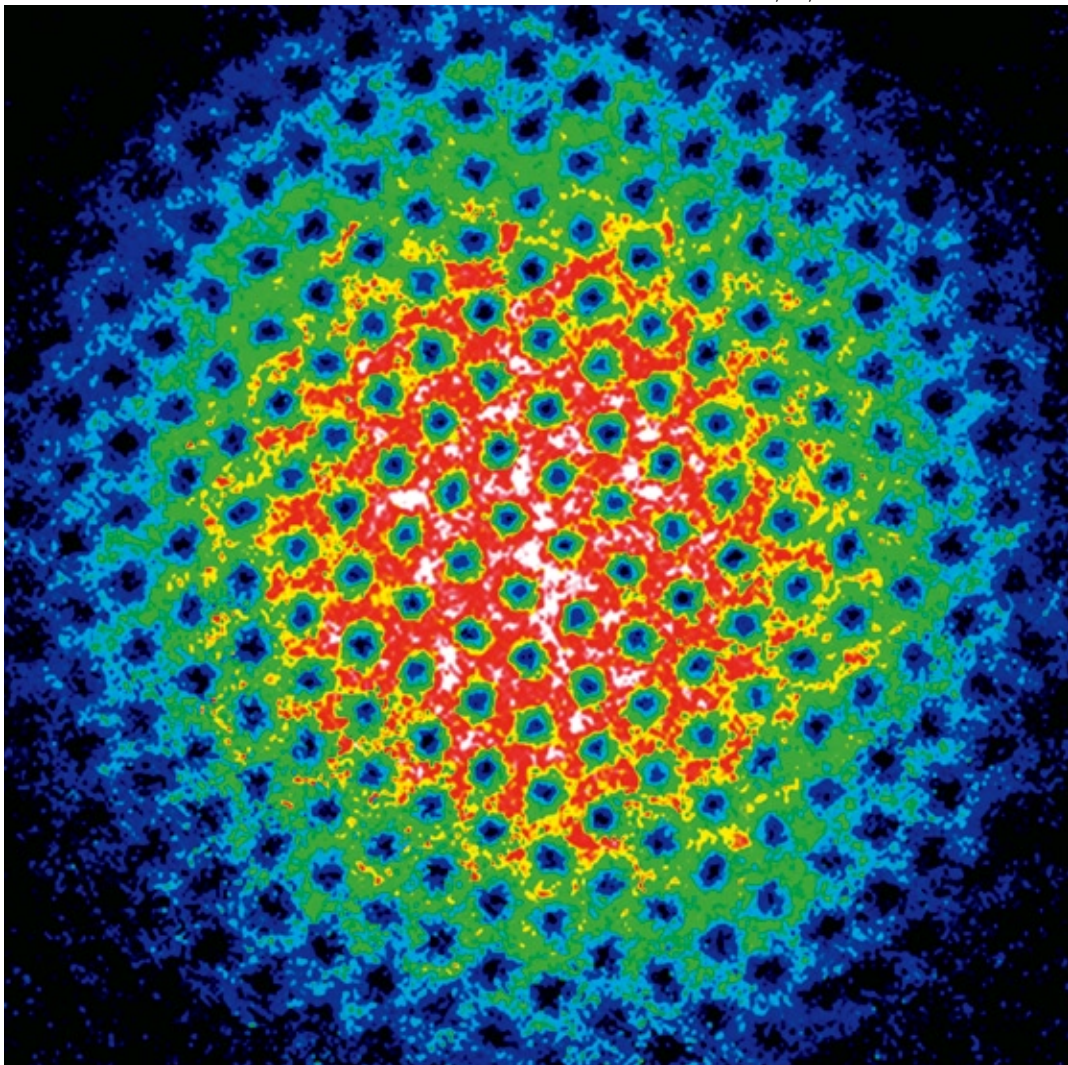
"The coldest stuff in the universe," as Engels describes it, survives just over a minute. That's plenty of time to experiment with it and photograph the results. Then Engels fires up the machine and makes another batch. He is embarking on experiments on how the rare superfluid reacts to impacts, and what happens when two elements are mixed and then condensed.

"He'll kind of explore," says Tomsovic. "It's a new state of matter. So you start playing with it and doing different kinds of experiments, and learning how the physics of that stuff works."

He can also start pursuing external grant support, which should be much easier now that he is the only physicist in

The computer-enhanced image below is a sample of Bose-Einstein Condensate (BEC). Because its individual atoms act like waves rather than like particles, BEC behaves very differently than the forms of matter—gases, liquids, and solids—we are familiar with. During his postdoctoral work at the University of Colorado, Engels showed that when a drop of BEC is rotated, the drop holds still and tiny whirlpools form throughout it—unlike a drop of water, the entire mass of which spins when it's rotated. The image reveals a crystal-like arrangement, with the whirlpools (blue spots) evenly spaced in a hexagonal pattern. Engels says working with BEC is comparable to being raised in a tropical climate, then encountering ice for the first time. Everything about it is new and wondrous, and the potential uses for it can barely be imagined.

COURTESY OF ERIC CORNELL, JILA, UNIVERSITY OF COLORADO



Left to right, from facing page: John Rutherford at work; catcher tank that holds targets in shock physics experiments; low-temperature target that would be mounted in the catcher tank; physicist Peter Engels.

the region who can produce BEC. Tomsovic shakes his head over the trend at universities nationwide to do away with their internal shops; he says the facilities here give his department a fighting chance to land researchers like Engels.

"We're really tiny compared to the average physics department and the size of our peers," he says. "If you're a physicist and you come in here [as a job candidate] and you're a little nervous about what we have, then you go down there and say, well that's a lot better than what this other, 'better' place has.

"Peter's a smart guy. He knew what he needed, and he knew this was as good as or better than what he would need [in order] to do what he wanted to do." ●

Vicki Owens Into Africa



ROBERT HUBNER

When Vicki Owens first went to Uganda, she thought she'd do her "little thing for humanity and then go home." That was 21 years ago—and she's still there.

TWENTY-ONE YEARS AGO Vicki Owens stepped off an airplane into the hot air of Kampala, Uganda, thinking she had come for a brief stay, just long enough to help Christian missionary pastors start a primary school.

"I thought I'd do my little thing for humanity and then go home," she says. It was her first time traveling overseas, and she really had no idea of what she would face in this country in the center of Africa.

Owens, who admits she was naïve to the culture, dangers, and challenges of living in a place like Uganda, had arrived two months after one military coup and about 10 weeks before the next. She didn't know that all nonessential U.S. government employees had been evacuated from the country. But it didn't take her long to assess the great poverty and needs of this country. Gunfire in the streets was a regular occurrence. Some nights she and the missionaries she lived with would sleep in the central hallway of their home to be safe from bullets. "It was a great prayer time for me," she says.

