How may we help you?

A point of reference
features
No longer the stodgy shushing environment, libraries have become a place in society to fill many of the needs other social organizations cannot.

How can such an isolated place seem so connected to everything? A recent visit points out why.

upfront
At Pachyderm Plaza, elephants delight children and families. They also have been an inspiration to our Smithsonian researchers.

Her time studying history has allowed her to tackle some of the state’s biggest IT projects.

Since technology has the ability to be used for good and for not good, these tech leaders think about it very carefully.

COVER: KAYAKING HENDERSON INLET (PHOTO MARK KING)
LEFT: GOING UP THE ICONIC YELLOW ELEVATOR IN THE SEATTLE CENTRAL LIBRARY. (PHOTO WIM VAN RENKING/ALAMY)
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Finding home: There’s a particular feeling of comfort when we return to a place we call “home,” but I think home is most noticeable in its absence. We orient ourselves to that place even when we’re not there. “Home is a place so profoundly familiar you don’t even have to notice it. It’s everywhere else that takes noticing,” Verlyn Klinkenborg wrote in a Smithsonian Magazine essay.

Although Klinkenborg’s writing typically meditates on rural life, his thoughts on home and “not-home” resonate for experiences of homelessness in both city and country. Homelessness is a defining challenge of our society, with millions of women, children, and men living in temporary shelters or no shelter at all. The causes are myriad and long-term solutions are elusive, but along with the physical hazards, people dealing with homelessness often need comfort and support to help them get back on their feet.

A group of heroes are stepping up to this crisis: librarians. In cities and rural communities, libraries have become an oasis for people who need a hand, a computer, or a seat to rest in. Washington State University alumni librarians like Linda Johns at the Seattle Public Library, Tara Murphy in Philadelphia, and Sarah English in Colville lead the way in finding innovative support.

People who are homeless also find comfort, as many of us do, in their pets. The costs of keeping dogs and cats healthy can be prohibitive, so WSU veterinary students provide free clinics in Spokane and Seattle. In a unique partnership with veterinary medicine, nursing students—WSU students in Spokane, and University of Washington students in Seattle—also give checkups for the people when they bring in their pets.

Many of us also think of the Northwest as a familiar home. Yet we can gain a lot of knowledge from sustained and intense observation of the Puget Sound and other well-known places. The WSU environmental field station at Meyer’s Point near Olympia offers researchers a place to deeply explore the urban-rural interface, history, and changing ecological spaces.

Our idea of home has shifted internally, as well. When people use computers in libraries or residences, they find digital homes. Does that replace community? Technology industry leaders, including WSU alumni Steve Wyrley and Rajat Taneja, tackle these and other questions about the role of social media and technology.

Speaking of social media, we recently welcomed a new associate editor to the magazine team: Adriana Janovich, an experienced journalist who brings fresh ideas and energy as she leads our social media efforts and alumni section.

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WASHINGTON STATE UNIVERSITY Foundations

WASHINGTON STATE MAGAZINE SUMMER 2019
Talkback

The long game

I was a Sigma Phi Epsilon member during my time at WSU. As president of the Sig Eps during the 1981–1982 academic year, I worked hard to mentor younger members in how to behave well and present a presence where no one embarrassed others, and everyone made grades. But, I didn’t have my own mentor and usually was guessing that my mentoring of the younger members was well founded. An alumna came for dinner one night, and after dinner I talked with him for some hours. Near the end of our conversation, he suggested that Coach Chaplin, as a Sig Epsilon member, might be amenable to a similar visit.

I contacted the coaching office and, with a palpable innocence and huge lack of confidence, made an invitation. The following Monday, Chapter Dinner day, Coach Chaplin showed up and had dinner with us. He stood up after dinner and gave a short speech. What he said has stuck with me all these years. He briefly stated his experience with athletes was that the best ones honored their commitment, and regardless of their athletic prowess, excelled in life provided they were entirely committed to doing their best. Coach Chaplin stated he remembered and held in high esteem each of his athletes that honored their commitment and did their best. He further stated that each of us, whether or not an athlete performing for WSU, had the opportunity to do their best, and now was the time to commit to that, 100 percent.

I followed his counsel, and I have, ever since hearing his speech, sought to do my best. His willingness to take the time to meet with a bunch of fraternity undergraduates and tell us how to succeed has served me very well and is at least as important as all of the other valuable learning I enjoyed during, and after, my WSU experience.

Bill Christman ’83 Civ. Eng.

Knowing the score

Your article entitled “Fight, fight, fight…” was a timely read for me. I recently sought a copy of the sheet music for the “New Washington State Fight Song” and in the process found out how hard it is to obtain.

I’m nearing retirement, and, fearing I may tire of my existing hobbies, decided to realize a life-long goal of learning to play a stringed instrument. After about four months of mandolin lessons, I was ready to learn how to play full-length songs. At the same time I returned to the Pullman campus to attend a football game with my grandson. I became inspired to play the light song.

