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Fall15
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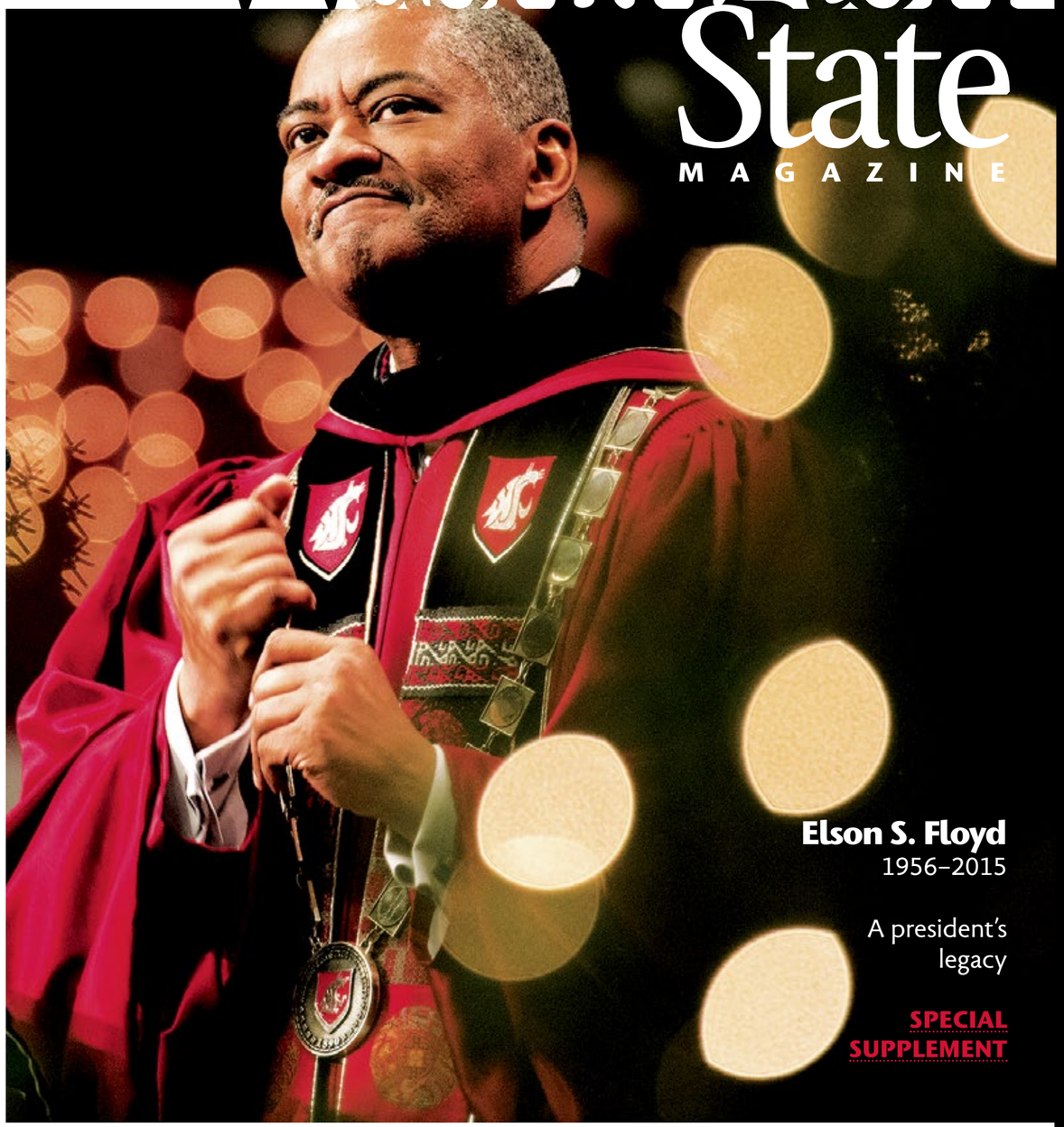
Washington State MAGAZINE



Elson S. Floyd
1956–2015

A president's legacy

SPECIAL SUPPLEMENT

Fall15
vol14no4

features

upfront

COVER PHOTO BY ROBERT HUBNER

CORRECTION: The summer 2015 story on the WSU Bread Lab, "Billions to Be Served," mischaracterized a request for Stephen Jones to breed a certain kind of wheat. He was asked to use traditional breeding methods to give wheat private genetic traits resulting from conventional chemical mutagenesis. He was never assigned by CAHNRS, nor asked by the Washington Grain Commission, to breed GMO wheat.

TUCANNON RIVER SCENE COURTESY LANDSCAPESBYRODGERS.COM

Memories of Bobo. A player and coach larger than life in every way. **IN MEMORIAM**

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ANDREW RYBACK PHOTOGRAPHY

Thematics

Departments

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"The universe is transformation; our life is what our thoughts make it."
—*Marcus Aurelius*

WE LOST AN EXCEPTIONAL LEADER THIS SUMMER IN OUR TENTH PRESIDENT, ELSON S. FLOYD. His vision in just eight years transformed the University and elevated WSU in research, student achievement, and land-grant service. This short space can't begin to list his accomplishments, so I encourage you to read his story in the special tribute supplement at the center of this issue. President Floyd will surely be missed, but it's imperative for us to continue his legacy.

In the spirit of transformation, we began a redesign of this magazine over a year ago. While the devotion to telling WSU's stories remains, we worked to create a new look and feel that both innovates and honors our 125-year-old land-grant mission.

The most obvious change you'll notice is the size and paper. In the land of Bigfoot, we decided to have a smaller footprint. The magazine production will waste less paper in printing because of its slightly slimmer form. Even the paper itself is an innovation. We are among the first university magazines in the nation to use 100 percent recycled paper, which uses less water and chemicals in manufacturing, in line with WSU's commitment to sustainability.

We also improved the digital side of the magazine. When you visit magazine.wsu.edu, you will find a mobile- and story-friendly look that better serves our readers. We will have more video and other online content to enhance the stories.

The web's great for another thing: having a conversation. I want to hear your stories, opinions, ideas, and updates, whether it's through an email, letter, or a connection on social media.

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BY REBECCA PHILLIPS

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Restoring chaos

WSU researchers seek to prove that an untamed tangle of nature is a prerequisite for long-term salmon survival

Young fish find shelter in the Tucannon's pools. (Photo Robert Dorion) **Opposite:** Researchers place piezometers in the river bed. (Photo Shelly Hanks)

"Look at all these fish!" says wildlife officer David Karl. My eyes adjust to the dappled sunlight as I bend toward the water. Shadows and leaves float in the stream, and beneath them tiny Chinook salmon undulate in the current, safe in a side channel that Karl calls a nursery.

The darting, hatch-sided fry are welcome evidence that salmon habitat restoration efforts are beginning to pay off in the Pacific Northwest. It is especially encouraging in the Tucannon River, one of the last breeding grounds for southeast Washington's wild steelhead and spring Chinook salmon. After ten years of intensive stream channel reconstruction, the river has emerged as a role model for the recovery of fish populations in the Columbia River Basin watershed and beyond.

Washington State University associate professor Alex Fremier and former graduate student Joe Parzych '15 MS are leading a study to document environmental improvements from the use of manmade logjams in the Tucannon. Anecdotal evidence suggests the logjams have successfully slowed the river's currents, creating deeper, cooler flows enriched with the oxygen vital for fish survival.

I join members of the Washington Department of Fish and Wildlife (WDFW) and the Snake River Salmon Recovery Board as they pull on waders and prepare to validate these reports.

While the pristine waters of the Pacific Northwest historically teemed with salmon and trout species, the numbers dwindled as habitat was lost to beaver trapping, logging, and dam construction. Riparian trees were cut to make way for agriculture, and well-intentioned wildlife managers removed deadwood from stream channels. The untamed tangle of nature slowly gave way to a more domesticated tableau. But nature prefers the chaos.

The human penchant for orderly landscapes produced "compliant river channels," where meandering streams became swift, straight currents clouded with sediment, says Parzych. To the detriment of the fish, the altered streams also grew warm, shallow, and muddy. Juvenile salmon, with no escape, were washed downstream while eggs suffocated in the silt.

Fremier says almost all native trout and salmon species in Washington have experienced a steep decline over the last century. In the Tucannon, Chinook salmon, steelhead, and bull trout are all listed as threatened under the Endangered Species Act.

On the hillside above the river, blackened spires stand as reminders of the 2005 School Fire, which ravaged the watershed and destroyed forests that had protected the stream banks and floodplains. It was the fire that finally opened the door to fish restoration efforts on the river.

"We've taken wood out of the rivers for 100 years and now we're putting it back in," says Fremier. Repurposing the timber, the WDFW began an intensive, collaborative effort to rebuild the Tucannon. Fire-damaged trees were flown in by helicopter and arranged like pick-up sticks in the water. To my eyes, the scene is a jumbled mess and difficult to navigate on foot, but it is pure paradise to Chinook salmon. Technically called "large pieces of wood," the logs create eddies and side channels where fish can safely hide and feed.

In the river, Parzych demonstrates the use of a device called a piezometer, first pounding a stake into the streambed and then threading a long white PVC tube down into the hole. This simple apparatus is a tool for measuring water level as well as the interaction between stream water and groundwater, called hyporheic exchange. In the hyporheic zone, the two water sources constantly intermingle, regulating oxygen levels in the streambed gravel where salmon make their nests.

Parzych's research provides compelling evidence that the logjams are indeed making an impact. Where water levels were once uniform, the Tucannon is now a composite of deep pools and shallow reaches. The pressure differences lead to enhanced hyporheic exchange, he says.

One sign of this is a healthy increase in downwelling, or the movement of stream water into the groundwater. "There is more recycling and less time for oxygen to be removed," says Parzych. "The more water moving through the hyporheic zone, the better it is for the fish and incubating eggs."

Steve Martin, director of the Snake River Salmon Recovery Board, says that over the last ten years, water temperatures in the Tucannon have dropped dramatically and water flows are nearly double. Stream sediments have decreased from 63 percent of the streambed to 9 percent.

"Intuition says the large wood is behind the changes, but we need Joe Parzych's data to prove it," says Martin. "Precipitation and snow pack are part of the variables involved, but all the other streams in the Blue Mountains are flat or have base flows that are dropping. If we document that large wood doubles water flows, it will have huge implications for rivers throughout the Pacific Northwest."

WDFW officer Karl wades over to an eddy behind a large tree trunk and points out two round steelhead nests along the bank. By all appearances, the restoration efforts have significantly boosted fish populations in the Tucannon, but Fremier says they'll know for sure in a few years, when the young salmon return from the ocean as adults ready to spawn in the river's cold, clean waters.

COURTESY WSU CMEC

Recycling Passion

Engineers at Washington State University take upcycling to a whole new level

BY EMILY SMUDDE '12

At the Composite Material and Engineering Center, they turn waste—from wood to carpet fiber to wind turbine blades—into composite materials strong enough for new buildings and bridges.

"My passion is the recycling aspect," says Karl Englund, an associate research professor and Extension specialist with CMEC. "I enjoy figuring out how to deal with trash and turn it into something good."

A composite material combines two or more materials for an added benefit, such as flexibility, strength, waterproofing, or durability.

"A cake is a composite material," Englund explains. "You mix things together, like eggs, sugar, and flour, to create something new."

However, more goes into a composite building material than into a birthday cake, Englund says. The engineer has to consider the science of making the composite, the economics, potential end uses, and the public benefit of the new composite.

Often Englund and other CMEC researchers are approached by industry or government to make something better. Vik Yadama, also an associate professor and Extension specialist with CMEC, is studying how the United States Forest Service could make new building material from the small trees it removes from forests.

Researchers have to be methodical and understand every step that goes into adding benefits. "You have to look at the big picture. You can't just jump in the middle of the process," says Yadama.

After identifying the material, the researcher figures out how to process it, says Englund. "How are you going to break down the material and how will you form it into a final composite? And how does this affect the properties?"

In the case of wood, grinding it up gives the engineer more freedom to reshape it, but it could potentially lose its strength. For Yadama's timber, the best option is to break the wood down into flakes called "strands" and fuse the strands together. This process converts up to 90 percent of the timber into lumber and keeps its structural strength.

A composite also needs to be easy to use, affordable, and marketable. "A lot of people have had really great ideas, but the economics just weren't there," Englund says.

Although Englund admits this mentality can be stifling, it's realistic. When creating new composites, Englund and Yadama have to consider where this composite will be manufactured, how much energy goes into manufacturing it, transportation and work costs, and of course what the material will look like.

"If the material doesn't look right, it won't sell," Englund explains. "Nobody wants to buy off-white toilet paper, for example."

Once the engineers create the composite, it's time to figure out if the material works. That's where CMEC director Don Bender comes in. Bender analyzes the architectural and end-use properties of the composite to ensure that when it goes to market, it's safe for public use.

"Building codes require products to undergo extensive testing at accredited laboratories such as ours," Bender says. "If a product hasn't gone through this rigorous process, then the local building official or inspector can reject its use in buildings for their jurisdictions."

Once testing has confirmed that the composite product is safe, the client has the green light to take the product to market.

"We generally wouldn't bring the product to market," Englund says. "We would definitely patent the material or the process, but we would need a commercial entity or a faculty member would have to start their own company to market the material."

stevens hall memorabilia: magazine.wsu.edu/gallery

BY KATELYN ORUM '15

STEVENS HALL TEACUPS (PHOTO SHELLY HANKS)

Tea traditions

Whether it's the tail end of the nineteenth century or the middle of the twenty-first, the women of Stevens Hall will sip tea on any given Sunday afternoon. For the past 120 years, thousands of women have called Stevens home at Washington State University and embraced its unique traditions.

Stevens Hall was built in the heart of the small Pullman campus in 1895. The college's first hall for women was named in honor of Isaac I. Stevens, Washington's first territorial governor. Only the original Ferry Hall, which burned down in 1897, preceded it as a residence. To ensure that Stevens Hall won't be demolished, it entered the National Register of Historic Places on March 12, 1979.

"We can look around and see the tubing where the wiring was added later on. Or be reminded that the fireplace was once used for heat, rather than just being a nice touch," says Minton. "We've even found pictures of when Stevens first got running water."

The brick portion of the exterior was molded in a clay pit behind the building, and has endured the Palouse winters for well over a century. Despite obligatory procedures to keep the building up to code and a few modern touches such as TVs and a kitchen, the picturesque building with the columned entrance maintains its original elegance.

"Some of the furniture is still there from long before I was even there," says Linda Seal '73. "There are couches that are the most uncomfortable things in the world but it is tradition after all. You don't just throw them out and get new ones. It's part of the charm."

"If the carpet gets replaced, it has to be the exact same carpet as before," explains Kreder.

The building is filled with memorable and quaint parts. A hand-carved cherry grandfather clock was given to the women by the men of Old Ferry Hall in the late 1800s as an apology for a "panty-raid," in the parlance of the time, which damaged some of the women's furniture. Just around the corner from the clock sits a baby grand piano that was donated many years ago under the condition that jazz never be played on it, as it was the provocative music of the time—and still jazz may only be played on the piano in the basement.

A small replica of Alexandros of Antioch's famous Venus de Milo is bolted down to a set of drawers in the entryway because it was once stolen by a group of men. The ladies secured the statue to ensure it will never be taken again. Now the small figure is adorned for special events. "After all she is naked lady, and could use some decorations," Seal laughs.

"It's an interesting feeling knowing you're living in a place where so many people have lived before," says second-year Stevens resident and senior wildlife ecology student Margaret Kreder. "You have a sense of community with people you haven't even met."

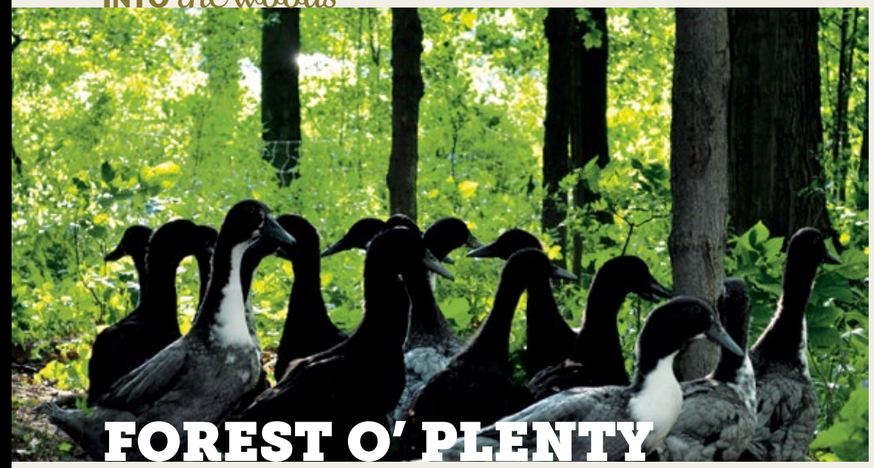
In the foyer, it's impossible to overlook the myriad of tea cups placed in glass cases. The impressive collection is one of the greatest treasures of Stevens Hall.

Traditionally, women contribute a tea cup after big events in their lives such as marriage and graduation. Visitors may also offer a cup. Helen Keller and her teacher Anne Sullivan allegedly stopped by for a cup of tea during their 1916 visit. Jacqueline Kennedy may have visited when John F. Kennedy came to WSU as a presidential candidate in 1960.

The tea parties were once a formal affair, but have now adapted to the laidback lifestyle of today's residents.

"I love the old photos of the ladies at tea in their puffy-sleeved gowns," says junior biochemistry major Michelle Minton. "And then there's us today in jeans and t-shirts," adds Kreder.

grow mushrooms: magazine.wsu.edu/extra/forest-farming



FOREST O' PLENTY

PHOTO JEN GABRIEL

BY REBECCA PHILLIPS

From above, forests unroll like thick carpets of maple or pine. Beneath the leafy canopy, however, one might find ginseng root, mushrooms, blueberries, hazelnuts, floral greenery, or even ducks. For millennia, indigenous cultures thrived on sustainable tree-based agriculture, and today, mainstream Americans are embracing the tradition through forest farming.

In their book *Farming the Woods*, Ken Mudge '80 PhD and Steve Gabriel offer a detailed look at multilayered, multipurpose forest production. A Cornell University professor specializing in agroforestry, Mudge says that healthy forests can produce a valuable range of food, medicinal, and other nontimber products. Coffee and chocolate, for example, are grown under the protective cover of tropical rainforests. Shade-loving ginseng root—selling for up to $600 per pound—is grown in U.S. forests, as are shiitake mushrooms, which are often cultivated on logs.

Forest farming is also a form of protective conservation, says Mudge, providing erosion control, nutrient recycling, shade, clean air and water, and wildlife habitat. Additionally, trees help buffer extreme temperature and weather events, an important consideration for forest management in the face of climate change.

Although *Farming the Woods* focuses on harvesting edibles like native pawpaw fruit and maple syrup from deciduous forests in upstate New York, the principles easily reach across the nation to the evergreens of the Pacific Northwest.

In Olympia, Washington State University Extension agent Jim Freed develops agroforestry practices with indigenous people around the world. He originally came to Washington to work with Christmas trees. "I got lots of questions about what people could do with their land besides watch the trees grow," he says.