Eventually, the government put in place by the coup stabilized, and the situation for Ugandans seemed to improve. Owens was able to help organize the school, and at the end of her contract started planning a return to the states. That's when a conversation with a young woman in the community led her to realize there was no good system in Uganda for training counselors. Keep in mind, this was the place of the most recent Ebola outbreak, says Owens. It is also where the Lord's Resistance Army kidnaps children from their schools and uses them as soldiers and sex slaves. "Rape has become almost an accepted way of life," she says. It's where AIDS and HIV are part of every family. There is a great need for counselors of every kind.

Owens followed her instincts to the campus of Makerere University in the Ugandan capital of Kampala. She asked someone to direct her to the school of education. There she sought out the dean, to whom she pitched her idea of creating a master's program for training counselors. "I'll never forget it. He just said, 'I can virtually assure you of an appointment,'" she says.

Owens, who grew up in the Tri-Cities, came to Washington State University in the early 1970s to study police science with the idea of becoming an officer. But when she heard a police chief say the only job a woman would have on his force would be behind a desk, she changed her major and received a B.A. in education in 1976. A few years later, she returned to the University, earning a Master of Education degree in 1985. It was around this time that she learned about the opportunity to go to Uganda. Two years overseas turned into a decade.

After teaching counseling at the Ugandan university for several years, Owens returned again to WSU, this time to obtain a doctorate in counseling psychology (1994). Then she went back to Makerere to help build the graduate counseling program. As a lecturer there on a string of two-year contracts, she has taught students from a range of fields, including law, medicine, religion, and the military.

One former student is now a lawyer advising the Ugandan parliament. Another teaches college students and is an expert in child counseling. A third is a nun who works in northern Ugandan camps of displaced villagers who have fled their homes after attacks, rapes, and kidnappings by rebels.

While her salary is a pittance compared to what she would earn in the same job stateside, Owens is able to support herself and make occasional trips home to see friends and family with money she earns working as a counselor for American employees of non-governmental organizations.

Last spring WSU named Owens a Woman of Distinction for the mentoring she has done for women in Uganda, as well as in Pullman. "Things like awards kind of make you look back at your life," she says, listing camp counselor, basketball coach, and teacher as three of her jobs that seem to be about mentoring. Along the way she has encountered many remarkable women. "It is my delight to give them a little something so that they can go out and make a difference in their society."

Owens is now starting to think long-term about staying in Africa. Last year she bought a plot of land in Kampala and hopes to build on it. Despite the rebellions, rapes, and dangers, she feels safe. "Really, car accidents are my greatest concern," she says. "I fell in love with Uganda. ... I can't imagine myself doing something different."

—Hannelore Sudermann



"I get to practice forestry and I get to teach," said John Gross '77 last spring after giving a lesson to a high school vocational forestry class. "I don't know how it gets much better than that."

BILL WAGNER

John Gross

Walking in both worlds

DURING HIS NEARLY TWO DECADES as a forester, there were days when John Gross would gladly have traded jobs with his wife, a teacher.

Yet, after he realized his dream and started teaching in 1997, he would occasionally find himself glancing out the classroom window during a math or state history lesson, longing to be tromping through the woods again.

When Gross ('77 Forest Mgt., Bus.) gave up his first professional passion, forestry, to indulge a long-growing love of teaching, he made the type of trade-off many people face during their careers. But it's a sacrifice he no longer shoulders. Three years ago, he started managing the Wake Robin Learning Center, the Longview School District's outdoor school on 82 wooded acres near the city. Based in a converted home on the property, Gross teaches forestry classes, organizes educational retreats for children and adults, and tends to the land with student helpers.

"I get to practice forestry, and I get to teach," he said last spring after giving a lesson to a high school vocational forestry class. "I don't know how it gets much better than that."

Actually, it did get a little better this year, when the Washington State Society of American Foresters (SAF) named Gross its Forester of the Year for contributions to his

profession and the public. Gross has been a member of the SAF throughout his career.

"There's not many people who put in the time and the effort that John does year 'round," says David Bergvall ('00 Forest Mgt.), who is a state forester and one of the SAF members who nominated Gross for the award. "When you start to look at the cumulative impacts of the kids he [influences]... it's pretty amazing."

Gross knew he wanted to be a forester while still a student at Kelso High School, where he joined Future Farmers of America (FFA) and where his father, Larry Gross ('52 Ag. Ed.), taught vocational agriculture.

After college, he landed a job with International Paper in Longview, next door to Kelso. Much of his work focused on replanting the company's harvested timberlands on both sides of the lower Columbia River.

"I enjoyed the farming part of it. I liked growing trees," he said. "I guess I would've made a good farmer at some point in time."

While growing trees, Gross also nurtured a love of teaching as a volunteer, often at an outdoor school with wife Trudi Gross ('78 Home Ec.), who now teaches music in the Kelso School District. He also mentored Longview fifth-graders on tree-planting trips, which evolved into the Forestry Day program he hosts for the district at Wake Robin.

In 1996, International Paper sold its West Coast timberlands. Gross lost his job but found himself primed to switch careers. A severance package paid his way through a one-year master's degree program at Vancouver's City University, and a year after

leaving the woods he was at the front of a Longview classroom.

Also in 1996, Joe Lammi, a retired forestry professor, and his wife, Eleanor, a counselor, signed a 20-year lease allowing the district to share their family retreat on the banks of Coal Creek, where salmon and trout live beneath a canopy of Douglas fir, western red cedar, and red alder trees.

Before becoming Wake Robin's manager in 2003, Gross worked with students during summer vacations to cut trails, build bridges, and prepare the property for educational uses. He and son Ian, a current Washington State University student, transformed the home's basement into a science classroom. Last year, he chartered an FFA chapter that focuses on forestry and natural resources, and he currently is developing a college-credit forestry course.

The Lammis have since died, but the district has options to extend its lease or buy the Wake Robin land. Other school districts send students into the outdoors to learn about the natural world, but few have such a treasure in their own backyards.

In John Gross, the district found the ideal caretaker, one who shared the Lammis' vision that "young people need peaceful, quiet, attractive, accessible, nearby areas for recreation and education."

You could not have asked for a better situation in putting Gross and Wake Robin together, says Ann Cavanaugh, the Longview district's executive director of student learning. "He fits well, because he walks in both worlds—the professional forester and the professionally trained educator."

—Eric Apalategui

Barbara Novak

Business as ministry

AFTER BARBARA NOVAK '72 received an M.A. in bassoon performance from Southern Illinois University, she became second bassoonist in the Spokane Symphony. "I really got a chance to play everything from the great second bassoon parts to the great contra bassoon solos. I had a great time. ... I think that the training I got in the orchestra here [Washington State University] was superb. It probably was the catalyst that... launched me into performing as a career."

