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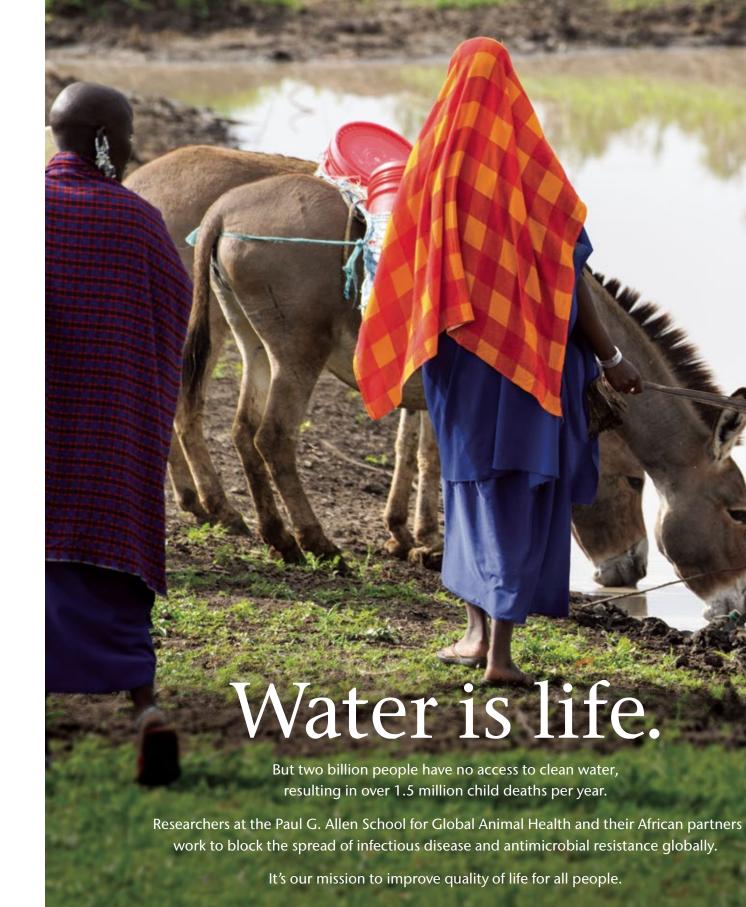
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FIRSTWORDS

EXPIESS YOUTSelf. Nature or nurture? It seemed so simple a debate when I was younger and first learning biology. DNA and genes determined some of our traits, and the rest came from family, society, and other external factors.

There was certainly debate about the extent of what we could learn versus what we inherit as hard-coded genetic information. Well, that discussion is a lot more complicated now, as recent empirical research and discoveries show offspring can inherit traits developed by parents' environment and experiences. Basically, what's passed on to kids is not just in the genetic code.

One way that happens is through epigenetics, where heritable changes in gene expression occur without changes to the underlying DNA sequence. Washington State University biologist Michael Skinner and his students over the last 15 years pioneered and replicated experiments in this field that showed epigenetic transfers, traits changed by environment that were passed down several generations. Skinner was treated initially as a rogue for the findings, but his research has spurred new understanding of evolution and inheritance, and could lead to effective gene therapies for diseases.

Even when we inherit traits, the environment can sometimes make it hard to express oneself, as Bob Dlugosh '71 and other gay, lesbian, bisexual, and transgender Cougs will attest. It wasn't easy to identify as LGBT, even at WSU, but with support these alumni could finally be who they are, and use their voices to build community and resilience.

The voices of Cougs over the years have resonated with people from all over. Edward R. Murrow's amazing broadcasts from wartime London reached millions. And who can deny that Keith Jackson '54 expressed the very heart of college football? Jackson, who passed away in January, is remembered by new Murrow College Dean Bruce Pinkleton in this issue. Younger voices, too, can tell us great stories, such as Kara Rowe's documentary work on women in agriculture.

One thing I've discovered over the years is that every member of the Cougar family has a story. Some are sad but must be told, like the untimely death by suicide of WSU student and football player Tyler Hilinski. Stories can help us heal, and hopefully reach out to others facing despair.

Other stories share the spirit of WSU life, whether it's trout fishing in Idaho rivers or playing piano in Kimbrough. That's why I'm asking you to express yourself with a 100-word story about your time at Washington State. The contest details are at the back of the magazine, but please note that the top stories will get a cheese-y prize.

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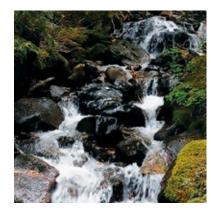
TALKback

Truth or consequences

I retired in May 2017 after forty-plus years teaching philosophy in various colleges, and I can corroborate the observations of Professor Hindman and Ms. Donaway.

Thirty or forty years ago, people listened to whatever the disc jockey selected for air time. Now, people can drive from Pullman to New York and choose to hear only what they want. One consequence is that young people are trained to think that they never have to hear what they don't want to hear—including campus speakers.

The remark, "When you remove truth from the equation, all that is left is power," captures the appeal of the Harry Potter books. J.K. Rowling had a sense of the unease and malaise of current society when, at the conclusion of the first book, Harry Potter and the Sorcerer's Stone, he-who-shall-not-be-named says, "There is no good and evil, there is only





BELOW, CLOCKWISE FROM TOP LEFT: TROUT I AKE CREEK CASCADES INTO TROUT I AKE NEAR CASHMERE MOUNTAIN IN CHELAN COUNTY; THE PACIFIC CREST TRAIL CROSSES TROUT LAKE CREEK IN SKAMANIA COUNTY; TROUT LAKE FLOWS INTO TROUT CREEK IN FERRY COUNTY; TROUT LAKE IN THE ALPINE LAKES WILDERNESS IN KING COUNTY; BROKEN BRIDGE OVER TROUT CREEK NEAR METHOW RIVER IN OKANOGAN COUNTY; TROUT LAKE IN LAKELAND SOUTH, WASHINGTON.*

Schools once required philosophy courses. In the 1970s, Marquette University, where I earned a Ph.D. in philosophy, required two philosophy and two religion courses. My undergrad school required three—and I did poorly: C+, D, C-.

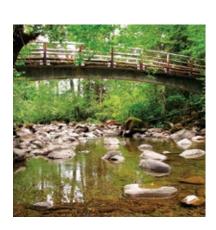
I was unprepared to listen to ideas that were

So it may be in WSU's interest, as well as many other schools, to reinstitute the philosophy requirement. Then students will be expected to hear ideas that are not their own, discuss those ideas in a respectful and civil manner, think critically about those ideas, i.e., find reasons for holding ideas, and judge those ideas.

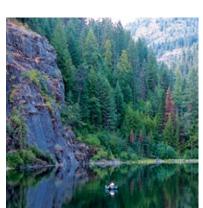
> RICHARD J. MCGOWAN '76 Butler University, Indianapolis, Indiana

Running up the competition

I enjoyed the track and field article by Larry Clark very much. There's nothing like a sunny day at









a meet with so much going on. I remember meeting Dan O'Brien through Coach Rick Sloan, who embodied true Cougar Pride, and certainly the Pickler twins deserve mention for all their accomplishments.

> MICHAEL CISNEROS WSU staff

Correction

In the February 2018 story, "Truth or consequences," we mistakenly named the Edward R. Murrow College of Communication doctoral student as "Rebecca Calloway" and ran a photo of her. The doctoral student is Rebecca Donaway, and a correct photo is on the online version of the story.

*While researching our summer issue cover photo and "In Season" article, we were confronted with the fact that there are quite a few Trout-named streams and lakes in Washington. We will add and credit any our readers suggest to a gallery at pinterest.com/







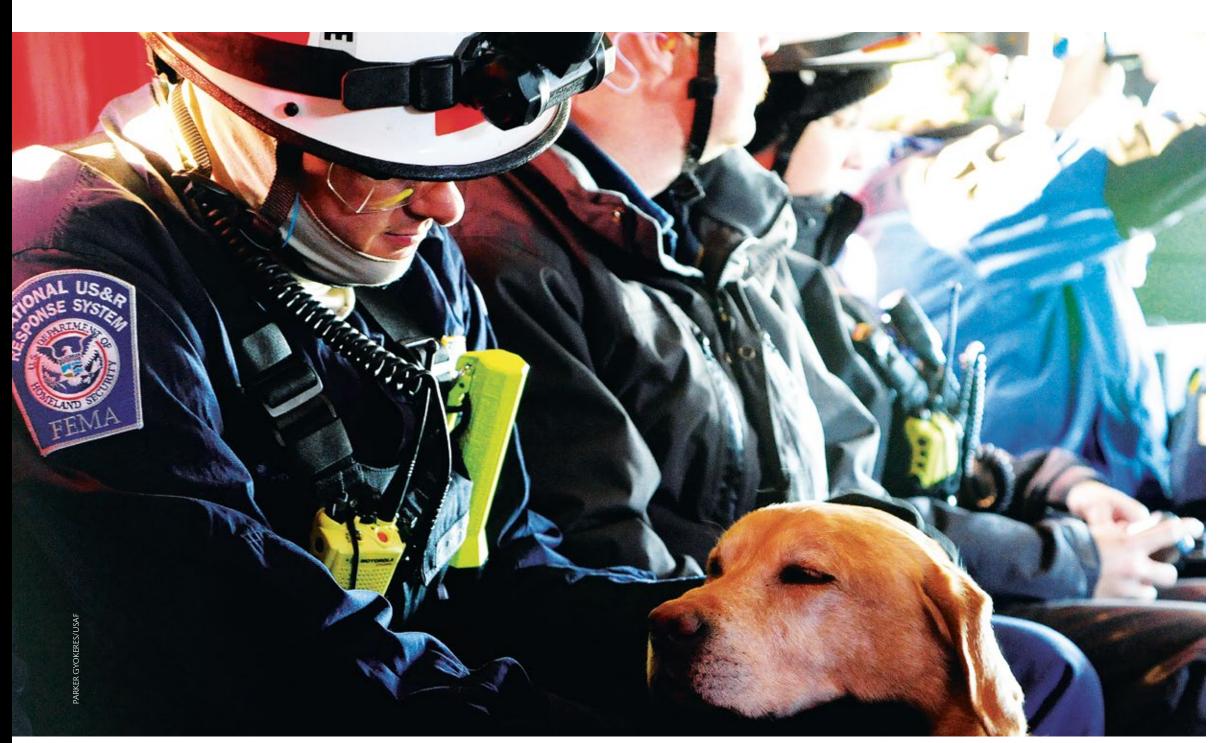




upfront

To the rescue

BY BRIAN HUDGINS



Jennifer Brown '99 grew up thinking a team of horses would be required to pull her away from an equine veterinarian career. Although Brown thought she was not that strong in science during high school, her love of training horses and interacting with the animals propelled her to pursue a doctorate of veterinary medicine at WSU.

The heroism displayed during the aftermath of the 9/11 terrorist attacks, however, introduced Brown to a new possibility. "During my residency, 9/11 happened," Brown says. "That obviously made a big impression on many people and one of the things that impressed me was the work of the search and rescue dogs at the sites. I thought that was something I could get involved in later in my career."

A few years after Brown had taken a faculty position at Virginia Tech, she joined the Veterinary Medical Assistance Team, right before Hurricane Katrina impacted the Gulf Coast in 2005. "That was my first deployment, and I worked with the search and rescue dogs down there," Brown says. "When I came back home after being deployed for five weeks for Hurricanes Katrina and Rita, I wanted to learn more about the dogs and how they trained and worked."

A colleague of Brown's on the VMAT introduced Brown to one of the local Urban Search and Rescue teams. Observing that training enabled Brown to get more involved with the search and rescue outfit as the team veterinarian who managed their canine care needs. "I said I would never be a dog handler because I just don't have time for that," Brown says. "Never say never, because now I have got five Urban Search and Rescue dogs."

Brown got her first search and rescue dog, Phanesse, in 2009. She has FEMA-Certified Live Find dogs and a FEMA-Certified Human Remains Detection dog. Following her relocation to Florida in 2010, Brown transferred to Florida Task Force-2 where she serves

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as a canine search specialist and team veterinarian.

Most of Brown's efforts have been after hurricanes, most recently in response to Hurricane Irma last September. She also deployed to North Carolina in response to Hurricane Matthew in 2016. A power plant building collapse in St. Petersburg, Florida, and an apartment fire in Temple Terrace marked local missions for Brown. "We don't deploy frequently, which is good, because it has to be a major disaster for us to get deployed," she says.

Equine surgery, emergency care experience, and her overall veterinary training helped Brown in disaster situations. In turn, that has helped Brown develop her canine sports medicine and rehabilitation practice.

Dogs used in sporting events make up a big part of Brown's work—dogs who compete in field trials, agility, protection sports, and disc competitions. Brown also does rehab to assist dogs recovering from knee surgeries or other surgical procedures. Companion pets who have an injury or mobility issues are part of the practice, too.

The career has taken Brown from her hometown of Lynnwood across the country caring for both people and animals in times of need. "That is the beauty of veterinary medicine," Brown says. "You are not confined to one thing. You might start as an equine surgeon, and you can go a different direction and still be successful." **



Jennifer Brown and a FEMA four-legged friend.

Bug out!

BY BRIAN CHARLES CLARK

A scrawled note was stuck to the door of the clinic. "All animals left here have died," it said. "We have buried them for you. I have no way of expressing my grief." The note was signed by the vet whose clinic was destroyed by Hurricane Katrina.

That note is a sad reminder that being prepared for a disaster is key to surviving storms, fires, floods, earthquakes, and whatever else might come crashing down upon us—and our animals.

That's why Cynthia Faux says, "If I have 15 minutes to evacuate in front of a fast-moving fire, I don't want to spend 10 of those looking for my pet carriers." Faux, a clinical assistant professor in Washington State University's College of Veterinary Medicine, has two cats, a dog, two birds, and a 30-inchlong lungfish. "During fire season, those carriers stay in my living room."

Faux teaches a two-week-long summer intensive evacuation preparedness course for fourth-year veterinary medicine students. The course immerses students in the intricacies of disaster management, including which local, state, and federal agencies to coordinate with, how to develop plans for moving livestock, and what animal health factors to consider when rendering aid to veterinary clinics in the path of a disaster.

As Faux says, "If your veterinary practice is in the path of a flood or a fire, whether you like it or not, you have to deal with it." The idea of the course, she adds, "is to prepare veterinarians, whether they're going to actively participate in disaster management or they just want to know in case it happens to them."

Emergency managers, as well as psychologists who study crisis communications and management, admit that there's no way to get 100 percent of people to leave a disaster area. One reason for that is that many people simply refuse to leave without their pets.

And even if some try to leave with their pets, they aren't always allowed to do so. One case, in particular, helped move American disaster planners to be more inclusive of animals.

In the wake of 2005's Hurricane Katrina, one of the deadliest hurricanes in U.S. history, a young boy was sheltering at the Superdome. He was to be evacuated to a more permanent facility in Houston. As he was boarding a bus to Texas, his dog was taken out of his arms by a police officer. Distressed, the boy called out to his dog, "Snowball!", and then crumpled to the ground in despair. Caught in a series of photos, the story went viral—and helped inspire a new law.



Cynthia Faux. Photo Shelly Hanks

More than a year later, in October 2006, Congress passed the PETS Act, which mandates that disaster preparedness plans include provisions for pets. Implementation of the law has been spotty, though, with only 20 states in compliance. Washington state is one of them. Sadly, Snowball and her boy were never reunited.

Still, according to a 2011 ASPCA poll, at least 30 percent of people in the South said they wouldn't know what to do with their pets if forced to evacuate. Now, though, many disaster management agencies are creating agreements with fairgrounds, motels, mass transit carriers, and other businesses to allow animals in emergency situations.

Faux was in Louisiana in the aftermath of Katrina as part of a team of vets who



Above: Fire threatens horses in pen during California fires. Photo Eric Thayer. Below: Cattle stuck in Midwest flood waters. Photo Jocelyn Augustino/FEMA

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volunteer to help animals in disasters. She was already an experienced disaster-aid vet, having worked in New York after 9/11, where she cared for search and rescue dogs.

Dogs worked in rubble piles with potential for paw-pad injury. Having vets on site meant that if the dogs had problems, they could get help right away. While dogs had very few problems, the site of the Twin Towers collapse was very dirty, so on-site vets washed a lot of eyes and ears, for which handlers were grateful, according to numerous accounts celebrating the canine heroes.

One of Faux's students, Corrie Hines '18 DVM, says pet owners need to have a bug-out bag ready to go. Animal owners need to have "vaccination records, food for a week, a can opener, ID tags, water and water bowls, a spare litter box," and whatever else a pet might need for a week-long evacuation. For horse owners, "own a trailer or have a partner nearby who does. Have friends or a



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"Have a plan," Hines insists. A veteran wildlife rehabilitator who has cleaned birds after oil spills, Hines adds, "Know that something bad can happen, so be prepared. Just opening your pasture gates and hoping your horses are going to be OK? That's not a plan. They can get hurt. They can hurt others."

Knowing where your local fairground is might just save your animal's life, especially in the Pacific Northwest where fire is a major concern.



Corrie Hines. Photo Robert Hubner

Hines and her fellow students worked with the disaster management team in Chelan County, in north central Washington. Wenatchee is home to a large number of horse lovers and their animals, so having a way of moving large animals to safety is important to Stan Smoke, Chelan County's emergency management specialist.

A former fire chief, Smoke says having defensible space around your home, barn, or stable is an important part of a preparedness plan. Sandy Duffy, Smoke's counterpart in Grant County, where Faux and her students have also worked, concurs.

"Everybody cramming into a school parking lot, looking for their children—that's probably not the best way to go about trying to find a child."

Duffy says that whether its large animals or small children, knowing the plan is critical to a safe evacuation. **

Virtually yours

How do you walk through a building in Atlanta when you're in a classroom in Pullman?

If you can't be there physically, virtual reality can deliver a new level of engagement, whether it's watching Shaun White's snowboard whoosh inches from your head, or working collaboratively on construction projects with students from Georgia.

Virtual reality is also a rapidly growing business. There were an estimated seven million VR headsets in 2016, which is expected to balloon to 47 million by 2020.

That acceleration has pushed companies like Intel to ramp up their VR offerings, including the 2018 Winter Olympics in PyeongChang, South Korea. The VR technology there was developed by former Washington State University engineering professors Sankar and Uma Jayaram from 1993 to 2015, funded by federal agencies and companies such as PACCAR and Komatsu. They started their company 3D-4U, which was bought by Intel in 2016, to create fully immersive and interactive experiences.

First used in Martin Stadium for WSU football games, the VR system had a major push during the Olympics. The Voiland College of Engineering and Architecture hosted a viewing party of the Winter Games where students and faculty could try out VR headsets at WSU Pullman's Spark, a new digitally-focused classroom building, and experience 360-degree views of snowboarding half-pipe, figure skating, and several other sports.

