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Washington State magazine

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SUMMER 2006
VOLUME 5, NUMBER 3

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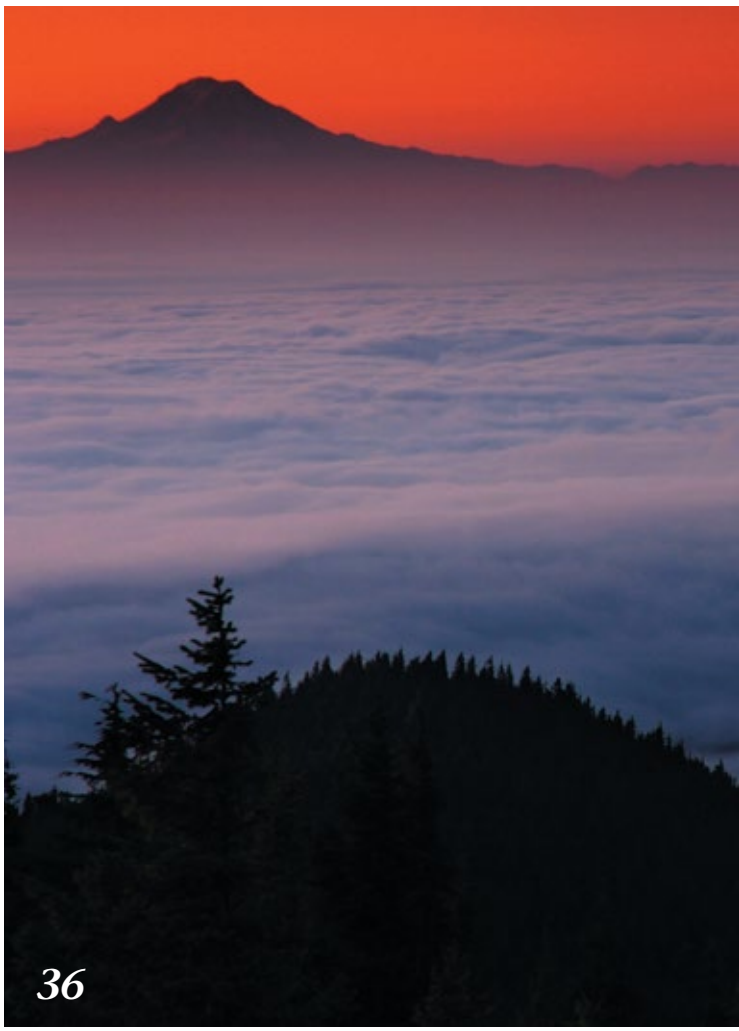
features



COVER: Hood Canal, near Union. See story, page 36. *Photograph by Kevin Nibur.*

KEVIN NIBUR

SPECIAL COLLECTIONS, UNIVERSITY OF VERMONT LIBRARY

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Scholarship Opportunities at Washington State University

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LETTERS

ROBERT HUBNER

The Clothesline Project

Robert Hubner's picture of the Clothesline Project display [Spring 2006] brought back 15 years of activism to my mind. Rachel Carey-Harper from Cape Cod, Massachusetts, developed the Clothesline Project and displayed it at the Women's International League for Peace and Freedom Congress at Bryn Mawr in summer 1991. WILPF members and I immediately recognized the power of publicizing the abuse against women. A gong, bell, and whistle sounded regularly to remind listeners of the persistence of injury, death, and rape in what continues to be a war against women. The Portland branch of WILPF has continued to support the Clothesline Project with displays several times a year. Brochures in Spanish and English list community services available to abuse sufferers as well as history of the Line. Displays often bring tears to even men's eyes. The evidence is obvious that domestic violence exists. Women who made shirts appreciate seeing their suffering aired in public.

Mary Rose '56
Portland, Oregon

More on Murrow

MANUSCRIPTS, ARCHIVES AND SPECIAL COLLECTIONS

Your publication of the [Beverly] Meyer letter [Spring '06] shows your complete lack of historical knowledge and puts you in the position of dishonoring WSC graduates who fought and died in WWII so that you and your descendents could be free.

How could Edward R. Murrow "intervene" in WWII when the Japanese attacked Pearl Harbor followed a few days later by the Germans declaring war on us?

Have you done your research? There is a published list of WSC students who died in WWII. Why don't you study that list and then apologize to us survivors and express your honor for those who died.

You should also publish a list of books from the 1940s that set forth the roots of WWII and the rise to power of Hitler, Mussolini, and Tojo. All three planned to kill your grandparents and wipe out all vestiges of freedom for Americans.

Major Phillip W. Foraker, Army (ret.)
Gresham, Oregon

PS: My active Army duty began in 1943. My WSC degree was awarded in 1944. I retired from the U.S. Army Reserve in 1966. My business career included time as a top corporate officer and also that of an entrepreneur.

All the authors Beverly Meyer cites in her letter are revisionists who are notorious for finding evidence to support a preconceived perspective. [Charles and Mary Beard] were pro-isolationist historians who used selective evidence, [John] Flynn was a Roosevelt hater, [Edmund] Wilson was a liberal turned anti-communist, and the motives go on. [John] Toland ignored masses of evidence available to him to prove his thesis. Meyer should read Gordon Prange's *At Dawn We Slept* for the origins of the Pacific war. If the people she cites had their way, we would all be speaking German today.

Edward M. Bennett
Professor Emeritus, WSU

Roughing it—sort of

I enjoyed reading the article ["When Pullman was a ski town"] in the spring issue of *Washington State Magazine*. I was especially interested to see that Bruno Richter's picture and comments were included. Early in 1956, Bruno Richter, Guy Bockus, another student whose name I've forgotten, and I drove to Sun Valley for a four-day skiing vacation between semesters. When we approached the town of Ketchum, Idaho, and saw the mountain to our left rising high above the surrounding terrain, Bruno remarked that he wasn't sure that he could handle the challenge; however, at the top of the lift early the next morning, Bruno took off down the mountain like a bat out of hell, and none of us saw him until the end of the day.

Just for the record, a three-day pass cost each one of us $15. We rented bunks beneath the hardscape of a local gas station for $1 per night per person. Even though there was no heat down there, we managed to stay reasonably warm in our long johns and sleeping bags.

Oh well, so much for roughing it.

Bob Settle '62
Danville, California

The Best Ever

Jo Savage, our art director and good friend, died in a car accident just before this issue went to press.

Even if you only knew Jo through the look of this magazine, you may have understood she was one of those people you wanted to please. She was the consummate colleague, equal parts inspiring and demanding, always expecting the best from herself and from us.

Jo was, after all, responsible for how the magazine looked. She had no qualms about sending something back, or telling anyone that what they had given her wasn't good enough.

Because of that insistence, at some point late in the production of every issue, Jo would hand me a proof and I'd say, "Best one yet." She and the others would laugh because my comment was so predictable.

But I meant it. We all had a lot invested in that comment. I had been handed the first impression of what would soon be mailed out to 140,000 of our alumni and friends. I knew this magazine for many of you is the primary impression of WSU that will linger until the next issue.

By the time Jo handed me that proof, Lori, Cherie, George, and I (and Pat Caraher before he retired) had all been through the stories many times. We'd tweaked and cut and rewritten. And then we'd given Jo our words and ideas and suggested what it was that we wanted first to reach our potential readers. No matter how much we writers and editors are attached to our words, we know that we depend on our designer to invite readers into our stories. We know how fleeting and varied are the attentions of readers—and how important it is that the way we look grabs them right there.

We are so fortunate both to be working on something we love and to have worked with Jo. I've worked with her for 16 years. George, our managing editor, has worked with her for 22 years. Jo had worked at WSU since receiving her M.F.A. in fine arts in 1970. Her death has left a big hole in many hearts.

This issue is Jo's last, of course. It is also, I'd say, her best. And we who remember her and love her will continue to do our very best to please her.

Tim Steury

New Cards. More Benefits. More Reasons to Join.

The Washington State University Alumni Association has more members now than ever before. More than 4,000 new members joined in the last year alone. Could it be the new cards? The great new benefits and services? The important work the WSUAA is doing in support of WSU? We think it's all of the above. If you're a card-carrying member of the WSUAA or would like to become one, here's a sample of what you get:

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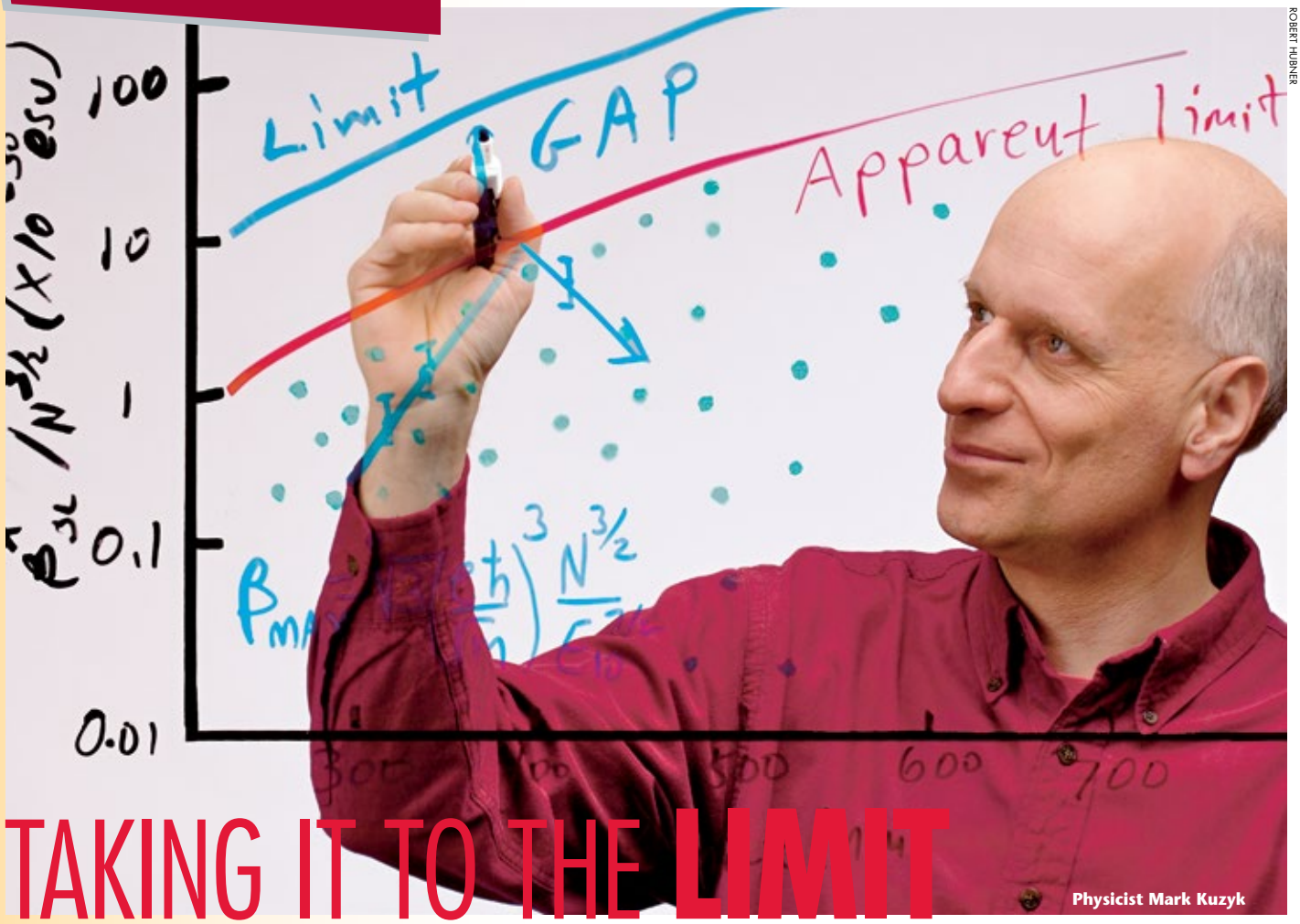


ROBERT HUBNER

Physicist Mark Kuzyk

TAKING IT TO THE LIMIT

"Because it's so simple, it had to be fundamental. There's some beauty in the equations."
—Mark Kuzyk

WHEN IT COMES to scientific immortality, not much beats having a fundamental physical relationship named after you. Ask Washington State University physicist Mark Kuzyk, who in 2000 discovered what has become known as the Kuzyk Limit.

"It's actually kind of embarrassing to call it that," says Kuzyk. He attributes the term to a group at the University of Toronto who used the limit as the basis of their own research. "Their press people came up with this. They coined the term, and it stuck."

Kuzyk prefers the term "fundamental limit." The limit isn't a single number; it's a curve on a graph that shows how strongly any given kind of matter can interact with light. The notion that light and matter "interact" might sound odd to a layman. To a physicist, it opens a whole spectrum of possibilities.

Matter can affect light, as when a crystal converts a beam composed of many wavelengths into a higher-energy beam of a single wavelength—a laser. Likewise, light can affect matter. Molecules that absorb light efficiently can gain enough energy to cause their electrons to behave in new ways.

"It turns out there is a fundamental limit to how much an individual molecule can absorb," says Kuzyk. "Whatever process you can think of that has light interacting with matter will have to obey that limit"—and that has implications for a wide variety of applications, from optical switches in computers to advances in medicine.

Kuzyk describes a cancer therapy in which a dye is injected into the bloodstream and becomes attached to tumor cells.

"Then you shine bright light through the skin," he says. "It turns out that some colors of light will go right through your flesh. The idea is that these [dye] molecules strongly interact with the light, and it burns the tumor." His limit tells doctors how efficient the cancer therapy can be.

One of the biggest mysteries about the limit is why none of the thousands of molecules tested so far come anywhere near it. A curve showing actual performance parallels the limit curve but is about 30 times lower. The discrepancy between what's theoretically possible and what has actually been achieved in the lab is so consistent that it has also been given an unofficial but widely accepted name: the Kuzyk Quantum Gap.

Figuring out how to make chemicals that are efficient enough to get into the gap—and closer to the fundamental limit—is "the million-dollar question," says Kuzyk.

He recently teamed with WSU mathematician David Watkins to do numerical simulations to under-

stand how the shape of a molecule affects the strength of its interaction with light.

"We've suggested shapes of molecules that would be worthwhile to try," he says, "but the chemists tell me when they look at those shapes, they're not sure if they can make those kinds of molecules."

Kuzyk says he first thought about trying to find the limit more than 20 years ago, when he was a graduate student, but he never had time to pursue his ideas until a brief sabbatical in 1999.

"In that two-month period, I was just kind of sitting around doodling and thinking about it," he says. "And very quickly, I tried several calculations and I hit upon the right one."

He knew he was on the right track when the complicated equations he started with—"a real big mess," he says—reduced to a simple algebraic equation.

"So then I knew it had to be something correct," he says. "Because it's so simple, it had to be fundamental. There's some beauty in the equations."

He recalls that his breakthrough didn't win applause at first. "The funny thing is, when I was a graduate student, I thought to myself, boy, if anyone could calculate this, it would be so fantastic," he says. "And then when I first published it, it was a very quiet response. I think people didn't notice it for about a year."

Then, some scientists who did notice Kuzyk's work weren't happy with it.

"Those are people who get lots of funding to make better molecules. So if they're saying they're making improvements, and I show this plot that shows they're *not* making improvements, it doesn't go over well."

Kuzyk got a more enthusiastic response from graduate student Xavier Perez-Moreno. "He caught on very quickly," recalls Kuzyk. "He fell in love with this work. He said, 'I can imagine doing this for a lifetime and never running out of interesting ideas.'"

After completing his master's degree in physics at WSU, Perez-Moreno, a native of Spain, went to Belgium's University of Leuven to pursue doctoral studies in the same field. Kuzyk will join him this summer for further work on the theoretical aspects of the limit and gap that, despite his embarrassment, now bear his name.

"I have more colleagues that are starting to get interested in it," says Kuzyk, who also now has National Science Foundation funding for the work. "The horizons are expanding. It really has been fun, because I feel like there's something really interesting buried in there. I don't think we've gotten to the most interesting stuff. It's about to come." ■

—Cherie Winner

SEEING **STARS**

THE SOURCE of the shimmering "star" pattern that gave star garnet gemstones their name has been found, thanks to graduate student Maxime Guinel and Professor Grant Norton of Washington State University's School of Mechanical and Materials Engineering.

Star garnets, which range in color from burgundy to purple, exhibit a four- or six-rayed star pattern that seems to float within the stone. Guinel and Norton showed that the pattern results from light reflecting off tiny, needle-like crystals of titanium dioxide embedded in the garnet.

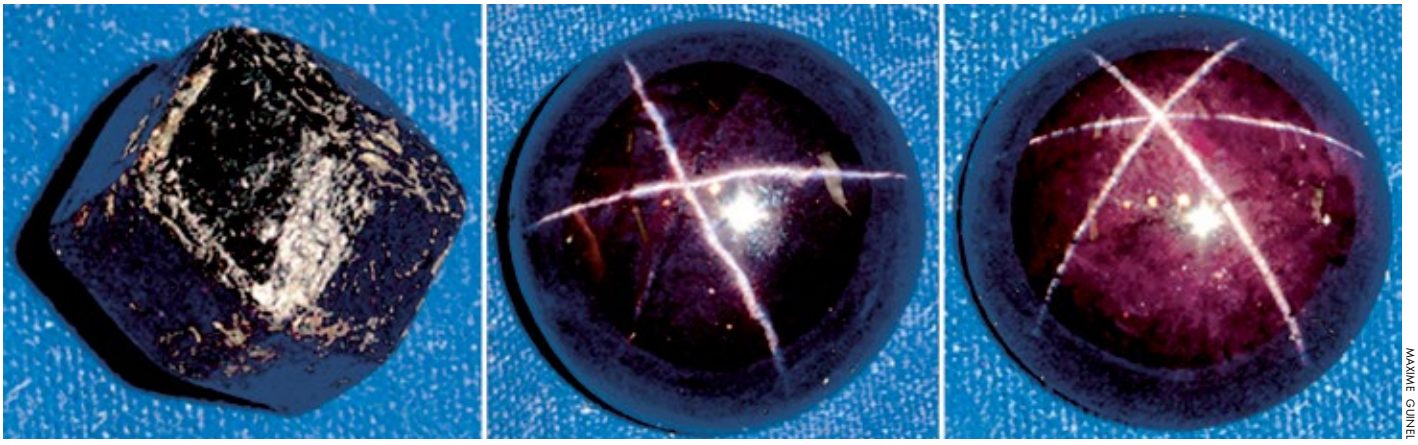
Commonly called rutile, the titanium dioxide crystals are impurities that became trapped within the garnet at the time the larger stone was being formed, perhaps millions of years ago.

Guinel used a transmission electron microscope to see the crystals within thin sections of garnet, and electron microprobe (X-ray) analysis to verify their composition.

The star pattern is a feature highly valued in the gem and jewelry trade. Idaho is one of just a few places in the world, and the only place in North America, known to produce star garnets. In 1967 the Idaho legislature adopted the star garnet as the state gemstone. ■

—Cherie Winner

A garnet in its natural state (left). After polishing, the stone may reveal a four-rayed or six-rayed star. Approximate diameters are 5 mm, 2 cm, and 1 cm.



MAXIME GUINEL

CAN AMERICA **COMPETE** IN A "FLAT" WORLD?

by V. Lane Rawlins, President
Washington State University


ROBERT HUBNER

President V. Lane Rawlins

At Washington State University, we are . . . strengthening our undergraduate curriculum, developing better science teachers, and putting our students in a research environment that we believe will better prepare them to compete.

MANY OF YOU are familiar with Thomas Friedman's argument, in *The World is Flat*, that technology has eliminated many barriers to competition and thus created today's globally competitive economic environment. His dramatic examples of outsourcing show that key services, including high-level engineering and scientific tasks, can be effectively accomplished without regard to the workers' physical location. This allows imaginative businesses to tap talent from around the globe, often at considerable savings.

Friedman, a foreign affairs columnist for *The New York Times*, uses this evidence to reach some alarming conclusions about how America will fare in the future. After establishing the central thesis that location is no longer a significant advantage in producing high-value commodities and services, he examines the conditions that America must meet to continue holding a dominant economic position. He gives appropriate attention to innovation and then, like so many others, concludes that for us to compete successfully, America must put far greater emphasis on education. He is especially emphatic about the need for more rigor and a larger number of qualified graduates from our higher education institutions.

Hot on the heels of Friedman's book came *Rising Above the Gathering Storm*, a report from America's most prestigious scientific organizations—the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Their special Committee on Prospering in the Global Economy of the 21st Century, including many of the nation's leading scientists and engineers, produced the report. They document in great detail, for example, how the production of scientists and engineers in America pales in comparison to nations like India and China.

The report predicts economic doom unless we can make major changes, including increasing both the quality and quantity of mathematical and scientific education. Recommendations include higher standards for students, better preparation for teachers, considerable incentives to students and teachers to develop their mathematical and scientific capacities, and a significant investment in higher education. The price is high, but the stakes are too.

All over the nation there are now committees and commissions addressing the apparent deficiencies in education, current and projected. Washington State is no exception, with Washington Learns, the Governor's Commission on Global Competitiveness, and several other committees, alliances, and associations producing recommendations focused on improving our educational system.

Some years ago, the noted popular historian Barbara Tuchman wrote *The March of Folly*. This challenging book includes historical accounts of societies that were on a destructive course and stayed on that course in spite of widespread understanding of the problem. Tuchman recognizes that when a society develops certain habits of behavior, changing directions takes enormous collective effort.

My favorite example in Tuchman's book is the British treatment of the American colonies prior to the American Revolution. She notes that the king and parliament were presented with numerous internal reports predicting that there would be a colonial reaction to prolonged and egregious economic exploitation. But that exploitation was so basic to British policies and behavior that even the American Revolution did not result in fundamental changes.

We must hope that we are not on a "march of folly" with our educational system in America. The current spate of reports and alarms is only the latest and loudest in response to trends that go back nearly

two decades. We have long known that American children do not perform as well as European or Asian children in standardized tests for mathematical skills and scientific knowledge and that they fall further behind with each year of school. Across the nation, the numbers of American-born students completing college degrees in science and engineering are actually declining, while these numbers are exploding in other regions of the world.

In the state of Washington, our high-school dropout rates are actually increasing, and the percentage of the state budget going to education is decreasing, with the greatest decreases occurring in higher education. Rather than providing incentives for our best students to continue their education, we are shifting costs to them with higher tuition and fees. And, while the cost of building and maintaining modern science and engineering laboratories is growing at double-digit rates, the public budgets for capital development in higher education have remained fixed for more than a decade.

At Washington State University, we are working to be part of the solution. We are strengthening our undergraduate curriculum, developing better science teachers, and putting our students in a research environment that we believe will better prepare them to compete. Our highest capital priorities place modern teaching and research laboratories at the top of our list.