Novak's life was changed, though, by the

called Far East Handicrafts, which Novak decided to continue operating. She now negotiates directly with craftspeople in Nepal, Laos, and Cambodia. The governments of these countries are sometimes very unstable, and the area can be dangerous for foreigners. She pays workers a wage that is fair but consistent with the economy in which they live.

Most of the workers were originally employed by her son. "They're wonderful people," Novak says. "We go to their homes for meals and watch their kids grow up. They're wonderful artisans and craftsmen." The craftsmen produce bags, purses, shirts, blouses, and some jewelry. The business is mainly wholesale, with a small retail outlet in Seattle's Fremont district. "If it's in Katmandu, you can probably find it in our

Cataracts are a big deal in Nepal because of the elevation. The clinics do free cataract surgery and eye care."

Novak serves as a deacon in Spokane's St. John's Episcopal Cathedral. She finds her business philosophies blend perfectly with her faith. "I guess I look at the business and the aid projects we have currently as my ministry. There are other deacons in the cathedral, too, with various emphases. My focus is a global focus. If you want to join in this humanitarian effort, you can have a vote with your dollar. If you buy just 5 percent of your Christmas shopping at fair-trade stores, you're doing something."

—Gail Miller

Jeff Clark

Elegant antiques

THE OBJECT OF Jeff Clark's desire once belonged to the Shah of Iran. The shiny black 1939 Bugatti Type 57C was originally commissioned by the French government and given to the Shah as a present on the occasion of his first marriage. Today the roadster is part of the Petersen Automotive Museum collection in Los Angeles, and in September spent a night in a covered concrete parking garage in Kirkland.

Clark is there when a driver brings it in and parks it next to Fred Astaire's Rolls-Royce, just up the ramp from the Porsche 917 Steve McQueen drove in *Le Mans*.

"It's my favorite," says Clark, who stands gingerly near the Bugatti's curved flank. Out of nearly 80 vintage automobiles that arrived for the 2006 Kirkland Concours d'Elegance, this car's bodacious curves caught the architect's eye. He was happy just to see it up close, a benefit of being chairman of the charity event.

Pebble Beach it's not. But at the Kirkland Concours, you'll find many of the same MGs, Stanley Steamers, Rolls-Royces, and Duesenbergs that have made the California Concours famous—and some of the same



COURTESY OF BARBARA NOVAK

After her son's tragic death, Barbara Novak decided to continue operating his business, Far East Handicrafts. Most of the workers were originally employed by her son. "They're wonderful people," Novak says "We go to their homes and watch their kids grow up."

tragic death of her son, Steve, in a mine exploration accident.

"When my son died, something happened to me, and I couldn't pick my horn up and play. If I hadn't signed contracts, I never would have played again. I continued to play for four years, and after four years it hadn't changed, so I retired from the Symphony in 1999 after 35 years."

Novak's son had established a business

shop," says Novak.

Far East Handicrafts supports aid projects in the countries it does business in. "We sponsor a hill-tribe school. We provide supplies and things like that. We installed the first toilets the village had, and now we are giving scholarships for children to go to another village farther away. The other thing we do is sponsor an eye clinic. People walk for miles to have their cataracts removed.



HANNELORE SUDERMANN

people wandering among them. "Eighty of the best darn cars we can find," says Clark.

The tradition of a Concours d'Elegance started in Europe in the 1920s, when the new luxury vehicles of the day were paraded in front of enthusiasts. Today, the Concours d'Elegance is a show of some of the rarest and most beautiful cars ever made, privately owned vehicles with a market value of \$200,000 to several million, but priceless to collectors and fans of vintage cars.

For Clark, 48, the pleasure comes in bringing them to his hometown. The Kirkland native graduated from Washington State University with an architecture degree in 1983. With his wife, Sharon '80, a young child, and an invitation to work for an architecture firm in Portland, he had no plans ever to return to Kirkland. But just as he was ready to start, the Portland firm's business slowed.

Instead, he took a job with an architect in Kirkland who paid him \$5 an hour to work on an addition to the city's post office. Not the most auspicious start, he admits, but it offered him plenty of experience. Today he owns the business, Architecture Werks, Inc.

And the town he planned to leave behind? He's more a part of it than ever. Since moving back, he's been a city councilman, chair of the city planning commission, and president of the chamber of commerce.

A few years ago Clark met car collector Peter Hageman when their daughters played softball in the same league. Hageman, who shows his own cars in events like Concours D'Eleganza Villa D'Este in Italy, would inquire after an older Porsche he knew Clark kept. Soon they were toying with the idea of having such an event locally. Hageman had the car connections, and Clark knew the community.

Two other such concours had been attempted in the Seattle area. The first, on

Mercer Island in the 1960s, didn't draw enough cars to get started. The second was at the Naval base in Everett. "Guess why that one failed?" says Clark. "Lack of venue."

They joined up with a few other local businessmen and solved their venue problem by planning their event at the posh Woodmark Hotel on the east shore of Lake Washington. Then they focused on a

D'Elegance, and Keith Martin, founder and publisher of *Sports Car Market* magazine. A fancy gala the night before included an auction with tickets to Jay Leno and a private tour of his collection.

Increasingly, the Pacific Northwest is a home for beautiful cars and their collectors, says Clark. That works in the organizers' favor. Besides attracting some great cars from



HANNELORE SUDERMANN

Jeff Clark '83 admires the object of his desire, a 1939 Bugatti Type 57C roadster once owned by the Shah of Iran. He matched his knowledge of the community with a friend's car connections to organize the annual Concours d'Elegance in Kirkland.

mission—to raise money for uncompensated medical care for children in Kirkland and Seattle, with the proceeds to be split between Evergreen Healthcare and Children's Hospital and Regional Medical Center.

"I'm on the foundation board for the Evergreen Hospital," says Clark. "I do all right, but I can't donate \$200,000 a year." He pauses for effect. "I can do *this*," he says, waving at the cars.

The event takes a full year to organize, and when the day finally arrives, Clark and his fellow volunteers throw themselves into organizing the cars and the thousands of people who come to see them. The Concours has managed to draw some big names in the boutique car world, including actor Ed Herrmann, an avid collector who serves annually as a judge and the honorary chairman, Glenn Mounger, former co-chairman of the Pebble Beach Concours

local owners like Carl Schmitt of Walla Walla, who brought his 1904 Pierce Arrow, and the Le May Museum in Tacoma, which sent a 1930 Stutz DV-32 Speedster, the show draws from internationally known collections like that of John Mozart in Palo Alto. He sent a pair of 1930s-era Packards.