Over in PyeongChang, several former students joined the Jayarams at the Intel

project. Barely two years out of school, Blake Rowe '15 managed the operation. John Harrison '07 supported coding and graphics activities. Matthew Poppe '11 handled the design and manufacture of proprietary cameras assisted by Aaron Hasenoehrl '15. And OkJoon Kim '07 MS, '11 PhD created VR Olympic apps for the Oculus Gear VR, Google Daydream, and WinMR headsets.

The headsets continue to improve, but aren't quite at the level of *Ready Player One*, the dystopian science fiction novel by Ernest Kline that takes place mostly in virtual space. That book was selected as the 2017–18 Common Reading selection read by all freshmen and integrated into coursework and lectures.

Although *Ready Player One* is set in the future, VR is already used in classrooms. In Anne Anderson's construction management class, students collaborate on building projects using VR headsets and 3-D software.

Anderson, an assistant professor of construction management and a virtual design expert, says, "We really feel more team cohesiveness, as though we are in the space together."

Not only do they work together, the WSU students join construction management students at Virginia Tech and Georgia Tech for lectures and to "walk" around virtual buildings, such as the historic Biltmore Building in Atlanta, for classes.

The projects aren't just in Georgia. Strap on a headset, and you can look around inside the walls of WSU Pullman's Elson S. Floyd Cultural Center and see how the beams create the unique "rolling" roof. It's certainly more than a game. As Anderson says, industry is already using this technology, which helps graduating students. **



SMOKEsignals

In the hazy days of summer

It's no secret that wildfires are on the rise throughout the western United States. Come summer, the plumes of graybrown smoke seem to arrive weeks earlier and often linger well into fall. The smoke irritates sinuses, clings to clothes, and despite your efforts, seeps into homes and cars like an everpresent smoldering campfire.

On those haze-filled days, people often wonder, "Is it safe for the kids to play outside? To

hold a neighborhood BBQ? What about those with asthma or other respiratory problems?"

Engineers at the Washington State University Laboratory for Atmospheric Research (LAR) are helping provide answers through a powerful computer modeling system called AIRPACT, which predicts daily air pollution levels for the Pacific Northwest, including wildfire smoke.

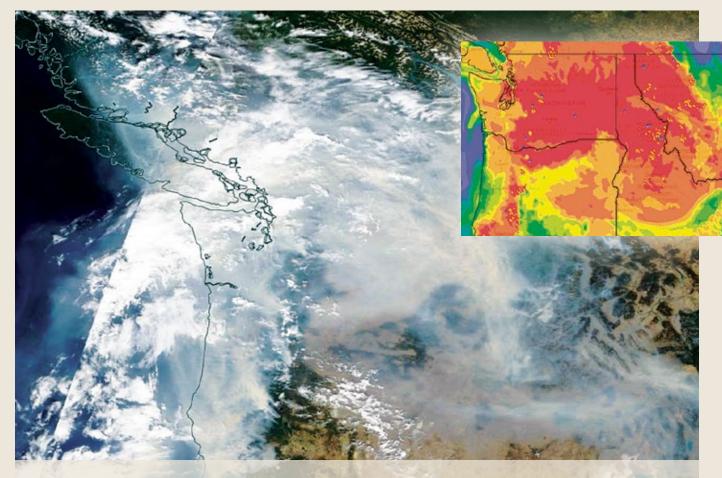
In response to growing public health concerns, the AIRPACT team recently expanded their wildfire smoke forecasting capabilities and is also developing early-warning alerts for those with respiratory health issues.

It's a welcome move after last summer, when the Spokane Clean Air Agency recorded the region's worst air quality since monitoring began 20 years ago. For several days in September, much of Eastern Washington was blanketed with thick mud-yellow smoke

that sent air quality readings into the very unhealthy zone—and people scrambling for N95 masks.

Though the severity of wildfire seasons varies, scientists say the number of smoky days has been trending upward for the last decade and is expected to continue. The reasons are complex, but it's generally agreed that average temperatures are rising and staying warmer longer due to climate change. The result is often more rain than snow during winter, which spurs spring vegetation growth and allows insect pests to survive. The combination of drought, dry fuel, and pests can turn what should be a normal fire year into something extreme.

The looming question, for many people, is how to adapt their daily lives to endure weeks or months of smoky air pollution while minimizing adverse health effects.



Smoke covering the entire state of Washington on September 5, 2017. *Overlay:* Detail of the online AIRPACT-5 Dynamic Map which forecasts air quality in the Pacific Northwest. *Images courtesy NASA and WSU Laboratory for Atmospheric Research*

Joseph Vaughan, research associate professor in civil and environmental engineering, says smoke forecasts are posted on the AIRPACT website by 7 a.m. each day and can help with decision-making and day-planning. The system models several components of wildfire smoke, with a focus on particulate matter that is 2.5 microns or less in diameter, called $PM_{2.5}$. In comparison, the average hair is 10 microns wide.

These tiny smoke particles stay suspended in the air and are small enough to get deep into the lungs where they cause irritation and inflammation, says Vaughan. According to the Environmental Protection Agency, particle pollution is carcinogenic and linked to serious health problems including respiratory disease, asthma attacks, cardiac arrhythmias, heart attacks, strokes, and early death.

PM $_{2.5}$ is one of six pollutants reflected in the EPA's Air Quality Index, or AQI, and regulated by the Clean Air Act. The AQI, available to the public on AirNow.gov, shows current air pollution levels using colors and a scale running from 0 to 500. Good air quality, for example, is shown in green and runs between 0 to 50. Yellow is moderate at 51 to 100, orange is unhealthy for sensitive groups at 101 to 150, red is unhealthy for everyone at 151 to 200, purple is very unhealthy for everyone at 201 to 300, and maroon is hazardous at 301 to 500.

In Spokane last September, the AQI for $PM_{2.5}$ reached 256—purple level and the highest ever recorded.

Vaughan says AQI is based on weather monitoring and forecasts while AIRPACT uses a computer model that brings in meteorology and emissions data to simulate air pollution conditions as they evolve over time. The AIRPACT team wants to use the model to provide practical information for widespread public use.

To that end, Vaughan and his colleagues recently teamed up with the Washington State Department of Ecology and Washington State Department of Health to create a program called CENSE—or Cardiopulmonary EveNts from Smoke Estimator.

Using AIRPACT forecasting, CENSE will alert individuals when air quality is predicted to deteriorate and could trigger specific health emergencies. Plans are in the

Ten tips to cope with wildfire smoke

From Washington State Department of Health and California Air Resources Board

- Check local air quality reports and forecasts at <u>airpact.wsu.edu</u> and <u>airnow.gov</u>.
- Reduce or avoid outdoor physical activity when smoke is in the air—especially important for children, older adults, pregnant women, and those with heart or lung disease.
- Smoke levels often change substantially throughout the day, so try to plan activities around the least smoky times to minimize exposure.
- Drink plenty of fluids to keep respiratory membranes moist.
- Stay indoors and keep indoor air as clean as possible. Keep windows and doors shut. Run air conditioners on recirculate and close the fresh air intake. Use a HEPA filter air cleaner. Don't fry meat, spray aerosols, use candles, fireplaces, or gas stoves. Don't vacuum.
- If possible, create a clean room in your home. Stock enough food and medicine to last at least five days.
- Consider leaving the area if air quality is poor and you can't keep indoor air clean.
- Protect yourself with respirator masks marked N95 or N100 and certified by NIOSH (National Institute for Occupational Safety and Health). Make sure to use both straps. Paper painter's masks and surgical masks are ineffective.
- Avoid driving if possible and keep windows closed if you must drive. But open vents periodically to prevent CO₂ buildup, which causes sleepiness.
- Make sure to protect pets and livestock. Call your veterinarian if animals show signs of distress.

(Courtesy of Jeremy Avise '07 PhD, manager, regional air quality modeling section, California Air Resources Board, and adjunct professor in civil and environmental engineering at WSU)

works for a website, subscriber function, and smartphone apps.

CENSE calculates values that relate the average 24-hour PM_{2.5} level to incidence of human health conditions such as asthma and chronic obstructive pulmonary disease (COPD). For example, Vaughan says there is a specific value for asthma patients under age five, another for the general population, and one for those over age 65.

"Our subscriber function will text, call, or email you with the day's warnings for the conditions you've signed up for," he says. "If you have a child with asthma, you might want an alert whenever there's a 20 percent increase in the risk of an event. Or a 50 percent increase for a parent with COPD."

CENSE ties in nicely with the work of WSU civil and environmental engineering professor and LAR member Von Walden, who leads air quality research for the Urbanova project in Spokane's U-District. Urbanova is a consortium of businesses and innovators who are using smart city technologies to improve services and infrastructure in Spokane.

"The smart city idea is using state-ofthe-art sensors in intelligent ways to improve health and well-being of citizens," says Walden.

Last year, he and his colleagues mounted air quality sensors on three streetlamps as part of the Avista smart streetlight project.

"This spring, we installed six more sensors—this time on rooftops in the U-District," Walden says. "We also put in a very sophisticated suite of air quality instruments as a reference site at WSU Spokane."

Their plan is to monitor air quality at the street and neighborhood level with an emphasis on winter air stagnation and wildfire smoke. As they gear up for what could be another smoky fire season, Walden says they hope to collect data that will benefit the general public.

"Smoke can have serious health effects, so we're making measurements to better understand the exposure of Spokane's citizens," he says. "By providing people with more information during smoke events, we hope that they will be able to make better decisions regarding their personal health."



Smoke gets in your wine

Smoke truly gets under the skin of wine grapes.

As microscopic particles and liquid droplets ooze and eddy through the vineyard, grapes are coated with toxic chemicals. Worse, smoke from forest and range fires manages to get into the plant itself, wreaking havoc with the plant's internal chemistry.

In self-defense, grape vines attempt to sequester toxic smoke particles that infiltrate berries and leaves by binding sugar molecules to the offending invaders. The plant can then metabolically shuffle the sugar-trapped particles into places where the smoke won't be as harmful to the vines' mission: produce grapes and reproduce.

Humans interfere with the vines' mission when we harvest grapes for wine. Making wine from smoke-tainted grapes, though, is a frustrating enterprise. According to the Washington State University wine science team, smoke-tainted wines are in danger of developing "unpleasantly 'pharmaceutical,' 'dirty,' 'ash tray,' 'medicinal,' 'camp fire,' or 'burnt'" flavors and, to add insult to injury, the taint compounds "reduce the perception of varietal fruit aroma."

The tainting compounds can't be washed off. With much less overall skin contact, the juice from white grapes can be quickly extracted and clarified. But, to get the color right, red wines are made with prolonged contact with skins, so taint compounds are a permanent part of the wine.

Filtering and fining techniques have been used to try to clear the juice of offending chemicals but, as Tom Collins, a wine chemist based at WSU Tri-Cities, says, the problem is much deeper. Sugar-sequestered smoke

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particles are very similar to other desirable compounds. Filtering techniques, such as reverse osmosis, remove both the good and the bad compounds, resulting in a wine that Collins charitably describes as "neutral." This bland concoction could be blended with unaffected wines to produce something consumable but, even then, trouble lurks.

Over time, the acidity of bottled wine cleaves the sugar from the particle, releasing a new wave of off-flavors and aromas.

Collins points out that not much is really known about smoke taint—except that it tastes nasty and can have a negative impact on the bottom lines of both growers and winemakers.

Collins and his team are engaged in an ongoing project that seeks to answer several big questions: How much smoke exposure, and at what period in grape development, is too much? And what can be done to clean up tainted fruit so that it can be used to make a useful product?

Collins and colleagues have constructed an in-vineyard method of controlling and testing smoke exposure, with the aim of answering the first question. And the second, he suggests, might lie in spit.

Since the enzymes in our saliva can cleave sugars entrapping smoke particles, perhaps a process could be developed using similar, non-saliva derived enzymes to liberate the sugars from the smoke particles, which then might be filtered out by one means or another.

Research-wise, it's early days—but the pressure is on. Fires in Australia, California, and Washington state threaten a beloved industry and there is much interest in finding ways to salvage fine wines from tainted grapes. **



l Union gap (courtesy komo news)

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Physics at

As the Oblique Collisions take the field, Ernest Rutherford, the renowned English physicist, is first up for the Mathematical Physicists. Better known outside physics circles for his cricketing skills, Rutherford is quite the hitter, though usually of particles much smaller than baseballs.

Indeed, in describing the collision of an alpha particle-better known as the nucleus of a helium atom, two protons and two massive neutrons-with a gold atom, Rutherford had this to say: "It was as if you fired a 15" [artillery] shell at a piece of tissue paper and it came back to hit you."

Swing and a miss! Strike one against the discoverer of some of the basic properties of particle physics.

Jeffrey "Rad Man

Newton

is heard

to say,

"Check this

coefficient of

restitution, baby,'

and then smacks

one over the center field

Lloyd "The Charm"

Another home run for the Mathematical

Jeffrey Kensrud, manager of the WSU Sports Science Lab in Pullman, is on the mound winding up another pitch. Crouched behind home plate—and wearing safety gear of course—is Lloyd Smith, director of the lab.

Kensrud fires, and it's another 88 MPH fastball. Rutherford swings, connects, and oh my! We're seeing a spin rate of 3,500 RPM as the Oblique Collision outfielders drop back, back ... home run! No wonder Rutherford was called a force of nature!

Isaac Newton is next up, adjusting his powdered wig, and taking a few practice swings. The all-star mathematician, not known for his

cian, not known for his baseball skills, is in fact a master of the game.

"It's not that we played poorly," says Smith.

"Rather, these guys are the masters of scatter experiments. I mean, Rutherford defined that move in the early twentieth century. We used the same principles in our efforts to understand what happens to a baseball when

and Kensrud talk about what went wrong.

Later, in a post-game interview, Smith

wrote in a paper on the subject, 'some of the same principles that apply to subatomic collisions also apply to collisions of macroscopic objects.'"

hit with a bat—as we recently

Kensrud nods, and adds, "And Sir Isaac developed the math that tells us how fast a hit object goes, based

on the coefficient of restitution. Simply divide the velocity after collision by the velocity before collision."

"That sounds simple," says the interviewer. "So, all the energy of the swinging bat is converted into ball velocity?"

"Not all," explains
Kensrud. "The ball is
slightly deformed, absorbing some of that
energy, while some of the
rest is lost to friction of bat
against ball."

"But what you really want," interjects Smith, "is to minimize the loss of kinetic energy and to maximize the post-impact spin by maximizing both the normal and tangential coefficients of restitutions."

There is joy in Mudville at this insight.

FINAL SCORE: Mathematical Physicists, 3, Oblique Collisions, 0, but the Collisions score many bonus points for their high-speed photography of bat-whacked spinning balls.

Betting your digital dollar

Vast, haze-filled casino floors where rows of flashing colors light up expressionless faces endlessly feeding coins into a machine. Men sporting Hawaiian shirts rake piles of plastic chips across green felt tabletops, all seeking the hedonistic rush of hitting a jackpot seemingly just out of reach.

This is gambling as many of us know it. However, the combination of luck, wagering, and a chance at a payoff is far from a modern concept. As far back as the Paleolithic era, humans wagered on the roll of crude dice made from knuckle bones. Nonetheless, the staples of contemporary gambling—slot machines, card games, craps tables—may be considered primitive technology soon, says Kahlil Philander, an assistant professor of hospitality business management at Washington State University Everett with an expertise in the economic impacts and public policy of gambling.

The advent of the internet is altering the gambling landscape. Traditional forms, such as scratch-off lotto tickets, are slowly being phased out in favor of more interactive, skill-based virtual games. What's more, gambling is becoming more accessible on computers, smartphone apps, and video games. As the digital realm gives a flurry of new avenues for gamblers, lawmakers grapple with the challenges posed by emerging technology and an evolving scientific understanding of gambling addiction.

Gambling in Washington state is governed by laws largely created in the early 1970s. While older than most, Washington's regulatory framework is not much different from other states, which do not take into consideration the multitude of new digital gambling forms.

The unique challenges posed by online and digital gambling have left policymakers scrambling to update

antiquated laws created in an era when the internet was an unknown concept. Complicating the equation further, the ambiguity of betting's newest forms has given way to debate about whether these activities even constitute gambling in the first place, says Washington State Gambling Commission Director David Trujillo.

"Is paying real-world money to open up 'loot boxes' for a chance at obtaining rewards within a video game considered gambling? What about earning virtual points on an online poker site? We spend a lot of time answering questions about 'is this gambling or is this not?' And we get these scenarios all the time because they're always slightly different," Trujillo says.

In the meantime, lawmakers across the country are eyeing the potential for a dramatic rework of the policies surrounding one notso-new form of gambling: sports betting. The U.S. Supreme Court is considering the case of NCAA v. Christie, which seeks to overturn the law that effectively outlaws sports wagering in 46 states. The case is gaining momentum as the NBA recently called upon U.S. policymakers to create laws that provide a basis for betting on its games, in spite of efforts by the American Gaming Association to block such regulations on the basis of unconstitutionality. State governments—including Washington—are closely following NCAA v. Christie, as a reversal of the sports betting ban would be felt across the country. "Everybody is kind of in wait-and-see mode," says Trujillo.

While many unanswered questions remain about legalized sports wagering, lawmakers are tantalized by the prospect of massive gains in tax revenue it could bring to

massive gains in tax revenue it could bring to

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their home states—not to mention the value it provides to consumers—says Philander, who has been working with West Virginia regulators to create a legal framework in case the ban is lifted.

Philander works with government agencies and other organizations across the globe to promote safer, more beneficial gambling operations, as well as efforts to reduce gambling addiction. He's found great success in the development of GameSense, a program devoted to fostering responsible gambling practices that has been adopted by casinos across the country such as MGM Resorts International. Philander says he hopes to see responsible gambling programs like GameSense more universally embraced. Moreover, he predicts casinos and other U.S. gambling manufacturers will begin using data mining and artificial intelligence to track and identify player behaviors indicative of problem gambling within the next decade.

The scientific community's comprehension of gambling addiction has undergone "quite a remarkable change" just within the past ten years, says Philander. As psychologists reconsider the severity and classification of gambling disorders, Washington lawmakers are following suit.

David Sawyer, a Washington state representative and ex officio member on the state gambling commission, dubs problem gambling the "red-headed stepchild of addiction," far too often overlooked as a secondary concern to drug addiction.

"The Gambling Commission has been taking a critical look at gambling addiction in our state, and we're trying to find a pathway to

help those who are addicts," Sawyer says. "Because we haven't taken a serious look at [gambling addiction] in such a long time, I think our first step is to step back and bring in whatever experts we can to help folks who are addicted to gambling."