However, increasing the numbers of students prepared to pursue our offerings and expanding our capacity to accommodate them will depend on hard decisions about standards and budgets that must be made now. The current literature clearly tells us that we have critical needs that we are not addressing. The unanswered question is whether our society can change directions when we know the negative consequences of where we are presently headed. ■

Read *Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (2006), fermat.nap.edu/books/0309100399/html

BILL WAGNER

UNCOMMON ACCESS

Gaylord Mink shifts his focus from viruses to WILD HORSES

BILL WAGNER

GAYLORD MINK, hunched over and quiet as a mule deer, picks his way through rugged rangeland near the center of the Yakama Indian Reservation.

Mink stops, straightens, and scans toward Dry Creek Elbow in the distance. Much closer, five wild horses lift their own heads to meet his gaze. They are all well within range.

The small band's stallion snorts a warning as the nervous mares and a colt seem anxious to bolt. Mink snorts back, and the stallion circles even closer to take up the challenge, dragging his wary entourage in his wake.

Mink is a hunter who doesn't pack a gun. He shoots with a video camera and bags scenes that few people would ever see if the retired Washington State University professor weren't lurking somewhere out there in the wilderness, his camera lens thrust through a thicket.

"I usually get out and crawl

around like a reptile among sagebrush and dirt and rattlesnakes," says Mink, whose face crinkles into frequent laughs.

Mink has spent his adult life on the hunt—first as an Army scout during the Korean War, then for the better part of four decades as a Prosser-based WSU researcher and professor who tracked down plant diseases that threaten some of the region's most valuable crops.

Now 74 and retired for a decade, by his own account Mink is hopelessly addicted to videotaping wildlife, a pursuit that calls him afield three to four days most weeks.

He shares his quarry—images that seem ready to gallop or soar off the screen—with the Yakama Nation and state and federal fish and wildlife agencies, who in turn use the films to teach the public about wildlife management.

In exchange, Mink gets uncommon access to critters ranging from black bears to bighorn sheep to burrowing owls.

"His dedication to getting the job done is pretty unbelievable," says Chuck Gibilisco, who coordinates the Washington Department of Fish and Wildlife's Watchable Wildlife program.

Mink has filmed burrowing owl behavior for the state agency's Web site. This year the partners hope to set up a live WildWatch camera inside an owl pair's burrow, allowing the public to observe the birds on the Internet without disturbing the troubled species.

Gibilisco believes that Mink's work could help turn the burrowing owls into "spokes-creatures" for the shrub-steppe landscape that dominates south-central Washington, where the habitat and owl numbers have declined.

After retirement, Mink learned about the Yakama Nation's various wildlife programs. That landed him on the range with wild horses.

"Without Gaylord, it wouldn't be happening," Gibilisco says. "He's such a tremendous resource because of his capabilities."

Gaylord Mink was an Indiana farm boy when he started working for a plant pathologist at Purdue University. After beginning his studies there, he took time off for military service, then returned and made a name for himself as a plant pathologist.

Mink specialized in viruses that attack fruit trees, so the year after earning his Ph.D. in 1961, it was a natural fit to continue his research in Washington's orchard country.

During his years in Prosser, he started programs that certify fruit trees as disease free, developed a lab to test for seed-borne viruses, and studied a type of ringspot disease that attacks cherries, peaches, and related fruits.

Well into his career, Mink signed up for a project with the U.S. Aid for International Development program. He traveled to East Africa six times during the 1980s and 1990s to research bean common mosaic virus, an African native that threatened bean seed production worldwide, including Washington's lucrative crop. Eventually, his work led to better understanding of the virus that in turn helped refine practices that now limit its spread.

Also during those years, Mink received a video camera as a gift and learned how to use it while aiming at waterfowl in the Yakima Valley. Naturally, he packed the camera for research journeys to Tanzania, Kenya, and Uganda.

"I developed a pretty serious passion for videotaping wildlife," he says. "I had my camera pointed out the window at anything that would walk, crawl, or fly."

After retirement, Mink learned about the Yakama Nation's various wildlife programs and volunteered to videotape a salmon project. That led to other assignments and eventually landed him on the range with wild horses, which are among his most exhilarating subjects.

Earlier ancestors of modern horses once roamed North America, but the wild horses of the Yakama Nation trace their roots to hardy Mustangs—with vestiges of other breeds released after the arrival of automobiles—first brought to the New World in the 1500s. They arrived north of the Columbia River in the 1700s, and the Yakamas quickly embraced the animal. By 1806, when Lewis and Clark bought horses from the tribe, the Yakamas were expert horsemen.

Today the Yakama reservation is home to at least 3,000 wild horses—by far the state's largest population. Wild horses were exterminated in many places but allowed to flourish on tribal lands, where they remain part of the Indian culture and economy.

However, today the horses might be too successful. They gobble the grasses that elk and other native species need. They scar the sensitive soils of sagebrush country, causing erosion that fills streams with silt and harms fish. They may degrade habitat where the Yakama

BILL WAGNER

plan to reintroduce pronghorn antelope and sage grouse.

The majestic animals, which have few predators, even harm themselves, because overcrowded horses are becoming stunted due to lack of forage and are more vulnerable to diseases, says Jim Stephenson, who works for the tribe as a large-animal biologist.

The Yakama Nation is in the process of developing a plan to manage horse herds that likely will include thinning their numbers by half or more, Stephenson says. He hopes many excess horses can be trained for riding, though some may have to be killed.

"The range has been hit pretty hard," Stephenson says. "We need to educate the tribal public as well as others on pretty much all aspects of the horse project. What [Mink is] doing is an important part of that."

Mink's documentaries also help the tribe preserve its culture, history, and lands through education, says Arlen Washines, a tribal member who manages the reservation's wildlife, range, and vegetation resources.

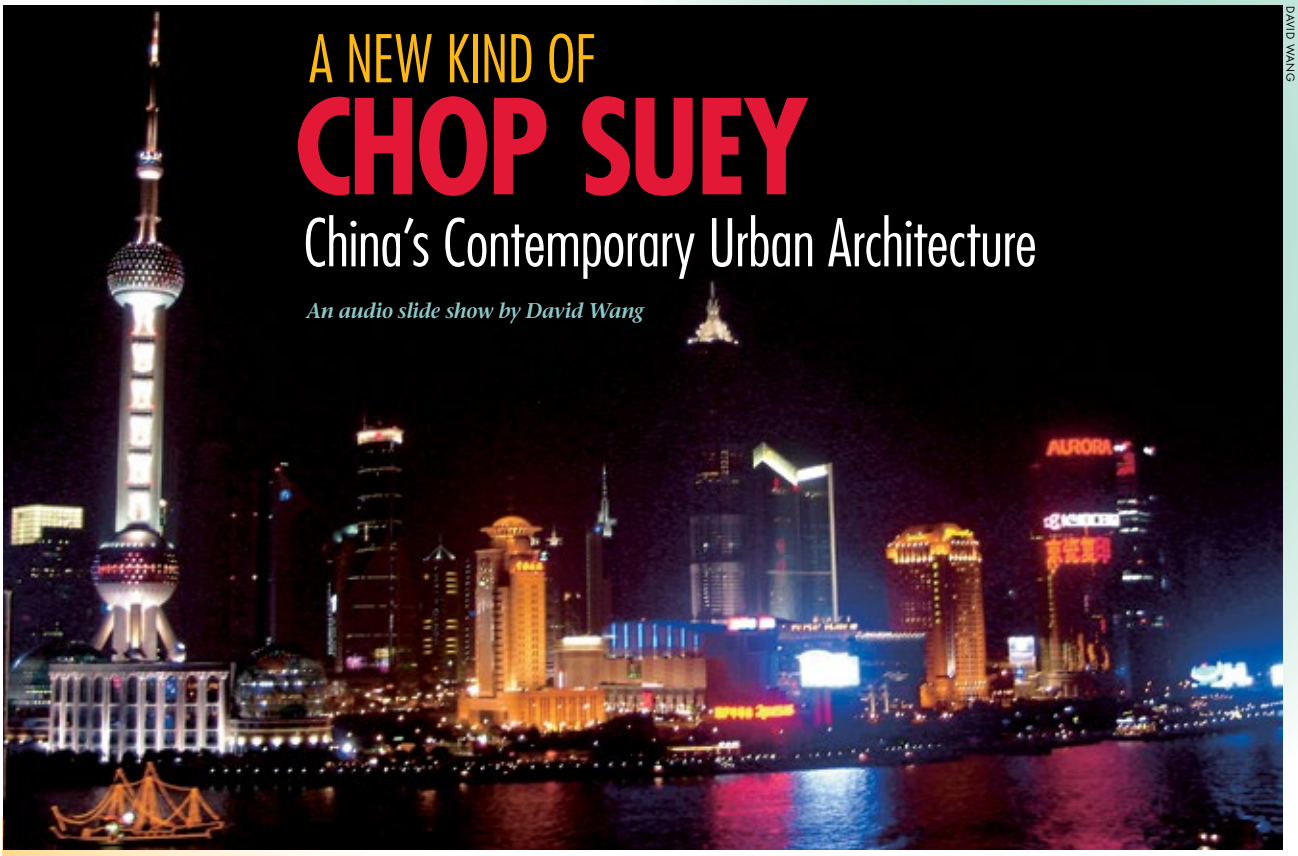
Mink is definitely not in it for the money; he donates his time and accepts reimbursement only for travel and videotaping expenses.

"If it ever turns out to be work," he says, "then I'll quit."

That seems unlikely, coming from the same grinning mouth promising to keep videotaping wildlife "'til either I die out there or somebody tells me I can't do it anymore." ■

—Eric Apalategui

***Writer Eric Apalategui and photographer Bill Wagner are frequent contributors to* Washington State Magazine.**



DAVID WANG

A NEW KIND OF CHOP SUEY

China's Contemporary Urban Architecture

An audio slide show by David Wang

VISITING CHINA'S CITIES in recent years is like watching time-lapse photography. Consider: the city of Shanghai had one skyscraper in 1985; now they are legion. In 1988, I looked from Shanghai's famous Peace Hotel on the Bund to the far side of the Huangpo River: nothing but a gray stretch of grimy shoreline. The view in the photo above is what you see from the same vantage point today.

In less than 20 years, Shanghai's Pudong District transformed from a forlorn swamp to something like the Chicago Loop. This kind of construction explosion doesn't afford much time to evolve a coherent architectural style. In traveling the country over the last 17 years—from Beijing in the north to Kunming in the south, from Shanghai in the east to Lhasa in faraway Tibet—I worked up a list of the ingredients for this architectural chop suey. I'd like to share that recipe. ■

—David Wang, associate professor of architecture, WSU

To see and hear David Wang's recipe for China's contemporary architecture, visit *Washington State Magazine Online:*

wsm.wsu.edu

SHELLY HANKS

Student Crista Ames and her roommate, Junko Matsumura, look at photographs from Japan.

FOREIGN STORIES

CRISTA AMES AND JUNKO MATSUMURA are both bright, friendly, and soft-spoken. They are just a few months apart in age. And both want to go out and see the world.

It was these common traits that brought the student from Kennewick and the student from Osaka together at McCroskey Hall last winter. They're roommates in a program that pairs international students with American counterparts to foster greater understanding between cultures. The residence hall, a former women's dormitory that was remodeled in 2001, is home to close to 70 students, half of whom hail from places like Japan, France, Wales, China, and Bahrain. In all, WSU hosts about 80 non-degree students, like Junko, each year. They come to learn English and experience a semester of study abroad.

While McCroskey has a healthy mix of residents from around the world, the number of international students attending Washington State University has dropped precipitously. For spring semester, enrollment was down to 538 graduate students and 582 undergraduates—down 8 percent from spring term last year—and this is the second year of decline. But WSU is no worse off than the rest of the nation, says Paul Svaren, the University's international enrollment manager. The decline here matches the national trend.

Part of the problem for WSU is that the community colleges that transfer foreign students here have been experiencing their own enrollment drop, especially after September 11. The community colleges have stepped up efforts to recruit overseas, but have had to battle negative images of the United States and concerns from students and families about safety, says Svaren.

On a larger scale, all the nation's schools are facing increased competition from other English-speaking countries, specifically Canada, Australia, and England. Those governments pay for recruiting, and they're promising the foreign students cheaper educations and easier-to-obtain visas, says Svaren.

But by this coming fall, the foreign enrollment outlook at WSU could change for the better. Washington's community colleges have been reporting a rise in numbers of international students, many now ready to transfer to a four-year program. "That pipeline will start feeding us more students," Svaren says. There is also a new initiative by the Saudi Cultural Mission to bring at least 5,000 students to the United States to learn English for a year. This spring WSU has 15 from that program, and that number is expected to double by the next school year, says Svaren. And China, Taiwan, Korea, Japan, and India, the countries that send the most students to WSU, are still offering a strong supply, he says.

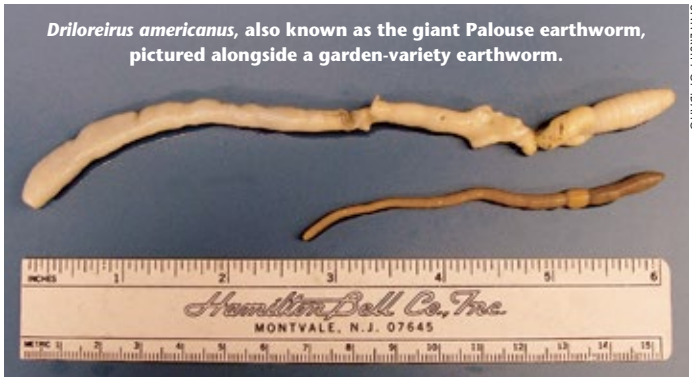
The current on-campus shortage meant that Crista Ames had to go without an international roommate fall semester. When she heard that a student from Kansai Gaidai University in Japan wanted an American roommate this spring, she eagerly volunteered, even though it meant living with someone very new to speaking English. Ames, an education major, had been to Honduras and knew the challenges of getting by in a new language far away from home. She also describes herself as a "mom-type," for whom helping a schoolmate from Japan comes naturally. "I really wanted to live with an international student," she says, as she sits next to Junko on her bed and peers into her roommate's photo album. "This was my one opportunity."

While living together has been fun, it hasn't been easy for either woman. During the first few days of Junko's five-week stay, there was a lot of pointing and gesturing, says Crista. Finally Junko resorted to a hand-held translator for help. But now the women, who share a two-room corner suite, have adapted to each other, and, in a way, are enjoying the struggle of communicating with someone from a different world. ■

—Hannelore Sudermann

A small representative of a BIG WORM assures that it is not extinct

A PALOUSE NATIVE, not seen in nearly two decades and feared extinct, has been rediscovered. While digging soil samples at the Washington State University botany department's Smoot Hill preserve, University



UNIVERSITY OF IDAHO

***Driloreirus americanus*, also known as the giant Palouse earthworm, pictured alongside a garden-variety earthworm.**

of Idaho graduate student Yaniria Sanchez-de Leon noticed a glimpse of white. Quick with her shovel, she captured the six-inch specimen of *Driloreirus americanus*, also known as the giant Palouse earthworm. Historically, specimens have been recorded as long as three feet. Although an observer reported it as "abundant" in the Palouse in 1897, tillage and competition from European earthworms seem to have taken their toll.

Smoot Hill contains the largest remnant of native Palouse prairie. Purchased by WSU in 1972, the 800-acre farm is also known as the Hudson Ecological Reserve, after biologist George Hudson, who negotiated the deal. More than 100 acres of the land are unplowed steppe. Another 100 acres are relatively undisturbed Ponderosa woodland. Research at the area has examined weed invasion, small mammal population biology, plant and insect relationships, and, of course, earthworm populations. ■

—Tim Steury

Smoot Hill

ROBERT HUBNER

SEASONS|SPORTS

SPORTS|SEASONS

SHELLY HANKS

A course of one's own, or

THE COFFEE-CAN COUNTRY CLUB

IF I'VE never seen a prettier golf course, I suppose it's because I built it myself, and because I was eleven.

It was 1966, and in my Salem, Oregon, neighborhood, I was that most exotic of hothouse flowers: a golfer. I loved playing baseball. I loved football, too, at least the passing and catching, if not the hitting and hurting. But I regarded myself as a golfer. Golf was uncanny, old, impossible, beautiful, soul snatching. I knew these things already. In a neighborhood of robust, rowdy, baseball- and football-loving brawlers, I was, at best, a curiosity.

The field behind my house, all 290 yards of it, was my walk to school, Cummings Elementary. Wanting to know if it could contain a 300-yard drive when I was capable of such a thing, I measured it myself, laying a yardstick end to end. It was known simply as the Field. Unimproved, except for an annual mowing, it was our playground for baseball and football, an essential place.

It was 120 yards wide, and had a dip to it just beyond my back yard, a rustic flaw for our baseball field: the left fielder was about six feet below the level of the batter. Correspondingly, our football field sloped severely from about the 30 all the way to the opposite goal line. The grade then made it an even more terrible thing to face 14-year-old Tim Faville, a junior-high star who had real cleats and a silver front tooth, returning a kick-off. Tim, running at you downhill, was the stuff of nightmares and awe.

But what were topographical imperfections for the games of exacting lines and dimensions were perfect for a golf course. I looked at the field as a 17th-century Scottish shepherd once looked at a piece of desolate ground near the Firth of Tay and started knocking rocks around to ward off boredom. In spirit, there was little difference between my unlovely ground and a nascent St. Andrews.

ABOVE: Bill Morelock (left) and Dave Tengesdal, another of the Salem golfing fraternity.

I designed and built a nine-hole course, measured it with my dogged yardstick technique (didn't my father have a tape measure?), made up scorecards.

I'd had some experience on real golf courses, but putting greens were still magic to me, dream-perfect, unicorn-like. Their actual existence in the world was one of the great mysteries. On my course I dealt with the rugged real earth.

The field was a combination of fodder hay, fescue, cheat grass tufts, patches of bare dirt, and odd bits of tar paper blown off the school roof in the Columbus Day Storm of 1962. Once I chose a location for a hole, I buried an empty one-pound can of Folger's coffee in the ground and leveled off the dirt flush with the rim. The holes were a pleasure. Shiny and clean when the course opened, the characteristic sound of the ball falling into the "cup" with a metallic thud became related to the thrill of sinking a putt on a green where a three-footer could take a 90-degree turn a foot from the hole. I've never understood pros complaining about greens. With a hand mower, I created a primeval putting surface about 10 feet in diameter.

My mother lavished time and art on the flags. Red pennants about nine inches wide, white numerals sewn on the red field. One through nine. Stapled to wooden stakes, the flagsticks stood about two and a half feet tall after they were pounded into the ground just behind the hole. In the evening, with the sun low and a light breeze, the fluttering flags were as pretty a sight as any available at Oakmont or Pinehurst or Pebble Beach. Par (27) was certainly as difficult, despite the modest length, ranging from 113 yards down to 35. The pin placements were just too devilish, the conditions too natural. The scores corresponded more to the era of Willie Park and Young Tom Morris.

As I worked, with my garden spade and yardstick and lawn mower, I felt exposed. This was a large, and very public, commitment. Would the other guys understand? Would they approve this land use?

One evening as I was practicing on what I called my driving range, Tim Faville came over. I was nervous. I might as well have been practicing pirouettes.

"What have you been doing out here?"

I told him, from design to excavation to coffee cans.

"Uh-huh," he said, mulling over an anthropological oddity. "Let's see that."

He examined my Patsy Hahn signature 7-iron (awkward age: too tall for junior clubs, too short for men's) more with real curiosity than amused tolerance.

"We have some of these," he said. "I'll be right back."

I was relieved. Tim Faville, the neighborhood's premier athlete, wanted to try my game. He returned in a few minutes carrying something Harry Vardon would have called an antique. The head was rusted and the word "mashie" was barely legible on the back. Roughly a five-iron. The hickory shaft was warped to a near parabola. Tim smiled, his silver front tooth shining wildly, extremely pleased with his antediluvian weapon.

He addressed the ball, and the world went cockeyed. I'd watched him hit a baseball three thousand times, and this was all wrong.

"You're not left-handed."

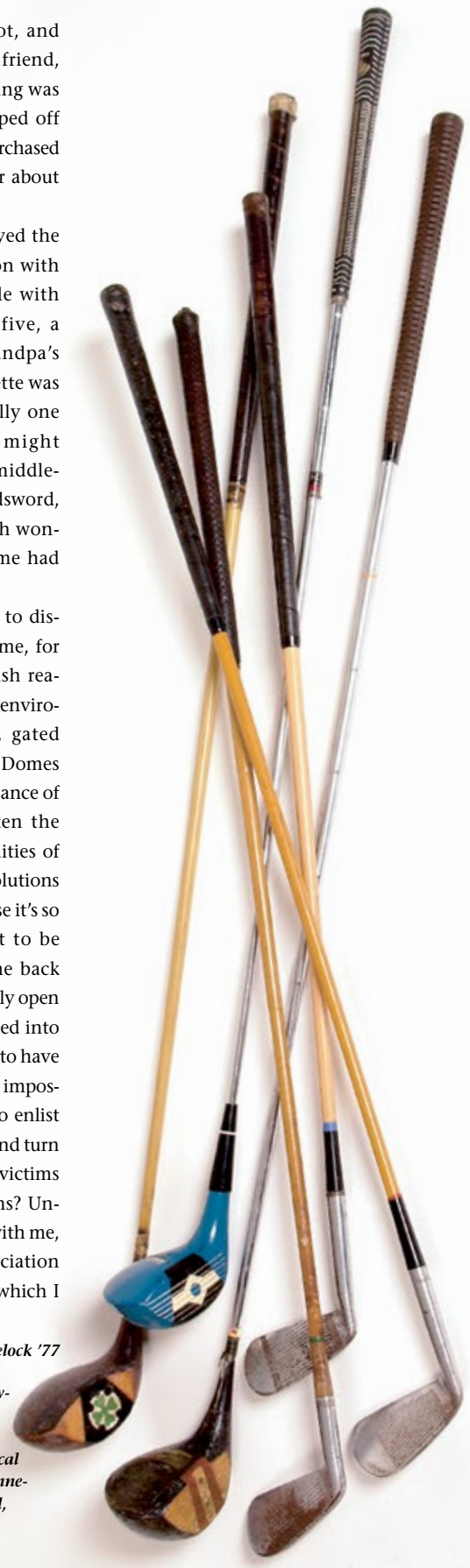
"No," he replied, calm as the Buddha, "but the club is."

And then, holding this relic from the Harding administration, and standing on the wrong side of the ball, Tim Faville (with luck or natural virtuosity I can't say) hit a perfect shot. A devastating high, he was hooked on the spot, and told his brothers and their friend, Jeff Lewis, that this golf thing was okay. Together we all trooped off to Sears, where they each purchased one shiny new golf club for about four bucks.

All summer long we played the course, Jeff with his six-iron with the green grip, Kurt Faville with his seven, Tim with his five, a modern tribute to his grandpa's mashie. Their course etiquette was a little raw, and occasionally one of the Faville brothers might threaten another with a middle-iron raised high like a broadsword, but mostly I looked on with wonder and pride that the Game had come to the Field.