"This is not just a car show. It's cars and art and people," says Clark the morning of the event, as he guides the entrants to the Woodmark grounds. They zoom, steam, and roar by. Clark squints at the sky, hoping for a break in the rain. He looks down the road, hoping the precious antiques can easily navigate their way in. This is probably his busiest, most stressful weekend all year, he says.

But, he admits, as the angry whine of a Ferrari rips through the air, it's also his favorite.

—Hannelore Sudermann

John M. Fabian '62

Astronaut.

Space Shuttle *Challenger*, 1983.
Space Shuttle *Discovery*, 1985.

Traveled more than 5 million space miles, with 208 orbits around Earth.

Co-President of the Association of Space Explorers.

Loves to travel (on earth) with his wife, Donna '63.

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CLASS NOTES

1950s

Dick Hannula ('50 Bus.) was recently named to the Washington State University Athletics Hall of Fame. The retired Tacoma teacher and swim coach led 24 high school teams to state titles and managed two USA Olympic teams.

Rex Davis ('53 Phys. Ed.) is coach of the Pullman High School Boys' Tennis team. Davis coached WSU Cougar Tennis from 1966 to 1994 and has been retired from teaching and coaching at WSU for 12 years.

Donald B. King ('54 Psych.) recently published *A Harvard Law School Professor: Warren A. Seavey's Life and the World of Legal Education*, in which King interweaves his own comments and observations with Harvard law professor Warren Seavey's writings on life and law in the United States.

1960s

Carol Lemon Allen ('61 Engl.) is editor of *Arizona Boating & Watersports*, a monthly publication based in Tempe, Arizona. Allen's husband, Jim, is the publisher. Allen also teaches English classes online for Maricopa County Community College District.

Ronelle Alexander ('64 For. Lang. & Lit.) co-wrote two textbooks released in the summer of 2006—*Bosnian, Croatian, Serbian: A Textbook with Basic Grammar* and *Bosnian, Croatian, Serbian: A Grammar with Sociolinguistic Commentary*.

Bob V. Conger ('67 Ph.D. Genet.) received the Lifetime Achievement Award from the Society for In Vitro Biology in June 2006 and an Honored Alumni Award from the Department of Soil and Crop Sciences at Colorado State University in September 2006.

Chuck Stewart ('68 Mech. Engr., '93 Ph.D. Mech. Engr.) recently authored *Sanford's Battle with Nuclear Waste Tank SY-101: Bubbles, Toils, and Troubles*. Stewart managed the Pacific Northwest National Laboratory's activities handling the waste tank's flammable gas releases and waste growth from 1993 to 2001.

Shaik Mohammed Ghazanfar ('69 Ph.D. Econ.) has published *Islamic Civilization: History, Contributions and Influence: A Compendium of Literature*. The book is meant to show the connections between the Arab world and European and Western cultures and to show the influence of those connections on today's global society.

1970s

Douglas N. Hastad ('72 M.S. Phys. Ed.) became president of Carroll College July 1, 2006. Hastad was previously chancellor at the University of Wisconsin-La Crosse. He is the school's 14th president.

J. David Turner ('72 Biol.) and **Margaret Slagle-Turner** ('72 Biol.),

Redmond, have retired. Dave was a software engineer for Quest and Margaret a cardiac nurse at the University of Washington Medical Center.

Gary Baranzini ('73 Ed.) recently received a Master of Science degree in traditional Chinese medicine from the American College of Traditional Chinese Medicine in San Francisco.

Bob Wiekling ('78 Voc. Tech. Ed.) retired as a full professor from Central Washington University. He taught in the Industrial and Engineering Technology Department at CWU for 24 years and was active in both power/technology and the preparation of industrial technology teachers.

1980s

Ron Faoro ('81 D.V.M.) was installed as president of the California Veterinary Medical Association (CVMA) in June 2006 at the CVMA's annual conference.

Susanne Wolff Vander Heyden ('81 Nurs.) has been elected to a second term as regional director for alumnae for Kappa Kappa Gamma Fraternity. Vander Heyden has served as a member of the Advisory and House Board Committee (2002-04), assistant to the director of alumnae (1998-2002), and a Province Director of Chapters (1997-98).

Jeanne Helfer ('82 Ed.) has left her coaching job at Mt. Spokane High School, after coaching students in the Mead School District for 23 years, to spend more time with her family. Helfer is the all-time leading scorer for the WSU women's basketball team. In 1994 she was the first woman from Washington inducted into the National High School Hall of Fame.

Kathleen (Dillon) Flenniken's ('83 Civ. Engr.) first book, *Famous*, is the winner of the Prairie Schooner Book Prize in Poetry, and was published in September by the University of Nebraska Press. She lives in Seattle.

Michael E. Howell ('84 Ag. Engr.) is a Civil Air Patrol lieutenant and member of the Twin W Squadron in Walla Walla. He has been appointed director of safety for the patrol's Pacific Region. Civil Air Patrol units search for missing or overdue aircraft and assist local police in missing-person searches and disaster relief.

Robert Lowery ('84 Comm., Pol. Sci.) received the Central Washington University 2005-06 Presidential Award for Staff Member of the Year. He has also twice been named the university's Civil Service Employee of the Month (July 2001 and March 2006). For his broadcasting work, Lowery was inducted into the CWU Athletic Hall of Fame in 2003 and, in a public vote, was named Best M.C. or Public Speaker in the June 2004 edition of the "Best of Kittitas County," published by the *Ellensburg Daily Record*.

Lt. Col. Don Klinko ('86 Ph.D. Amer. Stud.) retired in March from the military after 33 years of service. Klinko was

awarded his fourth Meritorious Service Medal in support of Operation Enduring Freedom.

William Warren ('88 Ag.), Dayton, was selected to participate in the 2006 agriculture program of Eisenhower Fellowships. He owns and manages Warren Farms and will travel to the European Union to examine the impacts of trade liberalization on renewable fuels.

1990s

Jason Wandler ('94 Pol. Sci.) and his wife, Carrie, welcomed their son, Lachlan Conner Wandler, September 5, 2006.

Tina Martinez-Greene ('95 Ed.) was selected Teacher of the Year for Central Elementary and Pike Township, Indianapolis, Indiana, where she is currently an English as a New Language (ENL) teacher for grades K-5.

Jeffery Higen ('96 Hosp.) is a sales manager at Spokane's Davenport Hotel, recently named one of the top-10 hotels in the nation by Expedia.com. His primary markets will be group corporate and sports.

Joaquin M. Hernandez ('98 Pol. Sci.) has been appointed litigation attorney to the firm of Schwabe, Williamson & Wyatt's Seattle roster. Before joining the firm, Hernandez served as an associate for Marston Heffernan Foreman, PLLC in Redmond.