Today, Freed uses horticultural techniques to help landowners manage forest plants like huckleberry, bear grass, and salal, as part of Washington's $60 million floral greenery industry. Organic Christmas trees and evergreens for holiday wreaths and centerpieces are also big business. "Over six million wreaths are made in Washington just from forest greenery," he says. "We prune the trees to produce a sustainable crop."

Native fruits and nuts are also in demand. "With wild blackberries, raspberries, and blueberries, we don't need sprays, we just manage the overstory," says Freed. He is currently developing local markets for pine nuts.

"Families are excited about this," Freed says. "Cultivating nuts, berries, oyster mushrooms, and medicinal herbs like yarrow give people another reason for owning property in the country. Beyond producing food and preserving the environment, forest farming can be a type of mental health therapy. And for native populations, it's about recapturing some of their culture."

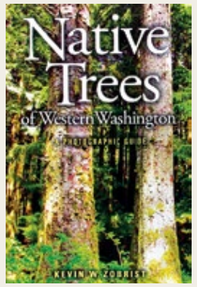
NATIVE TREES OF WESTERN WASHINGTON

From Douglas fir and western redcedar in the lowlands, to Noble fir and Engelmann spruce at higher elevations, forests and groves cover half of the Evergreen State and provide its nickname. A new photographic guide for enthusiasts and explorers examines the native species of western Washington. Its author, Kevin Zobrist, is a Washington State University associate professor and regional forestry expert for WSU Extension in the north Puget Sound counties.

The guide covers far more than evergreens. *Native Trees of Western Washington* also introduces broad-leaved deciduous trees such as Pacific madrone and bitter cherry. Each entry includes key features of the trees, range and habitat, modern and traditional Native American uses, and beautiful photographs of full trees and their details.

Zobrist, a native of western Washington himself, brings to bear his considerable knowledge of individual species as well as tree physiology, ecology, and the dynamics of forest stands.

The book, published by WSU Press, is available now.



Help Zobrist find two elusive tree species—golden chinkapin and white alder—growing naturally in western Washington. Check out the Tree Hunt page at **wsupress.wsu.edu/WSUTreeHunt** and start hunting. If you spot these most-wanted trees, simply upload photographs and GPS coordinates tagged **#WSUTreeHunt**.

In the USFS hot seat

BY LARRY CLARK

PHOTO USFS

Even though he didn't realize it at the time, scientific education from Washington State University would help U.S. Forest Service Chief **Tom Tidwell '76** tackle the challenge of managing 193 million acres of forest and grasslands during a time of increasing wildfires and climate change.

Tidwell was born in Yakima and grew up mostly in Boise, where his family would spend their vacations in the national forests. His love of the woods and the outdoors drew him to WSU's forestry program. Under the tutelage of plant ecologist Rexford Daubenmire and other professors, Tidwell learned principles and scientific rigor that would help him for many years.

"It gave me the science foundation to work in this field, and it helped me understand the complexity of ecosystems," says Tidwell.

After WSU, he began his Forest Service career in Boise National Forest, and has since worked in eight different national forests. In Tidwell's 37 years in the Forest Service, he worked as firefighter, district ranger, forest supervisor, and legislative affairs specialist.

"The idea of a job outdoors was attractive. Little did I know it would lead to a job that you spend most of the time in an office setting," he jokes.

Tidwell was named Forest Service chief in 2009 and has led efforts to balance uses and sustain national forests, particularly with the overarching challenge of climate change. He says a collaborative effort between local, state, and federal governments works best. He also believes that people should get outdoors and enjoy the forests.

"I encourage everyone to take advantage of this incredible resource we're fortunate to have in this country," says Tidwell.

He and his wife Kim have one daughter, MacKenzie. Tidwell received the WSU Alumni Achievement Award in 2011.

We tapped into Tidwell's expertise and talked with him about managing forests with the higher risk of wildfires in hotter, dryer summers.

With the drought in the Northwest and major fires like last year's Carlton Complex, what is the Forest Service strategy for dealing with the risk of major wildfires? Fire knows no boundaries. When we have these predictions of above-average fire seasons, we spend time coordinating with state, county, and local fire departments so they're aware of what we're thinking. We're doing everything we can to be ready to deal with whatever fire comes.

It takes all of us working together. There's no way the Forest Service can accomplish our responsibilities without state, county, and local working together.

I know that Carlton Complexes make the news, but 98 percent of fires on the national forests are suppressed in the initial attack. There's a lot of great work that goes on, not just on the large fires but on those smaller fires.

What's the long term plan for forest management, considering climate change, insect depredation, and other problems? Our strategy is first based on the science we have, and how to apply that science. We're fortunate that our research scientists have worked for decades to understand the effects of a changing climate on vegetation throughout the country. We then can apply that science to restore the resiliency of our forest ecosystems. When we do get that wildfire, the forest is able to recover faster.

We're also not restoring back to pre-settlement conditions. We recognize fire is part of the ecosystem. There's a need for us to allow fire to carry out natural resiliency efforts, but do that in a way to keep our communities safe. Around our communities, we're thinning our forests. However, as our summers get longer, hotter, and dryer, the windows we have to do prescribed fires or manage natural fire get shorter and shorter.

Times have changed. Climate change has contributed to our fire seasons being 60 to 80 days longer than what they were even about 15 years ago.

What do Pacific Northwest residents need to know about wildfire risk in our forests? We still want folks to get outdoors and enjoy the national forests, but we need to be more careful and reduce human-caused fires, which are the majority of ignitions. Everything we can do to keep those fires from getting started makes the job of firefighters a lot easier.

If there's a fire and the sheriff's department asks you to evacuate, please do it. I know how hard it is to leave your belongings and your home. Most people want to stay and defend it. But the best thing you can do to help firefighters is to follow those directions and let the firefighters deal with the fire rather than a rescue operation.

CARLTON COMPLEX, 2014—LARGEST WILDFIRE IN WASHINGTON STATE HISTORY. (COURTESY OKANOGAN COUNTY ELECTRIC COOPERATIVE)

Dr. Dan

WSU reinforced a sense of hard work and humility that carried him through graduation, his NFL career, and medical school

BY JACOB JONES '07

IN AN EXAM ROOM AT HIS YAKIMA MEDICAL PRACTICE, FORMER SEATTLE SEAHAWKS RUNNING BACK DAN DOORNINK '78 HUNCHES HIS SHOULDERS AND HARDENS HIS BROW AS HE RE-ENACTS A KEY 1979 PLAY AGAINST THE THEN-REIGNING WORLD CHAMPION PITTSBURGH STEELERS. EXPECTING A BLITZ, DOORNINK SAYS, HE LOCKED EYES WITH AN OPPOSING DEFENDER AND THEN GLANCED TO THE SIDELINE.

"Smart guys like him learn how to read the eyes of the receivers," Doornink explains.

With the snap, the Pittsburgh defender bolted for the sideline, but Doornink broke toward midfield, caught the ball and ran about 50 yards for a touchdown. Doornink says that his hours of studying film, subtle strategizing, and hard practice paid off at that crucial moment.

"This whole play was made by me going like that," he says, flicking his eyes to one side. "It was all done before it even got started."

A black-and-white photo from the play now hangs on the exam room wall. Doornink, 59, grew up in nearby Wapato, where the high school football field bears his name, before playing with WSU and the Seahawks. He returned to central Washington 25 years ago to join his brother's practice at Memorial Cornerstone Medicine.

Broad-shouldered and square-jawed, Doornink still moves with the heavy grace of the gridiron. He cruises the bright corridors of the clinic, noting the practice had moved into the new facility in December. Doornink says most of his patients rely on Medicare. He manages their treatment to keep them out of the hospital as much as possible.

"In a day, I might see eight patients who have 80 birthdays or more," he says. "They were a population that worked hard, didn't look for a handout. There was no safety net. You just did what you had to do. So they're sort of a fun group to work with."

Doornink says early work in the nearby orchards and playing sports against other regional farm boys helped toughen him up for his football career. He received a scholarship to WSU where he soon started at tailback while also balancing his demanding pre-med studies.

He says his time at WSU reinforced a sense of hard work and humility that helped carry him through graduation, his eight-season career with the NFL, and medical school at the University of Washington. He notes that he thinks a WSU medical school would certainly benefit rural communities.

"I used the same philosophy in medical school that I used in football," he says. "I'm not the smartest kid on the block, but if you're not a brilliant person, what do you do? You study more than everybody else."

Doornink credits his steady work ethic and strong faith for his successes. He has a comfortable patient load. He and his wife live just minutes from the clinic. He now spends most of his free time visiting his children and grandchildren.

But he says he will never forget those small, glorious moments on the field: The fake-out against the Steelers in '79, his first WSU start on national TV against Stanford, and maybe his greatest—rushing 126 yards against the defending champion Los Angeles Raiders in 1984.

Doornink tilts back his head and closes his eyes. A grin spreads across his face as his right hand grips at the empty air, like he can almost feel the ball and hear the cheering fans again.

"I can see it in my vision," he says, "where the guy was and the moves I had to make. It's still sort of exciting to think about those times."

view some career highlights: magazine.wsu.edu/video

Opposite: Nicknamed "Mr. 3rd Down" for his knack of gaining first downs as a running back, Dan Doornink '78 played one season for the New York Giants and seven seasons for the Seattle Seahawks. (Al Messerschmidt/AP) **Below:** Doornink, now a doctor of internal medicine, runs a clinic in Yakima with his brother. (Courtesy Yakima Valley Memorial Hospital)

OURstory

The unexpected presence of Mario Vargas Llosa

BY RAYMOND L. WILLIAMS '72

Recently on the streets of Panama, a t-shirt with the phrase "Keep Austin Weird" caught my attention. Pullman, unlike Austin, has never struck me as a particularly weird college town. The experience of being at Washington State University, nevertheless, is something that I always remember as being a little quirky, but in the same positive way that the young man wearing the shirt seemed to appreciate the "weirdness" of Austin. For example, I'm proud to have studied at WSU at the same time as cartoonist Gary Larson. And let's face it: Gary Larson must be a little weird, or if he is not, at least those hilarious *Far Side* comics most definitely are. I like Mike Leach, too, even though he might not be the most typical football coach.

During a recent visit to the WSU Honors College, I was reminded of how anomalous the campus was when I was there in the late 1960s and early 1970s. For me, one of the most precious of these anomalies was the almost secret presence in the fall of 1968, when I was a freshman, of the 2010 Nobel Laureate of Literature Mario Vargas Llosa.

There was hardly a more unlikely place for the young and radical Peruvian writer to have spent time teaching and writing. Right before arriving in Pullman, he had been a member of a jet-setting group of writers that included 1982 Nobel Laureate Gabriel García Márquez, Mexican writer Carlos Fuentes, and the Argentine writer Julio Cortázar. Their forefather was the Argentine master Jorge Luis Borges, already known among American literati from the appearance of his stories in *The New Yorker* in the 1960s, and the publication, in English translation, of his landmark book *Ficciones* in 1962. Other than Borges, Latin American literature was not really on the radar screen of most Americans. That began to change in 1970, when García Márquez published the bestselling *One Hundred Years of Solitude* in English translation, and in 1971, when poet Pablo Neruda won the Nobel Prize for Literature.

These were writers who highly valued being cosmopolitan. They had all escaped the limits of their previous lives in Latin America by finding refuge in the city that they considered the cultural capital of the West—Paris. When they were not in Paris, they lived and worked in large and vibrant European cities such as Barcelona and London. Today, Vargas Llosa lives most of the time in Madrid. In this context, then, his presence in Pullman was an anomaly in his otherwise lifelong commitment to urban life.

Why was this upstart Peruvian writer in Pullman? It had everything to do with something of an anomaly on the WSU faculty: Wolfgang A. Luchting, a professor of German nationality who had completed a degree in American studies in Germany, learned Spanish in Peru, and taught an unlikely combination of German and Peruvian literature in the Department of Foreign Languages. Luchting was also Vargas Llosa's translator into German. Vargas Llosa was considering the possibility of an academic career, so he accepted the invitation to WSU. When the author was in Pullman, he worked on two very lengthy books: the novel that eventually was published under the title *Conversation in the Cathedral* and a book-length critical study of the work of Gabriel García Márquez.

Most students and faculty who were reading Vargas Llosa's novel *The Green House*, attending his four public lectures, or hosting him in Pullman for his semester-long stay in 1968 are no longer living near WSU. To a large degree, the fact that a future Nobel Laureate taught a literature class in Spanish on campus has been forgotten. Nevertheless, even though the Nobel Prize is awarded on the basis of each writer's total work, one could reasonably argue that the centerpiece for his Nobel recognition was actually written in Pullman. That argument, which I personally would defend, is that his most complex and ambitious novel, *Conversación en La Catedral*, was the key piece of his Nobel Prize.

As a freshman, I was not among the rarefied American literati who had read Vargas Llosa's two extant books in English translation—*The Time of the Hero* and *The Green House*. I just happened to be in a Spanish advanced grammar class and attended the writer's four public lectures upon the recommendation of my Spanish professor Billy Weaver. The truth is, I was an anomaly myself; a first-generation college student of a working-class Scandinavian family from Tacoma, I became fascinated with the work of Vargas Llosa, then Chilean culture, and then Latin American literature. Since completing my doctorate in Latin American literature, I have published several books on this literature as part of an academic career that has as much to do with Vargas Llosa, Luchting, and the WSU Honors Program as has my graduate training.

It was really the special anomalies of the place that made all the difference for me. Only recently have I realized just how important those formative years were for me at WSU. Today, I am proud to be associated with the Vargas Llosas, as well as the unorthodox Gary Larsons and Mike Leaches of this unique institution.

A 1972 WSU graduate, Raymond L. Williams is the author of fifteen books and currently holds the title of Distinguished Professor at the University of California, Riverside, where he teaches Latin American literature. His book Mario Vargas Llosa: A Life in Writing *was published by the University of Texas Press in December 2014.*

DEARreader

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BY ADAM M. SOWARDS

Traveling ecologist Rexford F. Daubenmire

PHOTO COURTESY MARYJANESFARM.ORG

In a spiral-bound notebook, now yellowed after nearly seven decades, blue ink in a neat hand sprawls across page after page listing plant after plant from grasses to trees. Buried within Washington State University's Manuscripts, Archives, and Special Collections lie this and myriad artifacts of WSU botanist Rexford F. Daubenmire's scientific life. Daubenmire devoted his life's work to answering one of ecology's central questions: Did plant communities exist as discrete, predictable entities, or were they more or less random configurations of plants?

A field trip guided by Daubenmire reveals the practice of ecology and the region's community of science in the middle of the twentieth century. In 1948, shortly after coming to Pullman from the University of Idaho, Daubenmire developed a six-week summer field course that surveyed the northern Rockies. He opened the course to students in botany or forest and range management, as well as inviting professionals from other regions who wanted an intensive ecological introduction to "the finest scenery in North America," as a course advertisement put it. For $25 tuition and $0.97 per day for food, students received six credits in field ecology in the northern Rockies.

Seven students with various experience from universities in Idaho, Michigan, Montana, and Tennessee joined Daubenmire. His wife, Jean, assisted him as an instructor, part of a lifelong professional partnership that included co-authoring a seminal work in regional ecology published in 1968 through WSU Extension, *Forest Vegetation of Eastern Washington and Northern Idaho*.

From July 1 to August 12, the party drove more than 3,000 miles. They first headed west through the Palouse to the rugged scablands of Palouse Falls before venturing north toward Spokane. They then crossed Lookout Pass to Montana where they circled counterclockwise from Missoula toward Billings, to Great Falls, and on to Glacier National Park before returning to Pullman. They often camped in the woods and plains off the beaten path. Most of the six weeks and 3,000 miles passed uneventfully. Rain delayed them on occasion. They forgot supplies once and retraced their path. Another time, a landowner at a dude ranch in Big Timber Canyon, Montana, refused the party passage. And there were casual days, such as August 1, when Dauby recorded: "Sunday—went fishing—successful."

Throughout their travels, these peripatetic ecologists met other researchers at nurseries and experimental research stations. Part of the larger scientific community, these experts knew the local areas intimately and directed the party toward particular sites to see specific ecological processes. In these often remote locales, Daubenmire and his colleagues found and categorized plants, work that contributed to Daubenmire's lifelong project.

In the best tradition of the land-grant system, the WSU botanist consistently sought practical applications. Ecologists like Daubenmire believed that if plants existed in communities, experts could predict their behavior better and thus manage forest and range more effectively. So, he and students sought out relatively undisturbed landscapes—climaxes in ecology's jargon—to study plant associations in natural settings. They gathered and plotted data, hypothesized along the way, and built toward conclusions Daubenmire used in subsequent publications.

Daubenmire's time in the Palouse corresponded to transformations in ecology and WSU. He arrived during the Great Depression when ecology was but a nascent discipline and left during the post-Earth Day Age of Ecology when Americans hoped university scientists might guide them out of multiplying environmental dilemmas. Daubenmire's work demonstrates one man's place in communities—natural and scientific—and shows an abiding concern about the fate of the Northwest's forest and rangelands, an interest in the practical and theoretical rooted in this place where he traveled wide and deep.

Adam M. Sowards is an environmental historian and professor at the University of Idaho.

view litate village soil remediation: magazine.wsu.edu/extra/fukushima

What to do with toxic soil?

Fukushima soil remediation proves promising

BY LARRY CLARK

Japanese farmer Kenichi Okubo didn't lose his family farm immediately when the massive **TOHOKU EARTHQUAKE** hit in March 2011. Even the ensuing tsunami spared his crops from sea water. But the meltdown of the Fukushima Daiichi nuclear reactor, 30 miles away, spewed **RADIOACTIVE CESIUM** over the fields, and forced the 72-year-old rice farmer and his nonagenarian mother to evacuate.

"The cloud stopped at some hills east of the reactor," says soil physicist and WSU instructor Colin Campbell '95. "Then radioactive cesium-137 dropped in snow on this little village called Iitate and surrounding areas."

Campbell is vice president of Decagon Devices, a family-owned scientific instrument company in Pullman founded by his father, former WSU professor Gaylon Campbell '68 PhD. Since 1983, the company has made products to measure energy states of water, important for soil quality, food safety, and other uses. In 2007, one of their devices tested soil for water on Mars.

Campbell learned about Okubo and the soil contamination in Fukushima from his colleague and friend Masaru Mizoguchi, a soil scientist at the University of Tokyo.

The Japanese government response was to scrape the top ten centimeters of soil from the area and cart it away, leaving the fields a barren wasteland. However, Mizoguchi knew that cesium will bind onto certain soil particles, like clay, which is prevalent around Iitate. He had a plan to mix the soil and filter it so the heavier clay bound to cesium goes into a containment hole. Okubo and other farmers who returned could then start farming with little to no soil radioactivity.

Mizoguchi turned to Campbell and Decagon Devices for help. They donated sensors and expertise to the project.

Campbell visited Iitate in 2013 to see the progress. "They were just beautiful rice farms carved out in the valleys," he says. Campbell had studied rice cultivation as a doctoral student at Texas A&M, so he borrowed some boots and joined dozens of retired scientists and university professors to help remediate Okubo's farm.

Through the course of Mizoguchi's project, radiation levels dropped significantly and rice grown there was safe to eat.