The age-old notion of gambling and its place in society is far from settled. While the future of gambling, regulations, and how we treat gambling addiction is uncertain, the way we wager in the years to come is likely to be a far cry from the bets we place today. **

PHOTO 123

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I will do my part to make sure we compete and act with integrity and class.

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BY LARRY CLARK

AS A KID growing up near Cleveland, sports and devoted sports fans surrounded Patrick Chun. He became one himself, rooting for the Cavaliers, Indians, and Browns, even when they weren't winning. Chun's passion led him to Ohio State University and eventually to leadership in their athletic department.

But as much as he loves sports, Chun gives credit to his parents for instilling a devotion to education and a powerful work ethic. It all came together as he took the mantle of athletic director, first at Florida Atlantic University and now at Washington State.

Chun's parents came to Ohio from South Korea in 1969 in pursuit of the American dream, says Chun, and "like a lot of immigrants, their dreams manifest themselves in their children." They settled first in Youngstown, where his father was a taekwondo instructor at the downtown YMCA and his mother worked at a grocery store. They moved to a suburb of Cleveland when the steel industry in Youngstown declined.

They pushed Chun to work hard as well. "My first job was being a paperboy, and Cleveland winters are character builders," he says with a wry grin.

He also grew up playing baseball, basketball, and football, but didn't play at the collegiate level as he headed to Ohio State. "Like a lot of kids here in Washington, I wanted to go to the landgrant institution in my own state, in Columbus," says Chun. "I wasn't good enough to play sports there, so I graduated with a degree in journalism and wanted to be the next great sportswriter."

Chun learned that sportswriting would be working around sports but not working in

sports, so he took a sports information internship with Ohio State's athletic department. That transformed into a full-time job for 15 years with his alma mater.

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He started traveling with the baseball and football team and "got to see firsthand the extraordinary impact of good coaching on student athletes," says Chun. "They're impacted by their environment, and leave school confident, ready to lead companies, lead teams, and become great parents and citizens in their communities."

Athletic Director Gene Smith took Chun under his wing, "taught me the business and helped me understand what it takes to be a leader," says Chun. He made the leap to development and fundraising at Ohio State, ultimately becoming executive associate athletics director, where over four years he oversaw record fundraising years of \$42 million in 2012, \$41 million in 2011, and \$39 million in 2010, as well as a record \$128 million multimedia deal.

Yet, with all his success, Chun yearned for something more. "I realized I needed to get out of my comfort zone in Ohio," he says, noting that he married his wife Natalie (also an Ohio State alum) there, his kids were born there, and family and friends lived in the area. "I went to college and never left."

Florida Atlantic University presented just the opportunity he needed: a position as an athletic director. The decision wasn't easy, though. "It's a part of the world we'd never think about moving to, to take over a broken athletic program," says Chun. "But I had to say I jumped off the plank; I needed to see how good I can be."

Starting in 2012, Chun's tenure at FAU led to success across academics, athletics, student-athlete development, and fundraising. Chun's belief in education was manifested in FAU athletes' academic growth: Entering the 2017–18 academic year, they posted a combined GPA above 3.0 for each of the past four semesters, a first in school history. The school's athletic program won a national award for best practices in their programming for student-athletes, including a comprehensive life skills program for the football team that featured career services and a concerted effort to provide community service to the South Florida area.

Chun also oversaw significant fundraising and athletic achievements at FAU. The institution received its largest single gift, signed several partnership agreements worth millions, and built and started a number of facilities. The FAU Owls over the last few years posted impressive seasons in football, women's volleyball, women's soccer, beach volleyball, men's and women's tennis, baseball, and softball, among others.

After previous Athletic Director Bill Moos '73 took the same position at the University of Nebraska last fall, Chun was hired by WSU after a national search. In January, he became the first Asian-American athletic director at a Power 5 conference school, and the fourteenth person to lead Cougar athletics.

Chun couldn't be happier. He says there are three main reasons why he was ecstatic about coming to Washington State. First, he was drawn by the national reputation of Kirk Schulz as a university president who understands and supports athletics.



Second, WSU and the Cougar family are well-known and respected for their devotion. "I believe there are less than half a dozen schools in the country that have this kind of affinity, this kind of love and loyalty for their institution," says Chun.

He also knew Pullman was a welcoming community, an important point as he brings his family to the town: wife Natalie; daughters Vanna, Kennedy, and Gretta; and their dog Little Brother.

The Cougar family also convinces Chun that the greatest days of WSU athletics lie ahead.

"You can change the world from WSU. It transcends athletics; just look at engineering, farming, business, the wine industry, the Murrow

College. The people who come out of this place, they change history," he says. "We have a responsibility in the athletic department to model and mirror that."

Chun sees WSU's competitiveness in sports tied to its educational mission. "Cougs want to win, and Cougs want to win at the highest level. We all want to win championships, and to develop young people who will get degrees and go on to do great things."

Hearkening back to his own upbringing and the values of hard work and education, Chun makes sure to point out what's most important to him, and what he hopes all Cougs will help achieve: impact on students.

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Even in the short time he's been here so far, Chun has made it a point to meet and listen to members of the tennis, basketball, golf, and football teams

"I get the joy of going to the Cougar Athletic Training table with student athletes," he says with a smile. "I like to plop down next to some of the 18- to 20-year-olds and make it as awkward as humanly possible, just start talking about their life. It's the best part of the job."

As the students talk about why they're at WSU and what they want to accomplish, Chun wonders, "What can we do, as an athletic department, to help them achieve their dreams?"

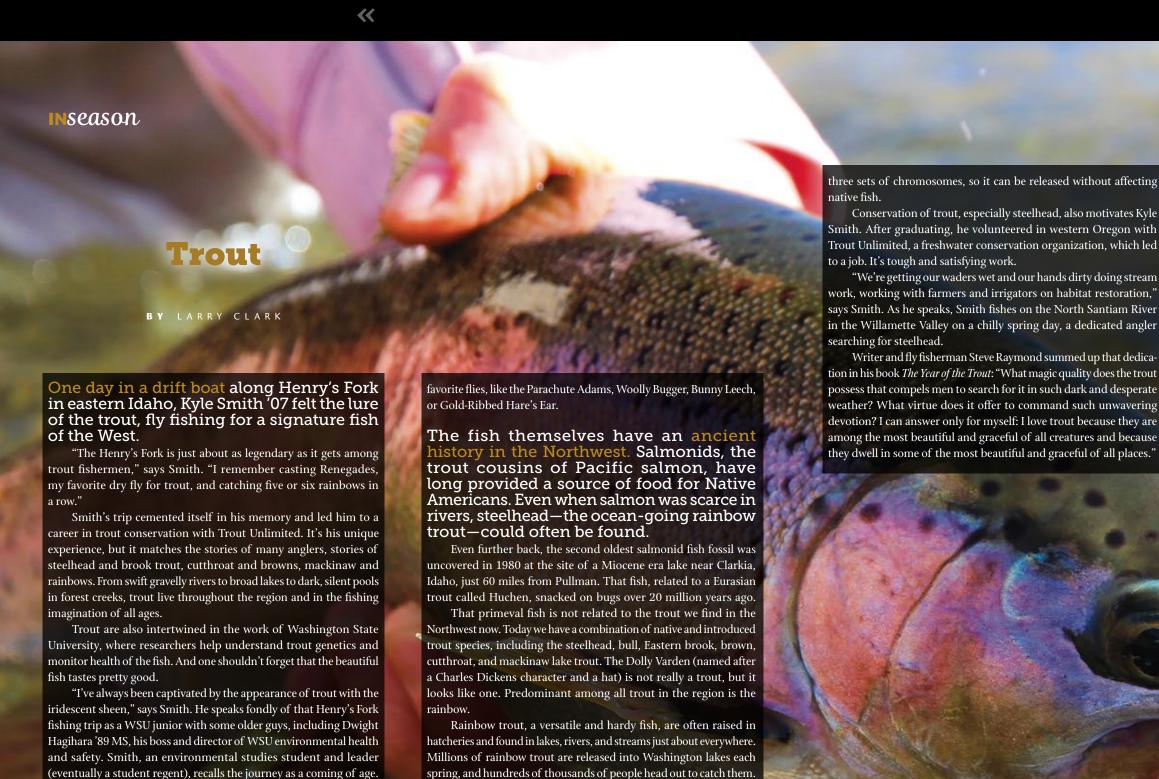
18 WASHINGTON STATE MAGAZINE SUMMER 2018





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Raising rainbow trout is a \$2 billion global industry with sales in the

Laboratory to screen for viruses, bacteria, and parasites that might

treatment thanks to researchers Kenneth Cain '97 PhD of the University of Idaho and Douglas Call '87, '97 PhD of WSU's Paul G. Allen School

a key part in the management of rainbow trout when he identified

their sex chromosomes. He found a sterile rainbow trout with

Maintaining a healthy population of rainbows is crucial. Tissue samples are sent to WSU's Washington Animal Disease Diagnostic

One such malady is coldwater disease, which has a probiotic

On a fundamental level, WSU biologist Gary Thorgaard played

United States around \$100 million.

affect the large number of trout.

for Global Animal Health.

Conservation of trout, especially steelhead, also motivates Kyle Smith. After graduating, he volunteered in western Oregon with Trout Unlimited, a freshwater conservation organization, which led

"We're getting our waders wet and our hands dirty doing stream

tion in his book *The Year of the Trout*: "What magic quality does the trout possess that compels men to search for it in such dark and desperate weather? What virtue does it offer to command such unwavering devotion? I can answer only for myself: I love trout because they are among the most beautiful and graceful of all creatures and because

STATE MAGAZINE

While fishing for trout is often catch and release in rivers, they can provide a delicious meal. They're usually sustainable, too, getting a "best choice" rating on Seafood Watch.

Smith's favorite preparation is smoked trout. "I have a cheap smoker and some alder chips—a couple of hours doing something else around the house while the fish smokes is my favorite way to cook trout and steelhead," he says. He likes to make pasta with a smoked trout alfredo, a recipe he got from working at Pete's Bar and Grill in Pullman.

A smoked trout chowder can also rival clam or smoked salmon

Poston loves pan fried trout for breakfast, a favorite from his grandpa Carey, made with Johnny's spice mix, egg, and panko breading.

Trout can be nuanced and light, and thus goes well with olive oil and lemon. Treat it simply, perhaps with thyme and dill, and trout can satisfy any fish connoisseur.



fishing derby.

Emily '14.

Tony Poston '08, a Pullman entrepreneur and owner of College

"Most people caught perch, but I got something and thought,

Fly fishing defines many anglers' hunt for trout. Mentions of

Hill Custom Threads, grew up fishing at Cocolalla Lake near Sandpoint,

Idaho, with his grandfather. His first trout came at an annual ice

'This is not a perch.' I ended up pulling in a rainbow and winning in

the children's division in the derby," he says. Poston now loves to fly

fish for cutthroat along the North Couer d'Alene River with his wife

fly fishing go back to third century Rome, through Izaak Walton's

1653 *The Compleat Angler*, to the modern hobby with its devoted fans

like Poston and Smith. Fly fishermen swear by their oddly-named

features

evolution evolution

In a word, Michael Skinner is tenacious. Growing up on a ranch outside Pendleton, the former Eagle Scout and college wrestler learned early on that you don't back down from a little head-butting or controversy. It's all just part of the game.

The trait has served Skinner well over the years and enabled him to persevere through the fallout of a chance discovery in his reproductive biology lab in the 1990s. The unexpected findings threw 200 years of scientific ideology into question and initiated a paradigm shift in the understanding of inheritance and evolution. They also sparked a wave of outrage and debate that continues today.

The Washington State University Eastlick distinguished professor and founding director of the Center for Reproductive Biology was the first to clearly document a nongenetic form of inheritance that works through epigenetics. The epigenome—which means "on genetics"—is a suite of chemical molecules that attach to DNA and regulate gene function like tiny on-and-off switches.

Skinner showed that certain agricultural and manufacturing chemicals can alter the epigenome in pregnant rats and those alterations subsequently passed down for four generations without changes to the underlying DNA. These epigenetic changes were also linked to a disturbing increase in disease in the rat's grandchildren and great-grandchildren.

In effect, "environmental contaminants dramatically change gene expression in the offspring without causing mutations in the DNA," says Skinner. "These are things that don't fit the traditional genetic paradigm."

The implications are huge. "What your great-grandmother was exposed to in her environment might actually influence what disease you're going to get and might also pass onto your grandchildren," he says.

Since the 1940s, it's been generally accepted that the DNA sequence controls transfer of biological information from one generation to the next. To suggest that environment alone could change heritable traits upended models stretching back to the battle between Darwin and Lamarck in the 1850s.

Skinner is well aware. "We're challenging the chief paradigm in biology—genetic determinism—which suggests that your DNA

sequence determines your destiny. I believe genetics is only a small piece of a much bigger story. Environmental epigenetics is probably equally important in regards to inheritance, disease etiology, or evolution."

The idea of nongenetic inheritance had been bandied about by academics in the past but Skinner's breakthrough provided the first plausible mechanism by which it could occur.

His inaugural publication on the topic in 2005 ignited a scientific firestorm that thrust him into the spotlight as a leader in the new field of transgenerational epigenetics—the study of inherited changes that can't be explained by traditional genetics.

Along with it came the dawning realization that supposedly harmless chemicals, stress, or nutritional deficits could in fact impart health problems to later generations. The bad news was somewhat tempered by a silver lining—the discovery also gave medical researchers new opportunities to improve personalized medicine and the diagnosis and treatment of disease.

In 2013, Skinner was honored with a Smithsonian American Ingenuity Award, given annually to people having a revolutionary effect on their fields.

Though some still doubt his findings and even regard him as a heretic, Skinner says hundreds of similar papers involving epigenetics in plant and animal species are being published each year.

"These paradigm shifts in science always take at least a generation to occur," says Skinner. "It takes a new generation of scientists with no vested interests to get involved and carry it forward."

A NUMBER OF THESE YOUNG SCIENTISTS cut their teeth on microscopes and dissecting trays in the classrooms of historic Abelson Hall on the WSU Pullman campus.

Up five flights of stairs in the stalwart building, you'll find the Skinner Laboratory, a quiet work space filled with hundreds of bottles arranged neatly on clean shelves, the tile floors surprisingly waxed and shiny.

In the back, the professor welcomes visitors into his office where an enormous northern pike appears to leap from the wall to greet



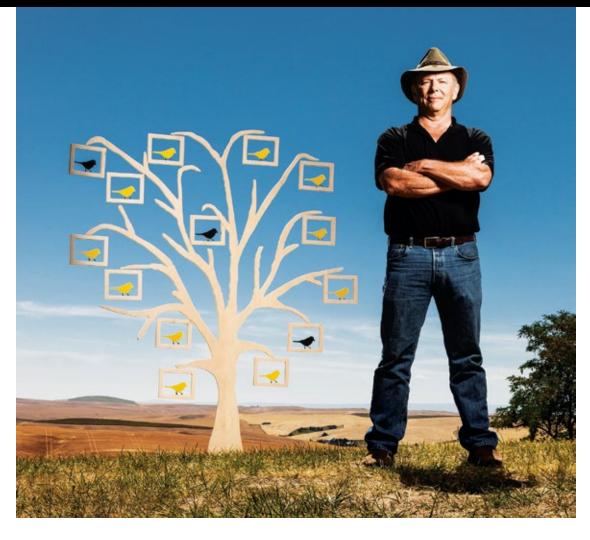
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er in the charles r. conner museum (photo brian sma

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them. The avid outdoorsman is casual in jeans and a gray wool shirt. His Stetson fedora rests in its spot on the bookshelf.

"The story began in the late 1990s," Skinner says as he reaches for a Starbucks coffee cup and leans back in his chair.

"I was studying the effects of two widely-used farming chemicals on pregnant rats—the pesticide methoxychlor and a fungicide called vinclozolin," he says. "Like many agricultural chemicals, the two are known to be endocrine disruptors that can interfere with normal development and function of the reproduction system."

In this experiment, one of Skinner's postdoctoral fellows, Andrea Cupp, exposed the rats to methoxychlor during the time the fetal tissues were developing into ovaries and testes. They wanted to see if it would affect sex determination in the pups.

"Unfortunately, it was a failed experiment," Skinner says. "There was no obvious impact on sex determination."

When the pups grew up, however, they discovered that 90 percent of the male offspring had abnormal testes and most of the sperm were dying. Those that did survive were much weaker than normal. Skinner and Cupp dutifully recorded the results and moved on to other projects.

Then, one day, Cupp knocked on Skinner's door offering apologies. "She was upset as she had accidentally bred the unrelated male and female pups from the methoxychlor experiment," he says.

"I said, 'don't worry about it. Just go ahead and look at the testes in the grandpups.' Since toxicology studies had not shown methoxychlor to cause these kinds of DNA mutations, I didn't expect to find any defects."

"A month later she came back and reported the exact same changes as in the others," says Skinner. "More than 90 percent of the males had very high levels of sperm cell death even though their parents were just tiny fetuses when their grandmothers were briefly exposed."

Surprised, the researchers checked the rat's DNA and confirmed that there were no new genetic mutations. Skinner also knew that a new trait appearing with 90 percent frequency in different families could not be explained by classical genetics. The traits should decline over time.

"So, of course, I didn't believe Andrea's findings," he says.

What happened next is described by Skinner in excerpts from a detailed account he penned for *Scientific American* in 2014:

There was one sure way to find out whether the chemicals were to blame. I asked Andrea to breed a fourth and then fifth generation, each time mating unrelated descendants of the original exposed rats. As the great-grandchildren—and later, the great-great-grandchildren—matured, the males all suffered problems similar to those of their ancestors. All these changes stemmed from a fleeting but very high dose of agricultural chemicals that for decades have been sprayed on fruits, vegetables, vineyards, and golf courses.

"I was shocked by these results," says Skinner. "Over several years, we repeated the experiments multiple times to confirm them and collect additional evidence. It was obvious it could not be genetics and the only other mechanism known was epigenetics.

The most plausible explanation, we concluded, was that the exposure causes a mutation in the epigenome that interferes with gonad development in male embryos—and this epimutation passes from sperm to the developing embryo, including its primordial germ cells, for generations.

"So, it was a very serendipitous observation from a mistake in the lab that led us down the path and into the field of epigenetics," says Skinner. "But we've known for a long time that major scientific advances are often serendipitous observations that someone goes on to investigate. Pasteur, for example, had no concept for antibiotics before he made his observation that led to the discovery of penicillin."

Despite the team's excitement, Skinner didn't immediately inform the scientific community.

"I sat on the observation for five years until we had enough evidence to convince ourselves it was actually epigenetics," he says. "It was critical to sit on it until we had the mechanism, since the concept of nongenetic inheritance had been suppressed for nearly 200 years. It was heresy to propose something like this 10 years ago."