James. M. Pjura ('98 Gen. Studies) is assistant port operations manager for Turbana Corp., Bridgeport, Connecticut. Turbana imports tropical fruit from Central and South America.

2000s

Thomas Edgley ('00 Comm.) recently acquired his CPA license and is now working for Moss Adams in Everett. He and his wife, **Kelly (Hageman) Edgley** ('01 Vet. Sci., '04 D.V.M.), live in Lake Stevens.

Amanda (Stafford) Johnson ('03 Engl., Ed.) was married to Chess M. Johnson of Colorado May 14, 2006. Chess is in the United States Army, and the couple will live in Olympia.

Sara Matuska ('03 Comm.) was promoted to promotions coordinator at Citadel Broadcasting in Spokane. She has also been doing on-air work for Oldies 101.1 as a weekend talent and as the morning show's "Hollywood Reporter."

Lynelle Brode ('04 Phys. Sci.) has been promoted to staff geologist for Apollo Geophysics in Bellingham.

Gabriel Gandia ('05 Mvmt. Stud.) is at Fort Benning, Georgia, training to become a U.S. Army officer.

In Memoriam

1930s

Floyd L. Norgaard ('31 El. Ed.), 98, April 21, 2006, Stanwood.

Julius Riseland ('31 Elec. Engr.), 97, September 2005, Mukilteo.

Jane Hicks Markuson ('33 Ed. & Psych.), 96, March 22, 2006, Brookings, Oregon.

John (Jack) Whidden Downie ('35 Phys.), 92, February 15, 2006, Syracuse, New York.

Maxine E. Simmons ('36 FA), 93, July 30, 2006, Moscow, Idaho.

Winnifred Greer Shelton ('37 Ed.), 89, July 9, 2006, Pullman.

Francis X. McArthur ('38 Sci.), 94, January 24, 2006, Boise, Idaho.

Alice E. Peterson ('38 Home Ec.), 89, April 12, 2006, Walla Walla.

Leslie E. Edwards ('39 Phys.), 91, March 14, 2006, Richmond, Virginia.

Betty Jane Moore x'39, 88, April 2, 2006, Everett.

Alice M. (Burke) Schuchman ('39 FA), February 2006, Sacramento, California.

1940s

John Charles Benner ('40 Bus. Admin.), 92, May 10, 2006, San Francisco, California.

Richard D. Sanders Sr. ('40 Econ.), 88, April 9, 2006, Bradenton, Florida.

Rachel Redman Camp ('41 Soc.), 86, February 18, 2006, Vancouver.

Don W. Clark ('41 Vet. Med.), 88, May 6, 2005, Tallahassee, Florida.

Betty E. Cranston ('41 Home Ec.), November 23, 2006, Victoria, British Columbia.

Agnes M. McQuarrie ('41 M.S. Phys. Ed.), 89, March 9, 2006, Pullman.

Donald Boyle ('42 Gen. Stud.), 85, May 27, 2006, Santa Barbara, California.

Harold Etzel Hodge ('42 Econ.), November 20, 2005, Newcastle.

Susan Simpson Sanders x'42, 87, February 14, 2006, Tacoma.

Marjorie Scott ('42 Home Ec.), March 28, 2006, Temple City, California.

William S. Yorozu ('42 Hort.), 92, March 27, 2006, Seattle.

Neil A. Baldwin ('43 Mech. Engr.), 87, Danville, Illinois.

James W. Cottrell ('44 Ag.), 85, March 3, 2006, Wenatchee.

Sue E. Hildenbrand ('44 Zool.), 84, May 15, 2006, Calgary, Alberta.

Virginia Lyon x'44, 86, February 27, 2006, Kokomo, Indiana.

Robert Ruff Reese ('44 Civ. Engr.), 84, April 15, 2006, Spokane.

Neil A. Degerstrom ('46 Civ. Engr.), 82, 2006, Spokane.

William T. Good ('46 Lib. Arts), 87, March 12, Freeland.

Thomas James Jurich Sr. ('48 Comm.), 79, March 13, 2006, Seattle.

William C. MacArthur ('48 Psych.), 90, March 17, 2006, Sacramento, California.

Claudia Celeste (Ruffin) Meenach x'48, 78, March 20, 2006, Wenatchee.

Robert Miller ('48 Mus.), 83, January 19, 2006, Pullman.

David Edward Myre Sr. ('48 Mech. Engr.), 82, April 27, 2006, Seattle.

Gordon J. Robinson ('48 Elec. Engr.), 81, March 15, 2006, Medina.

Lillian Strand ('48, Gen. Stud.), 80, March 28, 2006, Seattle.

Marie L. Skellenger ('49 Home Ec.), 84, March 25, 2006, Vancouver.

Cecil Edward Thill ('49 Bus. Admin.), 83, November 13, 2005, Uniontown.

1950s

Robert Lewis Erdmann ('50 Psych.), 77, July 10, 2006, Port Orchard.

William E. Wege ('50 Ag.), 82, July 7, 2006, Bellevue.

Alfred Kuehn ('51 Econ.), 80, June 9, 2006, Bad Homburg, Germany.

Richard M. "Dick" Boge ('52 Gen. Stud.), 78, July 1, 2006, Spokane.

James Weston Hickey ('52 Bus. Admin.), January 19, 2006, Spokane.

Shirley Ann Slippert McIntyre ('52 Elem. Ed.), 75, March 31, 2006, Seattle.

Edward H. Quinn ('52 Elec. Engr.), 84, January 12, 2006, Gresham, Oregon.

Lila Mae Swanson ('52 Phys. Ed.), 76, March 9, 2006, Portland, Oregon.

Joseph O. Virgin ('52 D.V.M.), 85, February 22, 2006, Lake Forest Park.

William A. Langbehn ('53 Econ.), 78, August 21, 2006, Rockville, Maryland.

Betty L. Campbell Loudon, ('53 Home Ec.), 75, June 7, 2006, Wenatchee.

Merrill Dean Snook ('53 D.V.M.), 79, March 17, 2006, Deer Park.

Mary Kay Lowery ('54 Hist.), 74, June 22, 2006, Tucson, Arizona.

Patricia K. Miller x'54, 74, March 3, 2006, Richland.

Gilbert Yasoki Inaba ('55 Phys. Ed.), 74, June 17, 2006, Seattle.

Andrew C. Knaphus ('56 Ed.), 85, April 14, 2006, Mesa, Arizona.

1960s

La Velle West ('61 Phys. Ed.), 68, February 14, 2006, Bellingham.

Dick Brown ('62 M. Ex.), July 26, 2006, Richland.

Lloyd Erickson ('64 D.V.M.), January 13, 2006, Butte, Montana.