Over the years I've tried to dismiss the game, quit the game, for the all the usual wise-foolish reasons: socio-economics and enviro-stresses of country clubs, gated communities and Pleasure Domes in the desert; for the malfeasance of multinationals which fatten the tour, for the market absurdities of perpetual technological revolutions in equipment. Or just because it's so foolish. But I submit that to be eleven and to walk out the back door and tee it up on a homely open field that one has transformed into a golf course of one's own, is to have an experience with the game impossible to escape. And then, to enlist the neighborhood skeptics and turn them for the summer into victims of the game's thorny charms? Unutterable sweetness. I carry with me, like it or not, a latent association between golf and pure joy which I can't completely sever. ■

—Bill Morelock '77



SHELLY HANKS

A broadcaster and writer following inglorious service on the WSU golf team from 1974 to 1977, Bill Morelock hosts classical music weekday evenings on Minnesota Public Radio in Saint Paul, minnesotapublicradio.org.

ROBERT HUBNER

Undergraduate John Renshaw '06 and physicist Tom Dickinson

LEARNING WHAT IT IS TO DO SCIENCE

"I can take a fairly nontraditional idea and try it, because undergraduates aren't afraid of anything."

—Tom Dickinson

A FEW YEARS AGO, TOM Dickinson lifted the lid from his grande americano and started wondering about the water droplets that clung to its underside. Why were they that size? Why did some merge into bigger drops surrounded by little drops?

Coming from someone else, such questions might indicate that the asker has too much time on his hands. Coming from Dickinson, they launch serious research—and new careers.

Dickinson has an international reputation in the physics of surfaces and optics, and a lab that every summer brims with undergraduates doing research projects. In fact, his resume wouldn't show nearly the breadth it does without his young collaborators. He says undergrads have let him branch out into new lines of inquiry, because they bring an exhilarating fearlessness to laboratory work.

"I can take a fairly nontraditional idea and try it, because undergraduates aren't afraid of anything," he says.

An idea like how water droplets behave. He enlisted undergrad Ryan Leach '04 to film the formation of drops on a clear plastic sheet and develop a mathematical model to describe their growth and movements. Leach ended up showing that droplets can be used to mix minute quantities of chemicals, allowing the production of specks or nanoparticles that have biomedical applications such as delivering tiny doses of a drug to a particular site in the body.

Dickinson explains that scientists run two main risks with any new experiment: first, whether it will work at all; and second, if it does work, whether the results will be meaningful and valuable. On the other hand, he says, "if you don't take risks, you won't make breakthroughs."

That poses a problem for graduate students; since they need to get publishable results to progress in their careers, they tend to choose—and their advisors encourage them to choose—projects that are likely to succeed. In other words, projects that are safe.

It's different with undergraduates.

"They have no fear of failure, because it's all exciting to them," says Dickinson. "We can try new things, even though they're risky. And these kids are willing to do it."

The risky ideas his students pursue usually emerge from Dickinson's own quirky curiosity about things most of us don't think twice about, like the droplets on his coffee lid, or how breaking a Wint-O-Green Lifesaver generates sparks of light.

Several of his undergraduates have worked on triboelectricity. "Tribo" refers to friction, and "triboelectricity" is the charge that is generated when two surfaces touch or rub against each other. It's what gives you a shock when you get out of your car or touch a light switch after walking across certain kinds of flooring. In the lab, Dickinson and his crew move a tiny electrical probe along a surface and measure the charge separation that develops.

"It's a function of how hard you push, how fast you move, and the materials," he says. Understanding triboelectricity is crucial in the production of ever-tinier electronic components, where even small discharges can severely damage the product.

The friction that creates triboelectricity isn't always damaging; it also can be harnessed as a lithographic or etching tool. Former student Ann McEvoy '05 used it to create a minute trench in a mica surface. It was an early step in creating a tiny holding pen for strands of DNA prior to their use in an experiment.

Despite working on relatively risky projects, more than half of Dickinson's undergraduate collaborators end up publishing their work with him in scientific journals. That's a huge advantage when the

students seek admission to graduate schools. McEvoy is now working toward a Ph.D. in biophysics at the University of California-Berkeley. Leach is studying meteorology—probably the pinnacle of droplet research—at the Navy Post-graduate School in Monterey, California.

Dickinson says he pushes his student researchers hard to take their research as far as they can.

"One of the functions that I think we perform here is getting them to realize what they have to do to write a publishable research paper," he says. "It's different than a report submitted to a teacher. It's really a couple of notches harder."

Other benefits of the experience are subtler. The students get to know firsthand how a first-rate scientist thinks.

"Often you'll start with one thing, and it goes off in another direction," Dickinson says. "That's something that I think is good for them to see."

One of Dickinson's favorite moments is when students come to him with a result they didn't expect and don't understand.

"They'll see something and know that it's new, but they don't know what to do next," he says. When that happens, Dickinson starts with the questions: Can it be explained? Is it valuable? What do we do with it?

When they're able to see on their own what to do next—"That's a *big* step," he says.

With the hindsight of someone who's come through the program and is now embarked on her own career, McEvoy sums up her experience. Amid the brainstorming and troubleshooting, she says, what Dickinson taught her was "what it means to 'do science.'" ■

—Cherie Winner

PHOTOS COURTESY OF THE OLMSTEAD FAMILY

cherries

The Sweet Fruit of Worry

IN MARCH, Don Olmstead Jr. ('70 Hort.) watches over his cherry trees night and day, ready to activate a heating system or switch on the wind machines to protect the tender buds from a killing frost. It's a task he shares with his son and business partner, Don Olmstead III ('98 Hort.).

In April, the Olmsteads worry about pollination, which only works if pollen is on the blossoms and weather is right for insect activity. Since most cherries can't self-pollinate, there must be another variety close by and in bloom. To facilitate cross-pollination, the Olmsteads hire one beehive per acre, inviting a few million bees to their ranch for a brief but crucial period. "There's even a risk of whether the bees can get out when the pollen is on," says Don III. If it's too cold, they won't leave the hive.

Next the pollinated cherries emerge from their husks, growing in a rapid spurt that determines their ultimate size. At that point, the skin is very delicate. "Then I'm worried about a wind storm, which could mark them up," says Don Jr. "The result is not a bad fruit, but it's not a perfect fruit."

As the leaves come out, the orchardists watch for mildew. Unchecked, it could spread from the leaves into the fruit.

Don Olmstead Jr., Don Olmstead IV, and Don Olmstead III.

When cherries start to turn color, the Olmsteads guard against birds, though this is one part of nature they can't control. "We have tried everything," says Don III. Fish oils. Scare guns. Ribbon tied to branches. They've even tried broadcasting distressed birdcalls from speakers set among the trees. "We've kind of come to a point where we say, 'Well, they're going to take a certain percent,'" he says. "We just hope they leave us enough."

The Olmsteads brace for other dangers too. "Cherries have vintage years, just like wine," says Don Jr. "In the last three years, two of them have been vintage, with one rather poor one in between with a rain storm." When the cherries are near ripe, rain can cause their skin to rupture, and "the consumer just doesn't care for split cherries," he says.

When the short harvest season arrives in June, the family farm grows from six full-time workers to nearly 200. The fruit must be hand picked, and the Olmsteads pack much of theirs out in the orchard. "The Rainier is so delicate, even the slightest rubbing shows up," says Don Jr. So they teach the workers which cherries to pick, to pick them by the stem only, and to gently place the fruit in a bucket. At the packing station they transfer the cherries from the bucket to the packing box, again by touching only the stems.

All this work for such a quick harvest and such a risky crop can

still be rewarding, say the Olmsteads. "Every year is a different challenge," says Don Jr. "My wife and I, we have no interest in Vegas other than the bright lights. We gamble for a living."

"For us it is a way of life," says Don III. "The things you worry about in a year, they are a part of you. Once it's in you, it's hard to get it out."

The 2006 cherry season is upon us. For a few weeks in the summer starting in early June, fresh, sweet Washington cherries will color produce stands and grocery stores around the state. The small, round stone fruit comes in a range of varieties and colors, from a delicate yellow to a deep, hearty purple-red. Washington's sweet cherry farmers dominate the industry, producing more than half of the nation's crop. The state's soils and cooler, dryer climate are particularly prime for raising this most risky of tree fruit. Cherry country spans the middle of the state, from Okanagan County in the north down to Benton in the south.

The Olmsteads, whose farm lies in Yakima County, grow three varieties: the Bing, a firm fruit with a deep red skin; the Van, another red-skinned variety; and their favorite and the most fragile, the Rainier.

The yellow- and pink-skinned Rainier came from Washington State University's cherry breeding program back in the early 1960s. It was made by crossing a Bing with a Van, and it produces many pollen-laden blossoms. Who would have known that the combination of two dark sweet cherries would result in a "fantastic yellow-fleshed big cherry," says Matt Whiting, a horticulturist at the WSU Research and Extension Center at Prosser. "That tells you something about cherry breeding. Serendipity is a big part of this."

The Rainier was bred as a cross-pollinator by Harold Fogle, a USDA breeder who worked at the WSU research station in Prosser. No one knew how good it could be as an eating fruit, until farmer Grady Auvil of Douglas County took note one year, after a major frost severely thinned the Rainiers, that what remained was this massive, beautiful fruit. By the 1970s, the Rainier cherry was a hot commodity, fetching almost twice what people were paying for Bings.

In hopes of creating more successes and finding a way to make cherries easier to harvest and even more appealing to consumers, WSU has reinstituted a cherry breeding program at Prosser. Whiting is now heading the effort.

In choosing cherries for your table, it's all a matter of taste. For a red cherry, look for colors in the range of dark red to mahogany. "And you want to see a natural shine," says Whiting.

Hunt for the freshest cherries at your local farmers markets, or, if you have time, find an orchard and fetch them yourself.

Store them in the refrigerator, and they can last for up to two weeks. And enjoy them while they're in season. It's all too brief. ■

—Hannelore Sudermann

THE CUB

BACK TO THE FUTURE

WORK HAS begun on a two-year, $86-million project to remodel the Compton Union Building. The plan is to modernize the 1951 building, carving out 53,000 square feet for stores and restaurants, installing a new state-of-the-art auditorium, and introducing more light and style.

The price tag, 60 percent of which will be covered by a student assessment of $120 a semester, is the highest in Washington State University history. That's because at six stories and 235,000 square feet, the CUB is one of WSU's largest buildings, says Travis Duncan '05, the CUB project coordinator. The renovation involves gutting the entire building and the costly endeavor of refitting everything, including windows, wiring, plumbing, and mechanical elements, he says.

The structure, which now seems like a cave in some places and a maze in others, will be as big and as open as possible, says architect Stephanie Kingsnorth of Pfeiffer Partners, the Los Angeles-based firm that, along with Integrus Architecture of Spokane, is planning and running the renovation of the 55-year-old structure.

The plan is not to overwhelm the vintage building with a new architectural statement, but to update it, enhance the entries so the CUB is welcoming on all four sides, and make it more environmentally friendly, say the designers. "We're doing it right this time," says Duncan.

The bulk of the retail space will go to the Student Book Corporation (Bookie), which is in its second year of a 10-year management contract with Barnes and Noble College.The store is destined for the northwest corner of the building and will occupy two floors. The Bookie's rent, along with money from other new retail entities, will defray the costs of the building for the students, says Isaac Wells, president of the Associated Students of Washington State University.

The project is scheduled to start May 15, 2006, and should be ready for a grand opening before the start of fall semester in August 2008.

It will be a hardship to have the CUB closed for two years, say the planners, who spent spring semester relocating 35 student programs and organizations to other parts of campus. But in the end, WSU will have a student union that will last the next half-century, they say. To view floor plans of the renewed CUB and get more information about the project, visit cub.wsu.edu/CUBRenewal/index.html. ■

—Hannelore Sudermann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THE Making

by Hannelore Sudermann

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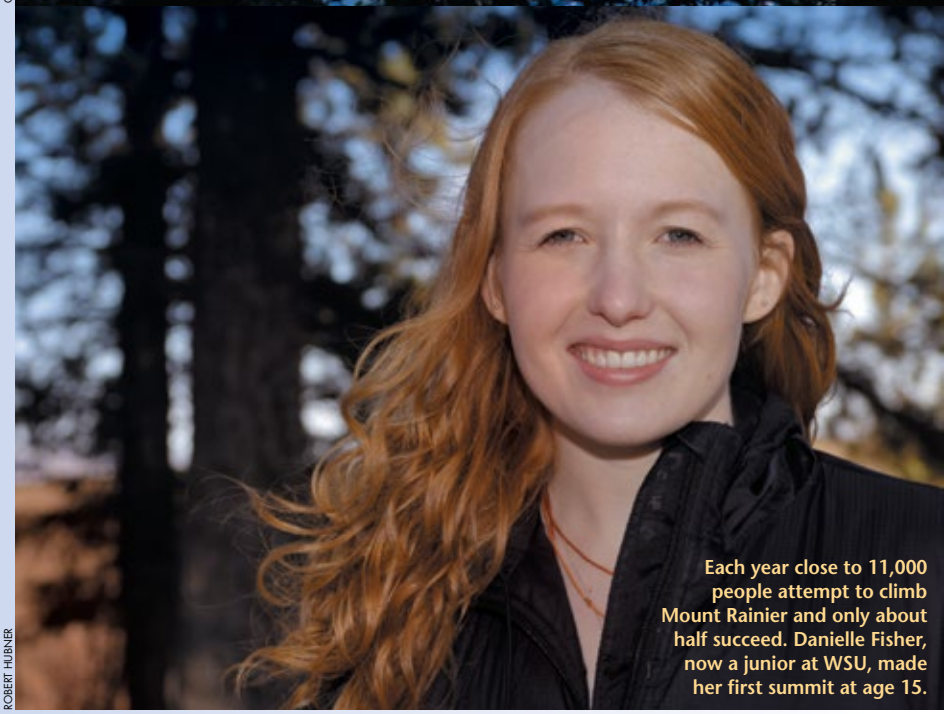

ROBERT HUBNER

Each year close to 11,000 people attempt to climb Mount Rainier and only about half succeed. Danielle Fisher, now a junior at WSU, made her first summit at age 15.

WHEN SHE WAS JUST 15, Danielle Fisher discovered her alpine addiction on Mount Rainier.

That trip wasn't the first climb for Fisher. She ascended Mount Baker a few weeks before, and she hated it.

"I was tagging along with my dad," she says. "He liked being in the mountains, and so did I." But the climb was scary and challenging. At one point Danielle lost her footing and fell, posing a threat to the team to which she was roped.

A couple of weeks later, she went along on an ascent of Mount Adams, the second-highest peak in the state and a popular mountain for beginners. "It was harder," she says. "I didn't enjoy it at all." Still, when her father offered to turn around, she refused.

"Two weeks later, we did Mount Rainier," says Jerome Fisher. To their surprise, "that's when it clicked." Even though Danielle had injured her leg, was carrying more weight in her pack, and had to spend the night on the mountain, Rainier did the trick. Neither of the Fishers could account for the change.

Last summer, the slender 20-year-old from rural Bow, Washington, became the youngest person in the world to summit the highest mountains on all seven continents.

Since Danielle was a baby, her parents, Jerome, a former Washington State University student, and Karen ('75 Ag.), would take her and her sister, Bobbi ('05 Civ. Engr.), on outdoor trips, day hikes, and horse camping. The Cascades were familiar territory for the Fishers, who could see Mount Baker from their back yard.

After the Rainier climb six years ago,

# of Mountaineers

DANIELLE FISHER

Fisher sits on the summit of Mount Elbrus of the Caucasus Range in Russia. In 2003, she summitted this, the highest peak in Europe.

Danielle was eager for whatever the Cascades could offer. That summer, between her freshman and sophomore years of high school, she summited 12 mountains.

When Fisher took on Mount Baker again during her second summer of climbing, she tackled the north ridge, a more technical climb than her previous one. Her guide was Christine Boskott of Mountain Madness, one of the leading woman alpinists in America. "She is a strong and driven climber," says Boskott of her young client, adding that Fisher was a good team member who took the initiative to help another climber out of a jam.

That strength showed again in her uncomplicated ascent of Everest last summer. Fisher was one of the few on her team to reach the top. "Danielle . . . seems genetically designed for high altitude, and nothing slows her down," notes Tony Van Marken, a fellow climber who struggled to follow her up the mountain.

"She has the gift to go climb high," says her father. Jerome Fisher realized that a few years ago on a peak in South America. Though he and Danielle at first lagged behind the other climbers, having stopped for about an hour to warm Danielle's feet and ward off the early stages of frostbite, she caught up to and passed everyone who had gone ahead, showing no effect from the thin air.

Fisher asked his daughter if she would like to try climbing the Seven Summits—the highest points on each continent—since she had a shot at being the youngest person to reach all seven peaks. The record holder at the time was a 23-year-old man, and the youngest woman to have climbed all seven was 33.

"I said yes," says Fisher. "At that point, I figured I had five years to do it."

She did it in two, joining the ranks in 2005 of an elite fellowship of world-famous climbers who got their start on Washington's peaks—climbers like Ed Viesturs, known around the world for his high-altitude abilities.

Viesturs first got hooked back in the 1970s on the pre-eruption Mount St. Helens. The climb's stunning views and technical demands were thrilling enough to send the raw college freshman from Illinois back for more.

If you look around the world for alpinists, you'll find one of the highest concentrations right here in Washington. Whether they're born here like Fisher or drawn to the state like Viesturs, they all develop their mountain habits and hone their skills on the sharp teeth of the Cascades.

One of the most widely read adventure stories of recent history, *Into Thin Air*, the account of a deadly season on Mount Everest, was written by Jon Krakauer, who lives in Seattle. Many of the book's characters were Washington based, including a member of Krakauer's

Danielle Fisher on Mount McKinley in 2004. At 20,320 feet, it's the highest peak in North America.

DANIELLE FISHER

So why is there such a Washington presence on the world's highest and most dangerous peaks? Simply put,

climbing team and a guide on another team. Viesturs was there, too.

Then consider Jim Whittaker of Seattle, who in 1963 was the first American to climb to the summit of Everest, and his brother, Lou, founder of Rainier Mountaineering, Inc.

Washington was also home to writer and teacher Willi Unsoeld, one of the most famous of American climbers of the 1960s and 70s.

A MOUNTAIN LEGACY

So why is there such a Washington presence on the world's highest and most dangerous peaks? Simply put, "Washington breeds climbers," says Jerome Fisher.

August Valentine Kautz, a lieutenant stationed at Fort Steilacoom, tried to climb Rainier in the summer of 1857. The German-born soldier prepared himself by reading the accounts of European alpinists who had climbed Mont Blanc. He and a few soldiers who volunteered for the expedition took along shoes with nails pushed through the soles for the ice-covered portion of the climb of the highest peak of the Cascades. The group made it across a glacier and to a high point, but could see that it was still further to the top. As it was freezing cold and night was imminent, they decided to turn and head for camp, considering their near-summit a success.

While the earliest explorers extolled the stunning views of all the mountains in the range, Rainier remained an obsession. Thirteen years after that first attempt, General Hazard Stevens, son of the first governor of Washington Territory, and his acquaintance, P.B. Van Trump, reached the summit. According to Stevens's account, published in the *Atlantic Monthly* magazine, they were helped by a farmer named James Longmire and an Indian named Sluiskin.

Stevens and Van Trump reached the top of Rainier on August 17, 1870. It was after 5 p.m., and a storm was blowing in. They had to spend the night on the glacier. What saved them was a steam vent that exhaled warm sulfur breaths into a snow cavern. There they huddled through the night and then raced back to camp during a break in the weather the next morning. They celebrated their return with hot coffee and morsels of marmot, the only creature their Indian guide had managed to trap.

The first Rainier fatality came in July 1897, when Edgar McClure, a professor at the University of Oregon, was on an expedition to measure the exact height of the mountain. Standing on a precarious ledge, a large barometer strapped to his back, he turned to his companions and said, "Don't come down here; it is too steep." Those were his last words, according to an article published that

"Washington breeds climbers," says Jerome Fisher.

year in the *Seattle Post-Intelligencer*, before he lost his balance and fell into a deep ravine.

Still, the popularity of the 14,400-foot mountain grew. A 1911 article in the *Chicago Evening Post* observed, "The public is just beginning to realize that one of the wonderlands of the world is within the confines of Mount Rainier National Park." The story noted that in 1906 the park had only 1,786 patrons, but in 1911 was expecting 12,000. Today the park sees about two million visitors annually, about 11,000 of whom try to climb the mountain. Usually only half succeed.

Nowadays, the summer crowds at Rainier tend to drive away the most serious climbers. Consider John Roskelley '71, who first climbed Rainier when he was a teen. His father was the Outdoors editor at *The Spokesman-Review* and often brought home books about climbing to review. Roskelley devoured the books and was eager to have his own adventures. So his father signed him up with the Mountaineers club in Spokane. He remembers the day they tackled Rainier. The weather was poor in the morning, and his equipment included his old Boy Scout pack, his dad's Army sleeping bag, jeans, and a pair of rubber boots. "It took me a few years before I got some decent equipment."

Roskelley didn't let a little thing like college get in the way of his mountaineering. His first weekend at WSU, he stayed on campus to study for a test, which he then flunked. "When I got that F, I said to myself, either I'm not supposed to be here over the weekend, or I'm not supposed to be here at all." From then on, as soon as his classes were over, Roskelley and his climbing buddy, Chris Kopczynski '71, would head for the mountains. "The whole Northwest was our playground," he says.

Today, Roskelley makes climbs around the world. In 2003, he climbed Everest with his 20-year-old son, Jess, who set the record as the youngest American to summit the mountain. (*WSM*, winter 2003-04) And when he's home, Roskelley climbs everywhere but Rainier. It's the perfect situation. Thanks to the mountain's popularity, "everyone neglects the other peaks," he says.

There's Mount Baker, all glaciers and views, the massive Mount Adams to the south, and the pyramid-topped Mount Shuksan to the north. Out toward the coast through old-growth forest rest Mount Olympus and the steep slopes of Mount Deception.

The state is covered with mountains and ranges, from the Olympics, east to the Cascades, north to the Selkirks, and south to the Blues. Hiking, climbing, bouldering, snow camping, rock scrambling, back country skiing, or just walking in the woods—there are dozens of parks and thousands of acres to do all of these things in Washington.

"You can spend your whole life here and be happy," says Viesturs.

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Two women and three men on a mountaineering expedition sit atop Pinnacle Peak at Mount Rainier National Park. The photo, which is part of the Rainier National Park Mountain-Glacier Wonderland Photograph Album, is dated circa 1925.

DRAWN TO THE PEAKS

Growing up in Illinois, Ed Viesturs could only read about mountain climbing, and he developed quite an appetite for the adventure tales. Then one day during his senior year of high school, a friend's mother mentioned someone at college in Washington, and "a light bulb went off," he says. He enrolled at the University of Washington sight unseen. He saw campus for first time on the fall day in 1977 when his parents dropped him off. It was a step into the unknown. But if he ever needed reminding of why he chose the school, he had only to look out his dorm window to see Mount Rainier. "It was like my Everest," he says.