A few factors confound the operation: cesium washes down from the unremediated hills; the public still suspects crops from Iitate might have radiation; and wild boars dig up the soil and return some cesium.

Still, the process shows promise. Campbell knows it's not a solution for every incident, but "Okubo is making rice in the land he loves," he says.

ZACH MAZUR

Birth of a medical school

BY DOUG NADVORNICK

Like the best athletes, sometimes a university has to run full speed then shift directions. For months beginning last summer, WSU representatives pushed hard for a new medical school. The legislature approved the authority for the University to create a WSU College of Medicine this spring. Now the work begins to build the medical school.

After the governor's signature, College of Medical Sciences Acting Dean Ken Roberts and his team pushed into action. They began the search for the new school's founding dean. Teams of WSU faculty and local physicians are writing the curriculum, and staff members are developing the school's student support infrastructure.

If preliminary accreditation is granted, the university could begin recruiting students in the fall of 2016 and the first class of students could begin in the fall of 2017.

Those students will spend their first two years of academic studies on the Spokane campus. For their third and fourth years, students will work in community settings at clinical campuses in Spokane, the Tri-Cities, Vancouver, and Everett, with an emphasis on primary care.

"We believe that by sending students to one of those places for two years, they will develop relationships with health care providers, patients, and the community, all factors that increase the likelihood that these students will return to practice in these communities," Roberts says.

The school will go through three accreditation rounds before full accreditation, perhaps by 2020. By 2021, the University hopes to increase the size of its class to 120 students.

follow the medical school progress: medicalsciences.wsu.edu

Tomatoes

A fruit of myths and legends

BY LARRY CLARK

For a staple found in backyard gardens and farmer's markets everywhere, the tomato certainly carries its share of myths. The rich, acidic fruit that we often call a vegetable has been considered a poison and an aphrodisiac. Even in late Renaissance Italy, a botanist connected the tomato to the golden apples of Greek mythology.

Despite its rep, gardeners grow tomatoes by the bucketful all over the state, often with help from Washington State University researchers and Master Gardener volunteers.

Tomatoes were no mystery to the South Americans who first ate them. The fruit grows wild in the coastal highlands of Peru, Ecuador, and northern Chile. It was later cultivated in Central America, where it looked similar to a plant the Aztecs called "tomatl." Spanish explorers took the plant to Europe and beyond, calling it "tomate," and farmers have grown the plant there since the 1540s.

Italian herbalist Pietro Andrae Matthioli in 1544 included in his plant guide a reference to a yellow tomato, which he called *mala aurea*, the "golden apple." In 1553, Swiss naturalist Konrad Gesner painted a watercolor of a red *poma amoris*, a "love apple," named for the tomato's alleged aphrodisiac qualities.

The smelly leaves and stalks of the tomato plant, or its nightshade cousins, may have led English writers to decry the toxicity of tomatoes in the 1590s. However, as Andrew F. Smith writes in *The Tomato in America*, tomatoes were still eaten throughout the British Isles and the rest of Europe.

On this side of the Atlantic, English botanist William Salmon reported tomatoes in Carolina in 1710, probably brought in by Spaniards or others.

By the middle of the nineteenth century, tomatoes were cultivated all over the continent, including the Pacific Northwest, where they were introduced by missionaries. In 1839, a visitor reported tomatoes growing on the banks of the Walla Walla River. Historian Sidney Warren claimed that Oregon and Washington pioneers boiled them with sugar until thick, added honey, and put them on hotcakes.

The misconception of belief in poisonous tomatoes spread with apocryphal tales of daring farmers who ate them anyway, according to Smith. His historical research found few early American accounts about the risks of tomatoes. They were sometimes not eaten because of polluted water used to wash vegetables. Others didn't like the smell or the taste.

Even the tomato's pests earned mythic notoriety. The fat, three-inch-long green tomato hornworm definitely wasn't a creature more toxic than a rattlesnake that could spit poison three feet at unsuspecting farmers.

Pests still exist for the tomato, as most gardeners know, but Carol Miles, a WSU vegetable researcher at the Mount Vernon Research Center, says the major concern in western Washington is late blight. The fungal disease, which can wipe out a tomato crop overnight, spreads on wet leaves.

Because of the short growing season, many tomatoes are cultivated in long, tall protective structures called high tunnels. They can capture moisture that leads to infection. Serendipitously, Miles and her colleagues discovered a well-ventilated tunnel will reduce the risk.

"As long as the tunnel has good ventilation and the plants are well-managed, there's not enough moisture to allow the spore to germinate and infect the plant," she says.

Miles works on both the east and west sides of Washington. About five years ago, she joined other vegetable experts in the Northwest to deal with an odd condition where leaves began to curl up all over Oregon, Idaho, and Washington.

"Everyone immediately thought 'virus' because that's a pretty common symptom of plant viruses. So people were starting to pull out plants," says Miles. After their labs determined it was physiological leaf roll caused by a dry environment, Miles and the others saved a lot of tomato plants by responding within a week.

Over on the east side of the state, at the WSU Extension office in Spokane County, Master Gardener volunteer Laren Sunde dispenses advice to tomato gardeners daily when she works from May through July. She says a big problem is eagerness.

"In our neck of the woods everyone wants to put out their tomatoes the first of May," says Sunde. "That's way too early."

Instead, she says, "if you want to have tomatoes in July, the best thing is to start seeds in the house in late February or early March. Harden them off outside during the day in April and early May. Then put them out in mid- to late May."

Sunde also encourages gardeners to water regularly, not sporadically, especially in dry summers.

For western Washington tomato fans, Miles' main growing advice is to prune heavily, one or two main stems to open up the plant. "If you don't prune, you get a lot of green tomatoes. If you prune, you get fewer tomatoes but they ripen early."

And you definitely want ripe tomatoes. There's nothing quite like a juicy, savory, and flavorful tomato right out of the garden.

Miles says her favorite way of eating them fresh is sliced in a vinaigrette with red onions, cucumbers, oil and vinegar, salt and pepper. "I top it with feta cheese if I'm feeling adventurous," she says.

For Sunde, ripe cherry tomatoes off the plant are a favorite, as is tomato salad with basil, parsley, and a little olive oil. She also roasts tomatoes with olive oil and coarse salt, then freezes them for winter use in sauces and stews.

With hundreds of varieties, in many colors, there's a tomato for anyone, says Sunde. She even had great success last year with a new variety: Cougar Red, developed for eastern Washington by WSU. ☀

WSU vegetable expert Carol Miles challenges readers to come up with really good, unique recipes for green tomatoes, since they are so easy to produce. Send your recipes to wsm@wsu.edu and we'll post them at magazine.wsu.edu/extra/green-tomatoes.

Tomato/Green Chile Salsa

3 cups peeled, cored, chopped tomatoes
3 cups seeded, chopped long green chiles
¾ cup chopped onions
1 jalapeño pepper, seeded and finely chopped
6 cloves garlic, finely chopped
1½ cups vinegar (5% acid)
½ teaspoon ground cumin (optional)
2 teaspoons oregano leaves (optional)
1½ teaspoons salt
Yield: 3 pints

Combine all ingredients in a large saucepan and heat, stirring frequently, until mixture boils. Reduce heat and simmer for 20 minutes, stirring occasionally. Ladle hot salsa into hot pint jars, leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims. Adjust lids and process in a boiling water canner 15 minutes at 0-1,000 feet altitude; 20 minutes at 1,001-6,000 feet; or 25 minutes above 6,000 feet.

Courtesy WSU Extension/Pacific Northwest Extension Publishing. You can download the entire "Salsa" publication, with tips on preparation and more recipes in English and Spanish at **magazine.wsu.edu/extra/salsa**

VINCE VOIGT

BY LARRY CLARK

Out the hack door

SIMULATING CYBERSECURITY ATTACKS TO PROTECT THE SMART GRID

illustration by James Yang

Hackers had a banner year in 2014. They stole hundreds of millions of passwords and other pieces of confidential information from banks, retailers, credit card companies, even film company Sony Pictures. A record number of computer breaches affected more than half of all American adults, costing businesses up to $500 billion, and fueling increased attention to the security of Internet interactions. But the financial consequences of those attacks pale in comparison to the possibility of intrusion and disruption of the electric power system.

From hospitals' life support machines to nuclear reactors to home heating during bitter cold winters, keeping the power flowing can be a matter of survival. Increasingly the power grid is a smart one, an interconnected system of electric power generation, distribution, advanced home meters and appliances, and computer control centers. The system can increase efficiency, reduce outages, and possibly lower costs. But with more and faster communication across the system comes greater vulnerability.

At Washington State University, a combination of power engineers, computer scientists, and their industry partners simulate holes and weaknesses in the smart grid, then work out ways to manage the risk of hackers interrupting and subverting the electric power system. Their key to successfully securing the grid is understanding that the threats are both cyber and physical.

"What is the nightmare scenario of an attack on the power grid? If you're an IT manager alone, you can't imagine that," says Chen-Ching Liu, electrical engineering professor and director of WSU's Energy Systems Innovation Center (ESIC). "We have to bring the two sides together, much like our group of computer scientists and engineers. You have to know enough about the power grid to see what kind of cyberattack would take control and do enough damage to the grid to create that nightmare scenario."

Liu says a successful attack could cause not just a power outage, but create a tremendous expense for utilities as they replace blown transformers worth millions of dollars each. The threat is not just theoretical; in 2007, Idaho National Laboratory ran an experiment where a cyber attack physically destroyed its Aurora Generator, causing it to explode after rapidly opening and closing circuits.

Even President Barack Obama and Congress agree that cybersecurity is a national priority. "No foreign nation, no hacker, should be able to shut down our networks, steal our trade secrets, or invade the privacy of American families," said Obama in his 2015 State of the Union, to rare bipartisan applause.

"If you think of the big threat, it's not just the cyber part. The power grid is always a target, whether it's terrorists or others," says Anjan Bose, an electrical engineering professor and former dean of the Voiland College of Engineering and Architecture, with more than 35 years of experience in the field. "What has been added is that now you might be able to get to the power grid through the cyber systems. That is what worries people."

view a cyberattack simulation: magazine.wsu.edu/video

DETECT AND CONTAIN

In the electric power transmission control room at WSU's engineering building, a hacker attacks the power grid. It's a smart grid, shown on large computer monitors as yellow squares and lines representing electric substations and generators, and at first everything is copacetic. A moving graph shows a steady flow of electricity that keep refrigerators running and iPhones charging. Then a square starts to blink red. A circuit has been forced open and a generator disrupted.

Within seconds, the red blinking spreads from one square to another, the graph line descends in jagged increments as voltage goes down, and soon the entire grid has cascaded into a complete blackout.

Fortunately the attack is a simulation, run by Liu's graduate student as the hacker. Another graduate student operates the control system. In a second demonstration, they use an anomaly detector within the smart grid's substations, which first identifies signals that aren't trustworthy, then isolates them to prevent further damage. This time the attack does not bring down the power grid.

Liu explains that their software looks at computer traffic and spots oddities. "When you find unusual things, you try to figure out what to do with that. Hopefully you kick out the intruder early enough that there's no impact on the grid," he says.

The control simulator, called a smart city test bed, is a valuable asset and one part of the strategy to safeguard a smart grid's integrity. "Cybersecurity is very hard to study on just paper. We know the power grid so we can simulate that, but the computer side is very complex," says Liu. "Unless you have a realistic environment, much like industry has, it'll be hard for you to do your research."

Pullman, wired up as a smart city, is part of the test bed, too. Its data will be used for simulating attacks, but not in real time, says Liu with a chuckle. "We can't play with a live system."

Smart meters, which send usage information to the Avista utility to increase efficiency, are part of the project in Pullman. On the consumer side, Liu recognizes the need for diligence on privacy issues for the devices, since around 60 million smart meters are expected to be deployed around the United States by 2019. There's a strong interest in securing smart meters because unauthorized access could not only lead to infiltration of the power grid, but a criminal might see that no one is home if there's less electricity use, says Liu.

Because of privacy and other societal and policy implications of the smart grid and cybersecurity, Liu brought WSU psychologists, sociologists, economists, and political scientists into the ESIC group. They work in concert with the engineers to address privacy and other human factors connected to electric power systems. Liu also headed up smart grid implementation for the European Union before coming to WSU, which shared many of the same concerns.

Up a couple of floors from the smart city control test bed, electrical engineer Anurag Srivastava leads the team in another smart grid demonstration and research lab, where stacks of electric relays, sensors, and controllers connect to real-time simulators. This is the physical side of the system, connected to its own smart grid simulation and acting as a complement to the smart city test bed.

The sensor helps in monitoring the simulated power grid using the same hardware as a substation, says assistant professor Srivastava. He explains that this WSU test bed emulates the way data flow from real equipment to control centers, and how different actions such as cyber attacks may impact the physical system. It also helps in analyzing advanced communication technologies in a smart grid.

"In the past, you used to get snapshots of the grid, like a picture which would come every four seconds. Now you're looking at more like a video of the grid with fast sensors," he says. That immediacy means more control ability to isolate problems and maneuverability to bring back the power system in case of trouble.

Srivastava says the test bed can help analyze responses to both hackers and damage from storms, accidents, or direct physical attacks by humans.

"A big concern is how to survive big storms like Hurricane Sandy. Turns out some of the techniques you need to survive cyber attacks are the same kinds of technology and processes," says Bose.

BAKE IN THE SECURITY

On the other side of Pullman, Dave Whitehead '89, vice president of research for the electric power equipment manufacturer Schweitzer Engineering Laboratories, or SEL, takes an engineer's perspective on cybersecurity.

"We build systems to take into account temperature and other environmental factors. Cybersecurity is just another thing we need to do so we can make sure the system is robust and reliable," he says.

Not that the sky is falling. It's really preventive medicine. "Is Pullman a dangerous place? No, but I'm still locking the door on my house. It's just prudent behavior."

After he graduated from WSU, Whitehead worked on submarines in Connecticut, and then returned to Pullman and the expanding company in 1994.

Whitehead says security has always been built right into the company's electric relays and other equipment. Edmund O. Schweitzer III '77 PhD started the company in his basement in 1982, with an industry-changing digital protective relay—a device that monitors power lines and systems for problems. Since Schweitzer, also a former WSU faculty member, had introduced the world's first microprocessor-based relay, he recognized the potential for misuse through the increase in electronic communications. The relay was now passing more information than ever to an electric utility's control centers through dialup modems. Even in the early 1980s, Schweitzer required two passwords to use the relays, one for technicians to evaluate problems and another for engineers to actually change settings.

It's essentially the same as the two-part access at SEL's offices, where a person might need both an electronic badge and a password. "We take data security we have in our headquarters and apply it to substations out in the middle of nowhere," says Whitehead. "It's a layered approach."

He says there are advantages to securing the grid, as opposed to guarding strictly online transactions. When it comes to cybersecurity, the challenge for Target or banks is abstract; it is money, but it's a handful of bytes in a computer, says Whitehead. "When you take the money from my account or give me a whole bunch, there's no connection to the physical universe. I don't all of a sudden have a million dollars sitting in my wallet." For the electric power system, the cyber part really does connect back to some physical thing, whether it's electrical current or an open circuit breaker.

Another advantage is that power systems are overmeasured, "so if somebody were able to spoof one location, we have another location that essentially measures the same thing," he says. If something is wrong or values don't match, the attack can be identified and isolated.

When they complete new products, Whitehead's research team at SEL works in a similar way to the WSU scientists, and sometimes with them. "Our cybersecurity team has a test bed where they put in equipment, and then start poking holes in it or attacking it."

PUT ON THE HACKER HAT

Adam Hahn, a computer scientist at WSU, says researchers must consider the worst ways to break the power system if they want to mitigate against attacks.

"How can you defend against something you don't know? You have to know what an attack is going to do before you can defend against it," says Hahn. "In other engineering fields you try to design a system that meets some functional requirements. Here we try to figure out how we can violate whatever assumptions they made.

"Instead of making a system work, we're trying to make a system fail."

Hahn came to WSU in 2014 after working in the private sector on cybersecurity, primarily for the federal government. He says cybersecurity really came to the forefront after the 2010 revelation of Stuxnet, the powerful computer "worm" that could propagate and infect computers to control machinery and industrial processes.

Stuxnet was a magnitude of order worse than anyone imagined, says Hahn. It pushed into high gear the research into cybersecurity of physical systems like the power grid.

Hahn and WSU computer scientist Carl Hauser work with students to infuse the security mindset—in effect, to think like a hacker. Hauser says students will often come up with good security ideas, but don't necessarily think about how their ideas might be circumvented.

"Having built this thing, it's hard for some people to ask, 'Where are the holes?' You don't want to admit there are holes," says Hauser.

They teach the students partly through attack and defense games on the operational systems, called red team-blue team competitions. Hahn isn't worried that they're teaching students to be hackers. "You pretend you're an adversary and attack the system. As a security person that's what you really need to focus on," says Hahn.

To Hauser, invasion is inevitable. Experience shows us that computer security will be breached, just not very often, he says. When there's only one line of defense, it reduces planning for the attack that makes it through.

MICROGRID

To keep the smart grid operating, it must be resilient when things go wrong, says ESIC Director Chen-Ching Liu. One tool to help recover from electric power system failure is a microgrid.

A microgrid connects onsite electric power generation—such as WSU's backup generators—to the local power grid. The smart grid can then use excess power from the backup source in case of disasters or outages.

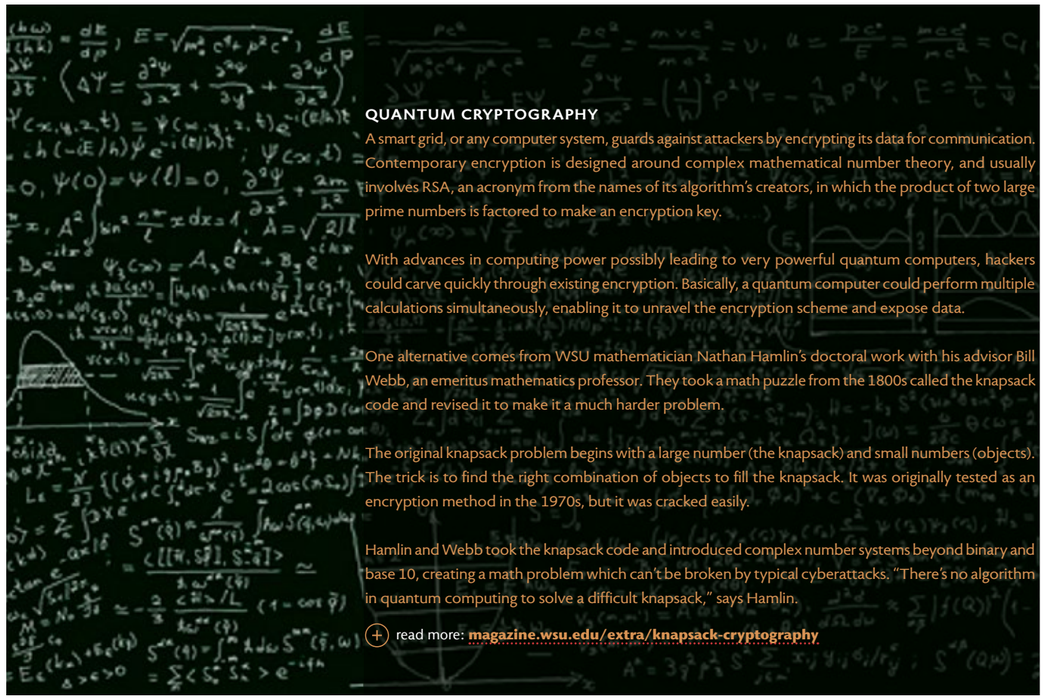
"When the utility is not available, how do you survive?" says Liu. "If you rely on a microgrid, you can keep critical services like hospitals going."