Barbara Jane Shaw ('65 Ed.), 62, March 8, 2006, Calgary, Alberta.

Gordon Carl Shogren ('65 Math.), 63, March 30, 2006, Kirkland.

Alva Johnson ('66 Ph.D. Bact.), 76, April 22, 2005, Stockbridge, California.

Diane L. (Louret) Tyson ('66 M.A. Sci.), 67, April 17, 2006, Lewes, Delaware.

Michael D. Forzley ('67 Gen. Stud.), 63, August 21, 2006, Sandy, Oregon.

Ranjit Singh Sabharwal ('67 Ph.D. Math.), 81, July 23, 2006, Fremont.

Gregg L. Tinker x'67, 60, April 18, 2006, Puyallup.

Frank Stuart Palmer ('68 Bus. Admin.), 86, June 4, 2006, Port Angeles.

Hank Grenda ('69 Bus. Admin.), 59, March 31, 2006, Seattle.

Roderick L. Lindberg ('69 Gen. Stud.), 58, February 10, 2006, Phoenix, Arizona.

1970s

Dennis Lane Bettencourt ('70 Comm.), 59, June 23, 2006, Boise, Idaho.

Larry G. Bettsworth ('71 Pharm.), 58, August 13, 2006, Spokane.

Jane Charlotte Kinion ('71 Pol. Sci.), July 25, 2006, Pasco.

Ronald D. Alldredge ('76 Arch.), 51, March 22, 2006, Snohomish.

Dianne M. Joseph ('76 Off. Admin.), 52, March 9, 2006, Fife.

1980s

Dwight A. Bergstrom ('80 Rec. & Leis. Stud.), 49, March 2, 2006, Bellevue.

Kevin E. Waltari ('84 Bus. Admin.), 46, July 20, 2006, Chandler, Arizona.

David L. Hoffman ('85 Ph.D. Agron.), 50, January 31, 2006, Pocatello, Idaho.

1990s

Jennifer Davis ('92 El. Ed.), 38, May 7, 2006, West Richland.

Faculty and Staff

Donald F. Adams ('41 Chem.), 84, August 23, 2006, Spokane. Donald was a WSU professor of chemical engineering.

Joyce A. Arnold, 66, April 17, 2006, Spokane. Joyce was employed with WSU for 28 years as a custodian, much of that time in a lead capacity.

Hella Bartlett, 74, May 6, 2006, Kennewick. Hella retired in 1997 as controller cashier supervisor. She worked for WSU for 27 years.

Kenneth Batty, 82, July 6, 2006, Palouse. Kenneth started working at WSU as a feed plant manager in the animal sciences department and retired in 1962.

Irene "Lavonne" Berg, 68, July 15, 2006, Pullman. A laboratory technician in the veterinary microbiology department, Lavonne was a WSU employee since 1979.

Phillip E. Bloom ('37 Ag.), 92, August 1, Ellensburg. Phillip was a Kittitas County extension agent from 1949 to 1978.

June B. Crantz, 79, May 22, 2006, Moscow, Idaho. June retired from Ferdinand's at WSU.

Sally Anne Franek, 68, April 15, 2006, Cheney. In 1983, Sally joined the faculty of WSU, where she provided new insights to multiple students in counseling psychology.

Barbara Jacquot, 97, May 14, 2006, Pullman. Barbara was a volunteer at the art museum at WSU.

Karen Shirley White Jordan, 66, May 7, 2006, Fairfax, Virginia. Karen worked as a manager and administrative assistant in several WSU departments, including the Office of the Dean of Students, the Primate Research Center, the Institute of Biological Chemistry, and the Department of Agricultural Economics.

Rafail Khairoutdinov, 58, April 4, 2006, Pullman. Rafail was a research professor in the chemistry department.

F. Dudley Klopfer, 85, April 22, 2006, Silverdale. Dudley was a professor of psychology and served as a University ombudsman from 1975 to 1977.

Constance Lydon, 67, July 3, 2006, Olympia. Constance worked with WSU County Extension from 1990 to 1997.

L. Frances Manus x'33, 95, April 9, 2006, Everett. Frances worked in Central Stores in the 1950s and served as executive secretary in the police science department in the 1960s and 70s.

Tory Wesley McWilliams, 29, June 9, 2006, Pullman. Tory worked full-time with computer technology in the WSU admissions department. He was the information systems coordinator in the WSU admissions office at the time of his death.

Maxine Rauch, 75, May 13, 2006, Pullman. Maxine retired from the President's Office.

Robert W. Richardson, 55, April 11, 2006, Pullman. Robert was a custodian at WSU.

Russ Swan, 42, April 26, 2006, Las Vegas, Nevada. Russ was a pitching coach at WSU.

Edward Eng Dui Woo, 55, March 7, 2006, Pullman. Ed worked in WSU Compton Union Building food services for more than 25 years.

Francis Allan Young Jr., 87, May 24, 2006, Pullman. Frank retired from the psychology department in 1988, after serving the University for 40 years with one of the longest tenures as a WSU professor. His involvement with WSU continued up until the time of his death.

Ann Elizabeth Zakarison, 71, April 7, 2006, Pullman. Ann began working at the WSU Cooperative Extension office in 1974 then later transferred to the entomology department, where she retired in 1997.

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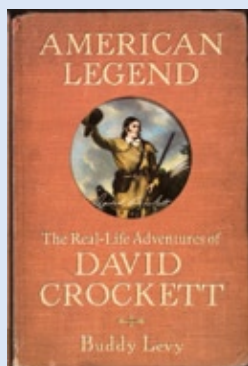


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American Legend: The Real-Life Adventures of David Crockett

By Buddy Levy
G.P. Putnam, New York, 2005

What most baby boomers know about the legendary frontier figure David “Davy” Crockett has been gleaned from the Walt Disney movie and television series starring Fess Parker. In *American Legend: The Real-Life Adventures of David Crockett*, WSU English professor Buddy Levy presents a fuller profile of the man who made Tennessee famous in the early 1800s. In this book it’s not just a master heroic outdoorsman who emerges; the consummate politician and ferocious fighter for underdog causes shines through as well.

Born August 17, 1786, Davy Crockett found his independent spirit and developed his frontier skills on the open road at the age of 14, when he ran away from home for two years. It was a scenario that repeated itself over the course of his lifetime, as Crockett went from adventure to adventure—on the rugged frontier, into the hallowed halls of the U.S. House of Representatives, and to his death at the Alamo on March 6, 1836.

This may be the definitive story of Crockett’s life, more so than

Crockett’s own 1834 autobiography, in which he capitalized on his own pop-culture hero status rampant at the time. Levy has obviously researched every inch of Crockett’s life but is careful he doesn’t let myth overpower the truth, even though it’s obvious Levy admires his subject.