In 2000, Cupp left for a job at the University of Nebraska-Lincoln where today she oversees her own reproductive biology lab as a professor and chair of animal science.

In time, Skinner and his colleagues pinpointed several spots in sperm DNA where the epigenome had been altered by the chemicals. New methyl molecules were attached to some of the genes and these "methylation tags or marks" damaged sperm production.

"Once we had the mechanism nailed down, we published the 2005 paper on transgenerational epigenetics," he says.

"Putting it out there was a big deal. It advances our understanding that we're not just inheriting our DNA sequence, we are inheriting our epigenetics. And since the environment can dramatically alter epigenetics, suddenly the environmental impact on inheritance is important. Before, it wasn't."

THE UPROAR WAS IMMEDIATE.

The first significant pushback came from his fellow academicians, the molecular biologists. Looking back, Skinner says, "It's probably routine, in a major discovery, that the institutional opposition usually develops first. Their life's work is being challenged—I understand why they opposed it."

The agro-chemical companies also rebelled. With their bottom line at stake, industry researchers were skeptical when they could not initially reproduce some of Skinner's findings. The discrepancy was likely due to using different experimental methods and was later resolved, Skinner says.

Government toxicologists who set FDA and EPA standards for drug and chemical use were no happier and balked at implications that their testing methods were incomplete or inaccurate.

Skinner explains that in the field of toxicology, scientists use direct exposure to assess whether a compound is harmful or not. These tests then determine how a chemical is regulated for public use.

"The problem is, many of the chemicals I tested in my lab had no direct toxic effects on the exposed rat or her pups, but there was a very dramatic increase in disease in the great-grandpups," he says. "So, in my mind, we can't just look at a person who is exposed; we also need to do toxicology studies for up to three generations to determine if there will be any effects."

The controversy softened a bit after Skinner published a half dozen new papers further confirming that epigenetic changes can persist for several generations. Eventually, some of his opponents investigated for themselves and published their own findings.

"The anger comes in waves," Skinner says. "Industry, academics, government agencies, and commodities groups—they ebb and flow as

ANOTHER LOOK AT DARWIN'S FINCHES

Darwin developed key aspects of his theory of evolution while pondering finches from the Galapagos Islands. It's only fitting that reproductive biologist Michael Skinner would choose those same islands to propose a Lamarckian idea—that environment can directly impact inheritance of physical traits

In this case, the process is driven by epigenetics, he says. "If we think about evolution, we can't simply think of genetics. We also need to think about epigenetics." According to Skinner, epigenetic mutations occur 1,000 times more frequently than do genetic mutations and could help explain why new species emerge more often than expected.

"The reason epimutations exist might be to dramatically expand the number of variant individuals in a population," he says. "Natural selection would then allow the best adapted among them to thrive and carry on—genome, epigenome, and all."

His premise is supported by two recent studies in the Galapagos Islands involving Darwin's finches, a group of birds noted for their

diversity in beak size and function. In the first study, Skinner's team compiled a family tree for each of the sixteen finch species. They then plotted variations in species genome and epigenome.

"It turns out the farther a species diverged within the family tree, the more epigenetic changes we saw," he says. "Genetic change also occurred but at a more random rate."

Their second study compared finches of identical species who lived in different habitats. Previous investigators had found differences in beak structure, color, and weight depending on whether the birds

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lived in a wild environment or intown.

Together with University of Utah doctoral student Sabrina McNew, Skinner examined over 1,000 finches from rural and urban sites and discovered dramatic differences between the bird's epigenetic patterns but virtually no variation in their DNA sequences.

"The biggest environmental difference between the two populations is diet," he says. "In town, the birds land on outdoor tables and eat from your plate. So, it looks like nutrition caused the trait changes through epigenetics." **

METHYL MARKS

to which one is currently active. But, it's my motto that if you're not doing something controversial, you're not doing something important."

In 2012, Skinner again rattled the status quo when he challenged the notion of Darwinian evolution.

"We started getting into evolution because if epigenetics is critical, it has to be critical for everything," he says. "A lot of evolutionary

"Darwin was absolutely correct that natural selection is one major driver for the process of evolution," Skinner says, "But there is more to the story."

He refers to a lesser-known naturalist named Jean-Baptiste Lamarck who, in 1802, speculated that environment could directly alter physical traits and those acquired traits then passed on to children and grand-

PREGNANT FEMALE EXPOSED TO STRESS OR POLLUTANT WHICH AFFECTS FETUS DIRECTLY OR THE FETAL PRIMORDIAL GERM CELLS Inheritance without a change to MALE SPERM CELLS EXPOSED TO STRESS OR POLLUTANT sequence

Epigenetics 101

While the DNA in chromosomes (left) carries primary genetic information, it is modified by a second layer of molecules called epigenetic "marks." These marks are usually methyl, acetyl, or other chemicals which act like switches to control gene expression. Epigenetic marks also control how tightly DNA winds around histone beads. The tighter the wrapping, the fewer genes available for activation.

Epigenetic traits can persist for generations

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Skinner's research shows that **exposure to pollutants or stressors** (*right*) can add abnormal epigenetic marks to DNA and these marks can then survive two distinct waves of post-conception reprogramming—a process meant to prevent such persistence. A number of rodent studies suggest the abnormal marks can be passed down for at least five generations along with associated health risks

SOURCES: NATURE 441 (MAY 11, 2006) "EPIGENETICS: UNFINISHED SYMPHONY." AND ADAPTED FROM SCIENTIFIC AMERICAN AUGUST 2014 "INHERITANCE OUTSIDE THE GENES"

2ND GEN: MULTIGENERATIONAL EFFECTS CAN BE EXPLAINED BY PARENTS' DIRECT EXPOSURE TO STRESSORS OR POLLUTANTS



3RD GEN: TRANSGENERATIONAL INHERITANCE FROM GRANDFATHER'S **EXPOSURE: GLUCOSE AND INSULIN** RESISTANCE HAVE BEEN OBSERVED



4TH GEN: TRANSGENERATIONAL INHERITANCE FROM GREAT-GRANDMOTHER'S EXPOSURE INFERTILITY, ANXIETY, OBESITY, LOW TESTOSTERONE (δ), AND OVARIAN DISEASE (Q) HAVE BEEN OBSERVED

components can't be explained with genetics alone—they tried but it doesn't fit."

The current paradigm was established around 1850 when Darwin proposed the concept of natural selection which states that environmental forces select for individuals with the most adaptive genetic traits.

children. The classic example is the elongated neck of the giraffe, which Lamarck said could've been produced through years of straining to reach tall branches. His theory was eventually rejected in favor of Darwin's.

Skinner, who has a soft spot for the underdog, says environmental epigenetics now provides the molecular evidence showing that Lamarck was correct in this aspect of his hypothesis.

"Environment does have the ability to increase variation in your traits through epigenetics," he says.

"Furthermore, our studies show that epigenetic changes can increase susceptibility for all types of genetic mutations. So, genetic variation can come from environmental epigenetics."

Skinner pauses for a moment. "I want to be very clear here," he begins. "I'm not saying anything against genetics. Genetics is absolutely essential. But there will never be a genetic-only process and there will never be an epigenetic-only process. These two things are integrated and cannot be separated."

He first took this "unified theory of evolution" public at the University of Wisconsin-Madison, an institution known for its scholarly evolution department. Skinner says he was curious as to how they would receive him.

It didn't take long to find out. Three times during the presentation, seasoned faculty members stood up and loudly interrupted him.

"It's extremely well established that genetics is the primary molecular mechanism for evolution and is supported by studies for decades, so why suggest anything else?" one shouted.

Reflecting back, Skinner says, "It was somewhat expected as science investigators spent 30-40 years studying a specific paradigm. Then some guy comes along and says it's not that this is wrong, but we need to add other parts. So, for some well-established scientists, there's a knee-jerk reaction against that kind of thing. It's just human nature."

"Today I could go there with no problems; this was their first time hearing about it and it shocked them," he says. "But then they sit back and think about it. They look in the literature and realize that many people are starting to investigate this area. So, it's slowly changing."

He gives a little laugh. "I didn't know it, but this also happened to be Darwin Week at the university. As soon as I said the word Lamarck, there was controversy."

SINCE THAT DAY, Skinner and other scientists have observed transgenerational inheritance of acquired characteristics in a wide range of species, including plants, flies, worms, fish, birds, rodents, and pigs. And with that comes disease susceptibility that individuals might not otherwise have.

"Today, no one doubts that epigenetic effects play a crucial role in development, aging, and even cancer," Skinner writes in Scientific American. "Follow-up studies at my lab have shown that the greatgrandchildren of vinclozolin-treated rats have consistently altered patterns of methylation in their sperm, testes, and ovaries, as well as abnormal gene activity in their primordial germ cells. We also found that fourth-generation offspring are prone to weight gain and anxiety; they even select mates differently."

Skinner says almost anything in the environment can cause these epigenetic changes, beginning with the food we eat each day.

"There are thousands of compounds in plants that we've adjusted to over the centuries. Genistein, for example, is a compound in soy that decreases the risk of prostate disease and is known to be modulated by epigenetics. Starvation and high-fat diets also alter the epigenome."

Stress at critical points in development can likewise trigger changes as can the hundreds of chemicals we are exposed to every day in our industrial society. A number of these compounds have been investigated in Skinner's lab where the workload relies heavily on the talents of postdoctoral fellows and select undergraduate students whom he recruits as freshmen.

One of those freshmen students was Margaux McBirney '17 who was recently listed as first author on a *PLOS One* publication showing that atrazine, an herbicide commonly used on soy and corn, causes epigenetic effects. Though it had no direct effects on exposed rats or their pups, she helped demonstrate that 80-90 percent of the grandpups and great-grandpups suffered from more than one disease, including the inability to store fat.

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"It's amazing that Dr. Skinner gives opportunities with these kinds of responsibilities to undergraduates," says McBirney, who is now a research technician at the Fred Hutchinson Cancer Research Center in Seattle.

Over the years, Skinner's team has also confirmed epigenetic health risks from Bisphenol A and phthalates in plastics, jet fuel, dioxin, permethrin, mercury, and DEET, as well as DDT and methoxychlor, which both promote obesity.

He says body tissues are most susceptible to environmental insults during times of rapid growth and development. Some organs like the mammary gland, prostate, testis, ovary, kidney, adipose tissue, and brain are sensitive to small epigenetic shifts while muscle, liver, and bone can withstand larger shifts with fewer problems.

"It turns out, there's not really too much we can do about it, so this is pretty doom and gloom," Skinner says. "Once methyl tags are programmed in the germ line, we don't know of a way to prevent it. Yet, by simply knowing this phenomenon exists, it will allow us in the future to both prevent and treat diseases."

Methyl tags do not always lead to disease, however. Skinner says your environment likely determines whether a susceptibility will go on to manifest as illness. The first line of defense is to adopt a healthy lifestyle and diet. Avoiding chemicals, maximizing exercise, and eating nutritious food could help deter or postpone disease onset.

"We used to think you were programmed to get a disease if you had a certain gene mutation, and no matter what you did, you'd get it. But that's clearly not the case," he says.

"Genome-wide association studies show that generally less than one percent of any disease has an associated genetic mutation. This suggests that the majority of diseases are not related to genetic mutations.

"In our studies, 90 percent of animals with a disease have epigenetic shifts. So, clearly things like the environment have been overlooked as potential causes of disease."

Looking toward the future, Skinner says he'll continue to unravel the precise mechanics of the transgenerational epigenetic process. He and his team are also breaking ground in the discovery of new diagnostic tests for the medical field.

"Theoretically, we should be able to do an epigenome analysis in our early twenties and determine if we have a susceptibility to various diseases," Skinner says. "And if so, we can be prescribed a lifestyle or diet or therapeutic change to prevent it from developing.

"So, I think preventative medicine will become a reality not because of genetics but of epigenetics. We may not be able to fix it but we will potentially be able to treat it." *

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ob Dlugosh says that he and his roommate, Al, "were always chumming around Pullman together." Best friends, Bob figured Al for straight, but he liked the guy so much he didn't let it bother him. Bob did wonder if Al knew he was gay. In 1968, "gay" felt like a brand new word. So it probably wasn't the one used on the sign Al and Bob found tacked to their Stephenson Hall door: "Bob and Al are gay."

But that's what Robert Dlugosh '71 recalls decades later. The noun was probably something from the much crueler vernacular of the day: They were being called faggots, queers, fairies. Al brushed it off, Dlugosh says, and the friends roomed together until

But that's what Robert Dlugosh '71 recalls decades later. The noun was probably something from the much crueler vernacular of the day: They were being called faggots, queers, fairies. Al brushed it off, Dlugosh says, and the friends roomed together until graduation. In recalling the sign of aggression, Dlugosh, too, brushes it off. Others had it much worse than him. He has "warm and fuzzy feelings" for the University. Dlugosh, an activist-through-education and Seattle architect, and his husband, Don McKee, now endow a scholarship for LGBTQ—lesbian, gay, bisexual, transgender, and queer—students at Washington State University.

For Prudence Miles '77, being outed wasn't a homophobic attack, but an act of defiance. Although open about her orientation, she only shared that with a small group of other gay and lesbian students, staff, and faculty. But one day the editors of WSU's student newspaper, *The Evergreen*, published a letter by one of that small group. Prudence's name was on the list of signatories.

"There was little me," she recalls, "eating breakfast in the Regent's Hall dining room, suddenly seeing this letter with my name attached to it. Probably 99 percent of the women in the room didn't care or didn't know who I was—but it was a public outing that I had not expected." She says she was already a member of the Gay People's Alliance, one of the first activist and awareness groups at WSU, and had volunteered for its speakers bureau. She got pretty good at answering the question, what's it like to be a lesbian?

Becca Prescott '12 came out in the safety of the Gender Identity/Expression and Sexual Orientation Resource Center: GIESORC ("gee-sork"), or just the Center. She discovered she was a lesbian while in college. Friends she made at the Center on the fourth floor of the CUB, along with the staff there, shared experiences and insights "about what being gay meant, and why people are that way," she says from her parents' home in Montana, on break from nursing school in Oakland, California. During her college years, it was precisely going home she stressed about. Her mother, especially, was having difficulty accepting her daughter's orientation, fearing she had made some terrible error in rearing her child.

"Having that conversation at the Center made me more confident in having that conversation with my family," she says, just before she heads out the door to go skiing with her dad.

Harvey Milk, the San Francisco city supervisor and first openly gay elected official in California, urged his "brothers and sisters" to come out "for your sake," and for the sake of friends, family, and coworkers. "I know that it is hard and will hurt them," he said in a 1978 speech. "Come out [and] once and for all, break down the myths. Destroy the lies and distortions." Milk urged people to come out at least to those they knew well, because coming out is a tonic for homophobia.

Coming out is how community is created among a very diverse group of sexual minorities. But it is no guarantee; it can be, as Milk acknowledged that day, dangerous. Later in 1978, Harvey Milk and Mayor George Moscone were gunned down in San Francisco City Hall, murdered by Dan White.

OPENING A DOOR

Becca Prescott learned a cool new word: "queero," queer + hero. The portmanteau, coined by comedian Cameron Esposito on her podcast, Queery, refers to activists such as Harvey Milk, Ellen DeGeneres, or Esposito herself. Much closer to home though, there is the quotidian grind and exaltation of "the little things," says Melynda Huskey, the first permanent director of the Center. That we can discover our orientations and identities at all in such an overwhelmingly straight, genderbinary—and frequently violently homophobic—culture is the real act of heroism. Huskey recalls students who walked past the always-open door of the Center, time and again, sometimes slowing down, maybe peering in. But only some ever made it in.

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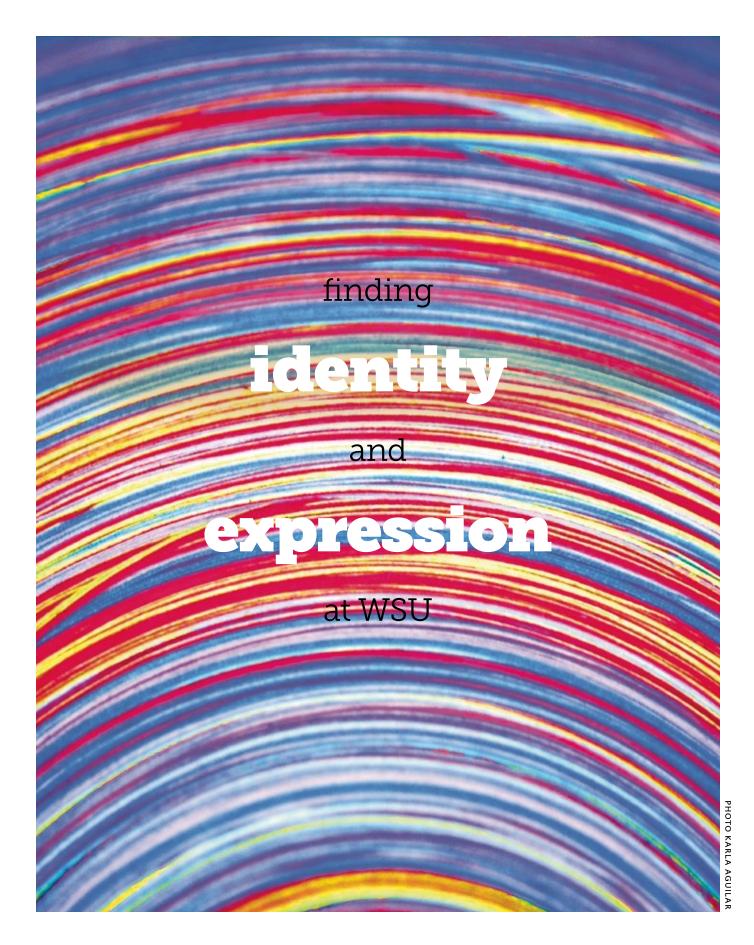
That door, always open, is not just a metaphor for LGBTQ community; it really is one of the entrances to queer culture at WSU.

As Paul Kwon, a psychology professor at WSU Pullman, says, partaking in community—having people to talk to and allies to count on—is the most important factor in the resilience of lesbians, gay men, and bisexuals. Minorities have forever formed communities, when possible, trying to strike an equitable equilibrium with the dominant culture.

Matthew Jeffries, the Center's current director, says that because Washington state—and Washington State University—have long been models of inclusion and diversity, we have a responsibility to keep striving for civil rights for all.

But WSU and the state weren't always that way. Just this year, Washington state legislators finally passed a bill that outlaws conversion therapy, a long-disproven "cure" for emergent, juvenile homosexuality that's still legal in 40 other states.

Dlugosh summarizes the situation in Pullman in the late '60s, but he might be talking about just about anywhere in the United States other than a few major urban centers—such as San Francisco, New York,



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and Seattle. He hesitates, then says, "How do I put this? I knew some other gay people—I mean, they seemed gay to me but we never talked about it. It was very frustrating for all of us students." Dlugosh's recollection is that there was no gay liberation movement, as it was only beginning to be called, during his years in Pullman.