I visited the bookstore in the CUB, sure that sheet music would be available for the light song for many instruments. None were to be found. A friendly sales clerk checked the “back store room”, and confirmed they did not carry sheet music for the light song. After an exhaustive search online, I finally found a copy of the original sheet music in the Holland Library Archives. I now can play the light song on an instrument perhaps never intended to play a march tune, but gratifying none the less. If copyright laws and royalty requirements allow, I suggest you publish the sheet music for the “New Washington State Fight Song” so old Cougs like me who wish to do so can learn to play it.

Keith Peifer ’79 Busi.

Editor’s note: I checked with Troy Bennefield, director of WSU Athletic Bands, about the Fight Song sheet music. He and the band provided a new, printable version of the Fight Song music, which you can reach through magazine.wsu.edu/extras/fight-song-music. Water considers going to the marching band while you’re there, so they can keep playing “Fight, fight, fight…”

Do you have any thoughts on magazine articles? Reunions, weddings, births, retirements, anniversaries, or other announcements you want to share? Let us know at magazine.wsu.edu/contact or email wsm@wsu.edu.

Keith Peifer ’79 Busi.

Because of private support, I can confidently go into the world and achieve my goals.”

As a child, Kim Santos set her sights on leaving Guam for a career in New York City. This spring, she will graduate from WSU Pullman with a degree in Digital Technology and Culture, and Fine Arts. A privately funded internship enabled Kim to gain hands-on experience as the marketing and social media assistant for the Jordan Schnitzer Museum of Art WSU, preparing her to fulfill her dreams.

Learn more at foundation.wsu.edu/santos
For billions of years, Earthly life has flourished in a reassuring 24-hour cycle of light and darkness. Over the past century, however, urban skies have grown increasingly clouded with light pollution. The excess light disrupts circadian rhythms, poses safety and health risks, wastes energy, and exacts a sad aesthetic toll as well.

For humans, the stars have long provided a primal connection to the cosmos, inspiring the imagination of artists, philosophers, and scientists throughout history. Today, residents of the Pacific Northwest remain among the few who can still marvel at the brilliance of the Milky Way on a clear moonless night. The creeping effects of light pollution are well documented in the 2016 “World Atlas of Artificial Night Sky Brightness.” The satellite images show that 80 percent of the world’s population now lives under sky gaze, with 99 percent of Europeans and Americans unable to experience a natural night.

In 2017, scientists at the GEZ German Research Centre for Geosciences found a 2.2 percent increase in Earth’s artificial outdoor lighting each year between 2012 and 2016. They say the use of cost-saving LED lights has actually led to increased installations and light pollution.

Michael Allen, senior instructor in the Department of Physics and Astronomy at Washington State University is a dark sky advocate who not only enjoys observing the heavens with large telescopes but also voices concerns about the effects of light pollution on the environment. “It can impact wildlife and the food chain in unpredictable ways,” he says. Allen points to scientific evidence suggesting that artificial light confuses sea turtle hatchlings, leaving millions stranded on the sand. It also disturbs avian migration patterns, and disrupts the feeding and mating cycles of insects, bats, fish, salamanders, and more.

Nighttime exposure to LED and other blue-spectrum lighting—under study at WSU Spokane Sleep and Performance Center—also suppresses the hormone melatonin and may increase human risks for obesity, depression, diabetes, breast cancer, and other conditions.

The American Medical Association recommends shielding all outdoor light fixtures and only using lights with a warm color temperature of 3,000K or lower. “Even if we do use shielded lighting with all new construction, we’ll still see increases in night sky brightness from all the new apartments and houses,” says Allen. “It’s not an easy problem to solve. To get zero growth in light pollution is not going to happen, even with intelligent lighting.”

All the same, a number of states are making an effort by enacting light pollution control legislation. Arizona leads the way with intelligent lighting.”

According to the International Dark-Sky Association, an estimated $1.7 billion is wasted each year through excess light spilling into the night, much of it as urban sky glow—the bright dome visible over cities from afar. Other light waste occurs as glare, clutter, and treepass.

To illustrate, Michael Allen shares a pair of photos, the first of which shows a man on a college walkway under bright globe-shaped lights. In the second photo, the man is nearly invisible standing to the side by a light pole. “It’s an example of lights we have here at WSU, so it’s my opinion that campus is nowhere as safe as it could be since those lights give rise to glare and shadows,” he says. “Safety doesn’t mean lit, it means intelligently lit. If the light is shining in your eyes, you’re not seeing as well in the dark as you should be.”

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The Bortle scale is a nine-level numeric scale that rates the night sky brightness of a particular location. Depicted (opposite and below) are celestial objects and groups that can be spotted with the unaided eye at the various levels of light pollution.

So far, he has recorded Bortle scale 6 on the north side of Pullman, and scale 4 two hours west at Palouse Falls. Encouraging others to fall in love with the night sky, Allen says some of the state’s best places to star gaze are in the Okanogan Valley or anywhere in central Washington. Last winter, he visited the Central Idaho Dark Sky Reserve in Stanley, the first international dark-sky preserve in the United States, which opened in 2018. “Now, that’s a dark sky! No question,” says Allen. “In my lifetime, it’s the only place I’ve seen zodiacal light—a hazy pyramid that is slightly angled to the horizon and appears just after dark. It’s sunlight scattered by interplanetary dust left over from the creation of the solar system. It was absolutely unmistakable.”