Still, *American Legend* is not without its dramatic moments. Crockett’s killing of a 600-pound black bear depicted on page 109 is as thrilling as any fictionalized adventure story.

What most historians will find interesting, though, is Levy’s close study of Crockett’s political prowess. Long before Bill Clinton and George W. Bush, Crockett perfected the common-man affability that attracts votes. He learned early in his political career that it was better to tell an amusing tale than it was to be informative and boring. Despite the lack of substance in his speechmaking, once in office, he was a man of principle who took strong stands against Andrew Jackson’s land reform and Indian removal policies. The political break with Jackson, who had commanded Crockett early in his military career during the Creek Indian War in 1813, led to Crockett’s 1831 political defeat in his bid for a third term in the U.S. Congress. A later, unsuccessful try for political office sent Crockett down the road to fight for Texas’s independence from Mexico.

Levy wrote *American Legend* using the purest biographer’s ethics. He doesn’t “recreate” conversations, and he backs up his story with extensive notes. Using his vast experience as an outdoor and travel writer for popular magazines, he weaves a story as excit-

ing and interesting as the tale portrayed onscreen by Fess Parker.

For more information, see wsm.wsu.edu/bookstore/faculty/biography/.

—Kathie Meyer '92

A frequent contributor to WSM, Meyer is the arts and entertainment editor for the Port Townsend Jefferson County Leader.



Mimicking Nature's Fire: Restoring Fire-Prone Forests in the West

By Stephen F. Arno '65 and Carl E. Fiedler
Island Press, Washington, D.C., 2005

Forest health has been much in the news. It is a powerful metaphor—but one of uncertain and ambiguous content. Congress has used it to avoid environmental assessments of logging; opponents of logging have often portrayed it as a smokescreen. *Mimicking Nature's Fire* is in part a guide to this debate. Stephen Arno ('65 For.), a forest ecologist, and Carl E. Fiedler, a silviculturist, have combined their talents to argue for “restoration forestry,” an approach that seeks to reestablish “an approximation of historical structure and ecological processes to tree communities that were in the past shaped by distinctive patterns of fire.”

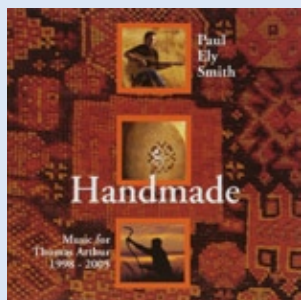
The book is divided into three parts. The first sets the stage. The authors discuss the historical fire regimes that shaped the forests that were present when Euro-Americans arrived in the West. They then turn to the ecological, political, and economic barriers to restoration forestry before concluding with an overview of its objectives, techniques, and economics.

The second and largest section examines a series of restoration projects, contrasting forest types, fire regimes, and management goals. These chapters analyze not only the ecological considerations but also the political issues that often are even more important in shaping the forests. Restoration forestry often requires a mix of thinning and fire, depending on forest type and the social and ecological context of the stand.

The book concludes with a short, clear statement of what is needed. Arno and Fiedler argue for active management of the forests, noting that unintended consequences of doing nothing—yielding to the temptation to “let nature take its course”—is a recipe for disasters such as the stand-replacing fires that have become a recurrent feature of Western summers.

The writing is clear and accessible to non-specialists. The text is enhanced with well-chosen photographs, line drawings, and helpful graphs. Although written for a general audience, the book includes nearly 20 pages of references that an interested reader can use to examine the issues in more detail.

—Dale Goble, Margaret Wilson
Schimke Distinguished Professor of Law, University of Idaho



Handmade

Paul Ely Smith, Palouse, Washington, 2006

It's no accident that the cover art for Paul Ely Smith's compact disc, *Handmade*, features a detail from an oriental rug. Paul, an instructor in the general Education Program at Washington State University, has been a collector of tribal woven pieces—carpets, bag faces, kilims, etc.—from places like Afghanistan, Iran, and Turkey for many years. And, of course, they're all handmade—just like the fretless gourd banjo, also pictured on the cover, which Paul himself built, and which he plays on the CD's opening track. Paul plays all the other instruments heard on *Handmade*, including the guitar he built in 2000, his great-grandfather's 1893 Fairbanks "Electric" banjo ("not in fact an electric instrument"), an 1840 C.F. Hartmann violin, a 1917 Gibson "A-3" mandolin, a 1904 A.L. White reed organ, and piano.

What holds the CD's program together is Paul's collaboration with juggler Thomas Arthur. The two have developed a performance repertoire combining Thomas's "new language of dance with objects" with Paul's compositions and arrangements. And, as the subtitle *Music for Thomas Arthur 1998-2005* sug-

gests, it's this music that we hear on *Handmade*.

The connection with Thomas notwithstanding, what I find interesting about this music is that it's pure Paul Smith. To the extent that I know Paul, I know him as a man enamored of world music. At various times, for example, he has brought to WSU such performers as Turkish musician Latif Bolat and the ensemble Shashmaqam, who perform classical and folk music of Uzbekistan and Tajikistan, as well as the liturgical repertoire of Bukharan Jews.

So it's not surprising to me to find on *Handmade* a "piece," as Paul writes in his liner notes, "made out of a few verses of the traditional Mandinka epic song, *Sunjata*," combined "with the traditional American fiddle tune, 'Sail Away Ladies,'" The magical thing is that, using just fragments of the originals, and investing the music with his own style and sound, Paul not only makes it work, but creates a piece of wistful, haunting beauty.

And so it is throughout *Handmade*. "Hector the Hero/Bred Dina Vida Vingar" yokes a "Scottish slow air" Paul learned from his great-grandfather despite the fact that "he taught no one in the family to play" to a Swedish Lutheran hymn which, Paul writes, "is clearly some sort of dance tune that some anonymous Swede tried to make legit." "Nihavend/Seyhemin Ileri" couples an improvised melody with a Sufi devotional song, composed by Dogan Ergin, that Paul "learned from Turkish musician Latif Bolat." And "Rocky Road to Dublin/Morning Dew" couples "a traditional Irish slip jig" with a reel.

Even Paul's original composi-

tions claim a broad cultural pedigree—such as "Spirals," with its echoes of South African street music; "Horo," which Paul describes as a "Balkan Scandofunk riff;" "Fatehpur," inspired by the Indian city of Fatehpur Sikri, "built by the sixteenth-century Mughal emperor Akbar as a shrine to all faiths;" and "Three Ball," which shares the "groove" he once heard in a village in India when an "old woman . . . pulled out a dholak barrel drum and began to play."