Viesturs didn't know anyone in Seattle. But he was quick to find the sporting goods stores. He'd pore over their reader boards, hunting for announcements from people looking for climbing partners or carpools. He'd call the numbers and say, "Hey I don't know much about climbing, but I'd like to learn. And I hope you have a car."

He experienced his first big climb that fall: Mount St. Helens, one of the most popular peaks in the Cascades prior to its 1980 eruption. Its gentle slopes and 9,000-foot stature made it an easy target, but it locked Viesturs into climbing for good.

"To have read about all these mountaineering expeditions and not to have done one was so frustrating," he says.

"When I got to the summit, I thought, 'This is it. This is what I've been seeking.'"

The glaciated St. Helens, which required crampons and ropes, was everything he had hoped. "When I got to the summit, I thought, 'This is it. This is what I've been seeking.'"

After St. Helens, Viesturs couldn't wait to climb Rainier. So in the winter of 1978, he and some friends decided to avoid the warm-weather crowds and made several attempts at the mountain, finally succeeding. The park rangers advised them to be prepared, but in a manner that has served Viesturs throughout his climbing career, the group was willing to turn around when things weren't going well. "I decided long ago that this has to be fun, but I want it to be safe," says Viesturs. "I do not want to die on a climb.

"The art of mountaineering is managing the risk," says the climber, who has walked in the footsteps of friends who had died on a climb a few days earlier. "You are either allowed to go up, or the mountain just says, 'Uh, uh, you've got to go home.'"

What makes mountaineering interesting for him is the uncertainty. "If you knew you'd get to the summit, why bother?" he says. What brings him the most respect from other climbers is his willingness to turn around, even with the summit in sight.

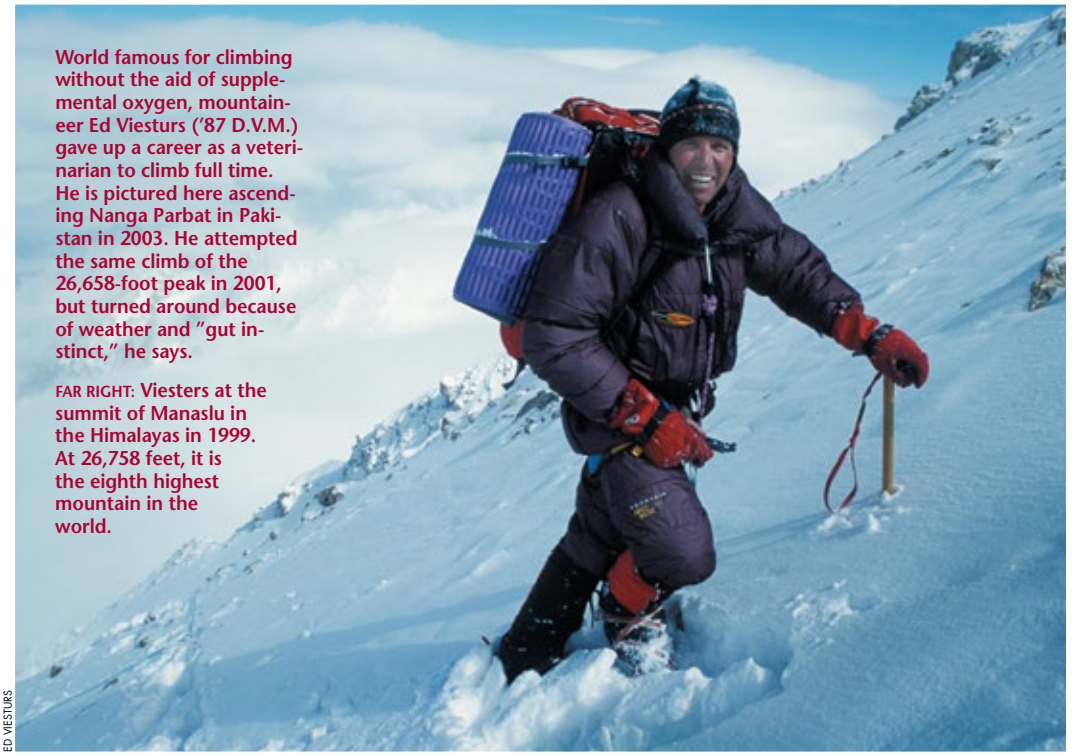
The mountains of Washington are the perfect training ground for mountaineers, says Viesturs. "They're glaciated, they're steep. The weather sucks."

"Climbing here makes you tough, strong, and capable," he says. "You can take that experience all over the world. You are used to the hardship."

After college, Viesturs enrolled at WSU, following through on his plan to become a veterinarian. The challenge of the program and the distance from the mountains really ate into his climbing time. "I was so bummed," he says. He consoled himself by spending summers as a guide on Rainier. At the time, he didn't have an inkling of becoming a professional climber. He finished vet school—and made his first Everest expedition—in 1987 and joined a practice, taking time off to go on climbs. But that arrangement didn't last beyond 1989. He had to choose between climbing and a veterinary career. Climbing, of course, won. Still, Viesturs manages to use his training in biology, medicine, and physiology when he's in the mountains, sometimes serving as medic for his team.

Viesturs attracts climbers and fans who are more interested in his accom-

ED VIESTURS



ED VIESTURS

World famous for climbing without the aid of supplemental oxygen, mountaineer Ed Viesturs ('87 D.V.M.) gave up a career as a veterinarian to climb full time. He is pictured here ascending Nanga Parbat in Pakistan in 2003. He attempted the same climb of the 26,658-foot peak in 2001, but turned around because of weather and "gut instinct," he says.

FAR RIGHT: Viesters at the summit of Manaslu in the Himalayas in 1999. At 26,758 feet, it is the eighth highest mountain in the world.

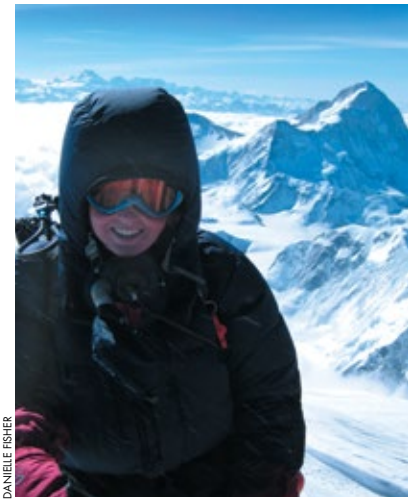
plishments and his lungs than his durable good looks and affable personality. He is one of those rare climbers with both the mental acuity to safely and efficiently climb a mountain and a natural ability to thrive at high altitudes. In 1997 pulmonary experts looked at Viesturs and determined he had a greater-than-normal lung capacity, above-average endurance, and the ability to manage on low oxygen. Simply put, "at high altitude, I'm not as debilitated as most people," he says.

In 1996, the season of the events described in *Into Thin Air*, he came to climb Everest without supplemental oxygen in pursuit of his goal to scale all 14 of the world's peaks higher than 8,000 meters. He became a hero on that expedition, helping to save lives on the mountain, and gaining the summit as he had hoped.

Last May, completing a successful assault on Annapurna, he climbed into the record books as the first American to summit all 14 peaks without the aid of oxygen.

Today Viesturs and his wife, Paula, live with their two children in the Seattle area, just a quick drive from the mountains. Twice every summer the elite climber is the star attraction in a guided climb up Rainier, an exercise he modestly calls "a good workout." It's one he's done nearly 200 times.

Danielle Fisher was one of the few members of her large team to attempt to summit Mount Everest last summer. At the top, she pauses briefly and takes off her oxygen mask for a picture.



DANIELLE FISHER

AT HOME IN THE HILLS

Since her first difficult climb of Rainier, Danielle Fisher has quickly become a seasoned mountaineer. In fact, she's somewhat embarrassed to tell people just how quickly. In January 2003, she and her father climbed Aconcaqua, the highest peak in South America. That summer, while her friends were headed for the beach to celebrate the end of high school, Fisher boarded a plane bound for Africa and Mount Kilimanjaro. She climbed that mountain, got on the next plane to Russia, and in the same month ascended Elbrus. In January 2004, she climbed Kosciusko in Australia, and that spring went on to Mount McKinley. The following January, she climbed Vinson in Antarctica, and in June 2005, with a team from Seattle-based Alpine Ascents, topped off the seven summits with Everest.

It wasn't the best season for the world's highest mountain. In 2005 there were only three days when climbers could even attempt to summit Everest. Part of it was a waiting game: weeks of waiting for a break in the weather, waiting for her teammates, and waiting for her body to adjust to the altitude. Fisher found she was better at it than many of her fellow climbers. In fact, most of her 12 teammates didn't make it above Camp Two, the second of four stations on the way up the mountain. Some left because they were scared. Some were physically unable to continue because their bodies wouldn't function in the oxygen-deprived atmosphere. "And then there were people who just lost the heart to go further," she says.

"I was never going to lose heart and turn around," says Fisher. "I thought, 'If I'm sick and throwing up, I'll turn around, but not right now.'"

On the day of her summit, all she consumed was a bit of candy bar and some Gatorade. She was exhausted and shaking, but still in better shape than some of her teammates. "I was a little bit worried," she says. "I was thinking, 'I can get up there, but what if I can't get back?'"

But then she got to the South Summit and realized she had the energy to make it to the top and back. "I started crying," she says. She cried as she trudged up the steep glacier, all the way to the top, where she sat down, buried some pictures for a teammate who couldn't do the climb, said a prayer, took a picture, and worked with a Sherpa to change her oxygen bottle. Yes, her body was surviving the altitude, but "It was still incredibly hard for me," she says.

There was some excitement at her setting new records, bringing TV interviews and newspaper articles, but Fisher went into the limelight with reluctance. "It's not about the record for me, really," she says. "I got to see the world and make some of my best friends."

Today Fisher, like Viesturs and Roskelley before her, lives in two worlds. In Pullman, she's a student majoring in materials science and planning for a career. None of her college friends climb, and none of her climbing friends come here to visit. And most who see her at WSU don't know about her other life, the one she lives in the record books and on the world's highest peaks.

Still, her heart often strays to places like the Himalayas. She still wears the orange prayer strings placed around her neck by the lamas she has met on her journeys.

"They're for protection," she says, as she untangles them from the silver cross she also wears. "You don't take them off while you're climbing. You're supposed to wear them until they fall off." She has already planned her summer 2006 trip to Pakistan to climb Gasherbrum 1 and Gasherbrum 2, the 11th- and 13th-highest peaks in the world.

And now that she can climb anywhere, is she ready to quit the Cascades?

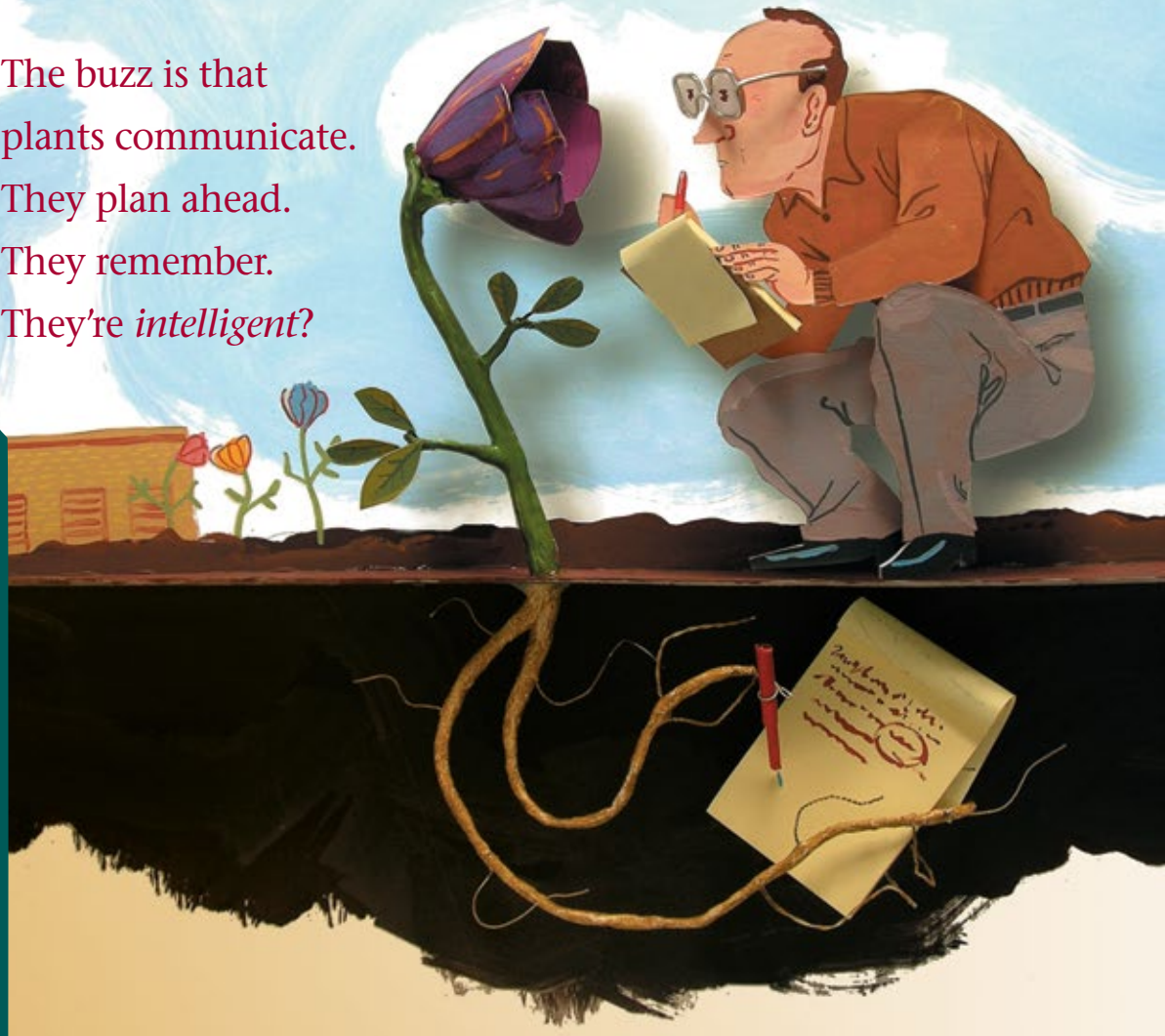
"Never," says Fisher. "That's where I think you can find the best climbing in the world. There's rock, there's ice, there's mountaineering. It's clean. And it's beautiful.

"You just don't get that in many places in the world," she says. "And that's my back yard." ■

NO SHRINKING VIOLET

by Cherie Winner • illustration by David Wheeler

The buzz is that plants communicate. They plan ahead. They remember. They're *intelligent*?



THERE'S A BUZZ IN THE WORLD OF BOTANICAL SCIENCE. Led by Anthony Trewavas, a highly-regarded scientist at the University of Edinburgh and a member of Great Britain's Royal Academy, researchers all over the world are suggesting that plants are more than a leafy backdrop for Earth's more active and interesting residents. The buzz is that plants communicate. They plan ahead. They remember. They're *intelligent*.

Are we on the brink of a revolution in biological thought? That depends.

Washington State University psychologist Jay Wright, who studies learning and memory in mammals, wonders what it means to say

that a plant is intelligent. Even with respect to animals, he says, "intelligence is in the eye of the beholder."

When sizing up smarts, we often look for intentional actions, goal-directed behaviors we can see and measure. How can plants be intelligent? To the casual observer, plants don't seem to have "behaviors." They seem to passively accept whatever the environment tosses their way.

As shown in these images (facing page) from a hand-drawn "herbal," or guide to useful plants, people in the Middle Ages thought plants had abilities that paralleled those of humans and animals. WSU psychologist Jay Wright says the idea of plant intelligence is intriguing—but it's not new. "It's cyclical" he says, citing a flush of "smart plant" research in the 1920s and again in the 50s and 60s. Those efforts sputtered out for lack of solid evidence. New research into how plants communicate and manage their environment puts the notion on more solid footing today.

IMAGES FROM THE *ITALIAN HERBAL*, SPECIAL COLLECTIONS, UNIVERSITY OF VERMONT LIBRARY

But researchers at WSU are finding that plants are surprisingly assertive. Based on their findings, a case could be made that the average potted plant is at least as active as the average human couch potato—and a lot smarter about what it consumes and the company it keeps.

WATCHING THEIR DIET

Plants don't "eat," of course, but they do take in energy, in the form of light. They use that energy to convert CO_2 and water into carbohydrates. Although plants can't move to a sunnier or shadier spot like a sunbather going for optimal tan, plant physiologist David Kramer says some of them make smaller movements to control their exposure to light. They turn their leaves to intercept more or less light. They even rearrange their internal parts to enhance or diminish their energy intake.

In fact, says Kramer, leaves are so active that they have made it nearly impossible to do certain kinds of experiments for longer than a fraction of a second. For example, when scientists directed narrow beams of light at leaves in order to track changes in the chemicals involved in photosynthetic reactions, the leaves responded about the same way you or I would to having a bright light shone in our faces. Ultra-short experiments worked fine, but anyone wanting to watch what happened over a span of minutes was out of luck.

"The plants were moving," Kramer says. "They could change the shape of their cells and the chloroplasts, and that scatters the light differently. That's a problem."

His solution was to invent an instrument that scrambles the light before it hits the leaf and efficiently collects the scattered light that comes out the other side. With this machine, movements within the leaf have little effect on the measurements, because the light is already scattered.

Kramer dubbed the instrument Nofospec, for "non-focusing optics flash spectrophotometer," and patented it. Besides the one in his own lab, he has made a Nofospec for colleagues at WSU and the University of California-Davis, and has orders for more from labs in Japan and France.

Kramer says plants have another, even more subtle, way to control how much light energy they feed into the photosynthetic pathway. In weak light, they are incredibly efficient. Their light-gathering apparatus, highly organized protein clusters called antennae, send about 80 percent of the photons striking them into growth and maintenance activities.

In bright light, though, they pull the shades. Instead of funneling the light energy into the photosynthetic reactions, the antennae send up to 90 percent of it back out into the environment as heat. They have to do that, says Kramer, or risk being bleached and burned by the intense energy concentrated in their chloroplasts.

"Basically, the plants are dealing with explosives," he says. "They need to, to drive all these [photosynthetic] reactions—but if they take in too much, they're going to pay the consequences."

His group is studying how the plant knows to turn its antennae up or down. "People spent decades trying to improve the efficiency of photosynthesis," he says. "And plants are already pretty damn good at it. The key here is matching the regulation to the environment."

And plants are masters at that. They monitor the light striking every bit of leaf surface, and act in a way that takes into account both their need for energy and the risks of overindulgence.

DON'T MESS WITH MUM

Plants also do a good job of defending themselves. Their defenses range from crude and always deployed—think thorns—to downright sneaky. How else to describe the fate that befalls certain insect larvae, as told by biochemist Clarence "Bud" Ryan?

"When they chew on the plant, their saliva mixes with the wounded plant tissue, and it gives off volatile [chemicals]," says Ryan. "Predator wasps pick up the smell. Then they come and inject their eggs into the larvae." When the baby wasps hatch, they gnaw on the host larvae from the inside. The larvae, understandably, stop chewing.

Ryan pioneered the study of another line of defense, which has come to be known as the systemic wound response. A protein chemist by trade, he started in the early 1970s trying to understand how plant protease inhibitors work. Those are chemicals that block the digestive enzymes (proteases) in the gut of any animal that takes a bite out of the plant. Raw potatoes contain protease inhibitors, which is why munching on them can cause severe stomachache.

Ryan found the inhibitors were present in the leaves of potato plants as well—but that some potato plants were loaded, while others had none.

"And I got the idea that maybe they're there because an insect was

attacking the plant," he recalls. "So I went out and borrowed some Colorado potato beetles from a friend of mine, and let them chew on potato plants in the greenhouse." A day later, the previously inhibitor-free plants were full of protease inhibitors.

Ryan then repeated the experiment, confining a beetle to a single leaf with a shield of aluminum foil. The next day, leaves on the opposite, uninjured side of the plant contained just as much inhibitor as the bugged leaf. News of an attack at one point on the plant had spread—and caused a response—throughout the entire plant.

"That was a huge discovery, because nobody had ever seen anything like that," he says. The breakthrough opened a whole new field of research, and secured Ryan's election to the National Academy of Sciences in 1986. In 1991, his research team isolated the signal chemical, a small peptide they dubbed systemin. It was the first signal peptide ever found in plants.

EMERGING PARALLELS

Loose stacks of journal articles swamp Bud Ryan's desk, articles about "emerging parallels" between the immune systems of animals and the defense systems of plants. Research in the field has taken off in the past decade, spurred by Ryan's discovery of the systemic wound response and the first signal peptide ever found in plants.

Ryan says similarities in plant and animal immunity suggest that the internal signaling strategies of animals and plants have a common origin.

"It's clear that these derived from some primitive organism that predated plants and animals" and was a common ancestor of both, he says. "It's very, very old."

That plants and animals share some biochemical tools shouldn't come as a big surprise. Features of living systems don't appear out of nowhere, and structures and pathways that prove useful tend to be conserved and passed on—although not always in the same role. Sathyanarayanan Puthanveettil ('01 Ph.D.), who has worked with kinase enzymes involved in calcium signaling in plants and learning in animals, says it's common for an existing protein to be co-opted for new uses in other species.

"The same things may be used by different organisms but in a different context, and they may be regulated differently," he explains.

That's well established in theory, but the obvious excitement in the articles on Ryan's desk indicates that the scientists who wrote them were caught off guard a bit by the similarities they found. Maybe it's just that researchers have so much to keep track of in their own field that it's easy to develop a bit of tunnel vision—until something like Ryan's discovery cracks open the tunnel.

Plant protease inhibitors do more than just give bugs an upset tummy: they send a message from the gut to the brain that ruins a bug's appetite.

"It's a satiety thing," Ryan says. "It's telling the insect, 'You're full, you shouldn't eat so much.' At the same time, the insect is starving to death.

"It's wicked!"

And it happens to work the same way on human hunger pangs. Ryan and research associate Greg Pearce devised a large-scale method for producing the inhibitor, which is now being sold by Kemin Industries as a human weight-loss aid called Satise®.

Recent explorations in his lab have revealed the presence of a different signal peptide that activates a plant's defenses against microbial pathogens. In the innate immune response, as it is called, an initial attack by a pathogen prompts nearby cells to make the new peptide, which then travels through the plant's vascular system and causes cells throughout the plant to make substances that fight the pathogen—and which also stimulate the production of more peptide. This "amplification response," as Ryan calls it, allows a plant to respond in a big way to a small attack. If the initial attack is followed by more, the plant will be prepared.

FRIENDS IN LOW PLACES

The innate immune response does a good job of protecting the aboveground parts of the plant. Roots are another story, according to plant pathologists Linda Thomashow and Patricia Okubara.