Alumni mentioned in

various Evergreen articles, and especially in the student newspaper's letters section, are difficult to find. Dlugosh says that when he tried to kickstart an LGBT alumni group, "we found [many alumni] had a bad taste in their mouth for WSU not being very progressive back in those days. They did not have warm and fuzzy feelings." It's not surprising; the virulent homophobia in some of the letters the Evergreen published from the early 1970s until as recently as the late 1990s is sometimes horrifying. To the paper's credit, the editorials were mostly in favor of giving gay people that right to live—a "right" as ominous as it sounds—and have at least some civil rights (if not all the rights, such as to not be fired from a job for one's sexual identity).

Dlugosh graduated in 1971. By the time Prudence Miles got to Pullman in 1973, things were perking up. She says she must have seen a poster for Gay Awareness and started going to meetings. Then, as now, what to call an alliance as diverse as a group of sexual minorities was always a struggle, so in the *Evergreen*, this group, or perhaps another, also went by Gay Alliance or Gay People's Alliance, with the name gradually becoming more inclusive

over the years as it became more inclusive of identities.

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In any case, Miles was soon part of what was then a community transitioning from "protective invisibility" to out, proud, and loud. She misses the diversity of what was then a sort of secretive social club. Secretive for self-defense, but it was nevertheless a group of people who spent their time rapping about awareness, rights, and the simple observation that coming out to people changed minds and softened hard hearts. That's why, she says, "there were a group of us who were willing to go out and talk when asked."

The Gay Alliance's speakers bureau would do interviews on the campus radio station, or give talks and answer questions at residence halls and sorority and fraternity houses.

"Human sexuality classes always wanted gay people to come and talk," Miles recalls. "You try to talk to people: it's not scary and it's not going to change who you are if somebody you know is gay. You're the same, they're the same. It's just, they're in love with somebody different."

Miles spoke up because of the tonic effect of coming out. Even more important, she says, "You never know if someone in that room is scared and questioning. They need to hear it's OK."

COMMUNITY AS RESILIENCE

The letter to the *Evergreen* where Miles' name was signed really sticks out as a sign of just how bad things were for LGBTQ people in the 1970s. Published on December 4, 1973—while Miles was still in her first semester of

college—the letter refers to an ASWSU survey asking if gay people should have "the equal rights supposedly guaranteed to all human beings." A majority of respondents said no, gay people should not have basic human rights. But, the letter writers say, here's "a good word for the ASWSU Assembly" for arguing otherwise and counting LGBTQ people among the

For his part, Dlugosh says he worked at passing for straight: the best defense against homophobia was camouflage. For many people, it still is; Becca Prescott is quite candid about that. But that approach to life results in an internal self-conflict that degrades mental and emotional health.

An anonymous interview in a video produced in 1977 by KUID called "From Sweet Land of Liberty: Moscow/Pullman Gay Community" captures this double consciousness perfectly. The interview subject is in shadow, but clearly bearded and, says the on-camera reporter, a faculty member, likely from the University of Idaho. "You have to establish a dual personality," the man in the shadows says. You have to have a straight face that you put on "so you can go out and cope and function with straight people. And then, somewhere between your house and the office, you become somebody else, the person who no longer plays games with himself."

"What if you were discovered?" the interviewer asks. "I'd be fired immediately. Shock and appall by my colleagues. My students would freak out. My parents don't know, and it would be really difficult to tell

them. My father would disown me. I'd like to stop being a dual personality.... It's a lonely life."

Lonely, and not at all healthy. Minority stress is the fracture line between a stigmatized minority and the dominant culture. It drives its victims to drugs and suicide at a much higher rate than the straight, white population.

Kwon enumerates the factors that defuse the chronic wear and tear caused by minority stress and that help create resilience. The most important, he says, is having a social support network, being connected to a positive community. Having hope and optimism about the future, where oppressors have a change of heart, and being emotionally aware are the other two major contributors to resilience and mental health.

Emotional self-awareness is a little counterintuitive, Kwon says. "If someone is targeted with an insult, the intuitive thing might be to immediately push your emotions aside, to try to not feel bad about what just happened. But what we know in psychology is that kind of emotional suppression is more damaging than accepting that there are going to be some uncomfortable emotions, and that we need to process and spend time and deal with those emotions wisely." And, he says, "rates of mental health disorders are about twice in LGB folks—I suspect it would be even higher in trans folks—compared to non-LBGT individuals.

"Some sources of minority stress can be very blatant,"
Kwon continues, "like having laws that are discriminatory.
But it's also more subtle, just feeling that you can't be your-







"If I'm going
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— Becca Prescott

self, that you have to conceal your identity. Or if you see negative messages in the media, or even overhear a remark that's not personally directed at you, it still impacts your sense of being OK with who you are."

A 2016 WSU Health and Wellness Services survey indicates just how many people are potentially affected by minority stress resulting from homophobia and microaggression. Nearly 15 percent of student respondents indicated they were not heterosexual.

Miles remembers the excitement of discovering that the LGBTQ community was blossoming into a social movement in the early 1970s. "A woman friend called me up and said, 'Come over, come over!' She had this album of women's music! Women singing about women!" Miles and her friends would sit and listen to Lavender Jane Loves Women, Meg Christian, Ferron, and many other voices

that found their way to vinyl via a burgeoning network of labels and festivals.

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"We knew we were becoming more visible and we believed in possibilities," Miles says. "And I think over the years we've gotten a lot of those possibilities but with it has come pain."

The pain comes in the form

of a seemingly endless backlash. According to a classic definition of prejudice by psychologist Gordon Allport, backlash is due to the fact that "prejudice treats persons as categories rather than as individuals. Because someone is black, female, homosexual, and so forth, the prejudiced person needs no further information on which to base his evaluations and behavior.... A summarizing, administrative spirit prevails."

Prejudice, including homophobia, has little to do with facts and everything to do with categorizing nemeses. Instead of a life-affirming

view of the world where other people are a potential source of support, people who suffer from prejudice, writes Thomas Henricks in a 2016 *Psychology Today* article that expands on Allport's analysis, "preoccupy themselves with social competition. Life strategies center on victory and defeat, offense and defense. Resources are comprehended as difficult-to-attain prizes, awarded to individuals and their allies."

As Kwon says, "Part of what I teach in my diversity class is the idea of privilege, the unconferred advantage that certain people have based on their demographics. I think what we've seen is that people are extremely reluctant to give up their privilege. And I think that is what results in this kind of backlash. People in power feel they are losing that kind of privilege and they retaliate by reinforcing that privilege. I think we know

prejudice rises when there is more competition over scarce resources."

Matthew Jeffries concurs that education is important. One of the goals of the Center's work is to offer workshops and trainings that educate faculty, staff, and students about the realities of being a minority. "We are here to create cognitive dissonance in students, so that the next time they think before speaking: 'Oh, maybe I shouldn't say "That's so gay." We can't unlearn behaviors for students that they've acquired over 20 years. But even tiny shifts in the way people go about the world—I'll take that."

Just as gendered language is a constant source of microaggressions against women, so too are all the default heteronormative things we say and do that ramp up minority stress; it's death by a thousand cuts as your true self is again and again diminished and erased—or worse.

Violent crimes against sexual minorities are on the rise, according to studies by the Southern Poverty Law Center and the Human Rights Campaign. Mark Potok, a senior fellow at the SPLC, wrote that "LGBT people are more than twice as likely to be the target of a violent hatecrime than Jews or black people."

And a lot of that violence is invisible. It does not rise to the scale of the 2016 mass murder at the Pulse nightclub in Orlando, but is rather in homes, highways, streets, and schools, according to the HRC study.

But it's hardly a competition to see who can suffer the most. One of the great realizations of the past few decades has been the idea of "intersectionality." The term was coined by Kimberlé Crenshaw, a Columbia Law School professor, in a 1998 paper that sought to illuminate the oppression of African-American women. The term has since been taken up by those seeking to elucidate the inherently intertwined workings of prejudice against all minorities. The result has been a networking of minorities and their allies fighting together against racial and identity oppression.

As Jeffries says, "The major issues are really intersectional. It's not just that they're LGBT, it's they're LGBT and a student of color. That adds a lot of complexity and creates a lot of work on their part." It's as Margot Lee Shetterly wrote in Hidden Figures: The American Dream and the Untold Story of the Black Women Who Helped Win the Space Race, about the women who were working in a Jim Crow, male-dominated world: They had to work twice as hard to get half as much.

The summer that Becca Prescott read The Laramie Project-the play about the brutal murder of a gay man, Matthew Shepard, in Wyoming—she realized that her personal experience intersects with those of people in the LGBTQ community as well as other minorities. "The community is so incredibly diverse," she says, as she realized that "if I'm going to be an ally to other parts of the community, it is going to take educating myself." One of the ways she does that is by reading, networking, and, yes, listening to podcasts, such as Cameron Esposito's Queery.

Even before the word intersectionality was coined by Crenshaw, students at WSU have been working in that direction. Melynda Huskey recalls that "we had a Filipina student who worked with students and me to put together something called Brown and Out," in 1997. "It was an opportunity to bring together white LGBT students, LGBT students of color, and students of color who did not identify as LGBT for a facilitated discussion about being your full self in all places." Huskey says that Brown and Out was part of the reason that the Center, after the CUB was remodeled. moved to the fourth floor, "the same floor as all the multicultural student centers because there's a large community of folks with many identities who needed support."

CHALLENGING THE FUTURE

Civil rights for LGBTQ people are improving, at least in Washington. WSU has certainly played a significant role in that progress. WSU ranks among the

top 25 in the national Campus Pride Index for its progressive policies and support networks. But, as Nolan Yaws-Gonzalez says, the support is uneven across WSU's campuses.

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Based at WSU Vancouver, where he is the assistant manager of student services, Yaws-Gonzalez is also a member of the President's Commission for Gender Identity/Expression and Sexual Orientation, which has representatives from every WSU campus. The commission advocates for policies that contribute to a positive campus climate for LGBTQ people. One of the goals is to be less reactive and more proactive, Yaws-Gonzalez says.

"If people want to come to a meeting and raise things, to ask us to partner, we want that," he says. "There's a lot of people with a lot of energy and motivation on the campuses" and the commission wants to tap into that.

tap into that. As hopeful as conditions are in Washington, Huskey points out that we still have a long way to go. "In the U.S. we are now seeing significant pushback around LGBT civil rights. We thought marriage was settled but it is not clear to me that it is going to stay settled. We have not achieved solid employment rights at a national level. There are many states where it is still perfectly legal to terminate someone from their job for the non-jobperformance related fact that they have an LGBT identity.

"We have enjoyed civil rights for such a short period of time," it's hard to see them start to slip away. "It's one thing for someone of my age. I went for a long time without the right to be married or for my children to be the children of both of their parents. But for young people—they started out thinking they would have those rights and to lose them is much harder if you didn't know that could happen. We've got to move forward."

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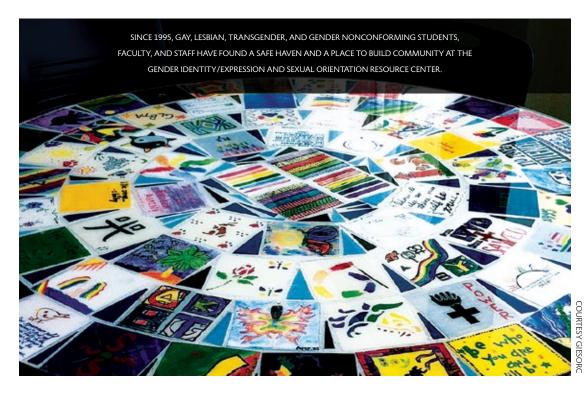
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Kwon says that "folks have been inspired to be more vocal, to be more active politically.... But it's draining, and you hear that all the time. People who are really making those efforts are just exhausted." Kwon, who offers counseling services one day a week in Lewiston, Idaho, admits to sometimes feeling "paralyzed by what is going on nationally or even statewide." So he focuses on those things where he can make a difference: teaching and working with clients. And reminding people to build community, be emotionally self-aware, and have hope.

Prudence Miles offers a ray of hope.

"I work for Seattle Parks and Recreation, and I had a funny thing happen recently. I was at the bus stop. Quarter of seven, it's dark. This random man walked up to me, looked at me, and said, 'Your girlfriend's cheating on you.' I had headphones on, and was like, I'm not engaging with you. But I was telling people at work about it and my boss, a straight woman, immediately quipped, 'Your girlfriend's cheating on you? Does your wife know?' And I just cracked up! That kind of casual comment at work!

"When I think about times in the past when I was so scared at work, when I was closeted. It's just so nice to just be who we are." **







From Wilbur to the world

Time for a pop quiz. Name at least one famous female farmer. If you're coming up dry, you're not alone—but Kara Rowe '00 wants to change that. An executive producer at Emmy-award winning North by Northwest in Spokane, Rowe is a champion of all things agricultural—especially women farmers.

Rowe, together with NxNW partner Dave Tanner, and Audra Mulkern, a photographer, foodie, and founder of the Female Farmer Project, are raising funds for a documentary called *Women's Work: The Untold Story of America's Female Farmers*. The producers hope to correct a longstanding problem with the history of ag in America by telling the story of the women who work so hard to grow food for their families and the world.

"We've met so many wonderful women who are keeping our farms going," Rowe says. "There are women who are physically on the farm, getting their hands dirty, driving the tractors, planting the crops, herding the cows. But there is also a huge army of women" working behind the scenes, in marketing, policy making, science, running ag businesses, and every other aspect of the agricultural enterprise.

Rowe is no stranger to ag. She was born and raised on a wheat and cattle farm in Wilbur, on the big bend of the Columbia River west of Spokane. She came to Washington State University to study broadcasting on, as she says, "the Glenn Johnson track" in hopes of being "the next Lesley Stahl."

Straight out of college, she took a job as a TV reporter for KPAX in Kalispell, Montana. There, she was a one-woman band as on-air reporter, camera person, and story editor. But she quickly expanded her horizons, starting a commercial production company with Ryan Rowe, her new husband.

"We did everything from local commercials to informational videos," Rowe says. "Then we got approached by a local family with ties to the Outdoor Channel." The Rowes shot a hunting and fishing show for a couple seasons.

THE SUMMER RESEARCH SYMPOSIUM SHOWCASES UNDERGRADUATE WORK EACH YEAR (COURTESY WSU OFFICE OF UNDERGRADUATE RESEARCH)

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ALUMNIprofiles

When the editorship of *Wheat Life*, the magazine of the Washington Association of Wheat Growers, came open in 2010, Rowe jumped at the chance to move back home to Washington state. In 2014, she came full circle when she reconnected with Dave Tanner, the president of NxNW, who had been Rowe's mentor when she was a high school senior producing a promotional video for her hometown of Wilbur.

Since then, she and Tanner have worked together on a documentary about Washington potato growers, *The Gamble*, that got picked up by PBS, as well as the long-running, award-winning series, *Washington Grown*.

Now a full partner in Spokane's premiere production company, cofounded by Rich Cowan '79, Rowe says she and Tanner have been kicking around the idea of a documentary about women in ag for years. When Tanner met photographer Mulkern at a conference, they realized they had the perfect partner to move the project forward.

"Women's Work is a look back at the history of women in agriculture," Rowe says. The story of American ag has only been "half-told," she writes on the project's

Video frames from the Women's Work documentary including narrator Audra Mulkern (below). Courtesy Kara Rowe







website, with women almost never mentioned. "Native women led their communities as farmers and true homemakers," Rowe writes, while "female settlers kept the farm fields productive and their neighbors fed. And it was women who kept the nation's farmland plowed and planted throughout decades of crisis and two world wars."

The film will be a welcome revision of the history of American ag. In addition

to the documentary features, "We're also working on a history of Washington agriculture project with Historylink.org and the Washington State Historical Society. That includes essays, a curriculum, as well as short video vignettes that teachers can use."

Rowe says she's blessed to be working as a TV and film producer who gets to harness her passions to tell the stories of the people she so deeply cares about. **

Of soil and stage

BY WILL DEMARCO

Born into a family of orchardists in Wenatchee, the "Apple Capital of the World," Paul Atwood's future in agriculture was practically a given from birth. As a high school senior with every intention to continue down the fruit-lined career path of his parents, Paul's first audition for a musical was the result of a classmate's

playful dare. Despite no prior performing experience, Paul '91 not only made the cast of the high school's big autumn production, he landed the lead role.

With one foot planted on soil and another on stage, Paul ultimately made the switch to a performing arts degree after taking a handful of agriculture classes as a WSU freshman. Unbeknownst to him, these seemingly opposite paths would converge to form the deep connections of Paul and his future wife Kelly to north central Washington.

Another WSU student unsure about the future, Kelly Ginger '91, also decided to study performing arts midway through freshman year after some convincing from a vocal teacher. Recalling fondly her high school theater days in Hillsboro, Oregon, Kelly was sold. "I just wanted to get involved because I know that with theater, there's always a home for you," she says. As luck would have it, Paul and Kelly's courses collided when they codirected *Godspell* in their senior year. Less than 12 months later, the two were graduated, married, and living in Wenatchee—working both on the stage and in the

Around the same time, the couple had another trajectory-altering coincidence. Sherry Schreck '68 was enthralled upon catching a glimpse of the Atwoods performing together on stage. "I didn't know who it was, but there was this riotous person playing the trombone, and she was just hilarious!" Schreck says. "And



Music Theatre of Wenatchee performs Guys and Dolls May 2-12. Photo Michael Gomez



Below: Paul and Kelly Atwood at the theater. Courtesy The Good Life magazine, photo Mike Cassidy. **At right:** Sherry Schreck with young thespians. WSM archival photo



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that was my first acquaintance with Kelly." What transpired marked a fork in the road for not only Schreck and the Atwoods, but for performing arts throughout Central Washington.

Beginning as an East Wenatchee high school drama and debate teacher for 15 years, Schreck laid the foundation for performing arts in the area. Perhaps most notably was her brainchild, Short Shakespeareans, which featured Schreck's own adaptations of Shakespeare works as told by thespians ages 4 to 15. After writing and directing the local favorite for more than 30 years, however, Schreck sought to retire. Paul and Kelly, who have performed, directed, and produced in excess of 70 local productions like *Guys and Dolls* and *Spamalot*, were natural fits to carry on Schreck's legacy. "They are the all-around theater people," Schreck says. "They're dynamos."