Hurricane Sandy focused attention on the resiliency problem when many New York and New Jersey coastal towns lost power for days. Since ESIC is an integral part of the $178 million, Department of Energy-funded Pacific Northwest Smart Grid Demonstration Project, WSU researchers and their partners have worked on better ways to increase resiliency, such as microgrids.

A military base, shopping mall, or industrial park can be a microgrid. In the case of Pullman, power utility Avista installed a state-of-the-art battery storage system, the largest of its kind in North America and Europe that is connected to the grid.

Washington Gov. Jay Inslee, U.S. Sen. Maria Cantwell, and U.S. Rep. Cathy McMorris Rodgers attended WSU's inaugural energy summit this spring to introduce the new battery, which is housed at SEL. The giant battery will give researchers insight into how power from renewable sources can be stockpiled, another major element of microgrids and smart grids.

WIDESPREAD POWER OUTAGES OCCURRED DURING SUPERSTORM SANDY. (MANHATTAN PHOTO WIKIMEDIA) **BELOW:** ESIC DIRECTOR CHEN-CHING LIU (PHOTO TINA HILDING)



QUANTUM CRYPTOGRAPHY

A smart grid, or any computer system, guards against attackers by encrypting its data for communication. Contemporary encryption is designed around complex mathematical number theory, and usually involves RSA, an acronym from the names of its algorithm's creators, in which the product of two large prime numbers is factored to make an encryption key.

With advances in computing power possibly leading to very powerful quantum computers, hackers could carve quickly through existing encryption. Basically, a quantum computer could perform multiple calculations simultaneously, enabling it to unravel the encryption scheme and expose data.

One alternative comes from WSU mathematician Nathan Hamlin's doctoral work with his advisor Bill Webb, an emeritus mathematics professor. They took a math puzzle from the 1800s called the knapsack code and revised it to make it a much harder problem.

The original knapsack problem begins with a large number (the knapsack) and small numbers (objects). The trick is to find the right combination of objects to fill the knapsack. It was originally tested as an encryption method in the 1970s, but it was cracked easily.

Hamlin and Webb took the knapsack code and introduced complex number systems beyond binary and base 10, creating a math problem which can't be broken by typical cyberattacks. "There's no algorithm in quantum computing to solve a difficult knapsack," says Hamlin.

⊕ read more: **magazine.wsu.edu/extra/knapsack-cryptography**

"That's not helpful. It doesn't lead you to doing the things you should be doing to make the system resilient," says Hauser. Instead he recommends that people look at computer security as risk management. That makes it easier to talk about how to contain damage in the rare instances when attacks succeed.

Hauser has worked with power engineering faculty for over 10 years on how to secure the communications that take place in the power grid and understanding the risks associated with different types of cybersecurity failures.

In turn he and the other computer experts learn from engineers about how to build control systems that fail gracefully and rebound after problems, just like the power grid itself. Their collaboration doesn't end with research. WSU's graduate students take courses team-taught by the two disciplines, a unique combination that benefits both fields.

"This is a very rare group in terms of our combination of power engineers and computer scientists," says Bose. "There are other parts of the country where power engineers work with computer scientists but I think this is the only place where we have three computer scientists focusing 100 percent of their research on the power grid."

IN MANY WAYS, the struggle between good guys and bad never ends. It becomes an arms race over the security of computer systems, and new challenges continue to push engineers. One of the challenges is the growing amount of data and computer traffic. The smart grid, with its numerous advanced meters on homes and businesses and complex control systems, will create a flood of new information.

It has become a scale problem, says Whitehead. "How do we secure all that data, as the data rates get faster and faster and the volumes get larger and larger?"

Hahn also points out that, unlike smartphones, home computers, and other short-lived products, power equipment lasts up to 30 years. That makes it tough to build computer security systems that can block out hackers of the future, perhaps even armed with the capabilities of ultrafast quantum computers.

Moreover, he says, the "Internet of Things," with its interconnected devices from refrigerators to light bulbs to smart meters, can exacerbate security concerns when they get picked up quickly by consumers. "We don't think about the risk before we do the adoption. From a security perspective, we're always chasing the problem," says Hahn.

Despite these challenges, the WSU engineers and industry researchers realize most people just want the electricity to work. "My expectation when I go home is that I hit that light switch and the lights come on. I think it's the same for all consumers," says Whitehead.

Protecting power transmission and distribution from hackers or storms keeps the TV on and businesses running. This is something the smart grid can do well, as long as it's secure. ✳

BY REBECCA PHILLIPS

photoillustrations with portraits by: Robert Hubner and Shelly Hanks
line illustration courtesy: NASA

THE ion INVESTIGATORS

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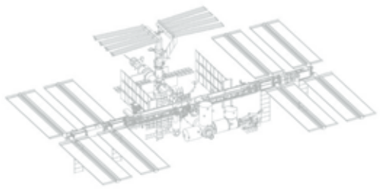
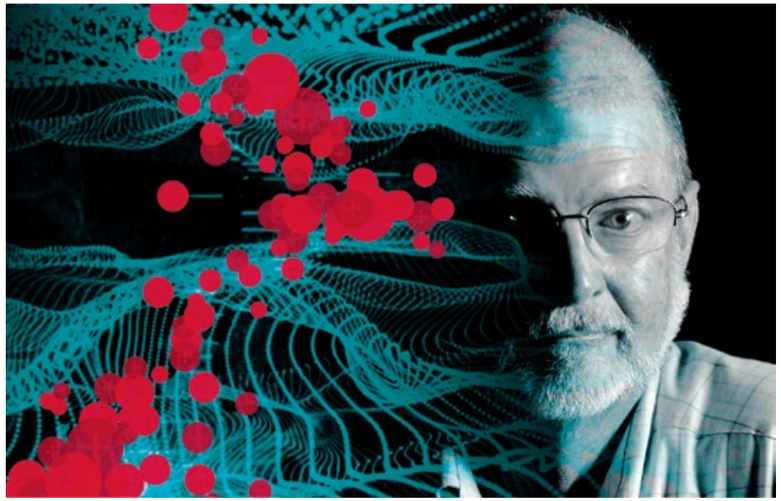


On a cool evening last April, at exactly 8:01 p.m., the International Space Station traced a bright silver arc over Pullman. Inside, astronauts went about their routine while a small sensor scanned the air for hazardous vapors and relayed the data to flight controllers in Houston.

Meanwhile, 200 miles below in the rocky Syrian desert, soldiers searched through rubble carrying a handheld device that sounds an alarm in the presence of chemical warfare agents. At airport security gates and customs stations all over the world, similar devices sniff out explosives and narcotics.



Above: An IMS experiment—a sample is vaporized and converted into ions, which are then put into a gas-filled drift tube. An electrical field guides the ions through the gas molecules. Large ions encounter more resistance than small ions, resulting in slower mobility rates. The speed of each ion is recorded when it reaches the detector. **Right**: Bill Siems. **Overleaf**: Herbert Hill

The technology behind those detectors is finding its way into the medical field as a rapid, ultrasensitive method to diagnose disease. It is also helping scientists probe the obscure workings of metabolism and complex conditions involving cancer and the immune system.

That technology is called ion mobility spectrometry or IMS. While it may be unfamiliar, IMS is emerging as one of society's most powerful workhorses, able to detect and identify an extensive range of potentially harmful materials.

For Herbert Hill, the Washington State University chemistry professor who led the development of ion mobility over the last 40 years, the journey has been nothing short of a grand adventure.

I navigate a labyrinth of hallways, elevators, and staircases one afternoon to meet with Hill. His laboratories take up most of the fifth floor of Fulmer Hall, the WSU chemistry building. The genial professor waves me in.

Seated behind a large computer monitor and dressed in jeans, boots, and a puffy brown vest, Hill takes a sip from a can of Pepsi and points to a chair. Papers and books are stacked everywhere. The wall behind me holds a dusty green chalkboard covered with equations. On the opposite wall, a long row of red-framed, faded photographs displays the smiling graduate students who have worked their way through Hill's classrooms.

Hill is an analytical chemist and Regents Professor, a modest man with a soft Southern drawl, who tends to downplay his role in the success and commercialization of ion mobility spectrometry.

Simply put, IMS is a fast, highly sensitive method to identify the chemical makeup of virtually any substance based on the speed of its molecules as they shoot through a cylinder. Tiny samples are first vaporized, and then turned into charged ions. Some ions zip through the cylinder quickly while others move more slowly, providing each a signature mobility rate.

On its own, IMS can be made into a small, simple, and reliable handheld device. When coupled with other analytical tools, IMS reveals the details of a chemical compound in three-dimensional ways never before possible.

The door opens behind me and Bill Siems '74 PhD comes in with a cup of coffee. Research professor and master of the mandolin, Siems has played a pivotal role in many of the Hill lab breakthroughs.

Doctoral students Brian Hauck and Jessica Tufariello follow behind. I listen as they chat with Hill about the progress of their dissertation projects. Hauck is refining IMS for national security measures and Tufariello is building what could be the first marijuana breathalyzer. Within a year or so, their faces will be featured in the row of red frames—the last graduate students to join the Hill legacy at WSU.

Herbert Hill grew up in Helena, Arkansas, a town on the Mississippi and birthplace of the Delta blues. "It was the 1950s and KFFA was the first radio station to play blues in the rural south," he says. "I remember racing home at noon to catch a 15-minute segment of the King Biscuit Boys on the radio while having dinner."

It was also the Jim Crow era and the radio frequently carried news of emotional confrontations taking place in Little Rock, as the town struggled to integrate Central High School in 1957. Hill was sympathetic. "My heroes are the people who stayed in Arkansas and tried to build civil rights," he says, likely following in the footsteps of his great-great-grandfather, a Quaker pacifist who refused to fight in the Civil War and was later elected to Congress.

Hill says he always liked science and, as a boy, set up a small laboratory complete with test tubes and Bunsen burners in the family garage. "We took gunpowder out of shotgun shells and blew stuff up," he says. "I also had chemistry kits and did experiments where things foamed and changed color."

His undergraduate years were spent at Rhodes College in Memphis, where he met an English major named Jannette, whom he later married. It was there, too, that he dedicated his life to the study of chemistry.

In 1970, Hill entered graduate school at the University of Missouri and was taken under the wing of a dynamic young professor named Walter Aue. There, collaborating faculty members studied moon rocks retrieved from the first lunar landing and Hill's best friend was conducting the organic analyses.

"They were looking for traces of life on the moon—searching for amino acids," says Hill who was thrilled by the research. In the end, the scientists found no evidence of lunar life forms but the experience sparked Hill's interest in the field of trace organic analysis. He soon found himself immersed in the lab for hours on end, teasing out tiny concentrations of pesticides and heavy metals contaminating the environment.

As often happens when living through historic times, Hill and his fellow graduate students were only vaguely aware of the revolution unfolding around them. The early 1970s had just ushered in the first Earth Day along with acclaim for Rachel Carson's clarion call, *Silent Spring*. It was the awakening of the modern environmental movement.

The times certainly affected Hill's chemistry department. "*Silent Spring* was required reading for two or three of my classes," he says. The book documented the harmful effects of DDT in the environment and prompted a surge of funding for trace organic analysis.

"It was a happening time for science," says Hill. "The idea that I could build instruments and develop methods to enable people to 'see' chemicals they couldn't see before was very exciting for me. I've always felt that new discoveries aren't made until the new measurement methods are first developed."

Indeed, it was the invention of two innovative detectors in 1957 that made it possible to identify environmental contaminants such as DDT, and provided the provocative data for Carson's book.

The air of excitement continued as Hill followed Aue to Nova Scotia in 1973 when the professor was hired to run a trace analysis center at Dalhausie University.

"There were new labs, new faculty, and I went with them to finish my PhD," says Hill. During the dissertation process, Hill also met Frank Karasek, a scientist who offered him a postdoctoral position at the University of Waterloo. "I went because Karasek had an exciting new tool called ion mobility and had just started using it for analytical work," he says.

In Karasek's lab, Hill and the other students were free to test a wide range of compounds including narcotics and explosives. They learned the basic mechanics of IM but had yet to discover its full potential.

"We thought it was just a rapid method of separating and analyzing volatile organic compounds, or VOCs, at atmospheric pressure," says Hill. This alone was impressive as it gave the chemist a new tool capable of identifying substance in milliseconds.

In 1976, Hill joined Washington State University as an assistant professor. Though eager to continue his work with ion mobility, he had to put it on the back burner. "There were problems with the technique and people had decided it wasn't going to be a useful analytical tool after all," he says.

Hill bided his time with other projects until 1982 when he received tenure and felt free to gamble a little. "I understood why ion mobility didn't work well," he says, "and I wanted to try building an instrument the way I knew it should have been done."

He recruited graduate student Mike Baim'84 PhD and the two of them built

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HERBERT HILL IMS LAB TIMELINE

1982: FIRST COMPUTER-CONTROLLED IMS

1980s: CHEMICAL WARFARE AGENTS (CWA) DETECTION

MID-LATE 1980s: DRUG AND EXPLOSIVES DETECTION

1990s: ENVIRONMENTAL MONITORING

2001: IMS USE ON SPACE STATION BEGINS

2005: FOOD QUALITY AND METABOLOMIC APPLICATION BEGINS

2015: GLYCOMICS AND MARIJUANA BREATHALYZER TECHNOLOGIES

the first computer-controlled ion mobility spectrometer. The design was Hill's first big breakthrough and it enabled IM technology to go mainstream where it was widely copied and commercialized.

"The key to making ion mobility work was to sweep 'all the neutrals' out of the system," says Hill. Using a countercurrent gas flow, they were able to push the non-ionized molecules away from the detector while the charged ions continued forward.

They initially tested the system with gasoline from a friend's motorcycle. "We injected a tiny sample into the IMS and were amazed to see peak after peak of compounds being identified. It was so impressive that the first book written about IMS used the image on its cover," he says.

Buoyed by their success, Hill took Baim to his backyard to test soil near dandelions that had been sprayed with the herbicide 2,4-D. "The sample about blew the instrument apart," Hill says. They followed with dirt from Hill's garden that had not been sprayed, but still detected a strong signal for 2,4-D. Intrigued, they collected samples from all over Pullman and found traces of the herbicide in each one. "We never could find any clean dirt. They all had 2,4-D in them," he says.

From left: Doctoral students Brian Hauck and Jessica Tufariello. **Below**: Brian Clowers.

Hill was about to accuse poor Baim of being a sloppy chemist but instead took a horseback trip into Idaho's pristine Gospel Hump Wilderness to search for uncontaminated soil samples. "When I came back and tested them, every one of the samples still had traces of 2,4-D," he says. Baim was vindicated but Hill was mystified.

One day, Hill heard about the campus soil bank where samples from the Palouse have been warehoused over the decades. He gave it a try.

"We had to go back to 1940—before the advent of 2,4-D—until we could find clean soil," he says. "This is an example of how widespread environmental contamination is at the trace level, and how well ion mobility can detect it."

Hill left for sabbatical in 1983, and fellow Southerner Siems was hired to oversee the IM research group during his absence. Siems liked the laboratory's pioneering atmosphere and ended up joining the team. "Herb has always been a fountain of knowledge and invention," he says. "He had a million ideas. As a physical chemist, my role has always been to bat the ideas back to him or whack them down as the case may be."

During this interval, Siems helped incorporate the idea of multiplexing which gave IMS the capability to run multiple experiments simultaneously. Their work quickly drew the interest of the Federal Aviation Administration. "There had been a number of bombings around that time and they were interested in detecting explosives on planes," he says.

"It was the beginning of our involvement with explosives, drugs, and chemical warfare agents, which continues on today through Homeland Security and our development of the marijuana breathalyzer," says Siems.

He explains that most people have had an experience with ion mobility at the airport when a TSA agent swabs their laptop or carry-on luggage during security screenings. "The swab goes into an IM device set to look at a specific window of compounds and an alarm sounds if they detect molecules that fall within that range."

When Hill returned to WSU in 1984, he was ready for a new challenge. At that time, IM could only identify volatile organic compounds, yet a world of non-VOC molecules remained. "How can we get compunds like large proteins into IMS detectors to measure them?" asked Hill. They tried a number of new laboratory techniques, but it wasn't coming together.

The answer arrived through another of Hill's grad students, Chris Shumate '89 PhD, who heard about electrospray technology at a conference in 1985. Electrospray uses high voltage electricity to turn liquids into an aerosol of ions. It is especially useful for ionizing proteins and other large molecules. Setting another milestone for the lab, Hill and Shumate built their first electrospray ion mobility spectrometry unit in 1986.

The discovery broadened the use of ion mobility spectrometry and set the stage for future work in the field of medicine. In 1995, Hill, Siems, and graduate student Ching Wu '97 PhD, advanced it yet further when they successfully coupled an IMS to a mass spectrometer, which can be likened to a tiny scale for weighing molecules. "The combination gave us a complex array of mass and mobility information never before possible," Hill says. "It allowed us to identify molecules in a much more comprehensive way."

With ion mobility-mass spectrometry, or IMMS, Hill finally had the vehicle to study the chemical processes involved in health and aging. In 2005, he introduced the idea of using IMMS as a tool for mapping the human metabolome—or the entire set of physiological byproducts called metabolites. IMMS can measure hundreds of metabolites simultaneously. Within 30 minutes, it can detect thousands of compounds in a single drop of blood.

Each metabolite produces a specific IMMS pattern, or signature, that can be altered by disease. IMMS can monitor these patterns to diagnose or track conditions such as cancer, heart disease, diabetes, depression, Parkinson's disease, and others. Hill has also shown that IMMS can detect colorectal cancer in the feces of mice, and most likely in humans as well.

Similar technology is being adapted for use on the International Space Station. NASA engineer Tom Limero has known Hill for 20 years and invited him to Houston in 2011 to help the agency develop electrospray ion mobility for space. "NASA is just moving forward on this," says Limero. "We want to monitor physiological changes using saliva or breath instead of drawing blood, which is problematic in space," he says. Several versions of IM have also been used for monitoring air quality on the space station since 2001.

Hill's cell phone rings playing Muddy Waters' "Bad to the Bone." While he tends to the call, Hauck and Tufariello invite me to the lab to see the ion mobility instruments.

Hauck is polite and articulate. "This instrument is currently the most accurate IMS in the world," he says, introducing me to a large machine bristling with wiry projections. Hauck explains that his doctoral project involves fine-tuning the accuracy of IM instruments for national security purposes. His goal is to eliminate the number of false positives that occur while searching for drugs, explosives, or chemical weapons agents, yet not err on the side of false negatives, which could result in disaster. "The government wants to set a standard for 0 percent false negatives," he says.

Tufariello is a freckled former art student from New Jersey who came to WSU on a whim. I watch as she tinkers with several small instruments, one of which will become a marijuana breathalyzer for detecting THC in human breath.