"Resistance to belowground pathogens is very rare in plants," says Thomashow. "Instead, it seems that plants use as a defense the bacteria on their roots."

Roots, which Okubara describes as "deceptively simple," exist in a sort of ecosystem of their own, known as the rhizosphere. Home to bacterial and fungal cells—several million per spoonful, at least—the rhizosphere is as crowded with opportunity and danger as anything the plant encounters above ground. But it is far from chaotic.

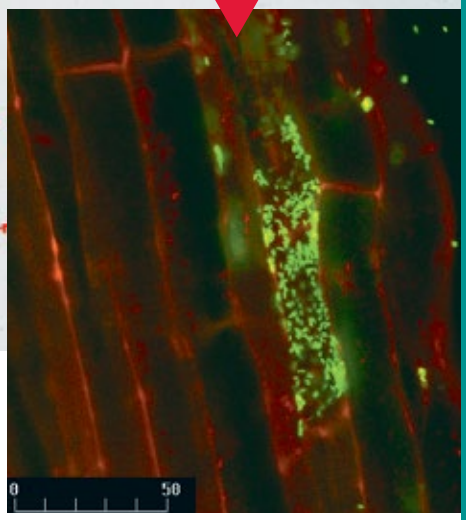
"When I first came to work here, I

A few days after a wheat seed germinates, fine root hairs grow from the main roots (arrow).

Pat Okubara uses digitized images to track the growth of roots or their loss to fungal pathogens. Large roots appear in yellow, fine roots in red.

Bacteria (green) that colonize wheat root cells (outlined in red) help the roots fend off fungal invaders. The bacteria have been given a gene that makes them glow green under some wavelengths of light. The red fluorescence in the root cells occurs naturally.

MICROGRAPH BY OLGA MAVRODI.



"There's a lot of dialog [between plant and microbe] . . . "

—Linda Thomashow

thought that bacteria on roots were sort of like butter on toast—you know, they were everywhere," says Thomashow. "Not true! They're patchy. They're in the cracks between the cells, they're in places where the surface of the root has been wounded as the root grows through the soil."

Bacteria cluster in these patches, she says, because the plant leaks nutrients at those points—by design, apparently, because the bacteria that come to feast on the leaked goodies produce chemicals that repel more dangerous bacteria and infectious fungi.

"One would think that the amount of carbon being leaked out through the roots was being wasted," says Thomashow. "In fact, it's very unlikely that plants would be so foolish as to waste 20 or more percent of the carbon that they fix. So they feed these bacteria, and the bacteria are sort of a first-line defense."

She says one of the bacterial anti-fungal chemicals, DAPG (2,4-di-acetylphloroglucinol), makes the roots of some plants become even more leaky. "So the root responds by feeding the bacteria even more than it did before," she says. "There's a lot of dialog [between plant and microbe]. We call it cross-talk. Molecular dialog."

"The host is actually quite active in this phenomenon," says Okubara. "It's not just sitting back and saying, 'Colonize me. Make all the anti-fungal metabolite you want to.' It actually has a role in the amount of bacteria that grow and the amount of DAPG that accumulates on the root."

Okubara is exploring exactly how root cells respond to DAPG and other substances produced by the bacteria. Using microarrays, microscope slides with tiny grids on which she places DNA probes, she has found several genes that are turned on in root cells exposed to the bacterial substances. She is beginning to identify what the genes code for and what their roles might be.

Thomashow is trying to isolate strains of bacteria that are especially "friendly" to crop plants such as wheat, and develop forms of them that can be used to coat seeds prior to planting. That would allow the helpful microbes to accompany the baby roots when they first poke down into the soil. Such a product would have big advantages for farmers, she says.

"The elegance of the whole system is that the amounts are very small, but they're exactly where they need to be in

order to be effective," says Thomashow. "It's the sophistication in nature. And *people* didn't think of it. Nature was working on this for a long time."

WHO'S WHO?

That sounds like a good system, but it raises a problem. Roots are immersed in a Mardi Gras of microbes benign, beneficent, and bellicose. How does the plant tell which is which?

> *"Plants don't have one big brain, they have tiny brains everywhere."*
> —*Joe Poovaiah*

The secret, says molecular biologist B.W. "Joe" Poovaiah, lies in the molecular dialog between root and microbe. He and his research team have decoded a crucial part of the conversation in legumes. Those are the plants, such as peas and beans, that form symbiotic relationships with bacteria that convert atmospheric nitrogen into a form the plant can use to make proteins and other organic compounds.

Here's how the conversation starts: Delicate root hairs that grow from the main roots exude chemicals called flavonoids. Bacteria in the soil are attracted by the flavonoids. They sidle up to the root hairs and, in effect, ask to come in. Poovaiah calls it "knocking on the door."

When helpful, nitrogen-fixing bacteria are trying to establish a relationship with a plant, they knock by secreting a chemical called Nod factor. Harmful bacteria don't secret Nod factor—and the plant knows that.

When a root hair cell receives the Nod message, it begins to move calcium around. Poovaiah's coworkers at the John Innes Centre in the UK showed this with special microscope equipment that allowed them to make a movie in which different levels of calcium appear as different colors: blue for low, red for high. Running in real time, the movie shows a blob of red squishing back and forth inside the root hair cell. It looks like a pixilated image of a beating heart.

"This is not just calcium going in," says Poovaiah. "It's not a flood. It is very rhythmic, coordinated in the intensity and the duration. That's the beauty."

The calcium pulses carry a message. Soon after they begin, the cell turns on specific genes, and the root hair bends around the bacteria like an enfolding arm. Eventually, the bacteria and root hair combine to form a nodule, visible to the naked eye, in which each partner supplies something that benefits the other.

"The door is only open to the bacteria that have the key, that sent in this Nod factor [and caused the calcium pulses]," says Poovaiah. "The enemies cannot create that." If a root hair encounters harmful bacteria, he says, the hair "would just stay there and say, 'I'm not going to talk to you.' That is the mystery: only friends come in. Enemies stay out."

Sathyanarayanan Puthanveettil ('01 Ph.D.), then a student in Poovaiah's lab, worked on one of the proteins involved in this sequence of events. It's a kinase, an enzyme that binds to calcium and then promotes changes in other proteins in the pathway. Poovaiah calls it a "decoder" that interprets the encrypted signal carried by the calcium pulses, and triggers the next steps in the pathway.

Biologists have long known that calcium plays a key role in animal systems. It's important in nerve transmission and muscle action, in addition to its structural role in bones and shells. Over the past 30 years, Poovaiah has established that the mineral is just as important to plant adaptation and survival. His lab has shown that calcium is the major player in a messenger system that helps the plant monitor and respond to more than a dozen environmental variables—functions that, in animals, are performed by the nervous system.

Still, he and Puthanveettil were startled when they realized that a large part of their kinase is very similar to a kinase found in mammalian brains. The mammalian kinase is called a "memory molecule," because it plays a key role in the formation of long-term memories.

"When we cloned the gene for this kinase, we thought, 'There must be something wrong here. It cannot be,'" recalls Poovaiah. "So we went back [and checked again] and we said, 'No, that's the way it is.'"

Other scientists were surprised, too—and impressed. Puthanveettil was recruited to do postdoctoral research at Columbia University in the lab of Eric Kandel, who won the Nobel Prize in Medicine in 2000 for his work on signal processing in the nervous system and the biochemical mechanisms of memory storage.

"I thought I would like to challenge myself in a very complex system—the brain," says Puthanveettil. He is now analyzing kinases and other proteins involved in learning in a marine mollusk called *Aplysia*.

Poovaiah has been invited to present his work on calcium signaling at a conference in Beijing in May 2006. The meeting is hosted by the Society for Plant Neurobiology.

You read that right: plant neurobiology.

That term doesn't make sense to psychologist Wright. Plants don't have nerve cells or nervous systems, after all.

On the other hand, they clearly have a system of biochemical communication between cells, a system that allows a plant to direct its own behavior and interact in specific ways with other organisms. Neurobiologists say that 99 percent of all communication in an animal's brain is chemical, not electrical. Why couldn't plants be doing something similar?

Pressed for an opinion about plant "brains," Poovaiah laughs. "You want the Poovaiah model? Plants don't have one big brain, they have tiny brains everywhere." Control is diffuse rather than centralized. Different parts of the plant direct different aspects of behavior.

The root tip, for example, senses gravity and directs the root to grow downward. Cut off the tip, and the root wanders aimlessly. Replace it, and it heads downward again. Charles Darwin did that experiment in the mid-1800s.

"He said the root tip is like the brain of a small animal, like maybe an earthworm," says Poovaiah. "We do know there's something. They're not as passive as we thought. They do have the ability to sense changes and respond. In that sense, they are intelligent."

There's that word again.

"I think the problem is starting with definitions we can all live with," says psychologist Wright. He thinks it will be difficult to figure out whether plants act in a flexible, problem-solving (i.e., intelligent) way, or whether they simply execute "fixed action patterns" they are genetically programmed to do.

For instance, a plant whose root recognizes and embraces helpful bacteria will thrive better and leave more offspring than plants without that ability; a plant that embraces the wrong kind of bacteria might not live long enough to reproduce at all. A complex behavior that looks intelligent could have arisen and been highly refined through eons of evolutionary pressure.

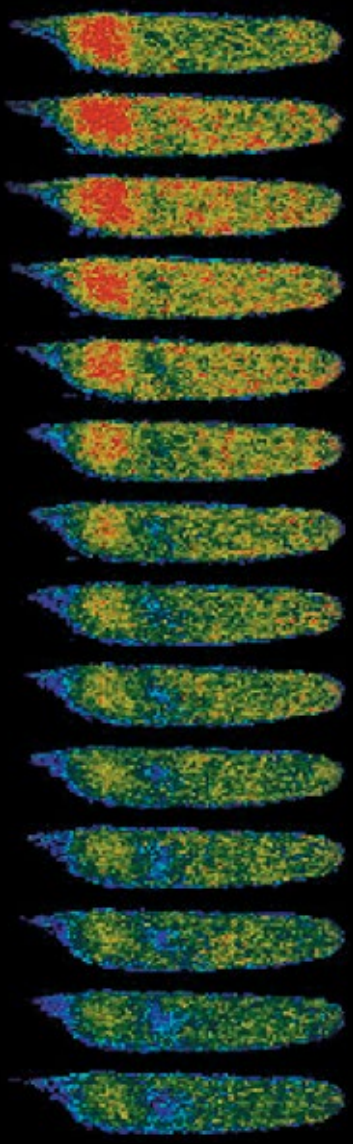
Poovaiah is intrigued by the current speculation about plant "intelligence," but for now, he is content to learn more about how calcium signals work, and what they reveal about the inner life of plants.

"It *was* private," he says with a sly smile. "But now we have opened the door." ■

JOE POOVAIAH

Calcium pulses carry a message . . .

Calcium is the major player in a messenger system that helps the plant monitor and respond to more than a dozen environmental variables—functions that, in animals, are performed by the nervous system.

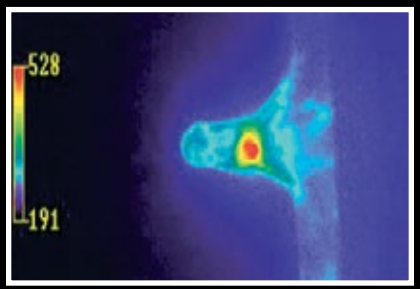


Calcium surges inside root hair cells of a legume after helpful bacteria "knock on the door" by emitting a chemical called Nod factor. A movie (lower right) and series of still images (right) show areas of high calcium in red.

The calcium pulses turn on genes that result in the formation of root nodules (top). Bacteria in the nodules convert nitrogen into a form the plant can use to make proteins.

The movie can be viewed online at:

http://molecularplants.wsu.edu/calcium/research/JS%20root%20hair.mpg



IMAGES BY GILES OLDROYD, JOHN INNES CENTRE, U.K.

by Tim Steury • photography by Kevin Nibur '05

EATING WELL *to Save the Sound*

To save Puget Sound, we need a mix of more education, more technology, and more shellfish.

Brett Bishop

HERE ON THE GRAVEL SHORE of Little Skookum Inlet, just south of Shelton, Brett Bishop shucks another native Olympia oyster and hands it to me. The Olympia is the Northwest's only native oyster. It is also fabulously unprofitable.

"They're exquisitely sensitive," says Bishop. In fact, they're downright wimpy when it comes to temperature extremes. Worse for the grower, if not the gourmand, they take forever to grow. While clams and other oysters reach market size in two years or less, the Olympia can take four to five years. Even then, they're still quite small.

Olympia oysters are a very small part of Bishop's family's business, Little Skookum Shellfish. Clams are far more lucrative and make up 85 percent of their sales. From a business perspective, Olympia oysters are mainly a labor of love.

But boy, are they good. Save your frying or stewing or grilling for their introduced inferiors, the Pacifics and Kumomotos. And no Tabasco or lemon, please, nor anything to mask their amazing taste. Olympias should be eaten just as they are, raw from the shell

with their liquor. And preferably right next to the water from which they came.

"They have an intense, complex flavor," says Bishop. "Japanese oysters basically taste like what you cook them in."

There's an oniony taste toward the end, I notice.

"Yeah," says Bishop, "and a nutty flavor, too."

Yes sir, I have found heaven here on Little Skookum Inlet.

So has Bishop.

True, there's a downside to raising shellfish. Puget Sound has two high and two low tides every day. Shellfish are generally harvested during the dominant low tide. But the dominant low tide in summer is during the day, and the dominant low tide in winter is at night.

"You can recognize a shellfish grower," says Bishop. They're dazed and confused, with large coffees in hand. "My family is just getting up when I'm going to bed.

"But it's worth it. I'd suffer something twice as bad to do it. I love this place, I love this way of life. And I love growing food of this quality and sharing it with people."

Bishop is a lucky man, in more ways than one.

The water in the Little Skookum Inlet of Puget Sound might well be cleaner than the last glass of water you drank. The quality standard as measured by fecal coliform count is more restrictive in Washington for shellfish-growing waters than they are for drinking water.

Shellfish themselves really don't mind a little fecal coliform. They're perfectly happy to ingest your waste. But shellfish that have been dining on such would not go down well with you. Shellfish are filter feeders. They feed continuously, sucking in water, filtering out the meaty stuff, then spurting it back out. A mature oyster can filter 50 to 60 gallons of water a day.

Unfortunately, Little Skookum is the exception, rather than the rule, on Puget Sound. The area has good zoning laws, says Bishop, restricting subdivision development to one unit per five acres. Also, much of the Little Skookum Creek watershed is timberland, owned largely by Port Blakely and Simpson timber companies. Port Blakely has determined it will not sell any of its land for development, except for schools or parks.

It's development, of course, that threatens Puget Sound. The area's 3.8 million population is expected to grow to 5.2 million within the next 15 years.

Even in his protected inlet, Bishop is well aware of a fundamental equation that will determine the fate of his livelihood and, ultimately, of Puget Sound. The variables include the number of people in the watershed, the number of acres of impervious surfaces versus absorbent soils, the ability of the marine environment to process pollutants and rejuvenate itself, and many other complex factors that a great number of scientists and public officials are puzzling over.

CRAIG HARROLD

A mature oyster can filter 50 to 60 gallons of water a day.

"Here in this bay," says Bishop, "I'm optimistic that my children will be able to grow shellfish. Maybe another generation."

But move out through Totten Inlet into the greater Puget Sound, and Bishop has grave concerns.

In testimony before the U.S. Commission on Ocean Policy in 2002, Robin Downey, executive director of the Pacific Coast Shellfish Growers Association, said that since 1985 the western United States has lost 29 percent of shellfish-growing areas to non-point pollution—"from failing septic systems, increased impervious surfaces and road runoff, and agricultural wastes."

So can anything be done, or should we just succumb to growth and forget about eating raw Olympias from the Puget Sound and wave goodbye to the orcas and steelhead and all the other critters affected by the increased human population pressure?

Bishop is surprisingly optimistic, and

Belfair Estuary

What keeps the main Sound as clean as it is . . . is the twice-a-day tidal flush. But the flush of tides in Hood Canal is partially blocked by a massive sill near its mouth.

yes, he does know exactly what can be done.

"Two things," he says. "Education and technology."

KAREN LIPPY '81 watches, bemused, as a couple of students swish nets around in the small stream we're standing next to. They're just starting to hone their technique for gathering benthic (bottom-living) invertebrates. Lippy gives them some brief instruction. "And tomorrow grab the bigger nets."

Regardless, invertebrates are showing up in the inadequate nets. "I got bunches of bugs," says one boy.

"Mayflies," says Lippy, picking them out of the net.

"This stream had no salmon in it when we came down here," she says.

"Here" is the Theler Wetlands Education Center in Belfair, at the head of Hood Canal. Sam Theler had left his land to the North Mason School District. Originally this spot was to be a ball field. But that was nixed by the Corps of Engineers, because it would have involved filling in a wetland. So it became instead the current 135-acre education site with what is now a salmon-bearing stream which, due to the efforts of Lippy's aquatic biology students, has 10 years of data affixed to it.

The stream is only a mile or so long. But now there's a hatchery upstream run by the Belfair Elementary School, which annually sends more than 100,000 chum downstream into Hood Canal. Lippy and her students started putting salmon carcasses in the stream, as nutrient sources, and now the Coho have come back naturally.

It wasn't long ago in geologic time that this area of Puget Sound was scoured by glaciers. Twelve or fifteen thousand years is scant time to build soil from rock. "We're actually standing on material from Canada," says Lippy, referring to the nutrient-poor glacial soil of the area.

What little soil nutrients that had built up over the last few thousand years were generally depleted in early logging of the area. Clearcutting was traditionally followed by burning.

The only nutrient sources for the local ecosystem are the alder tree, which is a nitrogen-fixing legume, and salmon. The salmon carcass as a nutrient source moves through the whole system through animals, says Lippy. Analyses have shown evidence of marine-derived nutrients in 137 species. So the health of

the system, she says, is directly related to the health of the salmon runs that come back up the streams to spawn. Salmon don't do well swimming up a foodless stream. When the salmon nutrients were returned to this stream, so followed the live salmon.

Herein lies the irony of Hood Canal. Whereas the land surrounding Hood Canal is nutrient deficient, the canal itself appears to be too nutrient rich, causing the algal blooms that plague it in the summer. When the algae die, they sink to the bottom and rot, consuming oxygen in the process, leading, with other factors, to the dearth of dissolved oxygen that suffocates fish.

Likely culprits such as septic system contamination and agricultural runoff aside, assessing the absolute cause of the problems of Hood Canal is difficult because of its peculiar nature. It is actually not a canal at all, but a glacier-carved fjord, a long, narrow inlet of Puget Sound.

What keeps the main Sound as clean as it is, in spite of its 3.8 million residents, is the continuous exchange of water between the Sound and the Pacific, the twice-a-day tidal flush. Most inlets benefit from this flush also. But the flush of tides in Hood Canal is partially blocked by a massive sill near its mouth. Although the canal is deep, because of that sill only so much water can flow in and out with the tides. So deeper portions of the canal, particularly below the sharp elbow where it turns back east, suffer from low dissolved oxygen.

There arises then the major question of whether this low dissolved oxygen would be a problem, even if the canal were not lined with thousands of homes and their septic tanks and lawn fertilizers. Or if storm runoff weren't flushing automobile-deposited hydrocarbons off the roads and parking lots around it. In spite of those thousands of homes, there is no sewage treatment plant anywhere on Hood Canal—except at Alderbrook, the luxury resort owned by Jeff and Tricia '78 Raikes.

A well-functioning septic tank with a well-functioning drainfield in suitable soil works pretty well at containing the more directly pathogenic parts of human sewage. What a conventional septic system does not do, says Bob Simmons, is stop most of the nitrogen in the waste from filtering downstream and percolating through the groundwater. Simmons is chair of Mason County Extension and a water-quality educator. Nitrogen, which makes up 78 percent of the atmosphere, is good stuff in appropriate forms and amounts. But where it accumulates in too great a quantity in plant-accessible forms, it causes major problems, such as eutrophication and the resulting low dissolved oxygen.

About half of the students in the North Mason School District will go through the classes taught at the Theler wetlands.

"This class depends on the weather," says Lippy. "In the winter we do things like build nitrogen-cycle models. We'll go from this unit into water-quality studies for about three weeks. They'll learn how to analyze data, how to take data, and become certified in the lab."

Even though Lippy pointedly keeps

Once Karen Lippy's students have finished counting benthic invertebrates as water-quality indicators, they pretty well understand how things work in the Hood Canal ecosystem.

It's development, of course, that threatens Puget Sound. The area's 3.8 million population is expected to grow to 5.2 million within the next 15 years.

politics out of the classroom, still, once her students have finished counting benthic invertebrates as water-quality indicators, they pretty well understand how things work in such an ecosystem. She runs through the phases of environmental education. First thing, she says, you have to have this basic awareness that it's there. Understanding leads to valuing. And finally, stewardship.

Does that understanding make its way into the community, where knowledge can be converted to action and prevention?

"It's difficult to measure what students do once they leave school and the effects they have on their families' practices," she says. "We suspect it is positive, even if it cannot be measured."

Regardless, she is undaunted. And a remarkable number of her students have gone on to be scientists.

We've left the creek and have moved to the edge of the wetlands near the head of the canal. One of the students has brought Lippy a dragonfly nymph, which she identifies.

"That's a dragonfly?" says the student. "I thought they were pretty."

I'M HAVING BREAKFAST at the Little Creek Casino near Shelton with Bob Simmons, Emily Piper, and Duane Fagergren. Like Simmons, Piper is a water-resource educator with Washington State University Extension. Fagergren is the director of special programs for the Puget Sound Action Team, an organization connected to the governor's office that coordinates research and education activities having to do with the health of Puget Sound. He is also a small-scale shellfish grower.

Fagergren is talking about the relationship between shellfish and water quality. And of Justin Taylor, the patriarch and founder of Taylor Shellfish, the biggest shellfish grower in the state.

"One of [his] theories is that because we have not relied on Hood Canal producing and harvesting wild set oysters, a lot of oysters just stay on the beach and are never harvested out of the system. That's where you get the benefit of natural filtration."

"So we take it out of the system and eat it?" I pause briefly over my plate of oysters and eggs. Which, by the way, are very good. Even though I don't gamble, I've enjoyed my stay at the casino, eating oysters every meal so far. But now I can't help but wonder what *they've* been eating.

Everyone nods, pleased that I'm getting it. They're not eating oysters, for some reason. But Simmons reassures me: "So it doesn't turn into nitrogenous waste." What he means is the non-toxic (to me, the oyster eater) nutrients. (The Department of Health is quite careful about keeping toxic bacteria from reaching my plate.) Generally the way it works is, nutrients flowing into the Hood Canal encourage the growth of phytoplankton, which the shellfish gobble up. What we want to do, I'm realizing, is, if we can't keep the nutrients from flowing into the canal, then we're just going to have to take them back out. And one of the best ways to do that is by harvesting shellfish. And that means, I realize virtuously, I need to do my part and eat more shellfish.