With the dynamic directing-producing-choreographing-set-and-costume-designing

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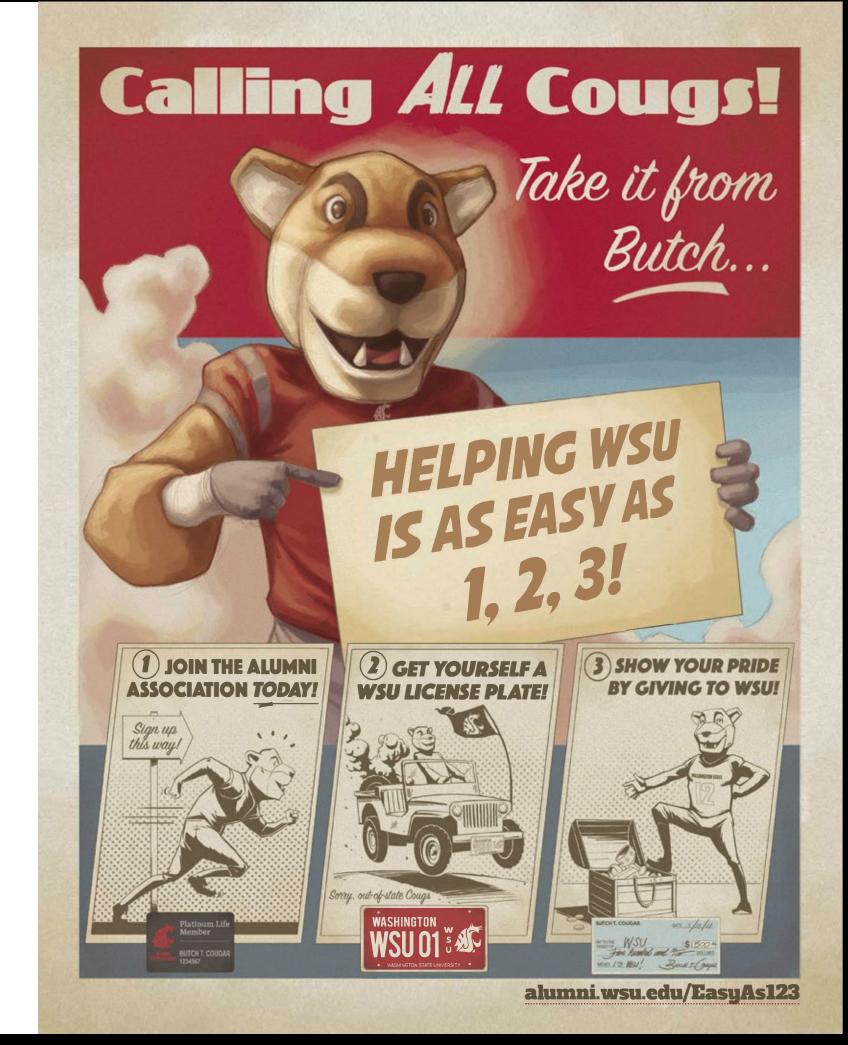
duo now at the helm, the Atwoods have carried the Short Shakespeareans banner for nearly five years. Kelly's extensive background in vocals and design provides a fresh perspective on Schreck's original winning formula. "She has a little bit of a different slant. The interjection of music, the glorious costuming, all of it," Schreck says. "I think it's very rare that a director does the costuming, too, but she's an expert at that, so it makes for a very spectacle-like production."

By the same token, Paul's exuberant style brings a witty humor to the table, affording Short Shakes a style uniquely, recognizably, their own. The two have adopted the mantra of a WSU mentor they shared with Schreck, Paul Wadleigh, who continuously urged: "Louder! Faster! Funnier!" The attitude is evident in Paul and Kelly's lively shows, which are punctuated by a vibrant humor and goodnatured sarcasm. "Usually we gravitate toward

the musical comedies," Paul explains, including modern favorites like *The Wedding Singer* and *Hairspray*. "Because sometimes I think you get your point across even more when people laugh at the situation."

Paul and Kelly share a deep appreciation for the transformative power of theater and a profound respect for the legacy one person can leave, which has committed them to continuing the work of predecessors like Sherry Schreck. Her endless affinity for theater has given Wenatchee-ites decades of entertainment rivalling that of larger cities. What's more, it provided a basis for the Atwoods to impress their signature style on the next generation.

"Not only are you helping nurture students' love of the arts, but it's an impact on the community as well," Kelly says. "A community that supports their arts thrives. It definitely thrives." *



magazine. wsu.edu



NEWmedia



Captain Cook's Final Voyage: The Untold Story from the Journals of James Burney and Henry Roberts

EDITED BY JAMES K. BARNETT

WSU PRESS: 2017

The British Navy was outfitting ships for war against the upstart American colonies when Captain James Cook sailed from Plymouth Harbor in July 1776 for his third and final voyage. The mariner sought the elusive Northwest Passage via the west coast of North America, but the ensuing three-and-a-half-year expedition didn't turn out as planned.

Much has been written about Cook, particularly his earlier voyages to the Pacific Ocean and Australia, using his journals. Lower ranking officers on the *Resolution* and its consort ship *Discovery* also kept notes on the third journey. This book brings two of those journals to print for the first time, after Barnett found them in an Australian archive.

Cook and 203 sailors first crossed the Indian Ocean to Tasmania and New Zealand. Among the explorers was First Lieutenant James Burney, a veteran of Cook's first and second voyages. Henry Roberts, a cartographer on the *Resolution*, worked under the watchful eye of notorious ship's master William Bligh.

Burney and Roberts chronicled the journey as it continued into familiar territory for Cook: the islands of the South Pacific. Mai, a Tahitian crew member, mediated encounters between the Europeans and the people of the Cook Islands, Tonga, and Tahiti. Those relations would often begin in a friendly manner but ended with cultural misunderstandings and violence.

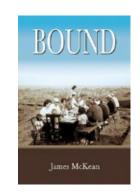
As Cook and company traveled east, they stumbled on a place they didn't expect, and one that would later prove fateful; the Hawaiian islands had never experienced a visit by British sailors when they landed near Kaui'i. The expedition then traveled near modern-day Oregon and skirted the coastline up to Vancouver Island and Alaska, where they believed they would find the Northwest Passage. Instead they found disappointment and a wall of ice through the Bering Strait.

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The ships returned to Hawai'i, where yet another meeting with islanders turned sour and sealed the fate of James Cook. He was stabbed and killed at Kealakekua Bay. Burney and Roberts witnessed and wrote about the battle.

The journals of Burney and Roberts give valuable insight into the lives of sailors, interactions with Pacific Islanders, and the hardships of eighteenth-century ocean travel. Barnett's discovery of the journals, along with his commentary, make this book essential reading for anyone interested in that era of discovery.

-Larry Clark



Bound

JAMES MCKEAN '68, '74

TRUMAN STATE UNIVERSITY PRESS: 2017

Bound presents a lyrical memoir about growing up in the Pacific Northwest and the women whose feminine fortitude contributed to the

Taking readers into the kitchens and parlors of mid-twentieth-century America, McKean lovingly unpacks the attic trunk,

sharing the exploits of his wife, mother, grandmother, and great-great-grandmother-in-law Rachel Cartwright Lee, among others.

At a time when ladies were expected to stay home and not make a scene, one woman swam for the Washington Athletic Club in Seattle and won a bronze medal in the 1936 Olympics. Another divorced an abusive husband and became a farmer. Others carried derringers, smoked cigarettes, rode horses, bound books, and through it all, held families together.

As a boy, McKean says he took these family members for granted. In *Bound*, he redeems himself by recapturing their individual beauty and dignity.

A glimpse of his grandmother:

Fifty-five years later, I remember my grandmother as a slight woman stooped as a willow, descending into my parents' kitchen from her room above the garage, a single bed made, a bedside table where she kept a two-dollar bill, its corner torn off so the bad luck would pour out, and three silver dollars, each minted in 1921, three years after the death of her second son (in the 1918 influenza pandemic.)

Beside her prayer book, a box of Kleenex that smelled like lilacs. Just now, over the fence, lilacs steal into our backyard in Iowa City, the neighbor having not pruned them in the twenty-six years we have lived here. I don't mind. My grandmother blooms each spring and fills the yard with her silent air, her faded print dress, sweater sleeves pushed up, her elbows dabbed with ointment and Saran wrapped for the psoriasis, her white hair permed and combed and held by a clasp.

-Rebecca Phillips

The Book of Caterpillars

EDITED BY DAVID G. JAMES
THE UNIVERSITY OF CHICAGO PRESS: 2017

Meet some of the world's most wild, weird, and beautiful caterpillars. Using its own hairs, the lichen moth builds a basket around itself to stay protected during metamorphosis.

As the Red Helen caterpillar develops, its body starts to resemble a snake's head. When threatened a red, forked appendage

inflates from behind its own head, giving off an unpleasant odor.

Flaunting "flower-like tufts" of bright yellow hair along its green body, the Pale Tussock caterpillar sends a colorful warning to potential predators.

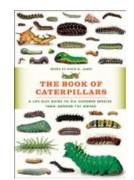
Editor David G. James, associate professor of entomology at Washington State University, introduces readers to the curious lives of caterpillars from egg to pupation to the natural wonder of metamorphosis in his latest work, *The Book of Caterpillars*.

Everyone from the youngest insect wranglers to more experienced naturalists can enjoy this beautifully designed book, which features more than 600 species from around the world and is divided into two sections: moth caterpillars and butterfly caterpillars.

Each page features full-color photographs of caterpillars, printed to reflect their actual sizes. Along with a description of the caterpillar, each page also includes information about the caterpillar's range, habitat, host plants, a notable fact, and conservation status.

In many places around the world, the number of caterpillar species are dwindling due to habitat destruction, pesticides, climate change, and other environmental factors. Building awareness of caterpillar diversity, the photographs and stories also serve as a reminder of the vital role these insects play in the lives of other animals and earth's ecosystem—especially as they transform from caterpillars into some of the planet's most important pollinators.

-Rachel Wehher





Protest on Trial: The Seattle 7 Conspiracy

WSU PRESS: 2018

It's December 1970, and surprise witness Horace "Red" Parker is mumbling his way through his testimony. The prosecutor has to keep telling the self-made activist infiltrator to speak up. The defense attorney keeps objecting to Parker's constant inferrals of what the defendants must have been thinking as they organized the anti-Vietnam War protest they're on trial for. Which, as Kit Bakke points out, is ironic, because "that's what defines the crime of conspiracy—people assuming they know what other people are thinking."

But the trial of the Seattle 7 never really was about conspiracy. As defendant Chip Marshall said, "The judicial system has to be aware that justice and obedience are not the same thing." And what the group of activists had done was essentially civil disobedience, protesting an increasingly unpopular war. Seattle in 1970 did not welcome disobedience.

Bakke's recounting of the trial of the Seattle 7 is fascinating and eminently readable, and thoroughly fills a gap in the history of anti-war activism. Bakke does a fine job of sketching characters and the milieu of antiwar activism in the late '60s and early '70s.

The Seattle 7 were ultimately acquitted of conspiracy (though they were thrown in jail for a few months for contempt of court for their theatrical courtroom antics) and several of the defendants continued to be social activists. A surprise cultural bonus is discovering that defendant Jeff Dowd was the model for The Dude, the main character in the Coen brothers' film *The Big Lebowski*.

-Brian Charles Clark

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Fly on the Wall

PODCASTS BY SQUEAK MEISEL SQUEAKMEISEL.COM

If you can't come to the artist, the artist will come to you, thanks to a series of podcasts produced by Washington State University Fine Arts department chair Squeak Meisel.

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Called *Fly on the Wall*, the artists interviewed on Meisel's podcast have shown their work at some of the biggest venues in the world, such as the Venice Biennial. They come to the Pullman campus, teach for a few days, work one-on-one with undergraduate and graduate students, and give a public lecture.

But Meisel realizes that not everyone has time or ability to come to the lectures at WSU. With the podcast, "I can provide more people access to these conversations that few of us would otherwise get. I've had people telling me they were driving to Seattle and listening to my latest podcast."

One of Meisel's interviews is with Sarah Kavage, an artist, researcher, and urban planner, who literally reframes landscapes. She'll juxtapose an enlarged historical photo with its contemporary context, creating a startling effect, as if the viewer were looking into the past through a rupture in the space-time continuum.

Another is with Canadian Laurel Terlesky, who investigates the tactile organ of skin and our desire for connection. The past, so often misremembered, leaves a residue, Terlesky says, and in her 2013 work, *Reverb*, she investigates the "embodied sense of how we shape each other by our relationships" with "evidence ... gathered from ten motherless daughters on how a mother's influence will echo and reflect inside us by moving in our shadow, both consciously and unconsciously, until it cannot be seen, heard, or felt anymore."

You can find the podcasts online at squeakmeisel.com/interviews.

-Brian Charles Clark

BRIEFLY NOTED

A Day in the Life of a Country Vet FRED NEWSCHWANDER '74 DVM 2018

Mostly true stories, anecdotes, and illustrations about the animals and people from the life and career of a retired mixed animal veterinarian.

STEVEN NIEMI '82 DVM

ACADEMIC PRESS: 2017

Niemi's professional analysis and experience informs ways to improve laboratory animal care and use. His book characterizes the current state of the industry and speculates on its long-term future. Niemi, director of the Office of Animal Resources at Harvard University, has spent a lot of time in the trenches and highlights new approaches to further advance the field in animal use.

Das Fischer

BEN HERNDON '08 COMM.

Herndon's first short film is a nine-minute comedy about a young German man, Otto Rubschlager, and his journey to Idaho to learn the art of fly fishing and uncover the mysteries of the reclusive, legendary outdoorsman, Hildebrand Richwine. Shot in southeastern Washington, northeastern Oregon, and north Idaho, it won "Best Angler Film" at the FilmFestivalFlix Mountain and Adventure Film Festival last spring and is touring internationally. It can be viewed on Vimeo and Amazon Prime.

Listening to Silence

PHILIP MARKS '77 FOREST & RANGE

COVENANT BOOKS: 2017

In Marks's novel of love and regret, Ginny Simmons, a gifted singer, faces heartbreak when the man she loves marries another woman. The story leads to forgiveness and understanding for the characters, as they struggle through illness and loss.

Black Swan Ghosts SIMEON HEIN '92 PHD SOCIO.

MOUNT BALDY PRESS: 2017

A sociologist encounters witnesses to unexplained aerial craft, their occupants, and other elements of the multiverse.

Forged: Made Strong in Weakness **SEAN NEAL '12 BUSI**

CHRISTIAN FAITH PUBLISHING: 2018

WSU staff member and alumnus Neal presents the story of a young boy diagnosed with Spinal Muscular Atrophy, a genetic disease that attacks nerve cells in the spinal cord. Through unshakable faith, he forges a successful, inspirational life.

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The Central Washington Sports Hall of Fame will induct its inaugural class in June, which includes **PETE RADEMACHER** ('53 Ani. Sci.). Rademacher was a Gold Gloves champion who won the gold medal in heavyweight boxing at the 1956 Olympics. The class also includes two WSU alumni who have passed away: GENE CONLEY (x'50) and CHUCK "BOBO" BRAYTON ('50, '59 MS Phys. Ed.). Conley was the only person to have won both a MLB World Series and NBA championship. Brayton was a Hall of Fame baseball coach who coached 33 years at WSU.

RONALD F. MARSHALL ('71 Phil.)

delivered the endowed Watkin Lecture last November at Saint Olaf College in Northfield, Minnesota, on "The Confused Nature of the Century: Luther's Thought as the Matrix for Kierkegaard's Writings." Marshall has been pastor at First Lutheran Church of West Seattle since 1979 and has published two books on Kierkegaard with another forthcoming. 5 PATRICIA KASPER ('73, '78 MS Bacterio.) was selected to lead the Northern California chapter of the Association of Clinical Research Professionals as the organization's new president. Kasper owns a consulting firm and recently published a book, Six Strategies to be a More Effective and Efficient Monitor. * The Mason County Public Utility District No. 1 in Hoodsport awarded retired commissioner KARL **DENISON** ('74 Forest and Range Mgmt.) with a lifetime achievement award for his commitment to public utilities and exceptional leadership spanning over three decades. Before his commissioner career, Denison served with the U.S. Forest Service and other government agencies to address environmental issues around the state. 5 The University of California, Riverside announced **GERRY BOMOTTI** ('75 MA Math.) as its new chief financial

officer and vice chancellor for planning

and budget. Bomotti has spent more than three decades in senior executive positions in public universities across the country, including his most recent role as senior vice president for finance and business at the University of Nevada, Las Vegas. 🧩 ENRIQUE CERNA ('75 Comm.) recently retired as senior correspondent for Seattle's public television station, KCTS, after 23 years with the organization. Throughout his career in media, Cerna brought attention to social justice issues such as race, immigration, and public safety. 🧩 The Mark Morris Athletic Hall of Fame recently inducted **JOCELYN SCHAUER** ('79 Ed.) and CAROL (SMITH) RUIZ ('93, '95 MS Civ. Eng.) into the Longview high school's newest class. Schauer, a teacher at Curtis High School in Tacoma, also stays active within her local church and all Mark Morris's sports. Ruiz, a three-sport athlete at Mark Morris, went on to place on the Pac-10 All-Academic Track and Field team three times while at WSU.

Former WSU football player LEIF **ERICKSON** (x'81) was recently inducted into Lynden High School's Athletic Hall of Fame. After claiming the state championship in both football and basketball as a senior at Lynden, Erickson helped the Cougs reach their first bowl game in 30 seasons as a tight end in 1981. ☆ Viridian Advisors of Bothell welcomed MAUREEN JONES ('81 Fin.) as the company's newest financial advisor. With more than 30 years of industry experience, Jones will help create financial plans and provide investment portfolio guidance to clients in her new role at the firm. 🧩 Centralia College Foundation announced ROBERT DOWLING ('84 MA Crim. Jus.) as its 2018 Distinguished Alumnus. Dowling has an extensive history of intelligence and security work with the U.S. government, and has helped create services used by law enforcement agencies to share

information and monitor threats. 🛠 **DWAYNE LALOR** ('85 Phys. Ed.) received the Lifetime Sports Achievement Award from the city of Red Deer, Alberta. He played baseball there, at WSU, and on the Canadian National Team. Lalor taught and coached nearly every sport at Lindsay Thurber Comprehensive High School in Red Deer. 🐕 Seattle-based Tableau Software has selected **GERRI MARTIN-**FLICKINGER ('85 Comp. Sci.) to join its board of directors. Currently serving as chief technology officer and executive vice president at Starbucks, Martin-Flickinger has also held chief information officer positions at a number of companies, including Adobe and McAfee, Inc. 🛠 BlumShapiro, the largest regional business advisory firm based in New England, has announced the election of a new partner, JAMES. J. KROUSE ('86 Acc.). Krouse is a partner in BlumShapiro's tax department in Shelton, Connecticut. He has 20 years of experience as a tax advisor. 🧩 **DANIEL** S. GLOVER ('88 Const. Mgmt., '95 Busi.) was recently appointed to the Goodwill Board of Directors for the Olympics and Rainier regions. As chief estimator for Tucci & Sons Construction in Tacoma, he brings nearly 30 years of business administration and construction management experience to his new role.