The idea for a marijuana breathalyzer grew out of a longtime friendship between Hill and Nick Lovrich, WSU Regents Professor Emeritus in political science. The two have neighboring cabins in North Idaho's Selkirk Mountains where they've spent vacations since 1977. One night in 2009, the two were seated at the same table at a WSU fundraiser. Their usual conversation revolved around fishing, barbeques, and the like, but that night Lovrich finally asked Hill, "Just what kind of work do you do?"

Hill replied that he was an analytical chemist and explained the concept of ion mobility. "What do you do?" Hill asked in

return. Lovrich said he worked with law enforcement and was trying to help control impaired driving due to illegal or prescription drugs. "Why don't you use a breathalyzer to detect drugs in the breath?" asked Hill. "No such thing exists," said Lovrich. "Interesting," said Hill, "I think it's possible."

The two obtained funding and Tufariello volunteered to tackle the project with the intention of studying an array of drugs. Soon after in 2012, Washington state voters approved Initiative 502, which allowed the legal use of recreational marijuana. Hill and Tufariello changed their focus to the detection of the cannabinoid THC in human breath.

"I believe it will work," says Hill, "but we have only just begun the study in breath and how it correlates to blood levels of THC."

Though the marijuana breathalyzer is still under development, the initial prototype is so encouraging that the National Highway Traffic Safety Administration and the United Nations Office on Drugs and Crime are interested in the technology.

When Tufariello's project is completed, Hill and Siems will slowly begin to close up shop. Brian Clowers '05 PhD, who not long ago took notes in Hill's classes, will carry on the ion mobility work in his own laboratory across the hall.

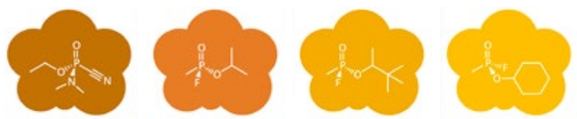
"There is still a lot of research to be done in the realm of IM," says Clowers, particularly in glycomics, the study of the body's sugar molecules. The work promises to shed new light on immune system function as well as how cells recognize bacteria and viruses and whether or not a cancer develops.

In mid-April, Hill took a preliminary step away from the chemistry lab and planted 600 young fir trees near his daughter's house outside of Pullman. "I'm going to have a U-Cut Christmas tree farm," he says—one, no doubt, where wandering customers will hear holiday blues drifting through the grove.

Hill will eventually transition to the role of consultant for academic and industrial research. He's happy with the way things have turned out. "I feel great," he says. "To be one of the earliest people in ion mobility … and to have said that it could be used for everything, and seeing it turn out to be true. It's been a lot of fun."

CHEMICAL WARAGENTS

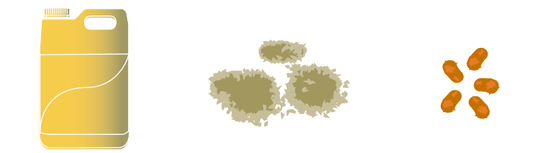
The military uses ion mobility spectrometry (IMS) for detecting chemical warfare agents like mustard gas or the nerve agents VX and sarin. More than 150,000 handheld units are currently deployed worldwide to help soldiers monitor the disposal of chemical weapons as well as warn of their accidental release. IMS is also used in a forensic manner to determine if chemical agents—banned for warfare by the Chemical Weapons Convention of 1993—have been used for combat or to attack civilians, such as those documented in the ongoing Syrian civil war.



TABUN [GA] SARIN [GB] SOMAN [GD] CYCLOSARIN [GF]

FOOD SAFETY

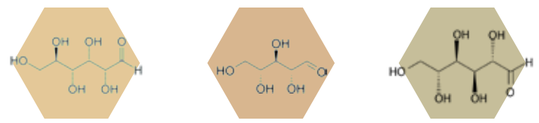
The safety of our national food supply relies on the use of accurate screening methods to detect chemicals, bacteria, or other contaminants as food travels from farm and processing plant to local markets. Ideally, detection methods should be fast, sensitive, and portable—all characteristics of IMS, which is gaining ground as an analytical tool of choice for the food industry. IMS can detect traces of pesticide residue on food as well as identify mold and bacteria. IMS is also used to monitor quality during the production of cheese, beer, wine, and pharmaceuticals.



CHLORPYRIFOS [pesticide] ASPERGILLUS [mold] PSEUDOMONAS [bacteria]

GLYCOMICS

Glycomics is the study of the body's sugar molecules, or carbohydrates. Assistant Professor Brian Clowers is developing innovative IMS techniques to identify the various forms of carbohydrates, which can be turned into novel therapeutic drugs like Herceptin®, an FDA-approved treatment for breast cancer. "There are a range of carbohydrates in a biological system which appear in different states for healthy and diseased tissue," says Clowers. "We don't have fast, sensitive tools to differentiate them right now, but we are developing them." Clowers expects many more drugs like Herceptin® to be developed in the future.



GLUCOSE RIBOSE MANNOSE

CWA GRAPHICS COURTESY ANDY BRUNNING/COMPOUND INTEREST

CUBA, ADIÓS COVER ART FROM JACKET DESIGN BY CIRO FLORES

BY JACOB JONES '07

Cuba, adiós

A secretive telegram—wired to Santiago, Cuba, in April of 1962—forever reset the course of Lorenzo Pablo Martínez's life, stripping away his teenage hopes for a prestigious musical scholarship in Europe and exiling him to an unfamiliar culture as a political refugee in eastern Washington.

Martínez '67 recalls a surge of outrage and confusion as he watched his mother pack bags for him and his 14-year-old brother. Both would depart for America in less than three days, leaving behind their parents and sisters, their home and dreams, everything they had ever known.

"I'm not going anywhere!" he remembers defiantly telling his mother.

Neatly folding another outfit, she ignored his outburst and continued packing their suitcases for the trip to Havana and then Miami. The family had traded many favors and risked imprisonment for his freedom. He should be thankful.

"You'll have a rainbow of opportunities," she said.

Despite his protests, Martínez and his brother would join more than 14,000 unaccompanied Cuban children expatriated from Castro's communist regime under the "Operation Pedro Pan" relocation effort between 1960 and 1962. Children went to temporary shelters or foster families in 30 states around the country—settling into asylum and paving a way for other family members.

As Martínez made his way in a new society, the universal language of music would continue to define his future. In a recent memoir, *Cuba, Adiós: A Young Man's Journey to Freedom*, Martínez recounts his first days in a Florida boy's camp, his musical studies at WSU, finding his artistic self in New York, and eventually returning to Cuba 40 years later.

"I gained a lot by coming here," he says now, "but it was not an easy journey."

Martínez, 69, grew up studying and emulating many classic composers such as Beethoven, Chopin, and Mozart. He spent hours practicing complicated piano arrangements, studying full-time at a music conservatory in Santiago. When the Catholic-run Operation Pedro Pan program placed him with a family in Pasco, his adept playing earned him a scholarship to WSU.

Adjusting to American culture took patience, but Martínez says he found an artistic and welcoming community in Pullman. While he struggled with the distance from family, he says he grew into a stronger and more independent musician. He played piano accompaniment for many singers and musicals, collaborating with faculty and mentoring younger students.

"I was very fortunate that I had a lot of people helping me along the way," he notes. "I think my artistic sensibility helped me through that time."

Pullman residents Bonnie and Remo Fausti embraced Martínez as their own, inviting him and other students over to play music and sing at their home in the mid-1960s. The Faustis' daughter, Jannis Peterson '70, says she first met Martínez as a young teen.

"He was wonderfully exotic," Peterson says. "That impressed me. He helped me develop as a pianist."

Peterson says she would sit in on Martínez's rehearsals or watch him perform in summer musicals. His guidance helped strengthen her passion for music, which she would go on to teach for 32 years at the State University of New York at Fredonia School of Music.

During his college years, Martínez continued efforts to bring his family to Washington, repeatedly watching visas fall through as United States and Cuba relations deteriorated after the Cuban Missile Crisis. It would take years of careful negotiation and eventually fake documents to bring the family back together.

Nearby, other young exiles hoped for similar reunions, including 63 Pedro Pan children placed with families in Colfax. Martínez notes many of those children were much younger than him.

After graduation, Martínez set his sights on New York and the Manhattan School of Music. As he pursued his master's degree in piano performance, Martínez also found a place in the city's thriving gay scene. Moving to New York, he says, felt like immigrating to a foreign country all over again.

"I am so glad that I went to New York," he says, "but that was very traumatic."

LORENZO PABLO MARTÍNEZ

In addition to his recent memoir about Operation Pedro Pan and his life, Lorenzo Pablo Martínez has composed music and written for children throughout his career. He contributed music to the television show *Captain Kangaroo*. A book of his children's songs, *The Circus*, was published in 1976. Some of his children's compositions were performed at international music festivals and one was featured in the kid's book *Group Soup*. Martínez translated into Spanish all 12 episodes

COURTESY AMAZON

of the 1988 PBS children's show *The Second Voyage of the* Mimi, which starred a young Ben Affleck as part of a sailboat crew exploring Mayan ruins and history in southern Mexico.

Martínez published a picture book, *The Ballerina and the Peanut Butter and Jelly Sandwich*, in 2010, and has written two bilingual books for children that are awaiting publication. He's currently working on a mystery novel for young adults.

Ultimately, the city would prove an inspiring fit. Martínez spent several years teaching piano, composing arrangements, writing music for the TV show *Captain Kangaroo*, and publishing children's songs. He says he later devoted his career to working with international nonprofits.

Cuba has haunted Martínez ever since he left. Throughout the embargo, he had watched the people and places he once loved wither under Fidel Castro's rule. He says he still longed to return though, despite what he might find.

"I had always been afraid of going back," he says, "but at some point the urge to go back was stronger than my fear."

In 2002, Martínez again walked the streets of Santiago. He saw his childhood home stripped and broken. Oppression continued.

But Martínez says he also found inspiration and an intense musical rhythm he had forgotten existed in the streets and shops of Cuba. He channeled that energy into his writing, collecting scenes and moments for his memoir. Slowly, he put words to his memories of the fateful telegram, leaving his mother at the Havana airport, and later revisiting his lost homeland.

"Some of it was really tough to relive," he says. "It was painful."

Thom W. Cunningham, Martínez's partner of more than 40 years, says the traumatic upheaval of Operation Pedro Pan could have easily turned Martínez hard and bitter. But he believes it only reinforced a sense of generosity. He says Martínez came to recognize the great power of small kindnesses.

"He's always giving," Cunningham says. "To my amazement, my delight, and my admiration, Lorenzo has only opened up more."

The pair recently moved to a new home near Houston, Texas. Martínez says he plans to release a second memoir and a young adult mystery novel next year. In addition to writing, Martinez recently refocused his career on his first love, taking over as executive director of the Houston Chamber Choir in June.

"We are hoping to tour to Cuba next year," he says, adding, "I see a very bright new future." ✳

Meaning to Go to the Origin in Some Way

LINDA RUSSO

SHEARSMAN BOOKS: 2015

Linda Russo translates the environmental characteristics of the Palouse from scenery to words in this slender volume of her poetry. The cohabitation between humans and nature is explored everywhere from a home garden to the vast wheat fields. Her other poems delve into post-pastoral themes of consumer development on farmable land:

> shopping centers and cheap food
> production
> the song of arable, or dams, of more
> natives squeezed out in
> the production of more
> arable land.
>
> *—from "Going to Survey Walmart Construction from the Crest of Pioneer Hill"*

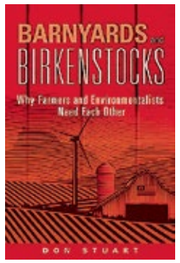
Meaning to Go to the Origin in Some Way encapsulates the expansive Palouse by detailing the smallest of organisms up to the "electric currents" of the sky. Russo addresses the friction between people and their surrounding environment. In this, her second full-length collection of poems, she brings the Palouse alive and makes the rolling wheat fields feel like home:

> I do not live here because I want to,
> but because
> being free is a kind of sympathy.
>
> *—from "City and Country Life"*

Russo writes with distinct fluidity while creating strong visuals out of small details. Even a simple wild rabbit can seem familiar to the reader.

In addition to writing poetry, Russo teaches creative writing and literature at Washington State University. Her forthcoming collection of lyrical essays, *To Think of Her Writing Awash in Light*, was selected as the winner of the Subito Press inaugural creative nonfiction prize. She also has another volume of poetry, *The Enhanced Immediacy of the Everyday*, coming out this year.

—Annika Torseth



Barnyards and Birkenstocks: Why Farmers and Environmentalists Need Each Other

DON STUART

WSU PRESS: 2014

Rural America faces the challenge of saving farmland to feed a growing population while sustaining the planet's ecosystems. Stuart tackles those issues confronting both the agriculture industry and environmental activists.

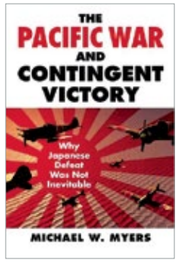
He explores pros and cons of regulation, climate change, land zoning, conservation, water rights, economic impacts, local food systems, and Farm Bill policy, among other debates. As he looks at each situation objectively, Stuart also gives voice to both agricultural and environmentalist perspectives.

Using multiple case studies, he delves into the interrelatedness of agriculture and environmentalism—how they've proven successful and beneficial to all those involved when people and policies were unified.

Stuart's experience lends unique insight to the relationship between farmers and environmentalists. He has worked with both sides as an attorney in Washington state and as a consultant. His work in public policy helps different groups find common ground and solutions to what he refers to as political deadlock.

Stuart leaves readers with two very different visions for the future of agriculture: one where the groups are divisive and the other where collaboration sees a fruitful future. With discussions geared primarily to farmers, environmentalists, academics, and policymakers, it will inform and educate any readers curious about the policy and practices shaping farming and our natural world.

—Rachel Webber



The Pacific War and Contingent Victory: Why Japanese Defeat Was Not Inevitable

MICHAEL W. MYERS

UNIVERSITY PRESS OF KANSAS: 2015

Conventional wisdom among scholars of World War II claims that Japan would inevitably lose the Pacific War to the United States and the Allies. They base that belief on greater American military and economic power and a U.S. strategy that forced the war against Japan on a path to unstoppable Allied victory. Myers, a professor at Washington State University's School of Politics, Philosophy, and Public Affairs, counters the historical paradigm and says Japan did have a chance to win the war.

Imperial Japan launched the Pacific War on December 8, 1941—on their side of the date line—with nearly simultaneous attacks on Pearl Harbor, Malaya, Hong Kong, and the Philippines. Their strategists primarily wanted two outcomes: more access to resources for Japan, and an end to the ongoing war with China that had become a proxy war with Western powers. According to conventional theory, the Japanese military expected the Allied nations to concede Japan's territorial gains in the first six months of the war, ensuring a "Greater East Asia Co-Prosperity Sphere," and thus access to the resources the Japanese desperately needed.

Myers says little evidence supports that conjecture, particularly since so many Japanese military records were destroyed at the end of the conflict. Moreover, he writes, "inevitable" can't describe a war that ranged over half the world for the better part of a decade.

"One might expect caution in assigning such a word to a historical event of such grand size and scope. An examination of the record, however, shows that caution is thrown to the wind in the case of Japan's part in World War II," writes Myers.

Another misconception, according to Myers, is World War II historians' assumption that Japan depended on a strategic concept of a single decisive victory, especially a naval defeat of the United States. He uses historical documents throughout the book, such as missives from Japanese military leaders, to show the shortcomings of that and other misconceptions. For example, General Yamashita, in charge of the Fourteenth Area Army in the Philippines, wrote to his commanders in Japan about the failure of decisive battles and the need for longer term strategy. He and other Japanese leaders were fully aware that it was a war of attrition.

Myers also says that no architect of victory determined strategy on either side. Even among the U.S. leaders—a committee of Admiral Chester Nimitz, General Douglas MacArthur, President Roosevelt, General George C. Marshall, and Admiral Ernest J. King—no single person formulated the strategy to defeat Japan. Moreover, writes Myers, the war proceeded on contingent events where leaders reacted as much as acted, and many factors determined the outcome.

Myers refers to Richard Overy's *Why the Allies Won* as evidence, which shows that victory in World War II was determined not just by economic and military power, but by battles, technology, production, leadership, and morale.

As an example, Germany had industrial and military advantages in Europe, but failed to win World War II. The United States, had events and battles not worked in their favor, could have lost to the Japanese imperial forces despite U.S. superiority in military strength and industrial production.

Just because Japan could have won, Myers says he doesn't place positive moral judgment on the Japanese (or American) military for their actions. However, by moving beyond a suspect belief in "inevitable defeat," Myers provides more fruitful ways of understanding the strategies of the combatants in the war, the way it was prosecuted, and the meaning of the Pacific War.

—Larry Clark

BRIEFLY NOTED

Signposts of Self-Realization: Evolution, Ethics, and Sociality in Modern Chinese Literature and Film

XINMIN LIU (Assistant professor, Foreign Languages and Cultures/Chinese)

BRILL: 2014

Ontological study of education and development of individual self in modern China, through the lens of contemporary Chinese literature and film.

Sport and the Law: Historical and Cultural Intersections

Edited by **SAMUEL O. REGALADO '83** and **SARAH K. FIELDS**

THE UNIVERSITY OF ARKANSAS PRESS: 2014

Essays on how athletes looked to the U.S. judicial system to solve conflicts, and how those cases often transformed human rights and other aspects of the law.

Fear Clinic

Written by **AARON DRANE '85**

MISFIT MINDS PRODUCTION ET AL.: 2015

Horror video series starring Robert Englund about a disturbing clinic for phobics, in which they face their deepest fears.

A Horse Named Sugar

JILLIAN CONNOLLY '08

2015

Sugar tackles each challenge that comes her way to become a professional barrel racing horse. Based on Odessa rodeo rider Connolly's horse "Sugar," who was treated at WSU's Veterinary Teaching Hospital.

CLASSnotes

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The Yakima Chamber of Commerce gave their community service award to radio broadcaster **RON KING** ('67 Comm.) for his work in Yakima. In addition to more than 58 years of broadcast and sales work, Ron has served with the Jaycees, school boards, Boy Scouts, Chamber of Commerce, and numerous other organizations. The Burien City Council named former *Highline Times* editor **ERIC MATHISON** ('69 Comm., Pol. Sci.) as citizen of the year, in recognition of his journalism and volunteer activities.

70

BUD WITHERS ('70 Comm.) retired from *The Seattle Times*. **TONY BAKER** ('72 Comm.) stepped back from day-to-day oversight as editor and publisher of *The Register-Guard* in Eugene, Oregon. He will remain on the board of directors. The University of West Florida Board of Trustees voted to extend the term of President **JUDITH BENSE** ('72 PhD Anth.). She has been president of UWF since 2008. **ARTHUR BOGAN** ('72 Anth.) received the Freshwater Mollusk Conservation Society Lifetime Achievement Award. The Bureau of Land Management appointed **JULIE WEIKEL** ('72 DVM) to the National Wild Horse and Burro Advisory Board. **TED BASELER** ('76 Comm.), president and CEO of Ste. Michelle Wine Estates and a WSU Regent, received the 2015 Lifetime Achievement Award from the wine industry for his many contributions.