Obviously, increased gastronomic possibilities are only a part of the needed solution. Everything involved would be better off if some of that nutrient flow were slowed. In fact, even from the perspective of shellfish, the health of Puget Sound and Hood Canal is a conundrum. Yes, their filtration powers are impressive. Shellfish can remove nearly 17 grams of nitrogen from estuaries for every kilogram of shellfish meat harvested.

But the water has to be sufficiently free of toxicity to support them and other life in the Puget Sound waters. What are you going to do with millions of harvested shellfish if you can't eat them, store them on the Hanford Reservation?

The effort to remedy the Sound's afflictions has been taken on by a myriad of organizations, both public and nonprofit. Coordination is kind of organic, says Fagergren. "There's so much to do, and we know the strengths of each other. As long as somebody doesn't claim overall leadership, I think we're far better off."

Much of that coordination, however, is through the Puget Sound Action Team. Under its broad umbrella are many nonprofit and government groups, including UW Sea Grant, the maritime version of the land-grant system. And of course Extension. Most of the Puget Sound counties have water-resource educators like Simmons and Piper.

"I think it's great having both major university systems working on the same problem," says Fagergren, "and doing what each of them does best."

AFTER BREAKFAST Simmons, Piper, and I head down to Oakland Bay to meet Bill Dewey of Taylor Shellfish. Oakland Bay is one of Taylor Shellfish's major growing areas. Other than the

hum of machines on the dock, the bay is serene. Across the bay are native Olympia oyster dikes built in the late 1800s. Between us and the dikes is a group of clam diggers, part of Taylor's crew. The tide is still going out, and not all of the flats are exposed yet.

"This is probably the most productive Manilla clam beach for us anywhere in Puget Sound," says Dewey. "The flat we're looking at produces about a million pounds of clams a year. It's an incredibly productive area."

Such was not always the case. In fact, not too long ago, Oakland Bay was dead, killed off by the effluent from the pulp mill in Shelton.

"There was nothing," says Dewey, "no barnacles, no crabs, no marine life out here at all. People used to bring their boats here, store them for the winter to kill the fouling on the bottom of their boats."

Before the effluent killed it, Oakland Bay was the seed source for much of the shellfish industry in Washington. In an effort to survive the effects of the pulp mill, the industry switched to the hardier Pacific oyster. But finally, everything in this bay died. The mill bought up all the tidelands to mitigate complaints from the oyster industry.

Finally, the mill shut down in 1958. Justin Taylor, in an act of foresight that must have seemed crazed to many, bought the tidelands from Rayonier.

"Gradually," says Dewey, "the bay has come back."

The Clean Water Act of 1972 eliminated point sources of pollution in Puget Sound along with the rest of the country.

Now the problems facing Puget Sound are far less defined, if not greater.

Dewey is worried about another area of Oakland Bay.

"Another productive area, around that point, is Chapman's Cove," he says. "Sampling results at one of the water quality sampling stations up there since May have been off the chart, really bad."

If the samples don't improve, the Department of Health may reclassify the

CHANGING LIVES

Saving Puget Sound is doable, believes Bill Dewey of Taylor Shellfish. All we have to do is "go to everyone in the Puget Sound watershed and get them to change their lives." Enabling that transformation is basically the job description for Washington State University Extension water quality educators **Pat Pearson, Cammy Mills, Bob Simmons, and Emily Piper,** shown above near the head of Hood Canal, and many others.

Extension educators work with many other governmental and nonprofit agencies around Puget Sound to promote the health of the ecosystem.

You may have seen Extension educators at county fairs, Oysterfest, and other events around the Sound. If you live on the water, you might have already talked to Cammy about signing the Shore Stewards pledge.

Once initiated, Shore Stewards follow 10 wildlife-friendly practices in caring for their beaches, gardens, and homes. (*WSM* has high hopes for Cammy Mills's leadership of Shore Stewards—she was the drum major of the Cougar marching band.)

Various other water-quality projects include the following:

The Native Plant Salvage Project works to preserve native vegetation, restore vegetation, recreate native habitat, and reduce the effects of urbanization such as stormwater runoff, use of chemical fertilizers and pesticides, and loss of habitat.

Water Resource Education for Real Estate Professionals consists of a series of courses for real estate agents, brokers, and appraisers on topics such as sewage systems, wetlands, woodlands, shorelines, salmon and streams, and low-impact development.

Beach Watchers receive extensive beach and estuarine environmental training and participate in monitoring and educational programs.

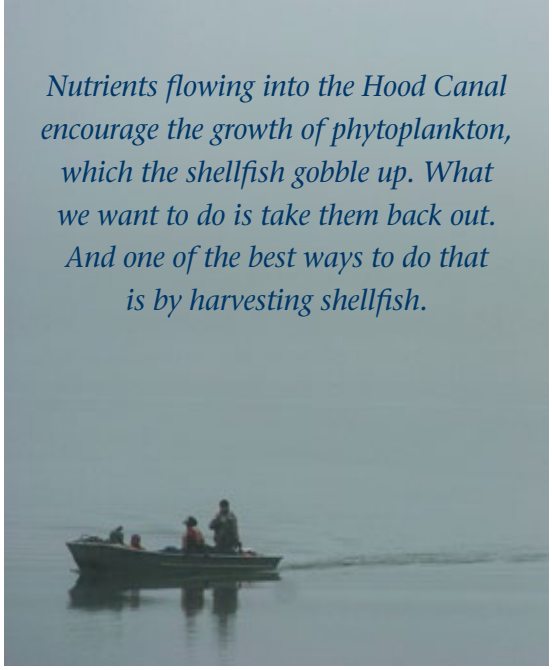
See **wsm.wsu.edu** for a list of pertinent Web sites.

area, says Dewey, which would mean a massive economic hit to Taylor.

As is the case throughout the Puget Sound, the problem with Chapman's Cove is not specific. "It's nonpoint pollution," says Dewey.

Any number of things contribute, including failing septic systems and domestic animals. In the more urban regions, a major problem is stormwater runoff. Roadways and parking lots block rainwater from soaking into the soil, so it washes quickly into the Sound, along with whatever pollutants it picks up on the way.

Shellfish-growing areas are classified in two ways, says Dewey. Every 12 years, inspectors walk the shoreline of the whole growing area and investigate every potential pollution source and test all tributaries coming into the Sound for fecal coliform. Much more frequently, the Department of Health samples the water. Following heavy rainfall, areas can be shut down temporarily. But consistently high levels of fecal coliform can lead to a growing area being reclassified.



Nutrients flowing into the Hood Canal encourage the growth of phytoplankton, which the shellfish gobble up. What we want to do is take them back out. And one of the best ways to do that is by harvesting shellfish.

"Once an area goes down," says Dewey, "the best turnaround I've seen is four years."

Nutrient loading of course is also on Dewey's mind.

"We've got oyster beds in a number of inlets in the south Sound that are growing oysters in half the time they did just six years ago. It's not a miracle of genetics. It's just so much damn food.

"I hate to kick a gift horse in the mouth," he jokes.

Miraculous growth is not a good trade.

"What's happening," he says, "there's so much plankton production that's going unconsumed, when those blooms die, they settle out. This time of year, they smother the beds. Inches of dead algae pile up in a matter of days.

WINE & OYSTERS

MATT HAGEN

LET'S SUPPOSE we all start eating more shellfish in the interest of saving Puget Sound. The question that arises immediately is, "What wine shall we drink with them?" I picked up some shucked Kumomoto oysters and smoked oysters at the Taylor Shellfish retail store in Shelton and headed up to Hoodsport to get some advice. Peggy and Dick Patterson's Hoodsport Winery was the 15th to open in this modern Walt-Clore,-Chas-Nagel,-et-al. era of Washington wine. (There are now 360 wineries in Washington.) Although they import grapes from eastern Washington for their red wines, they make white wines from more maritime varieties and excellent fruit wines. Peggy figures half their sales are fruit wines, and half grape.

Although you might hear that very crisp dry whites MUST be drunk with oysters, we decided we would start with no presumptions.

The Kumomotos had a slight sweetness, Dick noted, so we started with Sauvignon Blanc. Didn't work. The flavors didn't blend at all.

Next we tried the Madeleine Angevine. The grape originated in the Loire Valley in France and is quite similar to Riesling. According to Peggy, it's being grown on Lopez, Whidbey, and Bainbridge islands and around Sequim.

The "mad angie" was great with the oysters, a really nice complement.

Meanwhile, Peggy, who is not really "an oyster person," as in raw oysters, anyway, was nibbling at the smoked oysters and announced that the cranberry and raspberry wines go well with the smoked. Indeed they do!

"This is the one I've been waiting for," said Dick, opening a bottle of rhubarb wine. He likes to sauté oysters, pour in a little rhubarb wine, cover and steam for a couple of minutes, then remove the cover and reduce the wine.

It turned out the rhubarb went well with the smoked oysters, but not that great with the raw. It had too much residual sugar to blend with the raw oysters, but the smokiness overcame the sugar.

The sweetness of the rhubarb wine set us up for our big surprise of the evening. Although we figured the fruit wines just weren't going to work with the raw oysters, much to my disappointment, Dick and I tried the raspberry anyway.

Whoa! The combo was great.

"That's amazing," said Dick. "It's about 3.5 percent residual sugar." It shouldn't have worked, but it did.

For some reason, the raspberry flavor carried it with the oysters. Very nice!

Now you carry out your own experiments with clams and geoducks.

"It's always been a problem for us. But it's worse this year. We've had huge losses.

"These are not problems we're going to solve overnight," says Dewey. "These are lifestyle changes that have to happen for the whole population. We have to go to everyone in Puget Sound watershed and get them to change their lives."

NOW WHAT ABOUT that "technology" that Bishop mentioned? As Bob Simmons indicated, one of the weaknesses of conventional septic systems is they don't sort out the nutrients. New septic technology can boost nitrogen removal, through natural processes, to 80 percent. But these systems are pricey. When a conventional system can cost upwards of $10,000, the homeowner understandably draws the line at just getting the toxic stuff out.

Plus, there are plenty of sources of excess nitrogen other than human sewage. Animal waste, yard waste, garbage. If it finds its way into the Sound, it's more excess nutrient.

The answer that keeps popping up in conversation wherever I go is the "anaerobic digester."

There's nothing new about anaerobic digesters in general. They're used throughout the developing world to generate methane. At its simplest, an anaerobic digester is a sealed container with a gas valve into which a family can throw its waste, including manure from animals. Bacteria digest the waste, producing methane, which can be tapped as cooking fuel or to produce electricity. When the bacteria are done with their handiwork and the volatile organic compounds have been stabilized, what's left is a fine residue that can then be used as a soil amendment and liquid fertilizer.

"It's not a magic bullet," says Shulin Chen, the WSU engineer who's been tweaking the technology and consulting with a project in Mason County. "But it's a good candidate."

Once its basic virtues sink in, all sorts of possibilities start popping up, particularly along the flood-prone Skokomish River Valley, which empties into Hood Canal. Those possibilities were clear to Governor Gregoire, who budgeted better than half a million dollars for the Mason County Conservation District to build a digester.

Shannon Kirby, an environmental specialist, and Richard Geiger, an engineer with the conservation district, completed a report in December regarding the potential for a community digester in Mason County. One immediately clear use would be to process the thousands of chum salmon carcasses discarded by the Skokomish tribe after they harvested the roe. Until recently, the tribe was simply dumping between 16 and 24 tons of carcasses back into Hood Canal, a natural enough thing. However, that practice was halted once it became clear what a major source of nutrient they were adding to Hood Canal.

The carcasses are currently being composted. Anaerobic digestion will be better, says Chen. Not only will it circumvent the odor associated with composting fish, but it would produce methane for fuel.

The carcass production is seasonal, however, and anaerobic digesters work best with a steady and continuous flow of feedstock, just one of the kinks that Chen and Geiger are working on.

Another source of feedstock for the digester is the 1,060 cattle and horses, 500 poultry, 32 goats, eight llamas, and five pigs that live in the Skokomish Valley. That's not a huge livestock population, but still it means some pretty serious poop, at least if it washes down river into the Canal. It could mean some serious methane if it were gathered and digested. Kirby and Geiger envision gathering that resource as well as, possibly, digesting it, selling the remains as fertilizer, converting the methane to electricity or sellable gas, and everybody's happy.

At least if those byproducts result in sufficient income to pay for the digester, beyond the governor's subsidy.

And there's one of Chen's primary goals. "We can get a system working, no problem," he says. "Our challenge is, how can we reduce the cost?"

Once that cost is lowered, the digesters will be more attractive to individual farmers, such as Judy and Darryl Vander Haak of Whatcom County, who believed enough in the technology to build a digester on their farm. Their 1,500 dairy cows produce enough manure to generate electricity to power 180 homes.

So far, theirs is the only digester operating in Washington. But that should change soon. Chen is testing a digester on the WSU dairy farm, and Mason County is planning to go ahead with its digester this summer.

Now—if everyone around the Sound will take Bill Dewey's advice and change their lives, the future of the Sound ecosystem looks downright rosy. ■

ROBERT HUBNER

The Agri-Environmental and Bioproducts Engineering Research Group, headed by Shulin Chen (right), is involved in a number of projects generally related to water quality. Their work with an experimental anaerobic digester has generated much interest from dairy farmers, shellfish farmers, and the governor. See c100.bsyse.wsu.edu/aebe/.

Thom Eldridge '91, '94, '95

North American Operations Innovations Leader for Dresser-Rand.

B.S. and M.S. degrees in mechanical engineering, B.S. in math.

Developed an electro-hydraulic active control system for turbomachinery.

Loves to coach his two kids in youth soccer.

WSU Alumni Association Life Member.

"Being a member of the Alumni Association is the easiest way for me to stay connected to our alma mater and fellow Cougars in our area. My family enjoys reading about WSU in the members-only **Alumni Insider** *newsletter. Even in New York, we benefit from the many programs and services that the Association offers."*

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What I've Learned SINCE COLLEGE

MATT HAGEN

an interview with **ROBBIE TOBECK**

Seahawks Center Robbie Tobeck ('94 Phys. Ed.) has spent the past 13 years playing professional football. After going to both the Super Bowl and Pro Bowl last February, he took some time off to focus on his four children, McKenzie, Mason, Mia, and Madden, and to travel with his new bride, Sonya Rechkoff ('90 Ed.). He also opened his home in Sammamish to Hannelore Sudermann for an interview about lessons learned in the pros, his love for the Northwest, and finding time for family.

Have a dream.

As every guy who goes to Washington State to play football does, you dream someday of playing in the NFL. I had a really good senior year. It was my first year to play center. I was just hoping that I would get a tryout at some point, somewhere. Then the draft happened, and I didn't get drafted. But right after, my phone started ringing. There were three teams that were interested in me. I thought the best opportunity to make the team was in Atlanta.

Use your fear.

It was kind of a scary time. Atlanta didn't have anything invested in me, really, other than giving me a shot and a tryout. I was a long shot to make it. My first kid was on the way. Everything I dreamed of my entire life, as far as playing pro football, was right in front of me. It was exciting, because that's where I wanted to be at that point in my life. But also intimidating, because I thought, what am I going to do if this doesn't work out?

Take good advice.

The good thing for me was George Yarno ('79 Crim. J.), who's back at Washington State now as offensive line coach. He played pro football [for the Tampa Bay Buccaneers] for a long time. He was so good in just telling me what to expect. I took his advice as far as how I approached practice, my first minicamp. By listening to him, that gave me an edge over some of the other guys I was competing with. In the NFL, especially being a free agent, undrafted, it's "get it done or you're gone."

Put in your time and know when to shine.

My first year I was on what they call the developmental squad. I was on the team, but I wasn't on the team. My salary was reduced. I made half of what the minimum was. It's kind of like red-shirting in college, really. You practice, you work hard during the week, and then on Sunday the team travels, you stay home. That was OK. That gave me a foot in the door.

I had been getting worn out all year by Pierce Holt, who was an All-Pro, a big free agent signed from the 'Niners. A great guy, but he used to just wear me out daily. Then one day in practice I got my hands on him and just locked him down. And the defensive line coach said "Ooohhhh." He was giving Pierce a hard time and making a big deal about it, because I hadn't blocked him all year. So the next play I knew that Pierce was going to be bringing it. He was going to be coming with everything he had, because he was a little bit embarrassed. The whole team was watching it. And I locked him up again and shut him down again the very next play. That's when I realized I've gotten better. I can do this.

Have humor and attitude.

Football is very stressful and very intense. I try to have fun with it in the locker room. But also, I think I bring a little bit of an attitude on game day that some guys feed off of. It's a tough-guy mentality. Even as a kid, it was important to me to be that

way. I guess it comes from my dad, who is always considered a very tough man and a hard-working guy. He worked my butt off. He was a roofer. As a kid in Florida in the summertime and on the weekends, I had to be on a roof when it's 100 degrees out with 90 percent humidity. I was miserable. If nothing else, it taught me that I don't want to do that for a living.

Finish what you start.

When I left Washington State, I needed the one class to finish my degree. So I took the course during the off-season. Why did I finish? I think you have go back to being a roofer. I knew that there were no guarantees for me in football. I was just hoping to get one year in and hang on for a little bit. I didn't want to roof, and I didn't really know much else at that point. It was like, whatever I do, I'm going to have that degree. At least I can walk into an interview and say, "I completed something."

Know when to move home.

I played in Atlanta seven years. I had a lot of great memories there. I was fortunate enough to play in Super Bowl 33 against the Broncos. But Seattle is my adopted home. Other than staying in Atlanta, the one team I wanted to play for was Seattle. Coach Holmgren had been here for a year, and there were all the expectations of him building a winner and being a part of something. For me it was location and the opportunity to play for an organization that I really thought was turning a corner. It has been six years of a lot of work and some ups and downs, but this year we finally got there. It has made it all worthwhile.

Learn from losing.

This year, being a team that really wasn't given a chance and was looked past, to see it come together the way it did, there was a lot of reward in just the journey. People I talk to say there were problems in the officiating. But that's something you can't control. What I do is look in the mirror and say, "As Robbie Tobeck, as a Seahawk, or as my team, what could we have done to win that football game?" We had an opportunity to make some plays we didn't make. Before you can point your finger, or get your hands up in the air, or get mad, you've got to look in the mirror and make sure you're doing everything you could have done. It just gives us some more motivation for next year to get it right.

Relish your wins.

Going to the Pro Bowl—that's a dream come true. I consider myself a team guy. But in the end you're an individual, and you have individual goals. One of mine has always been to play in the Pro Bowl. For me it was a validation of 13 years of hard work. Being over there in Hawaii, it was even better than I thought it would be.

Take your licks.

I get on guys as much as anybody. If anybody does anything that's out of place, I pick up on it right away. If you're going to be the type of guy that does something like that, when it's turned on you, you've got to laugh. I'm six-two-and-a-half, 295 pounds. I'm the smallest lineman by three inches and 20 pounds. Last year after practice, coach brought out this big box and said, "Guys, this is the first annual coaches' award given to a Seahawk that doesn't always get recognized." He said the coaches had taken their own money and bought this gift, a custom set of golf clubs. Then he said they were recognizing me. I was almost choked up. I thought, "Wow, this is unbelievable." Then the coach reaches into this box and picks up this little tiny set of golf clubs. And everyone laughs. I'm glad I have that kind of relationship with the coach. He knows that I can handle it. I understand what he's doing when he's giving me a hard time. It's an honor for me to know that the coach has enough respect for you to trust you that way.

Find family time.

During the season, you get one day off. Tuesday. Which doesn't do much for time with the kids. But my son, Mason, and my son, Madden, come to all the football games. As a father and a husband, you're there as much as you can be. The reward from going through a long season is having this off-season, where I don't miss anything. I'm at every game and most of the practices. I help coach. You get a lot of time to make up for it.

Diversify.

I grew up with no money. When I started making money playing football, I didn't want to be a screw-up. So I got every book and read about investing and mutual funds and stocks and retirement. I enjoyed it. Now I work for another Cougar, Paul Dent ('93 Bus.), who is with Allstate. I knew him from college. I do life insurance and retirement planning, college planning, all that stuff. Working in the insurance and financial services industries is something I plan on doing full time when my football career is over.

Plan ahead.

I think part of the success I've had is that I've always known that football is here today and gone tomorrow. I never thought I'd make it 13 years. Other than Tom Rouen, our corner, I'm the oldest guy on the team. It's a young man's game. To be still playing is crazy. I'd like to play one more year. When the next season ends, I'll be turning 37. I look forward to losing weight and having more time to spend with my kids as they get older and to spend more time with my wife. ■

CLASS NOTES

1940s

Katherine P. Grigg ('45 Home Ec.) has been traveling around the world, including Austria, Germany, and Scotland. Grigg also has been volunteering weekly at the Northwest Hospital in Seattle for the last 18 years.

1950s

Hal Lyons ('50 Bus. Admin.) and his wife, Bev, La Quinta, California, are members of the University Club of the Desert and the local Cougar Booster club. Both provide scholarships for needy students at the College of the Desert and WSU.

Sherry L. McManus x'50 and **Joe Wise** ('50 Soc.), Bellevue, married in Hawaii December 2004. They reunited after they both lost spouses of over 50 years.

Paul W. Morgan ('50 Pol. Sci. and Admin.) has been managing a community food bank that serves more than 100 households and about 450 people per month out of John Knox Presbyterian Church in Keizer, Oregon. Morgan oversees a volunteer staff of 35 to 40 people.

E. Laird Hansen ('56 Bus. Admin.) was recently elected president of the Washington State Air Force Association. Hansen is vice chair for Verity Credit Union's board of directors in Seattle.

Mary Coon Knodell ('56 Ed.) is past president of United Vision for Idaho, a nonprofit think tank working for social and economic justice in the state.

Lawrence Dodd ('57 Geology) was recently honored when the Walla Walla Public Library named a room for him to recognize his support of preserving historical materials both as a volunteer at the public library and as archivist at Whitman College's Penrose Library.

Robert D. Duncan ('57 Bus. Admin.) and his family own a winery, Berghof Keller, in Leavenworth. They specialize in German-style wines

1960s

John Flinn ('62 Mat. Sci. Engr., '72 Ph.D. Engr. Sci.) was inducted into the Idaho National Laboratory's Hall of Fame December 2005 for his lifetime achievements in metal alloys. Flinn teaches at the University of Idaho in Moscow.

Lenny Kanner ('69 Police Sci.) has retired in California after traveling the world.

1970s

Crista Claar Whitelatch ('72 Ed.) and husband, Bob, own Claar Cellars Winery, an estate winery in Pasco.

Bruce Johnson ('74 Comm.) CDR, USN (ret), Virginia Beach, Virginia, is a senior proposal writer for a large defense contracting firm.

Dale E. Carlton ('75 Elec. Engr.) is retired and lives in the Des Moines Marina. He spends winter months in his home in Scottsdale, Arizona.