Staypineapple named **TROY LONGWITH** ('90 Hotel and Rest. Admin.) as the Bellevue firm's new regional director of operations. Longwith will help lead a brand of hotels located in Chicago, San Diego, San Francisco, Portland, and Seattle for the company. **Structure** LOREN CARLSON ('94) Poli. Sci.) was named the western region general manager of sales for online heavy equipment auction company bidadoo. In his new role, Carlson will develop business strategies and work to improve the customer experience for the online industrial equipment auction service.

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Members Make the Difference.

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CLASSNOtes

★ Knutzen Engineering announced the hiring of ERIC ANDERSON ('96 Civ. Eng.), who has more than 20 years of industry experience. Anderson will provide structural engineering and project management expertise to the Kennewickbased organization in his new position. ★ After 26 years as a collegiate throws coach, PAUL BARRETT ('96 Sport Mgmt.) was named Marshall University track and field assistant coach for throwing events. A three-time All-American at Spokane Falls Community College, Barrett went on to compete in the discus and javelin throws for WSU and was a Pac-10 finalist in the hammer throw. 5 JENNIFER PRIOR ('97 Real Estate, Const. Mgmt.) recently launched her company, PRE Consulting in Phoenix, Arizona. Prior brings more than 20 years of industry experience to the startup, which provides commercial real estate firms with project management services and financial solutions. 🛠 California State University, Chico recently named MILTON LANG ('98 MA Elem. Ed., '08 EDD Higher Ed. Admin.) as vice president of Student Affairs. Lang, who has served in a variety of capacities at University of California, Davis since 2013, vowed to support student development in his new role by addressing issues such as affordability and mental health. After five years at the company, Sinclair Broadcast Group, Inc. promoted ROBERT TRUMAN ('98 Comm.) to general manager of their KATU (ABC) and KUNP (Univision) stations in Portland. He has spent nearly 20 years in the business, holding sales roles at television stations in Seattle, Boise, and Salt Lake City.

GARY HILL JR. ('00 Comm.) moved into a permanent role on the Seattle Mariners' broadcast team after seven years in a part-time position. He takes over for now-retired Kevin Cremin as executive producer/engineer for the radio crew. Hill has hosted Mariners pregame and postgame

shows since 2010 and occasionally had play-by-play duties. Hill hosts a Mariners podcast and is a regular contributor to the Mariners Magazine. 🧩 WHITNEY HENION ('02 Arch.) joined the planning department of the Vancouver Public School District as capital projects lead. She was also recently appointed to the City of Camas's Design Review Committee. 🛠 BRANDY KERR ('05 Busi.) recently joined Portland-based Zelios as the cannabinoid processing equipment company's director of marketing. Kerr has held positions ranging from account management in advertising to marketing manager during her 12-year career. 5 BrightSide Animal Center selected **ERICA PSALTIS** ('05 Soc. Sci.) as its new coordinator of volunteers and events. She joins the Redmond, Oregon, shelter after serving as Mt. Bachelor Memory Care's director for four years. <a>5 The Bethlehem Inn of Bend, Oregon, appointed JEN BARCUS ('06 Fin.) to the organization's board of directors. In her new role, Barcus will draw upon years of financial experience and nonprofit work to help provide shelter to the situationally homeless. **K** CHAUNCEY DRINON ('06, '07 MAR Arch.) and CHAD LAWRENCE ('14 Civ. Eng.) were recently recognized as associates at Mackenzie in Vancouver. Lawrence joined the firm as an intern in the organization's civil engineering department, while Drinon joined as an architectural designer. Throughout their respective careers, the two have aided Mackenzie in an array of civil design projects and community involvement programs across the state. 5 SkyOak Financial announced that IAN BACHTEL ('07 Busi.) is joining the organization in its Medford, Oregon, office. As a veteran financial advisor, Bachtel is also a member of the Rogue Community College Budget Advisory Committee and serves on the Jacksonville Chamber of Commerce.

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ESTHER HYUN ('10 Busi.) was recently named an associate at Bellingham law firm Carmichael Clark, PS. As a part of the company, Hyun will represent clients in cases dealing with creditor debtor law, business, and real estate. * RITA M. **KEPNER** ('10 PhD Comm.) was recognized in Marquis Who's Who for more than 45 years of involvement with organizations like the Department of Homeland Security and FEMA. An educator, artist, and author, Rita has also cowritten a book and exhibited her art in galleries across the world. Freiheit & Ho Architects hired CHELSEA MERKEL ('15, '17 MAR Arch.) as an architectural designer, where she will undertake a variety of commercial and tenant improvement projects. MATT **GRINNELL** ('16 Busi.) also joined the Kirkland commercial architecture and interior design firm recently as permit and entitlement coordinator. 5 Peoples Bank announced JENNIFER EVANS-THOMPSON ('16 Busi.) as senior vice president and director of mortgage lending in Bellingham. Evans-Thompson, who has been with Peoples Bank since 2015, will help manage the company's mortgage production and operations in her new senior management role. 🧩 KAILA LAFFERTY ('16 Comm.) recently joined KATV-TV (ABC) of Little Rock, Arkansas, as the station's newest morning reporter. Throughout her journalism career, Lafferty has produced a regional Emmy-awarded newscast while at WSU and served as a news anchor and multimedia journalist at KLEW-TV (CBS) in Lewiston, Idaho. ☆ Skagit Valley College hired SHANE SERVOSS ('16 Sport Mgmt.) as the new baseball coach for their Cardinals. Servoss was an infielder for Skagit Valley. **★ ALEXANDER WOLFE** ('17 MAR Arch.) was recently hired as an architectural intern for ALSC Architects in Spokane. Wolfe brings design and graphics experience from working on various projects for the Central Valley and Cheney school districts.



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Inmemoriam

ANN ELIZABETH DANBY ('38 Busi.), 101, December 2, 2017, Eugene, Oregon.

ALBERT H. ADAMS ('41 Gen. St.), 97, November 27, 2017, Green Valley, Arizona. LENA "LEE" CORRAL BARRY ('41 Home Econ.), 100, January 10, 2018, Castro Valley, California. MAVIS L. ENGELLAND ('41 Phys. Ed.), 97, December 25, 2017, Gig Harbor. HERMAN E. PETWAY (x'41 Ed.), 99, January 2, 2018, Vineland, New Jersey. KENNETH WILLIAM SAX ('41 Mat. Sci.), 99, January 9, 2018, Sacramento, California, ELAINE BERRY (x'42 Lib. Arts), 100 October 30, 2017 Wenatchee EDNA J. FAST MAGUIRE ('42 Busi.), 96, December 22, 2017, Wenatchee. JEAN MARY E. NICHOLS ('42 Gen. St., '44 MA Fine Arts), 96, January 2, 2018, Racine, Wisconsin, DORIS MARIE SWANSON ('42 Music), 97, March 14, 2018, Spokane. MARJORIE H. MCDOWELL ('43 Busi.), 96, November 23, 2017, Spokane. JOHN **HORACE NUNEMAKER** ('43 For. Lang. & Lit.), 96, November 25, 2017, Spokane. **PHYLLIS MARY CARTER PERRINE ('43** Gen. St.), 97, January 24, 2018, West Seattle. JANE ALLISON SCHUSTER ('43 Gen. St.), 96, December 4, 2017, Spokane. HAL DEAN TIBBALS ('43 Mech. Eng.), 94, February 10, 2015, Albany, Oregon. DONALD CLAIR SCHMICK ('44 Gen. St., Phi Sigma Kappa), 95, January 13, 2018, Colfax, ELIZABETH "BETTY" G. MORSE ('44 Home Econ., Delta Delta Delta), 97, January 1, 2018, Spokane. DANIEL M. OGDEN ('44 Poli. Sci.), 95, February 8, 2018. Vancouver, WILLIAM E. BABCOCK ('45 DVM), 95, October 10, 2017, Terre Haute, Indiana. MARIAN FAYE BOWKER DAVIDSON ('45 Music), 93, January 25, 2018, Los Angeles, California. ELEANOR "ELLIE" J. CARSTENS (x'47 Bacterio., Chi Omega), 91, January 27, 2018, Arlington. SHIRLEY A. NICKERSON ('47 English, Alpha Delta Pi), 92, January 12, 2018, Mount Vernon, BETTY JEAN PEARSON ('47 Nursing), 93, November 27, 2017, Nampa, Idaho. BARBARA BACHMANN WEAVER ('47 English), 95, January 18, 2018, Rancho Palos Verdes, California. CLIFFORD P. WOLFSEHR ('47 MA English), 96, December 15, 2017, Thorp.

ROBERT T. AXWORTHY ('48 Chem. Eng., '49 Poli. Sci.), 93, December 20, 2017, Bethany, Oklahoma. LOIS ANN D. PEARSON ('48 Music, '50 Ed.), 91, February 9, 2018, Seattle. RAYMOND SPEER ('48 HBM, Alpha Tau Omega), 89, February 18, 2016, Lewiston, Idaho. MIKE WIRTH ('48 Econ., Sigma Alpha Epsilon), 94, February 7, 2017, La Grande, Oregon. HELEN-LOUISE CHITTY ('49 Fine Arts, '50 Ed., Alpha Delta Pi), 91, January 8, 2018, Richland. CHARLES HILLIKER PARKMAN ('49 Wildlife Biol.), 93, October 21, 2017, Port Townsend. AUDREY N. PETERSON ('49 Busi) 90 December 13, 2017, Houston, Texas.

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RAY GRAVES ('50 Poli. Sci.), 93, November 2, 2017, Lakewood, DONALD EUGENE HECTOR ('50 Music, '53 Ed.), 89, January 7, 2018, Cathedral City, California, MARILYN L. KINDER ('50 English, Kappa Delta), 89, January 8, 2018, Tacoma. MARYANNE C. LEAHY (x'50), 89, January 22, 2018, Portland, Oregon. ROBERT D. LOWE ('50 Mech. Eng.), 93, September 12, 2017, Des Moines. DAVID W. MCKEEN ('50 Socio.), 88, November 19, 2016, Nevada City, California, BETTY A. SKIDMORE ('50 Music, '51 Ed.), 89, December 2, 2017, Colville. ROBERT LYLE WARFIELD ('50 Psych.), 90, December 11, 2017, Gig Harbor. ELIZABETH A. WETZEL ('50 English), 90, December 8, 2017, Salt Lake City, Utah. HAROLD R. BALAZS ('51 Fine Arts), 89, December 30, 2017, Spokane. FREDERIC P. EMERY ('51 Elec. Eng., Tau Beta Phi), 90, January 4, 2018, Tucson, Arizona, GORDON K. HARRINGTON ('51 History), 88, December 28, 2017, Ogden, Utah. FRANCIS R. LEBLANC ('51 MS Hort.), 94, December 3, 2017, Redwood City, California. DONALD E. MEAD ('51 MS Psych.), 91, November 14, 2015. White Bear Lake, Minnesota, LYRA JEAN HERNDON PARKMAN ('51 For. Lang. & Lit.), 90, September 16, 2016, Port Townsend. DEVERE CARMAN ERB ('52 Chem. Eng.), 97, July 31, 2016, Placentia, California. RAYMOND H. HOBBS ('52, '57 MA Phys. Ed.), 88, February 9, 2018, Pullman. PAUL R. SELLIN ('52 History), 88,

MARY LOUISE "CHARLIE" SHATTUCK ('52 Home Econ.), 87, December 31, 2017, Toppenish. W. JOLEEN SMALL ('52 Elem. Ed.), 86, November 11, 2017, McMinnville, Oregon. WARREN TULLER STUART ('52 Busi.), 90, December 26, 2017, San Francisco, California. ELLSWORTH R. WOLFE ('52 Ag.), 91, January 14, 2018, Merced, California. SHIRLEY DAHLIN (x'53 Lib. Arts, Chi Omega), 86, December 4, 2017, Hardy, Virginia. DEE J. DICK ('53 Home Econ.), 86, February 5, 2018, Olympia. LOUIS HORVATH ('53, '63 MED Education), 90, December 31, 2017, Bangor, Maine. MARY J. KETTELKAMP ('53 Pharm.), 86, December 12, 2017, Astoria, Oregon. CURTIS KILLIAN ('53 Civ. Eng.), 85, October 3, 2017, Scottsdale, Arizona. MILTON T. LYNCH ('53 Fine Arts), 86, January 17, 2018, Saratoga, California. MERLE M. SMITH ('53 Wildlife Bio.), 86, November 5, 2017, Selah. KATHRYN A. SCHUMACHER WILLSTATTER ('53 Home Econ., Kappa Delta), 86, December 5, 2017, Orangevale, California. LLOYD THOENY HUNTER ('54 Elec. Eng.), 95, November 11, 2017, Normandy Park. KEITH JACKSON ('54 Comm., Alpha Tau Omega), 89, January 12, 2018, Sherman Oaks, California. JOSEPH JOHN MATELICH ('54 Gen. St.), 85, February 5, 2018, Irving, Texas. ANDREW IRVING MOE ('54 DVM), 91. February 19, 2018, Modesto, California. LEONE H. PETERSON ('54 Ed., Delta Gamma), 85, October 1, 2017, Sandpoint, Idaho, BARBARA LEE OUANN ('54 Busi.), 85, January 30, 2018, Pullman. HOLBROOK M. BUNTING JR. ('55 Gen. St.), 90, December 12, 2017, Middle Township, Pennsylvania. DONALD JOSEPH CONNOR ('55, '62 MS Phys. Ed.), 85, December 16, 2017, Spokane. **ROBERT EUGENE KLOCK ('55 Phys.** Ed.). 84. January 17. 2018. Bullhead City. Arizona. SHIRLEY L. SMITH ('55 Busi.), 83, December 12, 2016, Spokane. JOHN R. MATICICH ('56 Elec. Eng.), 81, April 2015, Portland, Oregon. ALFRED LEE "BUD" HALLOWELL ('57 DVM), 85, November 2, 2017, Auburn. GERALD EUGENE HANKS ('57 Pre-med.), 83,

September 24, 2017, Los Gatos, California.

Keith Jackson 1928–2018

When I finally met Keith Jackson '54 last summer, I felt like I was meeting a friend. He didn't know it, but we had already spent numerous Saturdays together. While he was calling the biggest games in college football, I was a fan, enjoying not just the games, but the spectacle and excitement that Keith communicated so skillfully to audiences.

Listening to Keith call a game, it was easy to get lost in the excitement of the event. He was a nearly flawless professional—this was obvious to even a casual fan. What set Keith apart from other broadcasters is that he respected the games and their players enough to let events happen without forcing himself into their most special moments. He was the rare, skilled broadcaster who could add to a game without making a broadcast about himself. Although he did it better than anyone, he was like all broadcasters in that he populated his sportscasts with outstanding play-by-play calling and relevant facts. What set Keith apart from his sportscasting peers were his timely observations, occasional stories, and uncanny use of silence. His accounts of sporting events as they unfolded on live television connected with millions of individuals and, by doing so, became a shared, national experience.

While I spent an afternoon with Keith and his wife Turi Ann x'52, I learned a few things about the character of the man I'd spent decades listening to—his humility and confidence, humor and pride, and most importantly, his strong relationship to his wife, familv. friends, and Washington State University.

First. Keith understood that he didn't need to be the center of attention to make an important contribution. It seemed to me that Keith's personal sense of fulfillment came, not from a sense of self-importance, but from a sense that he had contributed to the success of others.

Next, you couldn't talk to Keith for long without him mentioning family, friends, and the love of his life, Turi Ann. Keith and Turi Ann enjoyed a special relationship, which started when they met in Pullman. They were married in 1952 and the result was a lifelong partnership. I first noticed Keith talking about Turi Ann when he returned to Pullman for

the building we dedicated in his name. She was always close by and he was genuinely pleased to have her involved in the festivities.

It was clear that they were a team.

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Keith had a strong sense of who he was, and it made those around him comfortable. He had strong opinions and shared them freely. Even so, Keith's humility, self-deprecating sense of humor, and his stories gave him an unpretentious charm. Ask about his time at WSU, and he'd tell a story about driving a garbage truck. Ask about his experiences in the Soviet Union, and he'd describe the Russian vase he struggled to get past Soviet security as a gift for Turi Ann, only to discover that it was made in India. Perhaps it came from his small-town Georgia roots, but being sure of himself allowed Keith to make others feel sure of themselves.

Keith was a leader. Perhaps his experience serving in the Marines strengthened his confidence and resolve. I realized later that even as a college student Keith was honing those abilities. He was freshman class president, involved in a fraternity, and played significant roles in student organizations. Clearly, his time at WSU allowed Keith to sharpen his leadership skills.

BY BRUCE PINKLETON

Keith understood what it meant to be a Cougar. He and Turi Ann gave generously to the Murrow College and to other WSU institutions. We have a building, a newsroom, graduate fellowships, an excellence fund, and a scholarship that bear the Jackson name. Over the years, a select group of Murrow College broadcasting students have received the Keith Jackson Sports Award. Keith wrote personal letters to them, encouraging the students in their professional endeavors and offering to mentor them. These were personal, meaningful, and encouraging letters the recipients put away for

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Ultimately, Keith had pride in his work without being a proud person. If any of us have a reason for pride in the quality of our work, Keith had reason. Even now as I listen to him call a game, I'm impressed by its quality. It's almost as if I've forgotten how good a sportscast can be and, when I hear Keith again, I'm reminded of his tremendous work that was a regular part of my life for so

Bruce Pinkleton is dean of the Edward R. Murrow College of Communication.



December 20, 2017, Tiburon, California. **DELBERT JOHN "DEL" HAYES ('57 Acc.),** 82, January 17, 2018, Salem, Oregon. RONALD C. KNUTZEN ('57 Ag.), 82, February 19, 2018, Bow. PATRICIA MAY MARRAH ('57 Ed.), 82, December 22, 2017, Columbus, Ohio. HERBERT A. ARMSTRONG ('58 Civ. Eng.), 82, January 13, 2018, Kingston. RALPH G. HOSELEY II ('58 Busi.), 85, November 13, 2017, Boise, Idaho. CAROLYN S. MACPHEE ('58 Gen. St., Gamma Phi Beta), 81, December 31, 2017, Plano, Texas. SANDRA RAE FABER ('59 Home Econ.), 79, October 13, 2017, Ballwin, Missouri. LARRY DEE NEWMAN ('59 Police Sci.), 81, December 21, 2017, Fort Collins, Colorado. WILLIAM R. PURCELL ('59 Elec. Eng.), 86, January 10, 2018, Livermore, California. CHARLES L. WRIGHT ('59 DVM), 85, May 16, 2017, Lakewood.