RANDY FINK ('76 Music) retired as Spokane's Shadle Park High School choir director after 32 years. RBC Wealth Management awarded Tri-Cities branch director **BRAD FISHER** ('79 Bus. Admin.) with its Dick McFarland Volunteer of the Year Award. He focuses on children's literacy projects.

80

MIKE CHURCHILL ('82 Elec. Eng.) took on the role of vice president of operations at Aspen Avionics, where he will lead Aspen's manufacturing, supply chain, and quality departments. Penn State University awarded **AMY FREEMAN** ('82 Const. Mgmt.), assistant dean of engineering diversity, with the 2015 Council of College Multicultural Leadership Way Paver Award. **KATIE KNIGHT** ('82 Comm.) retired from her position as Mercer Island's city attorney after 10 years serving the city. LW Hospitality Advisors appointed **MARK LUKENS** ('82 HBM) as managing director. **JAY POWER** ('82 Ag.) was appointed senior vice president and chief lending officer for Malvern Bancorp in Pennsylvania. **MICHAEL KUEHNER** ('83 Soc. Sci.) was hired by Envoy Mortgage as their regional vice president in Northern California and Nevada. Vesselon, a preclinical stage therapeutics company, announced **JON SERBOUSEK** ('83 Mech. Eng.) as chairman of their board of directors. **MICHAEL BAIM** ('84 PhD Chem.) joined Q Laboratories as pharmaceutical and food chemistry laboratory supervisor. Simmons Hanley Conroy law firm hired **BRENT ZADOROZNY** ('84 English) as a senior attorney in their California office. **NATHAN ASPLUND** ('85 Ag. Econ.) is the new president and CEO at Red River Valley & Western Railroad, serving North Dakota and Minnesota. **PAUL ADAMS** ('86 MS Physics) was named dean of the College of Education and Technology at Fort Hays State University in Kansas. Orexigen Therapeutics, a biopharmaceutical company focused on treating obesity, brought on **TOM CANNELL** ('86 DVM) as chief commercial officer. Pacific Lutheran University appointed **ALLAN BELTON** ('88 Bus. Admin.) as their new vice president of finance and administration. After 30 years in the Air Force, **KEVIN MASTIN** ('88 Comm.) joins Acomb Ostendorf & Associates in Florida as director of new business development. **ALLISON REEVES-HELFEN** ('89 Hotel and Restaurant Admin.) is celebrating the tenth anniversary of her and her husband's wine shop, The Wine Alley in Renton.

90

The U.S. Forest Service named **LEANNE MARTEN** ('90 Env. Sci.) as forester for the northern region, which spans five states. **ANTHONY LAROSE** ('92 MA Crim. J., '97 PhD Poli. Sci.) published a mystery novel, *Cathedral of Salt*, inspired by a research trip to study police in Colombia.

PHOTO COURTESY WSU TRI-CITIES

After many years working as an environmental scientist at Pacific Northwest National Laboratory and serving his community, **WAYNE J. MARTIN** received the Washington State University Alumni Association Alumni Achievement Award on May 22, 2015.

Martin graduated from WSU in 1978 with a bachelor's degree in wildlife management, pursued a master's degree in radiological sciences from the University of Washington, and returned to WSU to earn a doctorate in environmental and natural resource sciences in 1996.

The environmental scientist recently retired from Pacific Northwest National Laboratory as acting chief operations officer for the national security directorate. Martin oversaw more than 100 research projects for chemical, biological, and nuclear safety at the laboratory.

While at PNNL, Martin mentored graduate students and supported intern involvement. He sits on the Kadlec Heath Systems board of directors and has chaired the board of trustees at Columbia Basin College. Martin has advocated for education on the WSU Tri-Cities advisory council, as well as the advisory board for MESA (mathematics, science, and engineering achievement) for middle and high school students.

« also check out class notes online »

He will donate all royalties to wounded veterans, with a goal to raise a total of $10,000. **BEN ANDREWS** ('93 Public Admin.) is the new fire chief for Clallam County Fire District 3. Lockheed Martin named **ROY STEVENS** ('93 MBA) as vice president of global solutions. **MARGARET GROGAN** ('94 PhD Higher Ed. Admin.) will be the new dean of the College of Educational Studies at Chapman University. Clackamas County Water Environment Services in Oregon appointed **GREGORY GEIST** ('94 Physical Sci.,'96 MS Env. Sci.) as their new director. **SUSAN TORNQUIST** ('96 PhD Vet Med.) was named dean of the College of Veterinary Medicine at Oregon State University. **MITCH REISTER** ('97, '05 MS Civil Eng.) was selected as Spokane County engineer by the Spokane County Commission. His department will have 40 fewer employees than it did in 2009. The Washington State Department of Transportation appointed **KRIS STRICKLER** ('98 Civil Eng.) as southwest regional administrator. **JOSHUA MEEK** ('99 Educ. and Eng.) was selected as the new assistant superintendent of the Moses Lake School District. **JEFF YRAZABAL** ('99 Arch.) received the AIA 2014 Young Architects Award. He is a principal at SRG Partnership in Portland, Oregon.

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After 14 years as Park Middle School's assistant principal, **SHAUN ESPE** ('01 MED) was named principal of the Kennewick school. He will begin his post next fall. **MICHAEL BYLSMA** ('02 English Lit.) was appointed special education program coordinator for the Mercer Island School District. He has worked in the district before as a seventh and eighth grade teacher at Islander Middle School. Through his love of Japanese agriculture, **JUSTIN POTTS** ('04 Psych.) found work at Umari Inc., which operates a Tokyo-based restaurant that offers Japanese food cooked with select produce from farmers all over Japan. Potts will lead a project called "Peace Kitchen" touting Japanese homestyle food in Italy. Indiana State University professor **TINA KRUGER** ('05 Psych.) is the inaugural recipient of the Rising Star Junior Faculty Honor from the Association for Gerontology in Higher Education. Kruger developed and now directs a gerontology program at Indiana State. The Washington Association of Wheat Growers (WAWG) appointed **KEVA HERRON GUSZKOWSKI** ('05 Ag. Econ., '08 Acc.) as their first policy director. In her new role, Guszkowski will keep staff and members of WAWG updated on state policies that impact the Washington wheat industry. **RYAN PATTEN** ('06 PhD Crim. Jus.) was awarded a full professorship at California State University, Chico in the criminal justice program. He began teaching there in 2007 and researches policing and drug courts. Animal identification and traceability systems company Allflex USA named **SARAH RYAN** ('06 Ani. Sci.) as their new northwest associate regional manager.

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BURL BATTERSBY '12, '13 MBA had been in Japan a day and a half. He was 18, an exchange student from Arizona. Someone handed him a book and asked him to read it to a classroom of 14-year-olds to improve their English pronunciation.

"I think the book was Greek fables," he says. "I had trouble saying some of the names."

When he finished, Battersby heard the desks shaking. Three thoughts went through his mind: 1) Wow, this must be the Japanese version of applause; 2) This is great, I really like teaching English; 3) It's an earthquake!

The ground stopped moving, but his desire to become a teacher had taken root. For Battersby, however, inspiration is seismic but accomplishment is incremental.

To pay for college, Battersby got a room-service job at a Scottsdale resort. He got promoted—and then promoted again—working at top Arizona hotels, the Westin St. Francis Hotel in San Francisco, and the Sheraton Seattle.

By 2006, Battersby's teaching goal had been derailed by success. He was director of Six Sigma process improvement at the Sheraton Seattle. He had a dream job—helping re-envision the future of 1,100 hotels worldwide—in a dream location: a marble-floored high-rise next to the convention center in a booming city.

The Sheraton added a tower and became Seattle's largest hotel in 2007, with 1,236 rooms, 44 meeting spaces, and 2 posh ballrooms. "This a city in itself," Battersby says, "with upward of 4,000 people here on a given night, plus 500 or so associates, who represent almost every culture you can imagine."

The new tower required new employees, many of whom spoke little English. Battersby saw a chance. He got an English as Second Language certificate, and taught hundreds of classes in the basement cafeteria.

Re-inspired, Battersby enrolled at Washington State University Distance Degree Programs, now called WSU Global Campus. By 2012, he had earned his bachelor's in humanities, which "gave me a global perspective, and helps me work better with the different cultures here," he says. He went on to earn his 2013 MBA online from WSU.

Last year, Battersby became director of rooms at the Sheraton, where he oversees nearly every aspect of the guest experience. He also finally became a college instructor, teaching hospitality business management classes for Skagit Valley College's online program. Battersby plans to start his doctorate in the next few years, then become a full-time professor.

For now, he's delighted to be both a teacher and a hotel executive. Each, after all, involves sharing knowledge. And in each role he offers people the same advice he's followed for 25 years: "Don't lose sight of your end goal," he said. "I never gave up. Don't give up."

BY RICHARD H. MILLER

PHOTO RICHARD H. MILLER

Cougar II wine—Tradition and innovation

After last year's enthusiastic reception of Cougar I wine, the WSU Alumni Association initiative continues with Cougar II, another fine blend from a Coug-owned winery.

Laura Sorge, part of the winemaking team who made the blend at Columbia Crest, says Cougar II celebrates the synergy between Washington wine pioneer Walter Clore, WSU, and Ste. Michelle Wine Estates—with a twist.

Sorge herself is an innovative winemaker. After many years in biopharmaceutical research, she decided to change careers. She studied enology at WSU before joining Columbia Crest under head winemaker Juan Muñoz Oca. Sorge says she loves that she can blend her science background with winemaking creativity.

"People are open to look not just at the art of winemaking but also applying science into the care and quality of our wines," says Sorge.

That thoughtfulness went into Cougar II. The red blend begins with a base of 2013 Columbia Crest Icon primarily with merlot grapes. Some Cabernet Franc keeps with the traditional Bordeaux style.

Then there's a surprise, says Sorge. Cougar II has a syrah fermented in a nontraditional manner in Columbia Crest's concrete tanks. "It lends savory elements to the wine, along with big spice from the syrah and nice fruity components," she says.

Cougar II encapsulates the winemakers' philosophy. With an eye toward tradition, the wine does something novel. And that's the goal of blending, says Sorge, to create multiple layers of flavor, where "one plus one makes three."

To learn more about the WSUAA and Wine By Cougars, visit alumni.wsu.edu or call 1-800-258-6978.

Ryan will be in charge of supporting sales and marketing in the Pacific Northwest. ✲ **BRYAN MCKINNEY** ('08 Educ.) will join the Minidoka County School District next year as East Minico Middle School's new principal. He grew up in Idaho and is excited to return. ✲ **JESSICA RIGGS** ('08 Soc. Sci.) joined Mark-Taylor Residential in Scottsdale, Arizona, in 2008 and has quickly moved up in the company. She has recently been promoted to director of sales and training. ✲ Former WSU basketball standout **TAYLOR ROCHESTIE** ('09 Comm.) received the Alphonso Ford Top Scorer Trophy in Euroleague professional basketball. Rochestie helped take Russia's Nizhny Novogorod team to the Top 16 by scoring an average 18.9 points over 21 games this season. He scored in double figures every time he played this season.

10

CHRISTOPHER MOREHEAD ('10 Hist.) joined law firm Fisher & Phillips in Portland, Oregon, as an associate attorney. His practice focuses on employment discrimination and related litigation. ✲ After 27 years of experience in law enforcement, **JAMES SPURGEON** ('10 Social Sci.) was appointed chief of the Flandreau, South Dakota, police department ✲ Former WSU Crimson Girl **KAILA (EVENOFF) WALLACE** ('10 App. Des. Merch.) returned to Pullman to serve as the Crimson Girls head coach. Since graduation she has been a part of multiple dance teams including the Spokane Shock, Denver Nuggets, and Tampa Bay Buccaneers. ✲ BernardoWills Architects in Spokane hired **CHLOE BUERSTATTE** ('12 Int. Des.) as an interior designer. She is a member of the International Interior Design Association and was previously employed by Contract Design Associates of Spokane. ✲ **LAINE HAMACHER** ('12 Comm.) was hired as an assistant digital media strategist at Pinckney Hugo Group, a marketing communications firm in New York. ✲ Minor League baseball team Everett Aquasox welcomed **JUSTEN OSLUND** ('14) to their front office team as an account executive.

IN*memoriam*

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ROBERTA C. ANDERSON ('33 Socio.), 103, May 15, 2015, Pendleton, Oregon. **HAROLD N. POULSEN** ('38 Ag.), 97, March 5, 2014, Fort Worth, Texas. **WILLARD E. HANSEN** ('39 Ag. Ed.), 98, March 18, 2015, Mount Vernon.

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MARIE MARGARET STRASSER BLEY ('40 Pharm.), 96, April 8, 2015, Spokane. **MARY M. HOOPER** ('40 Home Econ.), 98, May 5, 2015, Pullman. **CAROL CLEMENT ROBBINS** ('40 Chem. Eng.), 99, April 8, 2015, Bellevue. **WILLIAM A. CANNON** ('41 Chem.), 96, April 22, 2015, Monrovia. **MYRNA J. SMITH** ('41 English), 95, February 6, 2015. **MARSHALL L. SMYTH** ('43 Mech. Eng.), 92, March 22, 2015, Tucson, Arizona. **MARY E. SUHADOLNIK** ('43 Phys. Ed.), 94, March 19, 2015, Spokane. **ALICE E. KRAUSE** ('44 Home Econ.), 93, April 2, 2015, Lacey. **KEITH EDWIN PETERSON** ('45 DVM), 92, May 10, 2015, Harrisonburg, Virginia. **DOROTHY L. LINSCOTT** ('46 Socio., Alpha Gamma Delta), 90, February 5, 2015, Hansville. **DORIS TROXEL** ('46 Bus.), 92, March 23, 2015, Tualatin, Oregon. **JOHN BINNS MURRAY** ('47 Elec. Eng.), 91, November 16, 2014, Pullman. **NINA E. ROCKSTROM** ('47 Bacter.), 90, February 21, 2015, Springfield, Missouri. **MARGARET LOUISE SWANSON** ('48 Home Econ.), 91, May 11, 2015, Pullman. **PAUL WILLIAM ZIMMER** ('48 MS Geol.), 96, December 31, 2014, Boise, Idaho. **RODNEY D. ASCHENBRENNER** ('49 Civ. Eng.), 91, December 8, 2014, Bellingham. **FREDERICK CHARLES "BOBO" BRAYTON** ('49 Ed.), 89, March 28, 2015, Pullman.

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JAMES F. AYLWARD ('50 Bus.), 85, September 8, 2014, Walla Walla. **ANNA BARRIGAN** ('50 Pharm.), 85, December 6, 2014, Port Angeles. **MARY GARD KUHLMAN** ('50 Home Econ.), 86, March 3, 2015, Spokane. **EDWARD D. MCCORMICK**, ('50 Elec. Eng.), 88, August 29, 2014. **GEORGE MILLER** ('50 Mech. Eng.), 91, April 15, 2015, Anacortes. **DONALD M. NEWBOLD** ('50 Bus. Insurance), 89, April 11, 2015, Spokane Valley. **JOHN G. SARGENT** ('50 Ag. Ed.), 92, May 5, 2015, Anacortes. **CHARLES ULLMAN SMITH** ('50 PhD Socio.), 89, April 21, 2015, Tallahassee, Florida. **JOHN BRUCE SUTHERLAND** ('50 MS Ag.), 96, April 24, 2015, Lacey. **FRANK R. CLEMENT** ('51 Math.), 88, April 17, 2015, Des Moines. **BEVERLY J. FLOCH** ('51 Educ., Kappa Delta), 86, April 28, 2015, Spokane. **WAYNE ELMER MONBECK** ('51 Foreign Languages), 93, April 19, 2014, Reno, Nevada. **FRANKLIN DAROLD RIDER** ('51 Gen. St.), 86, February 18, 2015, Chico, California. **LAWRENCE EDWIN AMES** ('52, '54 MS Phys. Ed.), 87, March 14, 2015, Mukilteo. **DUANE LESLIE FLINT** ('52 Chem. Eng.), 85, April 2, 2015, Yorba Linda, California. **JEAN HAGIE** ('52 Socio.), 88, May 14, 2015, Cheney. **GLORIA KNAPSTAD** ('52 Ed.), 84, June 29, 2014, San Jose, California. **SVERRE KNAPSTAD** ('52 Bus., '57 MEd.), 88, March 30, 2015, San Jose, California. **THOMAS J. QUINN** ('52 MA Eng.), 89, April 6, 2015, Ocala, Florida. **LAVERN E. TORGESON** ('52 Phys. Ed.), 86, March 23, 2015, Huntington Beach, California. **GUY W. AMES** ('53 Ani. Sci.), 83, December 19, 2014, Cheshire, Oregon. **DOROTHY TEEL HARLESS** ('53 Home Ec.), 93, March 23, 2015, Eureka, Montana. **EDWIN WALTER SMITH** ('53 Forest & Range Mgmt.), 90, December 31, 2014, Omak. **E. ROY CURTIS** ('54 Pharm.), 87, October 26, 2014, Omak. **JEAN GULLICK** ('54 App. Des., Merch., Textiles), 81, September 23, 2014, Burlington. **RICHARD CLAUDE HENLE** ('54 Math., '73 MAT), 82, January 30, 2015, Mountain Home, Idaho. **GEORGE G. MAIN** ('54 General Studies), 83, December 29, 2014, Issaquah. **BRUCE EDWARD NOTSON** ('54 Bus.), 83, February 18, 2015, Burlington. **JAMES "JIM" QUANN** ('54 Ag., '60 Ag. Econ., '71 EDD), 82, May 23, 2015, Spokane. **JOHN RICHARD COLLEY** ('55 Forest & Range Mgmt.), 91, January 27, 2015, Bainbridge Island. **JERRY ALFRED HARSCH** ('55 DVM), 83, February 17, 2015, Medford, Oregon. **ERNEST DOYLE MONTGOMERY** ('55 DVM), 88, January 22, 2015, SeaTac. **GORDON D. 'WOODY' WOODWARD**, ('56 Comm.), 85, March 25, 2015, Merced, California. **ELINOR HAFSTAD SHERMAN** ('57 Fine Arts), 81, February 23, 2015, San Francisco, California. **DONALD G. FARR**, ('58 Pharm.) 78, March 25, 2015, Spokane. **STANLEY G. MCCLURE** ('58 Poli. Sci.), 79, April 8, 2015, Marietta, Georgia. **LAURA ANNE MCVICKER** ('58 Home Econ., '64 MAT), 78, March 23, 2015, Aberdeen. **ROY D. BELL** ('59 Ani. Sci.), 83, March 7, 2015.