Carol Rediske-Mudd ('75 Psych.) has changed her name to Maitri Sojourner. Maitri had her first two-person art show at the Side Door Studio in Olympia in January 2006.

Cynthia Duren ('76 HRA) is business manger for Market Vision Inc., Spokane.

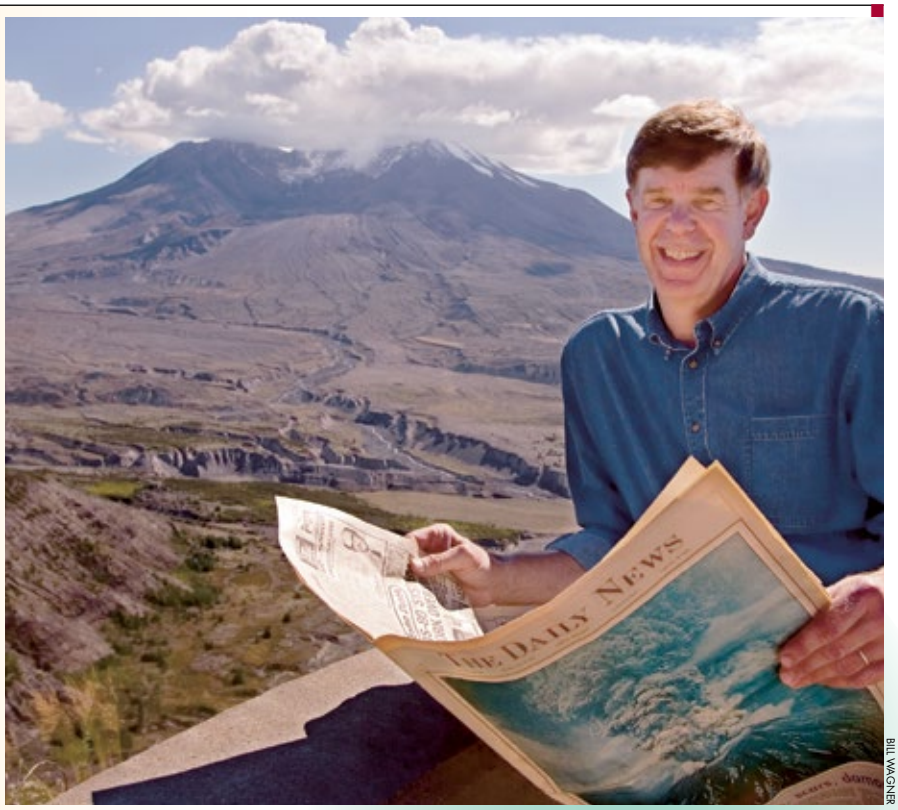
Dave Pratt ('76 Psych.) released his new novel, *Buried in the Records*, a mystery set in Olympia and Lakewood, in January 2006.

Mike Hathaway ('78 Comm.) was promoted to vice president of Encore

JOURNALISM'S GRANDEST PRIZE

"I didn't want anyone else to do a better job than we did."

—Bob Gaston '67



BILL WAGNER

Bob Gaston '67 was managing editor at *The Daily News* in Longview when Mount St. Helens erupted 26 years ago.

ON THE MORNING of Tuesday, May 20, 1980, journalists arrived at *The Daily News*, turned on their computers, and were greeted with the daily message from managing editor Bob Gaston ('67 Journ.). That day's message was far from typical.

This was two days after the devastating eruption of Mount St. Helens and less than 24 hours after the Longview newspaper staff published an astounding 45 of its own stories and numerous jaw-dropping photographs of the deadly blast.

Although his exact words are lost to time, the gist of Gaston's message to the newsroom was this: After just one issue, there was a tremendous buzz in the community about their coverage. If they kept it up, Gaston said, they might just win a Pulitzer Prize. His staff was even greener than it was small, but they knew that few journalists ever get a shot at the most coveted award in the profession.

Andre Stepankowsky, then a young reporter and now the newspaper's city editor, said Gaston's message further motivated them to charge after the mammoth story. "I'd be lying through my teeth if I said no," he said.

"We knew this [eruption] was going to make a huge impact on our community," Gaston said earlier this year. "I didn't want anybody else to do a better job than we did."

In April 1981, 25 years ago this spring, the Pulitzer Prize Board decided that *The Daily News* accomplished Gaston's goal and honored the staff for best local reporting. Despite fierce competition, including other Mount St. Helens entries from larger newspapers, the chairman of the jury that evaluated submissions rated *The Daily News*'s coverage "far superior."

That accomplishment is proof that "a small staff can perform excellent journalism as well as a large staff," says retired WSU journalism professor Tom Heuterman ('56 Engl., '73 Ph.D. Am. Stud.).

Gaston arrived at WSU as a junior in 1965, the same year Heuterman left newspaper reporting to teach journalism. The professor remembers Gaston as sharp and unflappable. "His subsequent performance never surprised me," Heuterman says.

After a year at WSU, Gaston landed a summer internship at the Longview paper, then owned by the McClelland family.

Upon graduating, Gaston returned to Longview. But this was the Vietnam era, and he soon left for the U.S. Air Force's officer training school. After serving stateside, Gaston was an editor at two Oregon newspapers before the McClellands lured him back.

Still in his early 30s, Gaston became managing editor in 1976 and took over newsroom hiring from Ted Natt, a member of the McClelland family who rose to editor and publisher. Gaston lobbied his bosses to replace typesetter jobs—being phased out with the arrival of computer technology—with reporters and photographers. By the time Mount St. Helens erupted, Gaston had increased his staff by a third and had a newsroom stocked with hungry journalists.

Gaston is quick to turn the spotlight toward newspaper staffers and owners, who busted their buns and their budgets to cover the eruption. Others credit Gaston's steady leadership and his guidance in keeping them on top of the ever-changing story as critical to their success.

"I doubt whether we would have won [the Pulitzer] or done the job that we did if it hadn't been for Bob," says Rick Seifert of Portland, a semi-retired writer and journalism instructor who was on *The Daily News*'s volcano team.

"One of his great talents was to spot talent," says Roger Werth, photo editor then and now. Better yet, Werth and coworkers agree, Gaston entrusted employees with enough freedom to find untold stories.

Gaston retired from *The Daily News* in 1999, when a chain bought the newspaper. Leaving daily deadlines behind "was a real gift of time," says Gaston, who is on the boards of his church and a local social service agency. He and wife Georgeann ('67 Ed.) also help watch two of their grandchildren. "I feel like I'm making a contribution to the community and my family."

For five years, ending last December, Gaston was the volunteer editor of the *Cowlitz Historical Quarterly*. He resigned partly to pursue two book projects—one a family history and the other the story of a local character.

It is often repeated that journalists write history's first draft. Gaston devoted one of his final *Quarterly* issues to a second draft of *The Daily News*'s Pulitzer-Prize-winning history and convinced many of his former staffers to write one last volcano story. The task stirred old memories and new pride in winning journalism's grandest prize. ■

—Eric Apalategui

Frequent contributor Eric Apalategui was a reporter for* The Daily News *from 2000 to 2005 and wrote the newspaper's first story when the mountain reawakened in 2004. That effort did* not *earn a Pulitzer Prize. Bill Wagner is a longtime* Daily News *photographer.

Visit "Mount St. Helens: 25 Years Later" at www.tdn.com/helens/.

BUSTING OUT

"I wanted to take the viewers along with me and explore."

ONE RAINY afternoon this spring filmmaker Francine Strickwerda entered the El Diablo coffee shop in Seattle. She ordered a cubano latte and sat at a table overlooking Queen Anne Avenue. She looked around the busy room. The scene brought back memories of a time, a few years before, when she was working on her first documentary, a film about breasts. "I wrote a lot of grants for *Busting Out* sitting in this coffee shop," she said.

Five years in the making, the hour-long movie is, in her words, "a strange mix of pop, politics, and history, and economics, and health, all these things that have come together to create these attitudes around breasts in our culture."

"This story has always been inside me," Strickwerda says. Her childhood was shaped by her mother's death from breast cancer in the 1970s. Ever since, she has struggled to understand the strong currents of sexuality and taboo associated with a body part that for her meant discomfort and death.

"I didn't get it," she says. "There's just so much heat in the culture around breasts, what's the deal?"

Her grant-writing didn't pay off. So she turned to her community, finding support from local artists and arts foundations, raising money with a comedy show benefit. She also found people who loved the topic and were eager to share their own stories about breasts. Some were insightful, some very personal, and some embarrassing. Then there was the TV exec who loved the idea of a breast movie and wasted no time telling Strickwerda that he preferred small ones to large.

But not everyone liked the idea of the film. One doctor said he didn't want to see a film that mixes breast cancer with strippers and sexuality. He said he'd rather see a straight documentary just about the disease. On the flip side, "It wasn't sexy enough for cable," says Strickwerda.

The documentarian honed her interests in journalism, health, and social issues as a communications student working on *The Daily Evergreen*. "When I first started working there, it was like, 'Oh, oh, I've found my place,'" she says. Some of the reporting she remembers best involved a controversy surrounding the placement of condom vending machines on campus.

After graduating from Washington State University in 1989, Strickwerda went to work at a small paper in Hailey, Idaho. She later moved to the Seattle area and wrote for *The Progress*, a newspaper for the Catholic archdiocese. Then it was a mix of freelancing, contracting with Microsoft, working on children's educational software, and volunteering at KCTS, the public television station.

MATT HAGEN

Film-maker Francine Strickwerda '89

Somehow, she found time to develop her documentary.

In pursuit of her story, she took her camera to the Seattle taping of a Tom Leykis show, an adult radio program that promotes "Flash Fridays" during which an on-air Leykis exhorts female listeners to show their support for the program by exposing their breasts in public.

She also sought out Deena Metzger, who wrote a book about her mastectomy and in 1978 posed shirtless, arms open wide, and face turned skyward for the cover. The portrait known as "The Warrior" serves as an icon for breast cancer survivors.

She followed a mother and daughter on a bra-shopping expedition, and went with a woman through a surgical breast enhancement, following her into the operating room. The stories are interlaced with the comments of professors, doctors, an anthropologist, burlesque dancers, and regular folk.

"I guess what I wanted to do with the film was not be judgmental," says Strickwerda. "It was a journey, and I wanted to take the viewers along with me and explore."

Woven throughout is her own story, one of losing her mother, feeling awkward about her own development as a teen, and exploring the culture and politics of breasts while coming to a better understanding of herself. It was hard to step in front of the camera, which is why she relied on her friend and co-director Laurel Spellman Smith to push her out of the shadows and into the scenes.

There's even a family in the documentary that mirrors Strickwerda's. "I wanted to understand the experience that I had a little better," she says. When she was growing up, her family and friends didn't deal with grieving or death or body parts very well. "I was hoping it had changed," she says. Visiting with the family, and talking with the children about joining a cancer support group for children and coping with their mother's disease proved "that it has," she says. "I think it was a really healing thing for me to find a family like this and to hear their experience."

While the project was made "on a shoestring" and hasn't yet broken even, it has met with success, airing at film festivals, health conferences, and on *Showtime*. Last fall it won a CINE Golden Eagle, and this year was named a winning title in notable videos for adults by the American Library Association.

Now she's dreaming about her next documentary.

"I think that *Busting Out* really isn't about breasts, it's about how we see women in our culture," she says. "I'd like to do the same thing with men." ■

—Hannelore Sudermann

For more information, visit www.stiritup.com.

CLASS NOTES *continued*

Media Group. He will be responsible for sales and major business initiatives in Seattle and San Francisco. Mike and his wife, **Patty** ('78 Food and Nutr.) live in Edmonds with daughter, Courtney, and son, Cameron.

Linda Jones ('78 Bus. Admin.) is director of corporate communications at Avista Corp., Spokane.

Bob Baker ('79 Elec. Engr.) is the senior vice president and general manager of Intel's Technology and Manufacturing Group. He lives in Arizona.

Daniel Quall ('79 Gen. Stud.) was appointed senior vice president of the Sonus Network, a national professional hearing care network, in December 2005.

1980s

David J. White ('80 Crim. J.) is chief of detectives and support services for the Kitsap County Sheriff's Office, where he has worked since 1980. He recently graduated from the FBI National Academy Program in Quantico, Virginia.

Laurie (Johnson) Loth ('81 Pol. Sci.) is a senior loan consultant with Washington Mutual Home Loans in Bellevue. She was named to the President's Club for the fourth year as a top producer for the company.

Jeff Thoren ('81 Vet. Sci., '84 D.V.M.) has founded Gifted Leaders LLC, a firm that provides coaching and consulting to help workplaces cooperate with purpose, leadership, and heart. He lives in Arizona.

John Kozba ('82 Elec. Engr.) is a visiting professor in the systems engineering department at the United States Military Academy, West Point, New York.

James Watanabe ('84 Hist., '85 TC Ed.) is chaplain at the Federal Correctional Complex in Beaumont, Texas.

Tom Butler ('86 Comm.) is the primary morning anchor at the Fox network-owned affiliate KMSP-TV in the Minneapolis/St. Paul, Minnesota, area. Tom was formerly at ABC in Memphis for five years.

John Jerkovich Jr. ('87 Comm.) joined the Oregon Lottery's Retail Operations Department as the corporate accounts representative. He works in Salem, Oregon.

Jud Preece ('87 Soc. Sci.) returned to Pullman September 2004 as marketing director for WSU's alumni relations. He and wife, **Laura** ('88 Engl./Bus. Admin.), have two little girls, Berklee and Berit. Coming to Pullman? Look us up!

Allison (Reeves) Helfen ('88 HRA) and her husband, Scott, have opened a wine store in Fairwood called The Wine Alley.

Laurie (Smith) Jordan ('88 For. Lang.) has launched Conexion Marketing, a Seattle full-service agency to help businesses target local Hispanics.

David Murillo ('88 Mech. Engr.) was appointed power manager at Grand Coulee Dam December 2005.

Tom Pounds ('88 Elec. Engr.) is still working as an electrical engineer in Albuquerque, New Mexico. He also is doing his best to keep the WSU flag flying on ESPN College Game Day shows during the football season.

Stacy Siroky Perrus ('89 Comm.) and husband, Jim, Ellicott City, Maryland, announce the birth of their second daughter, Eleni Sofia December 5, 2005. Eleni has a one-and-a-half-year-old sister, Alexandra.

1990s

Patrick Gendreau ('90 Comm.) is vice president of organizational development at Gordon Trucking. Patrick, his wife, Pam, and their two children, Nicholas and Natalie, live in Puyallup.

Laura Leist ('90 Comm.) is the author of *Eliminate Chaos: The 10-Step Process to Organize Your Home and Life*, due in bookstores nationwide spring 2006.

Gil White ('90 Pol. Sci.) has joined the Seattle office of CB Richard Ellis, a commercial real estate firm, as a sales associate. White previously spent 15 years as a major gifts fundraiser.

Rex Stults ('91 Comm.) is industry relations director for Napa Valley Vintners, a 270-member wine industry trade organization. He was previously CEO of the St. Helena Chamber of Commerce. He lives in Napa, California.

Barbara LaBoe ('93 Comm.) is the health reporter at *The Daily News* in Longview.

Yong Wang ('93 Chem. Engr.) received the Chinese Institute of Engineers-USA 2006 Asian American Engineer of the Year Award for his outstanding scientific achievements and contributions to his community.

Gary H. Pickering ('94 Bus. Admin., Fin.) is vice president of business banking at Skagit State Bank, Bellingham.

Jason Wandler ('94 Pol. Sci.) is a partner at the law firm of Oles Morrison Rinker & Baker, LLP, Seattle. Jason and his wife, Carrie, live in Kenmore.

Chuck Lietz ('96 Bus. Admin.) is senior vice president and director of finance for U.S. Bancorp Equipment Finance, Inc., Portland, Oregon.

James Rotholz ('96 Ph.D. Anthro.) recently published his second book, *Walking the Spirit: Embracing Life as a Spiritual Journey*. He lives in Gaithersburg, Maryland, with his wife, Louise, and both continue to struggle with chronic fatigue syndrome.

ALUMNI ACHIEVEMENT

THE ALUMNI ACHIEVEMENT AWARD was created in 1970 by the alumni association board of directors "to recognize and honor alumni who have given outstanding service, . . . and provide encouragement to alumni for perpetual service to Washington State University." Criteria for nomination include "significant service to Washington State University and/or outstanding contributions to community and/or profession and/or nation." Since 1970, more than 400 deserving alumni have been honored with this award. Unfortunately, we're able to include here only a few of the many fine Cougars honored with Alumni Achievement Awards. Following is a list of awardees since 2002. For a complete list, visit www.alumni.wsu.edu.

Manzoor Ahmad '61, Lahore, Pakistan
Robert Alessandro '57, Gig Harbor
Dr. Abdullah Mohammed Al-Musa '79, Amman, Jordan
John J. Ascuaga '52, Carson City, Nevada
C. Douglas Brown '56, Kennewick
Susan Bjornstad Brown '59, Kennewick
James Clark '75, '76, Glendale, California
Dr. Bruce A. Ellingsen '62, Spokane
Scott K. Jones '79, Spokane
Kenji Kitatani '77, New York, New York
Frank Krook '67, '69, Burlington
Edwin Little '76, '03, Vancouver
Norman Looney '60, '66, Summerland, British Columbia
Paul Maughan '59, Anacortes
W. Lowell Maughan '66, Pasadena, Maryland
David Maughan '64, Burlington, Vermont
Annette Bienek McGee '59, Shelton
Floyd Rogers '73, Renton
Judy Huie Rogers '74, Renton
Martin "Sky" Smick '72, Brush Prairie
JoAnne Spencer Stewart '66, '73, Lolo, Montana
Harley Hamilton Tuck Sr. '50, Post Falls, Idaho
Ray W. Whitlow '70, Kennewick
L. George Wilson '63, Raleigh, North Carolina
Jeanne Peterson Youngquist '67, Mount Vernon
Mike Youngquist '66, Mount Vernon

CLASS NOTES *continued*

Katie Christiansen ('97 Women's Stud.) and husband, **Erik Christiansen** ('98 Crim. J.), are expecting their first child in June 2006.

Jana (Pursley) Meinhold ('97 Hum. Dev., '00 M.A. Hum. Dev.) completed her Ph.D. at Oregon State University with a dissertation focusing on sibling relationships. She is an assistant professor at Portland State University. She and husband, **Travis Meinhold** ('98 Hum.), live in Portland, Oregon, where Travis works in real estate development.

Justin D. Ball ('98 Geol.) recently joined Kleinfelder, Inc. as a staff professional. He transferred from Pittsburgh, Pennsylvania, where he worked for Geologic Services Corp. At Kleinfelder's Albuquerque offices Ball will be supporting the underground storage tank program.

Jason Davis ('98 Comm.) is a reporting manager at COMSYS, Phoenix, Arizona.

Charmaine Harvey ('99 Pol. Sci.) joined First Independent Bank in Camas as branch manager.

2000s

Jeff Evans ('00 Comm.) is manager of baseball media relations for the Texas Rangers Baseball Club. Evans was formerly assistant sports information director at Arizona State University.

Ryan Gillette ('00 Kines.) graduated from basic combat training at Fort Jackson, Columbia, South Carolina.

Andrea (Ballard) Brower ('01 Psych.) and her husband welcomed their first son, Rick Leon Brower III, September 30, 2005. Andrea, who has her Master's in Teaching, is a sixth-grade math and science teacher in the White River School District, Bonney Lake.

David Berg ('02 Crim. J.) married **Julie Brown** ('02 Comm.) and is program director for a juvenile treatment facility in Spokane.

Cody Grabenhorst ('02 Hist.) is a broker at Coldwell Banker Mountain West Real Estate, Salem, Oregon.

Tyler Litzenberger ('02 Fin.) is a real estate representative for the Opus West Corporation, Phoenix, Arizona.

Adam Query ('02 Hist.) and wife, Eve, welcomed firstborn son, Dominic Kristos McQuery, November 3, 2005. Adam is stationed in Fort Gordon in eastern Georgia.

Bernadette Flynn ('03 Comm.) is donor relations coordinator and marketing assistant for the Tri-Cities Cancer Center Foundation, Kennewick.

Teresa Alexander Hammer ('03 Soc., Anthro.) received her M.S. in anthropology at the University of New Mexico.

Joel Curl ('04 Kines.) was hired by the Tukwila Fire Department October 2005.

Caron Dorman ('04 Biol.) and **Kevin Treloar** ('04 Biol.) were married June 4, 2005. Caron is in the doctoral program in physical therapy and Kevin is in the master's program in education at Northern Arizona University.

Robin Kurdirka ('04 Int. Des.,'05 M.A. Int. Des.) is an interior designer at ALSC Architects, Spokane.

Crystal Victoria Lambert ('04 Soc. Sci.), Vancouver. is in her second year of law school and works as a law clerk in the law office of Alfred Bennett. Crystal was married June 18, 2005, to William Lambert.

Andy O'Keeffe ('04 Civ. Engr.) and **Jamie Overlin** ('04 Hist.) were married August 13, 2005 in Kent. **Ian Somppi** ('05 Pol. Sci, Hist.) and **Emily Poland** ('03 Comm.) were in the wedding party.

Andrea Cirignano ('05 Comm.) is an advertising sales account executive at KNDU-TV. Kennewick. Andrea is also working freelance for the *Tri-Cities Republic* newspaper and *Reactor Magazine.*

IN MEMORIAM

1920s

Rudy Anderson ('27 Bus. Admin.), 102, October 14, 2005, Mercer Island.

Elmer A. Dykstra ('28 Mech. Engr.), 99, June 2005, Auburn.

1930s

Ruth D. Crossland ('32 Home Ec.), 95, January 4, 2006, Vancouver.

Boyd Harlow x'32, 95, December 9, 2005, Colfax.

Barbara Erwin Hunt, x'32, 91, September 10, 2005, Richland.

Dwight D. Forsyth ('35 Bot., '38 M.S. Bot.), 94, November 27, 2005, Madison, Wisconsin.

L.R. Libby ('35 D.V.M.), 94, 2006, Live Oak, California.

Patricia Still ('35 M.A. Fine Arts), 85, August 21, 2005, New Windsor, Maryland.

John Claude Bartholet ('36 Civ. Engr.), 91, January 23, 2006, Spokane.

Helen Dundee Nelson ('36 Mus. '37 M.A. Mus.), 91, December 10, 2005, El Cajon, California.

George A. Williams ('36 D.V.M.), 79, October 19, 2005, Sacramento, California.

Myra Rand ('37 Soc.), 90, September 7, 2005, Arlington, Virginia.

Kenneth Eroh Gallagher ('38 Chem.), 90, January 21, 2006, Hartford, Connecticut.

Francis X. McArthur ('38 D.V.M.), 94, January 24, 2006, Boise, Idaho.

Laurence L. Peterson ('38 An. Sci.), December 9, 2004, Virginia.

Gerrie E. Caines ('39 Ag.), 89, January 10, 2006, Battle Ground.