BRUCE MARVIN HASTON ('60 MA Speech Comm., '70 PhD Poli. Sci.), 82, January 15, 2018, Big Lagoon, California. RICHARD JOHN MACKIE ('60 MS Wildlife Bio.), 84, January 6, 2018, Bozeman, Montana. MARGARET "MITZI" B. MALSCH ('60 Home Econ.), 78, December 14, 2017, Bellevue. STEPHEN STANLEY KONZ ('61 Ed.), 90, August 16, 2017, Republic. CHARLES "CHUCK" L. MILLER ('61 Phys. Ed.), 77, June 3, 2017, Hemet, California, ALLEN LE ROY MOEN ('61 MS, '68 PhD Physics), 84, January 24, 2018, Lake Stevens. JAMES CLAIR MURPHY ('61 DVM), 86, December 25. 2017. Middleboro. Massachusetts. **ELIZABETH NESS NELSON** ('61 Socio.), 79, January 10, 2018, Fresno, California. DAISY F. ROBERTS ('61 App., Merch, and Text.), 86, January 16, 2018, Yreka, California. DAVID A. BOAG (x'63 Zool.), 83, December 6, 2017, Calgary, Alberta. NANCY MARIE KRUEGER ('63 Ed., Alpha Phi), 76, January 21, 2018, Tacoma. JOHN SAMUEL PEEK ('63 Forest & Range Mgmt.), 78, May 29, 2017, Walla Walla. EDWARD JOHN BRIS ('64 MS, '67 PhD Ani. Sci.), 82, January 8, 2018, Nampa, Idaho. DOUGLAS M. JACKSON ('64 DVM), 81, December 10, 2017, Richland. DAVID BRUCE MENIG ('64 Gen. St.,

Phi Gamma Delta), 76, January 6, 2018, San Antonio, Texas. JANICE LOUISE HARLOW ('65 Socio.), 74, January 26, 2018, Pasco. ALLAN MACDOUGALL ('65 Poli. Sci., Theta Chi), 75, January 20, 2018, Bellevue. ALLEN RALPH SAARI ('65 HBM), 73, February 15, 2018, Indio, California. JOHN N. TERREY ('65 EDD Ed.), 91, December 28, 2017, Shoreline. KAY EGGLESTON ('66 English), 74, January 30, 2018, Spokane Valley. RONALD M. MCHARGUE ('66 Math.), 73, January 4, 2018, Tekoa. BRIAN WILLIAM MCMAHON ('66 Poli. Sci., Phi Delta Theta), 75, December 12, 2017, Port Townsend. GEORGE T. **OSTRANDER** ('66 Econ.), 76, February 8, 2018, Ft. Lauderdale, Florida. **DENNIS** LEE CAVA ('67 Psych.), 71, November 2, 2015, Spokane Valley. HELEN JEANE JONES ('67 PhD Higher Ed. Admin.), 93, January 24, 2018, Reno, Nevada. BRIAN M. LUCARELLI ('67 Acc.), 76, January 27, 2018, Seattle. BRUCE R. ARMSTRONG ('68 MFA), 80, December 17, 2017, Akron, Ohio. FRED R. ESVELT ('68 Ag.), 73, December 12, 2017, Daisy. STEPHEN G. FELLSTROM ('69 Gen. St.), 70, December 24, 2016, Winthrop. DARLENE LUELLA RUSSELL ('69 MED), 76, January 11, 2018, Tacoma. RONALD ROSS UTECHT ('69 Ag. Ed.), 70, January 20, 2018, Spokane Valley. PATRICIA CLAIRE WILSON ('69 For. Lang. & Lit.), 68, May 20, 2017, Seattle.

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ROBERT "BOB" J. HUNGERFORD ('70 Const. Eng.), 69, January 6, 2018, **Rov. THELMA IRENE MOSEBAR ('70** Bacterio.), 70, December 5, 2017, Olympia. LINDA DIANE TURNBULL ('70 Phys. Ed.), 69, December 8, 2017, Corvallis, Oregon. CLAIRE "BART" BARTOK ('71 Ani. Sci.), 69, November 7, 2017, Marysville. **CANDICE ELAINE SHEARER SHERRY** ('71 Ed.), 68, January 27, 2018, St. Paul, Minnesota, BRUCE WAYNE TRIMBLE ('71 Arch.), 69, December 24, 2016, Missoula, Montana. WILLIAM GUST HAGELIN ('72 Fin.), 67, December 24, 2017, Seattle. TAMARA JO HUNGERFORD ('72 Ed.). 67, January 6, 2018, Roy. STEPHEN H. PETERSON ('72 Mech. Eng.), 69, January 29, 2018, Spokane. SHELDON



Son, brother, friend, student, quarterback, Coug.

The Cougar nation grieves with the family of TYLER HILINSKI. As we heal together, we must move beyond the stigma of suicide and mental illness, and help when we see friends or family struggling.

If you or someone you know talks about having suicidal thoughts or displays warning signs, please call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255). They will connect you to a local crisis center. **

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JAMES PRATT ('72 MA Ag. Econ.), 70, November 14, 2017, Salem, Oregon. MARK E. FIRESTONE ('74 Ag.), 65, February 23, 2018, Dayton, Oregon. JO ANNE MACDONALD ('74 MA Spanish), 71, September 19, 2017, West Lafayette, Indiana, JOHN F. MACDONALD ('74 PhD Entom.), 73, December 3, 2017, West Lafayette, Indiana. EDWARD PAUL MERTENS ('74 Const. Mgmt.), 64, March 18, 2017, Kennewick. LAWRENCE J. PIERCE ('74 Acc.), 65, November 26, 2017, Sequim. JOHN B. SAFFELL ('74 Gen. St.), 69, December 5, 2017, Olympia. SARA BETH AKRE ('76 Comm.), 65, January 11, 2018, Waterloo, Iowa. HENRY JOHN GROENEVELD ('76 Ag.), 63, January 30, 2018, Snohomish. ROY **EMERSON MATTHEWS III ('76. '87 MS** Mech. Eng.), 63, July 31, 2017, Cedar Park, Texas. MARK C. PAXTON ('76 Zool.), 63, February 7, 2018, Spokane. WILLIAM H. PIISPANEN ('76 MS Env. Sci.), 70, September 16, 2017, Boise, Idaho. LE ROI "SMITTY" MATTHEW-PIERRE III ('77 PhD Psych.), 71, December 22. 2017. Vancouver. British Columbia. **KENNETH R. TREMBLAY JR. ('77 MA,** '80 PhD Socio.), 61, February 12, 2015, Fort Collins, Colorado. JAMES HAMRE ('78 Civ. Eng.), 61, December 18, 2017, Puyallup. **DEAN ANTHONY YANKEE** ('78 Crim. Jus., Socio.), 61, December 23, 2017, Battle Ground.

JENNIFER AYERS ('80 Anthro.), 63, January 15, 2018, Seattle. JEFFREY S. BOYLE ('80 Env. Sci.), 65, January 2, 2018, Eagle, Idaho. LYNN MARIE LAMB ('81 Comm., Alpha Chi Omega), 58, December 15, 2017, Spokane. GORDON BRYAN CLAUSEN ('82 Elec. Eng.), 58, January 6, 2018, Spokane. **DUANE ALAN NEITZEL** ('82 MS Biol.), 71, November 16, 2017, Richland. ANNE L. KNOBEN ('83 Busi.), 54, January 13, 2016, Puyallup. DAWN CARLA ANDERSON ('84 Acc.), 56, November 28, 2017, Mundelein, Illinois. PETER ALAN LOPOSER ('85 Acc.), 54, December 17, 2017, Walla Walla. JON MIKI SONODA ('86 Pharm.), 54, December 23, 2017, Seattle. STEVEN S. HULBERT ('88 Busi.), 52, February 6, 2018, Bellingham. ANNETTE MARIE **ALLEN** ('89 Elem. Ed.), 51, January 12, 2018, Bremerton. JANICE LEE HIRSCH ('89 Poli. Sci., Alpha Gamma Delta), 64, October 16, 2014, Lake Oswego, Oregon.

ROSLYN GINA SEALY ('90 Zool.), 65, December 7, 2017, Marysville. NANCY SUSAN DABNEY ('95 MED Couns.), 62, December 30, 2017, West Richland. ELIZABETH ANGELA BURGESS ('97 Psych.), 69, November 30, 2017, Green Bay, Wisconsin. ERIC BYRON NELSON ('98 MS Env. Sci.), 56, January 30, 2016, Geneva, New York.

JAYNE E. TODD ('03 Soc. Sci.), 62, February 5, 2018, Carefree, Arizona. SHANE TERRELL BARRETT ('04 Comm.), 45, February 7, 2018, Vancouver. ANGELA J. BUEING ('05 Busi.), 48, January 22, 2018, Mukilteo. MICHAEL DAVID LEITL ('05 Neurosci.), 34, November 27, 2017, Miami, Florida. TAYLOR BURNETT FARRELL ('06 Zool., '08 For. Lang. & Lit.), 33, November 26, 2017, Ellensburg. LINDSEY DIANE WEAVER ('08 App., Merch, and Text.), 32, January 5, 2018, Othello. GLORIA ELLEN LARSON ('09 Nursing), 67, November 28, 2017, Kennewick.

AUTUMN NICOLE MORSE-JONES ('12 Human Dev.), 38, November 28, 2017, Albion.



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BETTY M. ANDERSON, 99, Nursing, 1968-1984, August 13, 2017, Spokane. MARIANNE BARABASZ, 71, Counseling Psychology, 1985-2017, January 15, 2018, Palouse. SHANET. BARRETT, 45, Finance and Administration, 2001-2014, February 7, 2018, Vancouver. 5 TIM BLOSSER, 98, Dairy/Animal Sciences, 1948-1974, January 14, 2018, Spokane. 5 STANLEY BUCKLEY, 91, Physical Plant, 1977-1990, December 10, 2017, Pullman. 🧩 **DENNIS** L. COX, 73, Facilities Services, 1964-2009, February 10, 2018, Pullman. A HAROLD DODGEN, 96, Chemistry, 1948-1986, November 26, 2017, Pullman. 🛠 **JAMES** ENGLUND, 97, Mechanical Engineering, 1948-1984, December 23, 2015, Mobile, Alabama. S EDWARD E. HARRIS, 87, Housing and Dining, 1972-1992, February 20, 2018, Kennewick. KLISA JEFFERS, 52, Housing and Conference Services, 1990-2012, February 11, 2018, Palouse. SHERYL JENKINS, 69, Liberal Arts, 1986-2013, December 10, 2017, St. John. ★ DELBERT KESSLER, 83, Facilities Services, 1989-2001, December 30, 2017, Lewiston, Idaho. A DAVID G. LANG, 49, Athletics, 1998-2018, February 24, 2018, Pullman. **SOURCE LIOTTA**, 95, University Recreation, 1956-1982, Tualatin, Oregon. SERNICE MEIER, 95, Health and Wellness Services, 1974-1983, December 4, 2017, Pullman. KATHLEEN MARIE OLLER. 72. University Publishing, 1985-2009, December 17, 2017, Moscow, Idaho. 🛠 BARBARA QUANN, 85, Libraries, 1975-1994, January 30. 2018. Pullman. F CLYDE OUINTANA. 91, Physical Plant, 1973-1989, January 20, 2018, Federal Way. S DIANNE SCHLOTT, 60, Multicultural Student Services, 1987-2018. March 1, 2018. Pullman. **SECOND YOUR SERVENS CROFT** SMITH, 73, Mathematics, 1989-2014, December 7, 2017, Moscow, Idaho. 3 WALTER WILSON, 83, WSU Tri-Cities, 1999-2005, January 7, 2018, Kennewick.

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You can also post full obituaries and remembrances on the online class notes: magazine.wsu.edu/MyStory.

Alumni Association News

A little help from a friend

When you hear about the WSU Alumni Association, you might think of fun events and crowds of spirited Cougs. For students and recent grads, the WSUAA can also be a source of help in making the transition from college into the "real world." By taking advantage of their membership in the WSUAA, students and new grads can participate in networking events with successful alumni, seek career opportunities (after all, Cougs love to hire fellow Cougs), and connect with Association chapters around the country as they plan their next steps. We find the stories of some of our recent graduates inspiring. We hope you will, too.

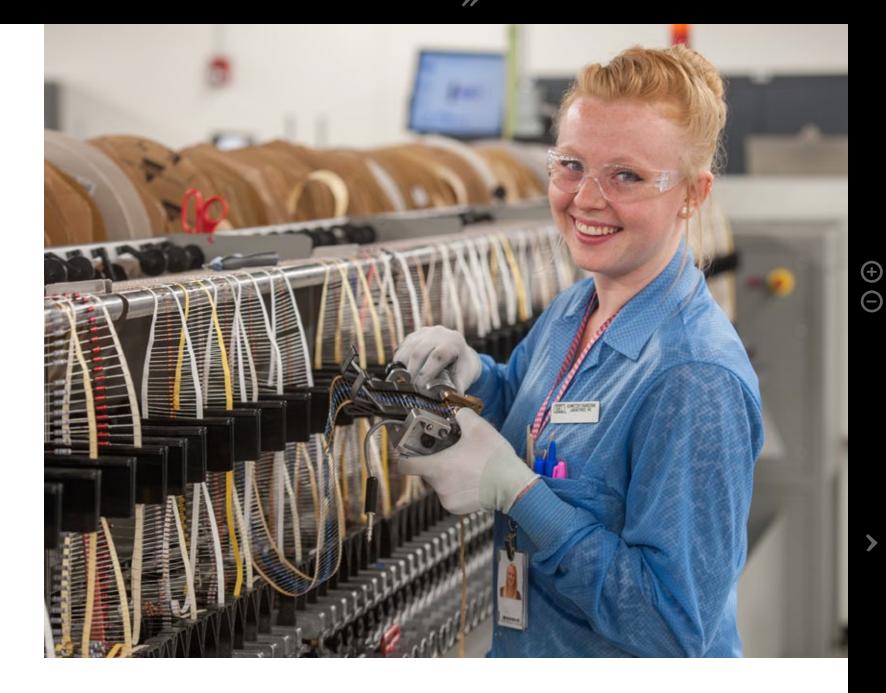
For Lisa Heard '13, "the WSUAA provided me with lifelong friends and a network." As a student, she knew she wanted to move to New York City to pursue her dreams. "During my senior year, I attended a WSUAA barbeque and was introduced to the WSUAA NYC Chapter president. I had no friends or family in New York and this first connection was one of the best things that could've happened to me. A few months later, I went to NYC, and the Big Apple Cougars were there to welcome me. They set up a happy hour for me to meet other WSU alumni in the city. The people I met at that happy hour were my first and now closest friends in New York."

Other recently-graduated members of the WSUAA have had similar experiences. Preston Smith '12 says he uses his membership for fun, discounts, and networking. He said "Many of the friendships I made after I graduated were fellow Cougs I met during WSUAA football viewing parties." Baiba Murray '12 also capitalized on networking and career opportunities. "As a student, the WSUAA gave me resources to feel connected after I left campus, like how to find my local chapter, and how to stay involved with WSU."

Ashley Vu'16 has the unique perspective of being both an alumna and student. A WSUAA Leadership Scholarship recipient and two-time Student Alumni Ambassadors president during her undergrad years, she is currently working on her doctoral degree in mechanical engineering (under Coug extraordinaire Susmita Bose, no less) and later plans to apply to the WSU College of Medicine. It's safe to say that Ashley is the definition of a Cougar over-achiever. So what does the Alumni Association mean to her? "The WSUAA helps students to learn how to network and build their career with alumni, prepping them for life post-graduation. I feel like the WSUAA is working to assist the broadest cross-section of Cougs—students, alumni, and even future Cougs! That means a lot to me."

In Lisa's words, "I am proud to be a Coug and grateful for the help I have received from other alumni." To learn more about a WSUAA chapter near you and the membership programs offered by the WSUAA, go to alumni.wsu.edu.





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Pick your favorite memory and send it to us. The top essays will receive a can of legendary Cougar Gold cheese or a WSU hat.

Send us your 100-word WSU memory by June 1, 2018, through the magazine's website at magazine.wsu.edu/contact, email wsm@wsu.edu, or a letter.

We'll print our favorites in the August issue and post others at the magazine's website: magazine.wsu.edu.

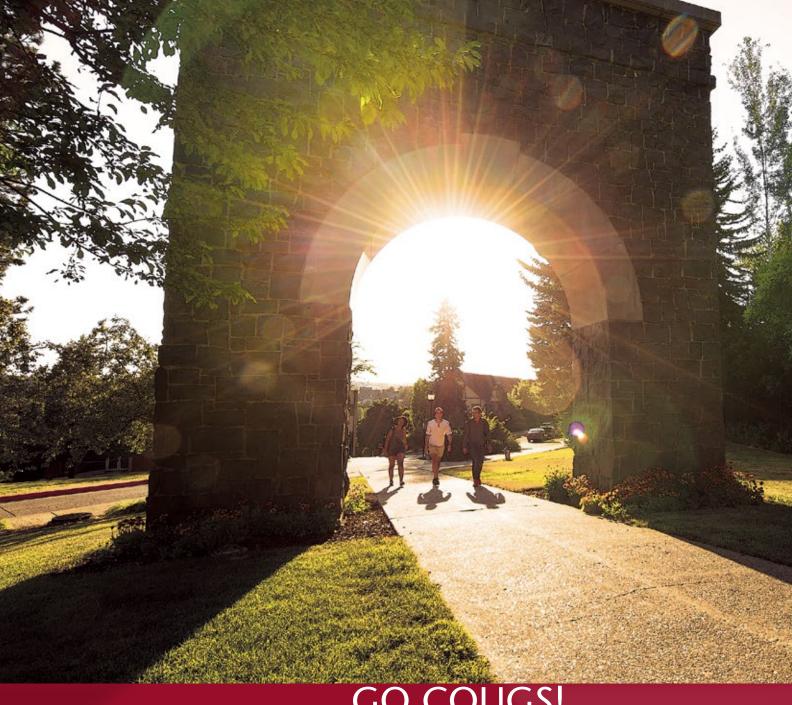


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n a cold October night, the four of us stroll through campus and find the door to Kimbrough unlocked. We walk the hallway and come across a dimly lit room. It's practically empty except for a grand piano sitting in the far corner. We go inside and a friend plays a few notes before breaking into Chopin's "Raindrop." It's a surprise to us all. The rest of us twirl around and plié like ballerinas. My grandpa had told me that the pianos on campus are kept well-tuned. He was right. The song ends and we head back into the night.

-Rachel Webber '11

(+) Dr. Universe's contemplations on children's science questions can still to be found at: askdruniverse.wsu.edu



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