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EVAN J. VAN ANTWERP ('60 Hotel and Restaurant Admin., Theta Xi), 76, January 23, 2015, Palm Springs, California. **JOHN WILBERT HARRER** ('60 DVM), 86, March 23, 2015, Bozeman, Montana. **ROBERT S. MCGEE** ('60 Bus. Admin.), 81, April 9, 2015, Caldwell, Idaho. **MARJORIE J. STONE** ('60 Pharm.), 77, April 15, 2015, Spokane. **HAROLD R. HADDOCK** (x'61 Ed.), 74, April 26, 2015, Green Valley, Arizona. **PAUL R. TROEH JR.** ('61 Gen. St.), 78, May 7, 2015, Portland, Oregon. **GARY GENE BANKS** ('62 Phys. Ed.), 75, September 1, 2014, Walla Walla. **LAWRENCE A. BURCH** ('62, '64 MS Civ. Eng.), 76, May 19, 2015, Suisun, California. **KIRK ALLEN SEEKINS** ('62 DVM), 79, February 24, 2015, Great Falls, Montana. **KENNETH H. RUSSELL** ('64 PhD Chem.), 81, January 9, 2015, Fresno, California. **DAPHNE SUSAN DAVIS** ('65, '71 MA Poli. Sci.), 71, June 18, 2014, Mountlake Terrace. **CHARLES 'CHUCK' H. ROGERS** ('65 Mech. Eng., Tau Kappa Epsilon), 74, Denver, Colorado. **ROSS TAYLOR** ('65 Gen. Stud., '69 Const. Mgmt., Sigma Alpha Epsilon), 71, February 21, 2015, Spokane. **ROBERT R. ANDERSON** ('66 Speech), 72, January 24, 2015, Scottsdale, Arizona. **KAREN LOUISE JELLUM** ('67 Ed.), 70, October 21, 2013, Chinook. **ROBERT POWL MYERS** ('67 DVM), 76, April 9, 2015, Bozeman, Montana. **DAVID DUANE THOMAS** ('67 Vet. Sci., '73 DVM), 70, March 1, 2015. **CHERYL M. CORKRUM** ('68 Gen. St.), 69, February 12, 2015, Spokane. **THOMAS J. HEDEMARK** ('68 Phys.Ed.), 72, February 22, 2015, Spokane. **LINDA LOUISE HEDRICK** ('68 Home Econ.), 69, March 14, 2015, Dallas, Texas. **THOMAS LYNN RICHMOND** ('68 Marketing), 68, November 13, 2014, Coeur d'Alene, Idaho. **RICHARD NEIL HORMAN** ('69 Gen. St.), 68, April 26, 2015, Shoreline. **CAROL NADINE KETTLESON** ('69 Psych.), 67, October 9, 2014, Spokane. **ROBERT WESLEY SIMPSON II** ('69 Finc.) 98, May 11, 2015, Coeur d'Alene, Idaho. **GARNETT KIRBY WHITE** ('69 Pharm.), 70, March 5, 2015, Stanwood.

70

CAROL MARIE RUNOLFSON-ECKSTROM ('70 English), 62,, March 15, 2011. **LARRY JAY VANDENBRINK** ('70 Comm), 66, February 11, 2015, Tualatin, Oregon. **JAMES F. HOGGATT** ('71 Elec. Eng., Delta Tau Delta), 64, December 13, 2014, Twin Falls, Idaho. **ROGER D. HYLAND** ('71 Civ. Eng.), 67, April 29, 2015, Spokane. **RONALD ALBERT NAIL** ('71

PHOTO ROBERT HUBNER

MEMORIES OF BOBO As a high school senior I visited the WSU campus in Pullman and saw a baseball game with Buck Bailey in his final year as the Cougar baseball coach. The next year when I joined the freshman class in 1961, I was part of the first group of players recruited to the incredible 33-year **BOBO BRAYTON** baseball era at WSU. Within one year I had just met two of the most storied and colorful coaches in the history of American baseball.

At that time, budgets and facilities meant that there were no assistant coaches, and road trips were in state-owned station wagons driven by Bobo, Marv Harshman (when recruiting for basketball), and certain "responsible" players. As the team catcher I always rode with Bobo for strategy discussions as well as his "zit game" partner—a point for being the first to say "zit" when a dog, green-headed duck, or pheasant is identified, 5 points for a white horse, and 15 points for a cougar. I also had the privilege of being Bobo's road roommate if Harshman wasn't along. Every Cougar who played for Bobo would recall those driving adventures as a source of some of their most hilarious and memorable Bobo stories.

Bobo was larger than life in every way. On the field it was his intense coaching methods, dugout humor, dramatic tirades toward umpires, and, at times, the intensity would turn toward players whose attention had strayed or whose execution was flawed. A teaching moment was at hand. His practices required concentration. Everyone was continuously involved and in motion.

A college baseball player spends much more time with his baseball coach than any of his professors, so there are many opportunities to learn life lessons and acquire values. Bobo was a central figure and mentor in that growing up process for me. Some of the lessons I learned include: don't let anyone out-work you; don't let anyone be better prepared; be as good as you can be; make the most of where you are; have pride in your school (it's great to be a Cougar); have pride in your country (it's great to be an American); a swinging bat is a dangerous bat; and quality wins.

Bobo was a vital life force. He gave everyone around him energy. He taught us baseball skills as well as how to focus our intensity, compete at the highest level, and most often to win. Having played seven years of professional baseball while going to medical school, I can easily say that Bobo was the best teacher of the game and the best baseball strategist I ever knew. I was happy that his career was sufficiently long that my son was able to play for him at WSU and have the opportunity to experience the same lessons in baseball and life that meant so much to me.

JOHN E. OLERUD '65

John E. Olerud is professor emeritus of dermatology at the University of Washington's School of Medicine. He received WSU's highest alumni honor, the Regents' Distinguished Alumnus Award, in 2011.

Charles "Bobo" Brayton coached WSU baseball from 1962 to 1994. His Cougar teams won nearly 70 percent of their games, captured 21 conference titles, and made 10 NCAA postseason appearances and two trips to the College World Series.

IN*memoriam*

MA Mus.), 72, March 1, 2015, Modesto, California. **LLOYD THOMAS SWAIN** ('71 Comm.), 66, March 30, 2015, Richland. **JAMES WILLIAM KELLY** ('72 MBA), 73, May 11, 2015, Klamath Falls, Oregon. **LYNDA L. RICHARDS** ('73 Zoo.), 71, March 28, 2015, Colton. **GERALD W. BANNON** ('74 Enviro. Sci.) 69, April 29, 2015, Spokane. **PAUL A. SWINEHART JR.** ('74 Zool.), 63, March 8, 2015, Tacoma. **DEBORAH SUE WILLIAMS** ('74 Socio.), 62, February 22, 2015, Whittier, California. **NANCY ELLEN BALDWIN** ('75 MA App. Merch., Des., Textiles), 84, May 24, 2015, Flat Rock, North Carolina. **GUY HAROLD STONE** ('75 Pharm.), 70, March 16, 2015, Desert Hills, Arizona. **JOSEPH E. ESCHBACH** ('76 Econ., '77 MS Mech. Eng.), 61, April 13, 2015, Los Altos Hills, California. **ELISABETH ANN KEITGES** ('77 Bio.), 59, March 25, 2015, Renton.

80

BONG SOO LEE ('80 Econ.), 62, March 6, 2015, Tallahassee, Florida. **VERNON L. MERKLEY** ('81 MA Couns.), 72, November 15, 2014, Richland. **VIRGINIA ANN ALBARADO** ('82 Psych.), 71, May 18, 2015, Spokane. **DAVID K. SCHNEIDER** ('82 Econ.), 55, May 6, 2015, Bonney Lake. **JEFFREY MICHAEL DENNIS** ('83 Pol. Sci.), 55, March 25, 2015, Dallas, Texas. **KATHLEEN LOUISE GOOD** ('83 Hist., '90 MEd), 53, May 21, 2014, Federal Way. **JACQUELIN DARRYL GRIBBLE** ('89 PhD Chem.), 69, April 22, 2015, Columbus, Ohio.

90

SONJA LEE McDANIEL ('93 MED, '06 EdD), 63, February 23, 2015, Sunnyside. **SCOTT CLIFFORD BRADLEY** ('97 Env. Sci.), 44, January 23, 2015, Olympia. **MICHAEL K. MCARTOR** ('97 Hum.), 40, March 23, 2015, Renton. **JODY LYNN LITTEN** ('99 Crim. Jus.), 36, April 26, 2013, Lacey.

00

SAILA CLARK ('00 Speech & Hear. Sci.), 63, October 28, 2014, Flagstaff, Arizona. **BEN LEWIS DECREASE** ('07 DTC), 32, February 1, 2015, Seattle.

10

ELENA MARIE LAMPMAN ('12 Soc. Sci.), 26, May 10, 2015, Carrollton, Texas. **GARRETT BEATON** ('13 Fin.), 24, March 8, 2015, Seattle.

FACULTY AND STAFF

FREDERICK C. "BOBO" BRAYTON, 89, Athletics, 1961-1994, March 28, 2015, Pullman. **RICHARD D. DAILEY**, 93, Housing and Dining, 1967-1987, April 6, 2015, Sierra Vista, Arizona. **DANNY "ERNIE" DAY**, 65, Housing and Dining, 1984-2013, April 7, 2015, Palouse. **CHARLES 'RAY' FARRELL**, 89, Facilities Operations, 1963-1988, May 14, 2015, Albion. **ELSON S. FLOYD**, 59, President, 2007-2015, June 20, 2015, Pullman. **THOMAS J. GAZZOLA**, 55, WSU Vancouver-Mathematics, 2014-2015, June 10, 2015, Vancouver. **JON B. GRIMES**, 76, Mechanical and Materials Engineering, 1971-2007, March 16, 2015, Pullman. **BRENDA J. HACKLIN**, 66, Creamery, 2010-2015, April 27, 2015, Moscow, Idaho. **BETH P. HARRIS**, 95, WSU Puyallup, 1960-1993, March 7, 2015, Puyallup. **DAVID E. ('PETE') HERTZ**, 72, Central Receiving, 1976-2005, May 18, 2015, Palouse. **BENNING F. JENNESS**, 79, Benefit Services, 1973-1998, June 1, 2015, Moscow, Idaho. **THOMAS L. KENNEDY**, 85, Vice Provost, History, 1970-2001, June 5, 2015, Pullman. **ERICH JOSEPH LEAR**, 66, Music and Dean of the College of Liberal Arts, 1989-2011, February 18, 2015, Maltby. **GERALD "GERRY" W. LILJE**, 81, Philosophy, 1967-1995, March 29, 2015, Portland, Oregon. **S. MARC LINDSEY**, 59, University Publishing, 1999-2015, May 31, 2015, Spokane. **ROBERT G. MESHISHNEK**, 85, Central Stores, 1949-1987, April 6, 2015, Clarkston. **JEFFERY R. PECK**, 69, Facilities, 1972-2007, March 24, 2015, Pullman. **CHARLES E. ROYCE**, 55, Veterinary Clinical Sciences, 1986-2015, April 16, 2015, Moscow, Idaho. **VIOLA ELEANOR WILLIAMS**, 89, Executive Secretary for Provost, 1967-1982, March 24, 2015, Kennewick.

If you have a class note or would like to recognize a WSU alumnus in the "In Memoriam" section, please email wsm@wsu.edu or visit magazine.wsu.edu/contact.

IN*memoriam*

IN MEMORY OF ERICH JOSEPH LEAR, 1948–2015

"For a warrior, to be harmonious is to flow, not to stop in the middle of the current and try to make a space of artificial and impossible peace. He knows that he can only give the very best of himself under conditions of maximum tension … Ask yourselves these questions: What am I doing with my life? Does it have a purpose? Is it tight enough? A warrior accepts his destiny, whatever it may be. However, he fights to change things, and he makes something exquisite of his passage on Earth."
—Carlos Castañeda

This quote by Carlos Castañeda, a 1960s shaman and spiritual writer, was included in the program of Erich Joseph Lear's memorial service, held on March 29, 2015, in Bryan Hall Theatre. Castañeda's books had a profound effect on how Lear approached both life and death. Erich stated his career approach was "to help people reach their goals." This was evident in his work as an administrator, educator, mentor, and friend.

Erich earned his college degrees in violin performance and was an accomplished musician, playing in a variety of orchestras and chamber ensembles. He began his academic career as a teacher but soon realized that his true calling was as an administrator. While he was a philosophical thinker, Erich was also pragmatic and the combination made for a strong leader. First as the director of the School of Music at WSU and later as the dean of the College of Liberal Arts, he impressed people with his brilliant mind and ability to see both the big picture and the details within. Colleagues were often amazed at how his mind worked, similar to a giant spreadsheet, whether discussing budgets, architectural drafts, or long-range planning for a program. And yet through it all he was humble and respectful of other ideas and viewpoints.

For me, Erich was my mentor, colleague, and dear friend. In honor of his retirement in 2011, I performed a voice recital entitled "Words of Wisdom" with pianist and WSU professor Gerald Berthiaume. Lear loved Mahler's music, and the songs included this lyric:

I have died to the world's turmoil and rest in a silent domain.

Surrounded by those he dearly loved—his wife, Jane, and his daughters, Sarah and Rachel—Erich lost his battle with cancer on February 18, 2015, leaving this world much too soon. What he left behind was a wonderful legacy of dedication to his profession, students, family, and friends.

BY JULIE ANNE WIECK

Julie Anne Wieck is an associate professor of music at WSU.

PHOTO SHELLY HANKS

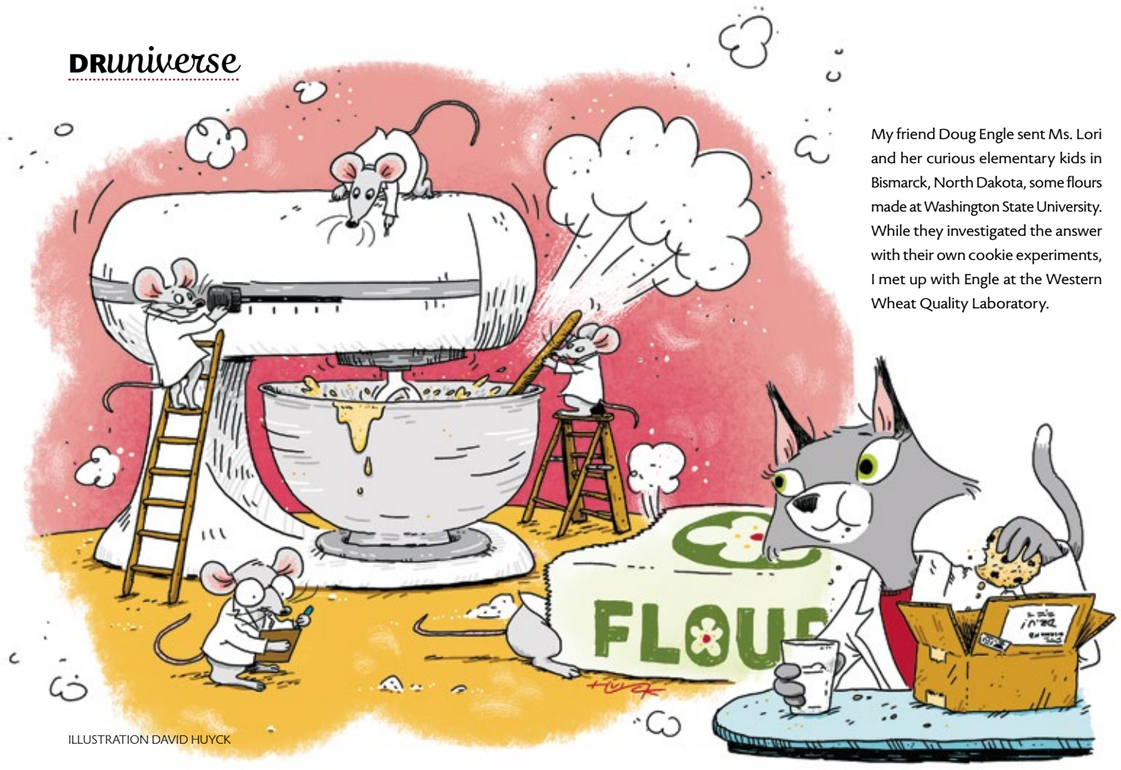

ILLUSTRATION DAVID HUYCK

My friend Doug Engle sent Ms. Lori and her curious elementary kids in Bismarck, North Dakota, some flours made at Washington State University. While they investigated the answer with their own cookie experiments, I met up with Engle at the Western Wheat Quality Laboratory.

HOW DO YOU MAKE THE BEST CHOCOLATE CHIP COOKIES IN THE UNIVERSE?

You've got to know your dough. Whether you want chewy cookies or crispy dunkers, it's all about chemistry. Especially when it comes to the flour.

At the wheat lab on the Washington State University campus where my friend Doug Engle works, scientists test out different kind of flours to find out which kind works best. They've got baking down to a science.

Different types of wheat grown in the west come into the lab for testing. Their first stop is the flourmill.

The machinery at the mill grinds up wheat kernels and makes them explode. When the kernels explode, they turn into tiny flour particles that will impact how the cookies look and taste.

While an explosion might sound like it damages the wheat kernel, it actually happens fast enough to keep tiny storage compartments for the long, sugary chains of molecules—the starches—from blowing apart. You need starch in your flour to help soak up the liquids in the dough and help give the cookies their form. If the storage compartment, or starch granule, breaks then liquids will flood the cookie.

Cookie structure also depends on proteins. Cookies have protein, but not a whole lot. So, unfortunately we can't just make cookies for dinner.

Long stretchy chains of proteins help hold the dough together, and even trap tiny air bubbles. This gives the cookie the texture you can feel when you take a bite.

At the lab, scientists test out flour that comes from either hard or soft wheat kernels. Hard wheat is great for baking bread, but doesn't work as well for cookies.

"What makes the best cookie is soft wheat," Engle explained. "If you bite into a wheat kernel and if it's softer, it will make a better cookie."

All wheat started out soft, but over centuries, hard wheat developed. Scientists aren't totally sure why there are two kinds, but they can tell them apart when they look closely at their structures.

Some of my mice friends helped with wheat research here at WSU. They tried both kinds and preferred soft wheat to hard wheat. We don't know exactly why or how they can tell them apart, but soft wheat is easier for them to chew. Scientists, on the other hand, can use lab equipment to measure the differences.

In the wheat lab, they measure the quality of a cookie by how it spreads in the oven. Most cookie recipes call for all-purpose flour. Usually it contains mostly hard wheat flour so to balance out the dough they call for more water and butter.

With hard wheat, the starches suck up too much of the water in the dough and the cookie shrinks when it bakes. Soft wheat makes a cookie softer and bigger.

After talking to Engle about cookies, I was getting thirsty. Thankfully, the lab of cookies was just a short walk away from a place where you can find milk courtesy of the university dairy cows.

Sincerely,
DR. UNIVERSE

WASHINGTON STATE UNIVERSITY

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Washington State MAGAZINE

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A celebration of

the life and legacy

of Elson S. Floyd

In the service of education

August 26, 3 p.m.

Beasley Coliseum

Washington State University

Pullman

Elson S. Floyd, PhD
1956–2015

President of
Washington State
University
2007–2015

The tenth president of Washington State University, Elson S. Floyd, arrived in Pullman with aspirations to lead the University into a new era of prestige and growth. Even though Floyd faced an unprecedented budget crisis that drastically cut state funding, an uphill effort to establish a medical school, and a closely-held personal struggle with illness, he worked tirelessly toward WSU's land-grant mission of service and access to education—and achieved his goals.

Charismatic and intuitive, decisive and visionary, Floyd as a leader inspired the Cougar nation. In just eight years, he elevated the University in student access and diversity, research and private funding, academic and campus expansion, and service to the state.