Mary Conover x'39, 84, December 16, 2005, Seattle.

Roy Lester Long ('39 Phys. Ed., '40 Ed.), 88, June 2005, Toledo.

1940s

Mary Neigel ('40 Phys. Ed.), 87, October 7, 2005, East Wenatchee.

Susan (Simpson) Sanders ('40 Mus.), 87, February 14, 2006, Tacoma.

Opal Lunette Wise ('40 Off. Admin.), August 18, 2005, Lacrosse.

John Leland Jordan x'40, 84, March 27, 2005, Bremerton.

Louise F. Ayars ('41 Home Ec.), 85, July 18, 2005, Kirkland.

Frederick W. Bollinger ('41 M.S. Chem.), November 28, 2005, New Jersey.

Constance "Connie" Elise Moore ('41 Home Ec.), 85, September 13, 2005, Santa Fe, New Mexico.

Jane Robinson Adams x'42, 86, January 2, 2006, Chattanooga, Tennessee.

Francis W. Rish ('42 Phys. Ed, '46 Ed.), 86, February 3, 2006, Richland.

Gordon L. Viles ('42 Mech. Eng.), 85, March 8, 2005, Dillsboro, Indiana.

Charles Herring ('43 Comm.), 83, January 23, 2006, Seattle.

Kirk Athow ('46 Plant Path.), 85, December 4, 2005, Tacoma.

C. Gordon Edgren x'46, 80, August 29, 2005, Liberty Lake.

Jared James Davis ('48 M.S. Entom.), 85, January 26, 2006, Kennewick.

Herbert D. Hadley ('48 Bus. Admin.), 81, August 2, 2006, Longview.

Robert L. Miller ('48 Music, Ed.), 83, January 18, 2006, Pullman.

Jack Morrison ('48 An. Sci.), 79, November 27, 2005, Spokane.

A.D. "Jack" Radke ('48 Bus. Admin.), 81, January 1, 2006, Fresno, California.

William P. Eng ('49 Civ. Engr.), 83, January 6, 2006, Seattle.

Robert M. Stump ('49 Soc.), 82, March 31, 2005, Colorado.

Roger H. Walther ('49 Bus. Admin.), 78, September 21, 2005, Spokane.

1950s

Lauren L. Main ('50 Agron.), 83, November 14, 2005, Wilsonville, Oregon.

Richard "Dick" Nygaard ('50 Bus. Admin.), 79, July 23, 2005, Lacey.

Ron Eugene Cripe ('51 Pharm.), 81, March 20, 2005, Puyallup.

Charles Lenning ('51 Bus. Admin.), 78, September 4, 2005, Mount Vernon.

Joan Marion Patton ('52 Home Ec.), 75, June 5, 2005, Calgary, Alberta.

Sara Ann Staley Brock ('53, Home Ec.), 76, February 14, 2006, Lynnwood.

Peggy J. Macarthur ('53 Engl.), 74, November 14, 2005, Sacramento, California.

Franklin H. Greenough ('54 Gen. Stud.), 73, December 7, 2005, Port Angeles.

James Carlsen ('57 Bus. Admin.), July 12, 2005, Louisiana.

Dolly Littleton ('57 Ed.), 93, October 11, 2005, Colfax.

Marlene Perras ('59 Ed.), 68, January 17, 2006, Roswell, Georgia.

Winnefred L. Wyckoff ('59 M.S. Phys. Ed.), 72, December 10, 2005, Sun City West, Arizona.

1960s

David B. Harden ('61 Mech. Engr.), 67, November 11, 2005, Louisa, Virginia.

William Albert Wolf Jr. ('61 Wild. Rec.), 68, January 12, 2006, Palouse.

George Edward Cooper Jr. ('62 Sp. & Hear. Sci.), 68, February 17, 2005, Redding, California.

Donn Owens ('63 Pol. Sci.), 64, January 21, 2006, Reno, Nevada.

Richard L. Hill ('67 Wild. Bio.), 61, November 13, 2005, Portland, Oregon.

Tresa McLean ('67 Fine Arts), 60, October 10, 2005, Colville.

Karen McBeth ('68 Hum.), 59, September 3, 2005, Port Townsend.

Jack Pittis ('69 Civ. Engr.), 59, February 3, 2006, Port Angeles.

1970s

Jennings A. Jones ('71 Mech. Engr.), 58, August 19, 2005, Murfreesboro, Tennessee.

James C. Stachelek ('71 Soc. Stud.), 59, January 14, 2006, Medina.

Michael W. Roberts ('73 Comp. Sci.), 54, May 5, 2005, Seattle.

Stephen "Steve" Mark Deller ('74 Engl.), 54, November 19, 2005, Everett.

Clifford Ryan Irwin ('75 Psych.), 53, October 16, 2005, Los Angeles, California.

Fredrick Retzlaff ('76 Gen. Stud.), 54, January 24, 2005, Fall City.

Roger M. Sealock ('76 Ag.), 58, December 16, 2005, Yakima.

Adelita (Lela) Lira-Harris ('77 Ed.), 55, January 1, 2006, Kennewick.

1980s

Doris M. Cottam ('81 Ph.D. Soc.) 82, February 19, 2006, Sheboygan, Wisconsin.

Daniel P. Fertakis ('86 Engl.), 41, October 9, 2005, Pullman.

Todd David Brown ('88 Comm.), 41, January 5, 2006, Sumner.

1990s

Kimberly Marie Dammeier ('93 Bus. Admin.), 35, January 3, 2006, Gig Harbor.

2000s

Jaime (Krausse) Campbell ('02 App. Merch.), 25, January 7, 2006, Iraq.

Benjamin Kapp x'04, 33, December 12, 2005, Vancouver.

Faculty and Staff

Carol Colley, 83, December 21, 2005, Farmington. Colley worked in WSU's housing department and the research department of the vet facility.

Lester Forner, 86, September 16, 2005, Selah. Forner worked in technical farm labor at the Irrigated Agricultural Research and Extension Center from 1970 to 1981.

Geraldine Haynes, 83, September 29, 2005, Spokane. Geraldine worked as a staff librarian at Holland Library for 31 years.

Edward Thomas Huff, 89, December 10, 2005, Pullman. Huff worked as a plumber at WSU until his retirement in 1972.

Madeline Klossner, 89, October 22, 2005, Sequim. Klossner was a WSU librarian from the 1950s to 1970s.

Beverly Lange, 73, October 3, 2005, Pullman. Beverly worked in the bookkeeping department of the Student Book Corporation from 1967 to 1980 and in Holland Library from 1983 to 1995.

Bonnie Ruhoff, 53, December 21, 2005, Moscow. Ruhoff was a long-time employee and worked as the executive assistant to former WSU president Sam Smith.

Janice Walden, 67, November 14, 2005, St. Maries, Idaho. Janice was the wife of WSU head football coach Jim Walden, who coached from 1978 to 1986.

Donald E. Zimmerman, 62, February 24, 2005, Port Orchard. Zimmerman taught film classes at WSU in the 1970s.

First Lieutenant Jaime (Krausse) Campbell

IRAQ FALLEN REMEMBERED

IN LATE JANUARY students, friends, and faculty gathered on the Pullman campus for a memorial service and candlelight vigil for First Lieutenant Jaime (Krausse) Campbell, who died when the BlackHawk helicopter she was flying went down in northern Iraq January 7. The 25-year-old graduated from Washington State University in 2002 with a degree in apparel, merchandising, and textiles.

Campbell grew up in Ephrata and had been the Washington State Rodeo Queen. At WSU, she was a member of the Army ROTC program, where she developed an interest in flying. After finishing her degree, she chose to pursue a career in aviation with the National Guard. She and her husband, Army Captain Sam Campbell, had been stationed in Fairbanks, Alaska.

Campbell is the third Cougar to have died in Iraq since the start of the war.

The first fatality came in November 2003, when Captain James Shull of the Army's 4th Batallion, 1st Field Artillery Division was killed in Baghdad in an accidental shooting. Shull graduated from WSU in 1995 with a major in criminal justice. He was 32 and married, with three young children.

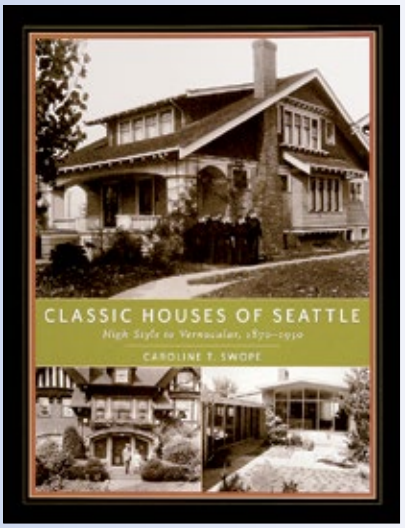
Sergeant Damien Ficek, a student serving with the Army National Guard 1st Batallion, was killed on patrol in Baghdad December 2004, when his patrol was attacked. He left behind a wife.

The names of all three soldiers will be cast in bronze and will join the names of more than 300 other casualties of war memorialized at the WSU Veterans Memorial near Murrow Hall.

In the three years since the start of the war in Iraq, more than 100 students and many more alumni have served and worked in the Middle East. About 30 WSU students were stationed there this spring. ■

—Hannelore Sudermann

BOOKS, etc.



Classic Houses of Seattle

By Caroline T. Swope
Timber Press, Portland, Oregon, 2005

When something is regarded as "a classic," it is usually because the object has achieved the ability to express the cultural spirit of an era. Objects having this status are often considered as art, or at least as cultural symbols. And so we have classic cars, classical novels, classical music, and so on. We also have Classic Coke, so called because, after public outrage at trying to change the recipe of its brew, the soft drink company quickly went back to the original version—now dubbing it "Classic"—realizing that it was messing around with an established cultural icon.

Caroline Swope's *Classic Houses of Seattle* makes use of "classic" in this way. Her book categorizes the significant historical styles that have shaped Seattle's residential architecture: Victorian, Craftsman, Four-Square, Modern, and a variety of Revival styles. All of these styles are represented by their classical exemplars in a book that is well organized and attractively illustrated.

Swope begins with a very readable overview of Seattle's residential architecture since the city's inception in 1853. This is followed by seven chapters covering different residential styles. Each chapter begins with a clear explanation of the style and its historical roots, followed by brief but succinct summaries of the classic examples. Each chapter, along with the book's appendices, documents whether the cited houses are still extant, or have been demolished for various reasons.

One theme that emerges is how, like many cities of the American West, Seattle looked to Europe and the American East Coast for its sty-

listic—and hence its cultural—cues. I was particularly struck by how much the 1876 Philadelphia Centennial Exhibition and the 1893 World Columbian Exposition in Chicago affected almost all of the styles Swope analyzes. This fact, along with recurring names such as Andrew Jackson Downing and the English architect Richard Norman Shaw—not to mention the Sears & Roebuck Company catalogue—paints a picture of a simpler and more homogeneous national culture, in which single events, single voices, and single publications were indeed able to affect national trends. Swope's book, when read in one sitting (as was the case for me), suggests how an overview of a city's architectural heritage can result in understanding that city as a historical-cultural collage of social forces that leave their imprints on the city's streets and neighborhoods.

Swope's final chapter is an added value to the book: it gives practical tips for how the reader can research the history of his or her own residence. To be such a sleuth, one must leave one's armchair and do some reading, some digging, possibly some visits to archives. But the rewards can be, if not great, at least very pleasurable and informative. The case studies Swope includes underline how drastically one house can change over the years. Don't believe what you see; the truth may be behind three layers of wallpaper!

Classic Houses of Seattle is meant for a general readership, so I don't think scholars will be referring to Swope's work as a primary source. And I guess I can quibble with Swope on small details; for example, balloon framing in residential construction is *not* commonly used today, as she claims. But this is indeed quibbling (besides, I would not want people to be reading *my* books that closely either). Caroline Swope has given us a very readable reference book for Seattle's residential architectural history. I am already thinking about assigning the last chapter to my students as a good example of how a little research can go a long way towards understanding the built environments all around us.

For more information, see wsm.wsu.edu/bookstore/alumni/architecture/.

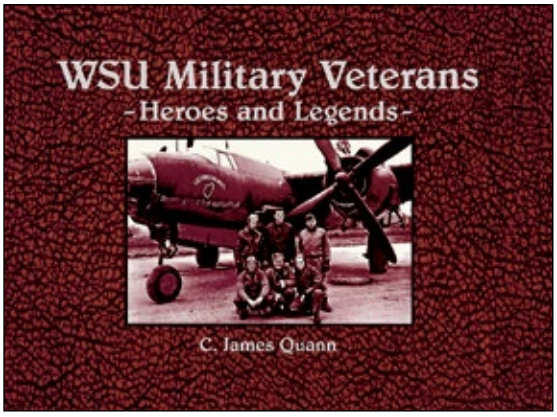
David Wang, Associate Professor of Architecture, Washington State University

WSU Military Veterans: Heroes and Legends

By C. James Quann '54, '60, '71
Tornado Creek Publications, Spokane, 2005

With three engines lost on a B-29 bombing run over Tokyo December 3, 1944, pilot Robert Goldsworthy and his crew bailed out. For the next nine months, he would endure brutal beatings as a Japanese prisoner of war. Far worse, he said, was the cold and starvation.

Goldsworthy and his older brother, Harry E. Goldsworthy Jr., both flew World War II combat missions. They retired as Air Force generals with five stars between them. Their contributions to the war are among the 120 case studies chronicled in C. James Quann's new book, *WSU Military Veterans: Heroes and Legends*. The author relates military experiences of former Washington State University students—and a few faculty and staff members—who served during World



War II, Korea, Vietnam, and the 1991 Persian Gulf War.

The WSU registrar emeritus spent a decade (1995-2005) conducting oral history interviews with many of his subjects. He also perused official military records, including U.S. War Department citations.

Like the Goldsworthys of Rosalia, many were native Washingtonians and products of WSU's Reserve Officer Training Program. Marine Corps generals John F. Kinney, Endicott, and Keith A. Smith, Cheney, distinguished themselves as pilots on Wake Island and in Vietnam respectively. Colonel Jack D. Holsclaw, Spokane, flew with the "Red Tails," the famous all-black World War II fighter squadron. Air Force colonel James P. Fleming, Moses Lake, is WSU's lone recipient of the Congressional Medal of Honor. He logged 810 combat missions in Southeast Asia, including a daring helicopter rescue under heavy fire.

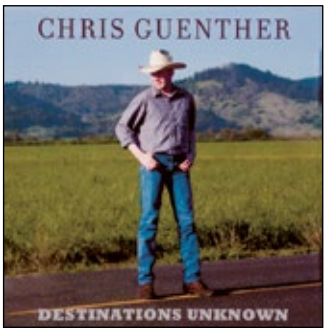
Some made the supreme sacrifice. Navy lieutenant Archie Buckley, Colville, died saving shipmates following a kamikaze attack on the USS *Saratoga*. Jeanne Lewellen Norbeck was one of four WASPs (Women's Air Force Service Pilots) to die testing U.S. aircraft at home during World War II. The book lists those killed or missing in action from World War I through the first Persian Gulf War.

Quann himself was an infantry officer in Korea. During a 25-year professional career in Pullman, Quann founded the WSU Veterans Memorial, which enshrines the names of 387 veterans. However, it was a visit with students on the 50th anniversary of D-Day (June 4, 1994) that confirmed his resolve to do the research leading to his book. He found most had little knowledge of D-Day's significance.

Quann regrets his book may not adequately reflect the important roles WSU veterans played in serving their country. He's aware too that his research likely failed to uncover acts of military heroism that should have been included in the volume. A 1973 fire destroyed many official military records archived at the National Personnel Records Center in St. Louis. And Quann was unable to interview 18 of the veterans he had planned to meet with, since they died before he could talk with them.

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

—Pat Caraher '62
***Pat Caraher is former senior editor of* Washington State Magazine.**



Chris Guenther: Destinations Unknown

Red Arrow Records, Olympia, 2005

Broken hearts, barrooms, rodeos, and crying in your beer—the CD, *Destinations Unknown*, from Chris Guenther '04 has all the ingredients of a traditional country album from the heart of country music, Nashville. Chris separates himself from his crooner colleagues, though, with minimal instrumentation and a vocal delivery that harks back to the early days of country music.

Destinations Unknown is the second full-length CD from the southwest Washington native. Chris penned all 10 songs, sings lead vocals, and plays six of the nine recorded instruments, including lead guitar, mandolin, fiddle, and piano. (Bassist James Gillette is a 2003 graduate.) He also stepped into the producing role for the project, helping to shape the overall sound into a pleasing package of country, rockabilly, and down home, foot-stomping honky-tonk.

Recorded digitally in Olympia, the CD never overwhelms the listener with sound, which can easily happen with too much production. Chris does a great job of arranging his band, "The Honky Tonk Drifters"; all the instruments find their place in each song beautifully. His vocals, styled somewhere between the nasal twang of Hank Williams Sr. and the smooth baritone of superstar Alan Jackson, also sit perfectly in the mix.

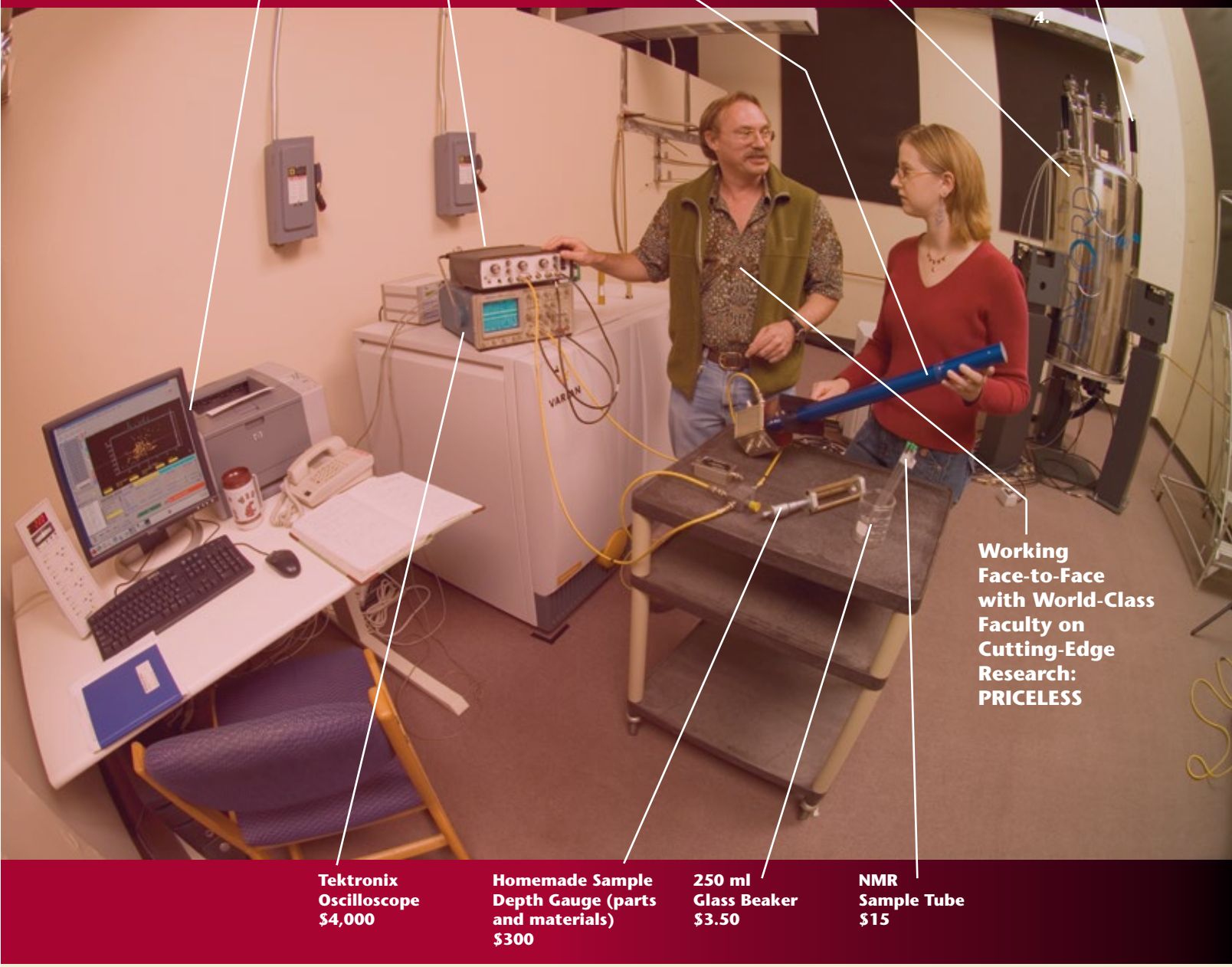
Destinations Unknown draws on a variety of moods, from the Caribbean feel of the Jimmy Buffet-influenced "Juarez, Mexico" to the more serious tale of youthful rebellion in "It Will Never Be the Same." The title track, "Destinations Unknown," is an inspired waltz layered in tasteful lead guitar and pedal steel guitar, a combination used successfully throughout the CD.

The storytelling truly comes alive with "I Gunned Him Down," a Marty Robbins-inspired song that focuses on a neophyte gunfighter looking to make himself a name in the old West. The infectious hook of the chorus—"I gunned him down./ I pulled that pistol from my hip/ And the shots rang out./ I just let that bullet rip"—stays with you long after the first hearing.

Chris doesn't attribute his songwriting style to any particular one of his many influences, but rather to a combination of them all. Judging from what he has accomplished with *Destinations Unknown*, he has succeeded in finding his own niche within the genre.

For information and sound clips, see www.cdbaby.com/cd/guenther2.

—Jason Kardong '95
Jason Kardong is vocalist and guitarist with The Wakefields, an alt-country band based in Seattle.



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WASHINGTONIA

Old Palouse House
by DeWitt Beattie

There is no wind. What was the wind like
yesterday when it blew?
Nothing moves, for mile after mile, nothing moves.
I watch a stalk of grass nearby. Nothing.
I expect a leaf of sweet clover to stir.
Stillness everywhere.
And then
in a kind of glory,
out of a spray of alfalfa a bee flies away
into the distance,
lost.
The leaf he sat on shifts back into place.

From Bunch Grass, *by Robert Sund, University of Washington Press, Seattle, 1969. Reprinted by permission.*

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There are many ways to support Washington State University and Janice R. Beckman ('51 Bus. Admin.) may have used them all. Janice's giving history reflects many of the alternatives our donors have when choosing to help WSU. Although Janice passed away in 2005, her legacy continues.

Janice made regular gifts to WSU since 1959. She later included WSU in her estate plan, naming WSU a partial beneficiary of her IRA and in her Will. She also established a Charitable Gift Annuity with the WSU Foundation for additional income.

These gifts were designed to fund the *Janice Beckman Endowment* at her passing, but Janice directed that her annual gifts immediately support what her endowment proceeds ultimately would—internships for business students.

Janice's legacy will provide generations of students the support they need to achieve their dreams.

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