But Paul is more than just a collector of musical gestures. His eclecticism is as deep as it is wide. I'm intrigued, for example, by the way he co-opts middle-eastern musical form into his own



JIM RIVERPIECE

brand of musicianship, as in "Hijaz" and "Nihavend/Seyhemin Ileri," each of which begins with a taqsim, a type of improvisation associated with Turkish and Arabic performance. I grew up in a cultural milieu steeped in the melodies and modes of Armenian, Turkish, and Arabic music. I heard them on the radio and on my family's cherished hoard of scratchy 78-rpm recordings of old-country songs on such labels as Decca, RCA Victor, and Odeon. Whenever my parents got together with friends who, like them, had immigrated from Asia Minor and its environs, someone would unfailingly produce an oud—a middle-eastern lute—and

initiate a songfest replete with Turkish and Armenian lyrics. I can even remember being present at a performance somewhere by the oud virtuoso, Hrant Kenkulian, known as Oudi Hrant, whose mastery of the taqsim, and of the oud in general, was legendary.

I've heard many a taqsim since then, but I've never heard any played the way Paul does it, first in "Hijaz," then in "Nihavend." He makes of each performance an exercise in adaptive re-use, bending the sonic and melodic character of the taqsim to his own purposes and gifts, but allowing it to remain in the meditative space it's always occupied. So while remaining true to the spirit of the taqsim, he makes it his own.

He describes both "Hijaz" and "Nihavend/Seyhemin Ileri" as "a maqam, 'a melody-mood of Arabic music. It turns up,'" he writes, "in India as Raga Bairav and among Klezmer musicians as 'the questioning mode.'" Does either piece sound like Arabic, Indian, or Klezmer music? Not a bit. And that's what's so wonderful about this music. Not only has Paul synthesized tunes and styles from around the world to make a music unique unto himself, he's also internalized the forms of those tunes. The result is music of an almost rough-cut simplicity that retains its freshness with repeated listening—yielding the kind of pleasure you might derive from viewing a finely crafted handmade rug.

For more information, sound clips, and a look at the entire carpet illustrated on the CD cover, visit <http://www.palouse-rivermusic.com>.

—George Bedirian

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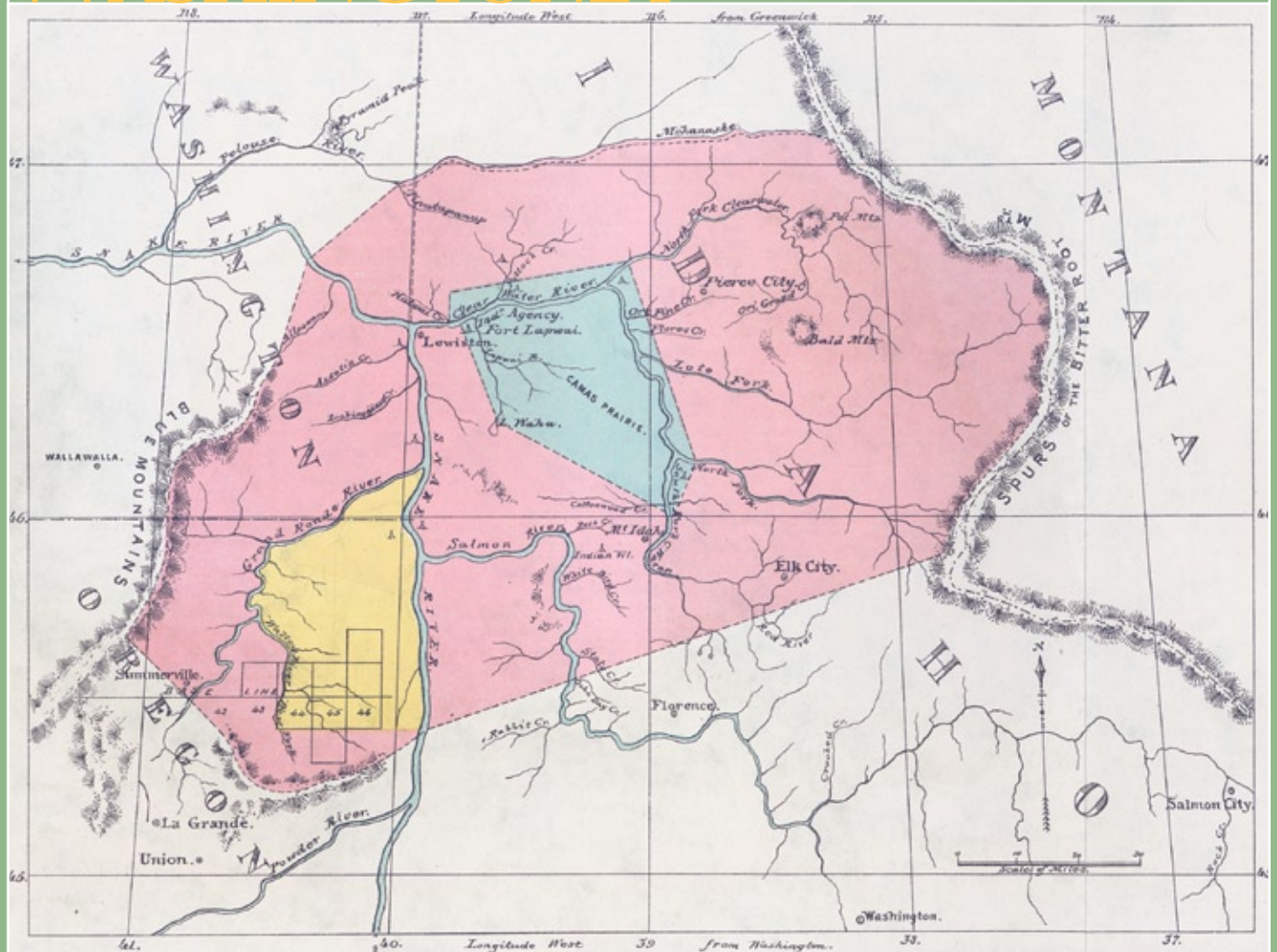
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MAP SHOWING THE NEZ PERCE INDIAN RESERVATION and the Wallowa Valley, included with the eighth annual report of the Board of Indian Commissioners to the Secretary of the Interior, 1876. The pink area represents the reservation under the Treaty of 1855, blue the reservation under the Treaty of 1865, and yellow the Wallowa Valley claimed by Young Chief Joseph. Note that the reservation under the 1855 treaty includes land that is now the WSU Pullman campus.

The map is currently part of *Eye of the Beholder: Plateau Lands and Peoples in Historical Maps*, an exhibit in Manuscripts, Archives, and Special Collections in the Holland and Terrell Libraries. The exhibit is on display through January 8.



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For more information about creating your WSU Legacy, contact the Gift Planning Office at 800-448-2978 or by e-mail: gift-planning@wsu.edu.

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