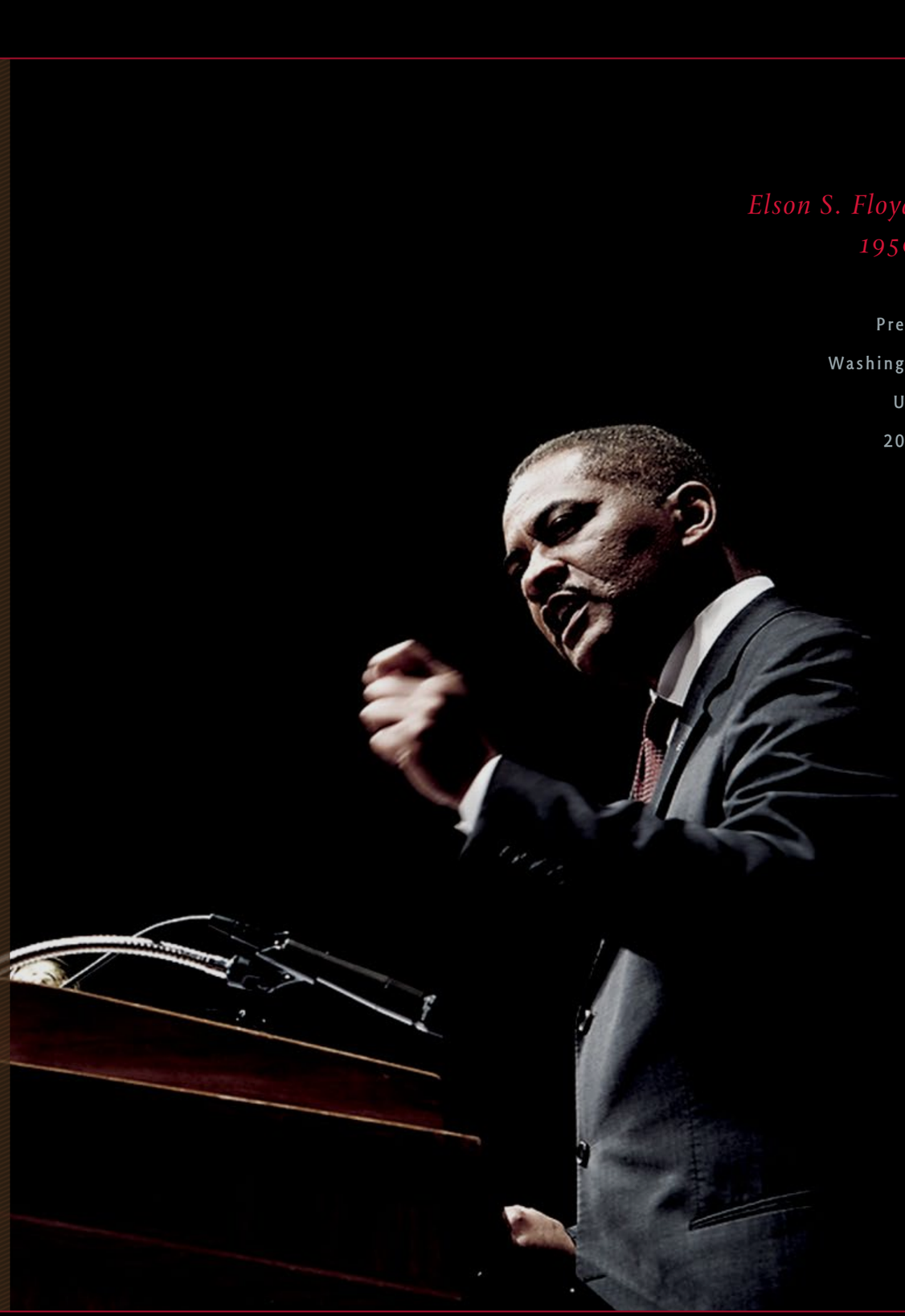
Floyd died June 20, 2015, in Pullman, after a battle with colon cancer. He was 59. In the wake of his passing, condolences and appreciation flooded into the campus and social media from students, alumni, dignitaries, and state and national leaders. He was remembered not just as an exceptional leader, but as a kind and loyal man who cared deeply about students, family, friends, and colleagues.

"I have a hard time thinking of when one Washingtonian's loss has been this noted and appreciated. It was very profound all over the state," says Washington Gov. Jay Inslee. When he met Floyd in 2007, says Inslee, "I remember thinking, this is a real comet that's going to light up the state. And he did."

Inslee and others recall Floyd's warm smile, emotional intelligence, work ethic, and his unselfish and sincere desire to promote education.

"He was somebody who was driven to succeed and change the world. He had a drive and a will that was incomparable. But he was driven for the greater good. It wasn't about Elson Floyd. It wasn't about WSU. It was what WSU and Elson Floyd could do for you," says WSU Interim President Daniel Bernardo '85 PhD.

by Larry Clark '94



Floyd's commitment to education began in Henderson, North Carolina, where he was born on February 29, 1956. The oldest of four boys, he was raised by his mother Dorothy and father Elson, neither of whom graduated from high school but desired an education for their sons. Dorothy said that, as a child, Floyd would do math problems in the sand because they couldn't afford paper.

"Dr. Floyd was a rags to riches guy. He was afforded a higher education because of scholarships and financial aid. He was all about providing that chance to others," says Bernardo.

Because of a scholarship opportunity, Floyd was the first African American to graduate from Darlington School, a prestigious private institution in Rome, Georgia. He excelled at school, both academically and socially as president of the student council, vice president of the honor council, and a three-sport athlete.

He went on to college at the University of North Carolina, where he received his undergraduate and graduate degrees. Floyd began his career in higher education there as an assistant dean for student life. He also met and married the love of his life, Carmento.

Floyd first came to Washington state in 1990 when he took leadership roles first at Eastern Washington University and then as executive director of the state's Higher Education Coordinating Board.

He returned to UNC as a vice provost and executive vice chancellor from 1995 to 1998. Floyd became president of Western Michigan University in 1998 and served there for five years. He worked as president of the University of Missouri from 2003 to 2007.

When Floyd applied to be president as WSU, he immediately impressed the leaders of the University. Bernardo was dean of the College of Agriculture, Human and Natural Resource Sciences (CAHNRS) and a member of the presidential search committee when he met Floyd at the first interview.

"I was a little bit cautious because he didn't come up through the academic ranks. Then he spoke and two minutes into it, I knew who would be the next president of Washington State," says Bernardo.

WSU Regent Michael Worthy also recalls how Floyd's magnetic presence and confidence, without arrogance or self-aggrandizement, won over the Board of Regents.

"There was no dissension; it was unanimous. He was the one," says Worthy.

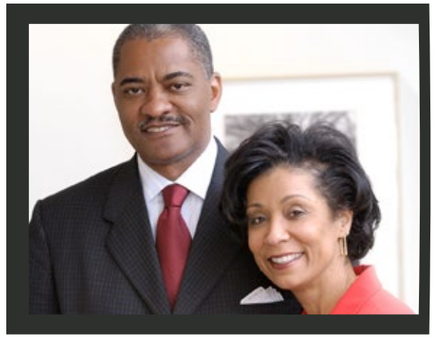
Leading the state's university

Floyd became WSU's first black president in 2007, and he soon articulated a strategy of growth for the University, by connecting to its roots.

"We will not fulfill our potential as an institution, we will not keep faith with the vision of those who came before us, by taking half-steps and half-measures," said Floyd in 2008. "We are building the intellectual capacity and scientific acumen to become one of the leading land-grant universities in the country."

Bernardo, who was later appointed as provost, felt heartened by Floyd's plans to return WSU to its origins. "As someone who was educated and worked at only land-grant institutions, it really rang true for me," he says. "Not land-grant in terms of agriculture, but land-grant in terms of access to higher education for the population of the state, the outreach and engagement of the University to all communities in Washington, and the application of our research to solve problems in the state."

Elson Floyd raised everybody up who was around him, and his leadership impacted every corner of the University, the state, and beyond.



John Gardner met Floyd at Missouri, where he was dean of the College of Agriculture and then vice president of research under Floyd's leadership. Gardner joined Floyd at WSU in 2007. Now WSU vice president for development, Gardner says, "He saw in WSU a public research land-grant university that had tremendous potential, an institution well-poised to have a much bigger voice, a much bigger presence, a much bigger impact."

One area that needed cultivating was WSU's relationship with the agriculture industry.

"We had sort of lost touch with the farmers in Washington state. Even though CAHNRS did good work with them, they didn't get the sense that it was a priority for the University. That was one of the first things Dr. Floyd did, to reestablish that connection with the ag community," says Worthy.

Another of Floyd's earliest endeavors was an ambitious tour to each of the state's 39 counties to spread the word about WSU and its academic and service mission.

"That entire tour set the course for his presidency because he was articulating the vision that we were in every county to serve the people of the state," says Bernardo.

Back on campus, Floyd quickly became a very visible and welcomed presence for the students. They affectionately called him "E Flo" when he sat with them at sports events and greeted them on campus. As a student, Rafael Pruneda remembers when he first saw the Floyds at the all-campus picnic in 2007.

"He stood out because of his presence, and Mrs. Floyd had on this big, beautiful hat. I remember them walking from Beasley Coliseum to Mooberry Track and saying hello to everyone," says Pruneda.

Soon after Floyd became president, the worst fiscal crisis in University history struck in 2008, during the recession. Over the next several years, state funding was cut by 52 percent. Undaunted, Floyd was forced to make tough budget decisions, but never lost sight of his goals.

Floyd was known for his transparency and honesty, and it was never more apparent than during the budget problems. He made it clear that he would safeguard WSU students, faculty, and staff as much as possible.

"From a faculty perspective, his leadership through the economic crisis, his extraordinary commitment to students and faculty during that time and trying to protect us, was impressive," says Laura Griner Hill, professor and chair of the human development department. "He made wise decisions that were both financially prudent and compassionate that brought us out of that crisis in amazingly good shape."

Although tuition went up and some programs were cut, Floyd saw the tight budget times as an opportunity to focus the University on areas with demonstrated strength, such as veterinary medicine, agriculture, communication, and engineering.

"It made us a very different university—a lot more nimble and entrepreneurial and one that is

consciously not as dependent on state resources," says Bernardo.

Part of WSU's resilience during the budget cuts came from an increase in private support. Floyd oversaw the "Campaign for Washington State University" and early on set an ambitious $1 billion fundraising goal.

WSU topped the goal this year, thanks in great part to Floyd's efforts—both in garnering major gifts from individuals like Bill and Melinda Gates, Paul Allen, Gene Voiland, and Oregon property developer Jordan Schnitzer, and in supporting other WSU fundraisers.

"He was a sensational partner for a dean in the fundraising arena," says Bernardo. As former dean of CAHNRS, "It gave us credibility as we sought gifts from the agricultural industry—such as the $32 million endowment from the tree fruit growers of the state—when the president says it's a priority."

Floyd also pushed the University to pursue more research funding. During his tenure, annual research expenditures grew by 57.5 percent, placing WSU among the top 11 percent of public universities for research funding.

Floyd saw the urban campuses of WSU—Spokane, Tri-Cities, and Vancouver—as a priority for broadening access to education.

Mel Netzhammer was selected as WSU Vancouver chancellor in 2012, the first chancellor appointed by Floyd. Netzhammer recalls how the president explained his plan for the campuses.

"He wanted to create a new vision for the urban campuses that really complemented each other. He wanted to move away from this idea that the urban campuses needed to duplicate what was in Pullman," says Netzhammer.

President Floyd built on the traditions and the promise of WSU to make it the place it is today.

Floyd later appointed Lisa Brown as chancellor of WSU Spokane and H. Keith Moo-Young chancellor of WSU Tri-Cities. All three oversaw expansion of their campuses in enrollment and academic success.

Floyd also founded WSU North Puget Sound in Everett in 2012, and began discussions about a partnership with Bellevue College this year.

WSU grew tremendously during Floyd's presidency. Cranes and trucks were familiar sights at all WSU campuses, as the University completed 30 major construction projects. Among them: one of the world's most technologically advanced wine science centers at WSU Tri-Cities; the first residence hall on the Pullman campus since 1971, followed by two more; Martin Stadium expansion and other athletic facilities; the Paul G. Allen School for Global Animal Health; several buildings at WSU Vancouver; and health sciences buildings in Spokane.

Within the academic sphere, Floyd established the Edward R. Murrow College of Communication and brought back together the College of Arts and Sciences. In athletics, Floyd hired Athletic Director Bill Moos '73, who then brought in new coaches and new energy for Cougar sports.

Among Floyd's many accomplishments, the establishment of a WSU medical school stands out as a singular achievement. Floyd saw access to health care as one of the core values for a land-grant institution.

"He very clearly wanted medical education and medicine as part of WSU's portfolio of things we did in a meaningful way," says Ken Roberts, acting dean of WSU College of Medical Sciences.

The process began by consolidating WSU's health sciences programs on the Spokane campus, including the Colleges of Nursing and Pharmacy. When discussions frayed around expanding the WWAMI medical education partnership with the University of Washington, Floyd decided in 2014 to have WSU pursue a separately accredited medical school in Spokane.

The University won strong bipartisan support from the state legislature for the medical school this spring, and the accreditation process will begin this fall. The new medical school will almost certainly be named for Floyd.

"When the state does benefit from that new medical school, Elson will be attached to that. Twenty-five or fifty years from now, the medical school will probably be the thing most identified with Dr. Floyd," says Roberts.

Unwavering commitment to students

The medical school and other changes at WSU were paralleled by achievements close to Floyd's heart: student access to higher education.

During his presidency, WSU had the highest enrollment rates in its history, peaking at almost 29,000 in 2014. Floyd made great efforts to get financial aid to students so they could come to the University, despite increases in tuition.

"He was always a champion of affordable access. While some other universities wanted autonomy in setting tuition rates, he was lobbying to reduce the level of tuition," says Worthy.

In summer 2015, shortly after Floyd's death, legislators voted to lower tuition and increased funding for universities. Floyd would have approved, says Bernardo. "It pained him to see tuition go up. I just wish he could have seen it go down. There's little doubt that the tuition reduction and the way higher education was treated in the state's budget would not have occurred without the leadership of Elson Floyd."

Not only did the number of students increase across all of WSU's campuses, the diversity of the student population expanded dramatically. From 2007 to 2014, the number of students of color almost doubled.

"In a very thoughtful and strategic way, he said to the entire University community, we need to expand the percentage of our students from minority populations," says Worthy.

Elson and Carmento were both known for their compassion for students, through scholarships and aid, and even staying at the bedside of ill students until parents arrived. "When individual students were troubled, he took a genuine interest in their personal and academic welfare," says Hill.

Pruneda saw Floyd's compassion during the budget crisis. "A lot of students were very unhappy and he was aware of that. In an article in the *Evergreen*, he said 'If you have questions, I'll be in the CUB for three hours.' It was a very powerful message to let students know he was approachable and willing to listen to you."

Pruneda worked as a staff member for events in the Floyds' home where he got to know the Floyd family. An ASWSU senator and leader among Latino students, Pruneda was appointed as a student regent in 2012. Even though Floyd didn't know about the application, Pruneda credits the president for the inspiration and support.

"He went out of his way to make sure his former students were taken care of," says Pruneda, who is pursuing a career in higher ed. "I work now for the WSU Foundation in Student Affairs and Enrollment. I wouldn't be in this position without his mentorship and guidance."

The rarest of people

For Pruneda and the countless others who met him, Floyd's warmth and character left a powerful impression.

"When he would come into a room, he would really command your attention because he had this very bold presence. When he would smile, you knew he was a good person and he had your attention," says Pruneda.

Floyd's charisma and intuition let him move smoothly between the worlds of business, politics, and academia.

"Until I met President Floyd, I thought of university presidents as being circumspect and scholarly, but not harmonious with being decisive and a true executive. He was a president who could walk with scholars and be an academic, but he was a president who could walk with CEOs and be decisive," says Gardner.

Floyd connected to people no matter their social class, political leaning, or ethnicity, transcending his own childhood in the segregated South, says Gardner. It was a talent recognized by everyone, from students and alumni to state and national leaders.

"He raised everybody up who was around him," says Inslee, who had Floyd as part of his gubernatorial transition team. "His legacy won't be chiseled in

marble or granite on an edifice. It's built on people's lives because he opened doors to them."

Many people who worked at WSU also saw that Floyd was invested in their success. "Elson was chief among my great

mentors," says Netzhammer. "He wanted to give you confidence in the decisions you were making, yet bring you along in his vision. He was truly one of the rarest of people."

Gardner says a major part of people's commitment and connection to Floyd came from Floyd's belief in unqualified loyalty. "I used to believe loyalty should be questioned. He taught me that loyalty stands on its own merits."

Regent Worthy often witnessed Floyd's honesty and loyalty. "He was absolutely a man of his word. If you heard it from Elson Floyd, there was never a retreat," he says. "In the very public role as president of Washington State University, he realized there was a lot of potential for misinterpretation of his intention. He always sought to be as clear and deliberately spoken as he could be."

Floyd was admired for his diligence, even beyond his position at WSU. "He had a work ethic like I've never seen," says Worthy. Worthy points to Floyd's role as one of the most prominent African American educators in the country, chairman of the Pac-12 Conference, a member of the Knight Commission, a trustee at Oregon State University appointed by Oregon Gov. John Kitzhaber, and an active member of the Black fraternity Alpha Phi Alpha.

On a personal level, Floyd was known to welcome students and others into his home, and even cook for them at times.

"He had a really good Southern hospitality about him, both he and his wife. They were really proud of where they were from. They made sure any guests that came into their home were welcome. Whether it was a student or the governor, they were always treated well," says Pruneda.

He also remembers lighter moments, such as when Floyd was walking across campus during homecoming week and saw students dancing the "Electric Slide" on the mall. "He was watching us and then he stopped and started electric sliding with us. He had a big smile on his face. Not a lot of people can say they saw a university president electric slide on the Terrell Mall," says Pruneda.

Anecdotes of Floyd's compassion abound at WSU and beyond. "As a person, there was a tender side to Elson that some people didn't know," says Bernardo.

A Pullman grocery store clerk tells of helping Floyd at the checkout line. A teenaged boy behind him had some flowers, and Floyd asked who they were for. "My mother," the boy replied. Floyd smiled, said, "That's a fine thing," and paid for the boy's flowers.

In simple acts of kindness and his belief in people, Floyd showed that he was a man of faith, says Worthy. "I didn't see it as clearly until I had an opportunity

to go to North Carolina for the memorial service with his family and his colleagues in his hometown."

The memorial service in the Henderson church was attended by hundreds of Floyd's family and friends as they laid him to rest and remembered the man they admired and loved.

Floyd is survived by his beloved wife, Carmento; his mother, Dorothy; his daughter, Jessica Floyd Middlebrooks, (her husband Shawn) and granddaughter Victoria; his son, Kenneth Edwards and granddaughters, Kenae' and Kennedy, all of North Carolina; and brothers, Michael and Dennis Floyd of North Carolina, and Garrett Floyd of Tyler, Texas.

In lieu of flowers, the family suggests memorial gifts to honor President Floyd be made to the ***Elson S. Floyd Founders Fund*** *for the* ***WSU College of Medicine****.*