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Life with elephants

By Rachel Webber

Walk through the main gates of the Smithsonian's National Zoological Park, follow the path past the cheetahs, the American bison, the pandas, and you’ll find the Asian elephants. At Pachyderm Plaza, elephants delight children and families who stop to wonder at some of the world’s largest land mammals. But for Janine Brown (’80 MS, ’84 PhD Anim. Sci.), these elephants have been the inspiration and driving force behind her work the past three decades.

Brown heads up the Endocrinology Laboratory at the Smithsonian Conservation Biology Institute in Front Royal, Virginia, the world’s largest reproductive endocrinology lab. When visiting the zoo in Washington, D.C., she enjoys meeting with colleagues and old friends.

Among them are Ambika and Shanthi, the Asian elephants she met when she first started working with the endangered species in 1987. “The are the two most studied elephants on the planet,” Brown says. “Hands down.”

Brown investigates the intricate patterns, the peaks and plunges, of hormones that can shape an animal’s reproductive health and well-being. While she started out at the zoo working with fields like cheetahs and clouded leopards, she remembers when the elephant manager called her in 1987 with a question: “Can you measure hormones in elephants?” Brown recalls. “I went, ‘Sure. Well, yes. I can.’”

To find out if Shanthi was ready to breed, Brown began monitoring the elephant’s reproductive hormone cycle, or estrous cycle. At the time, there was no consensus on the length of elephant estrous. Brown designed a scientific study to pinpoint the cycle, which turned out to be about four months long, and identified the short time frame, about two days, in which the elephant could get pregnant. She also identified the hormone pattern that can be used to time ovulation.

These discoveries led to some of the first techniques for artificial insemination in elephants—a no easy task, especially considering the length of a cow’s reproductive tract is about three meters long. And while the study was supposed to stop after the successful insemination, Brown and her team decided to monitor Shanthi’s pregnancy and conditions once the baby was born.

“We didn’t know very much about elephant biology,” Brown says, reflecting on early days at the zoo. “Every year we were discovering something new.”

Brown’s team measured levels of prolactin which led to developing a pregnancy test for elephants. She also found innovative, non-invasive ways to analyze different hormones using urine, feces, and saliva.

Today, the Smithsonian Conservation Biology Institute lab has data on more than 150 species and helps analyze hormone samples, assess reproductive health, and provide artificial insemination services and support to dozens of zoos around the country.

“As soon as we develop something, I want to take it out into the world,” Brown says.

Before Brown found elephants, she studied animal reproduction and collected sperm from dairy bulls for her master’s at Washington State University, then explored endocrinology and fertility in dairy cows in her doctoral research. Along the way, Brown became fascinated with the differences and similarities across animal species, particularly their reproductive systems.

She credits her mentors, including master’s advisor Phil Senger and doctoral advisor Jerry Reeves, for setting her up for success. That mentorship is something Brown takes to heart and wants to carry forward. She’s mentored dozens of graduate students and Smithsonian interns.

Camille Ogdon (’17 Anim. Sci.) had the chance to intern at the zoo a few summers ago before beginning her veterinary program at St. George’s University in Grenada. She researched automatic feeding systems for elephants, which would allow them to better mimic feeding habits in the wild. It was the same summer in which a new elephant named Spike was brought to the zoo in hopes he might breed with an elephant named Maharani.

“I am keeping my fingers crossed that in a couple years I will be heading back to the Smithsonian to meet Spike and Maharani’s baby,” Ogdon says.

Brown enjoys working with interns and notes that, in a way, they never really leave. While retirement might be on the horizon for Brown, there’s not exactly an end in sight for her research.

“I can’t imagine anything but elephants,” she says. “It’s like it’s in my DNA or something.”

Most recently, she’s been looking at their hormones to understand more about elephant nutrition, obesity, and gynecological questions about stress and arthritis. She’s also preparing for a trip to Chiang Mai, Thailand, this summer where she established an endocrine laboratory more than a decade ago and mentors Thai graduate students who study elephants.

The day we met at the zoo, she was picking up a thermal imaging camera from the office. She’ll take it into the field this summer as she looks at stress hormones and body conditions of elephants in tourism. The findings will join Brown’s ever-growing volume of science-based recommendations to help inform conservation strategies and improve elephant well-being around the world.*

“It’s the taxpayers’ money,” she says. “Technology has to meet a need. What you invest in tech can save time that you can invest elsewhere, but it is also taking resources so, coming from human services, tech is about a child that gets fed, a foster kid finding a home, a vulnerable adult receiving care.”

After years in the health and human services sector, mostly in Washington and North Carolina, Langen is back home in Washington, bringing her analytical and critical thinking skills to bear on some of the state’s biggest IT projects—including her alma mater’s IT modernization initiative.

Langen and her team have oversight for all major IT projects in the state. What defines “major” is a complex calculus involving factors such as cost, timeline, the experience of project managers, and what might be called the change quotient: “How much change is your project asking staff or customers to absorb?”

Langen says that studying history in “the Athens of the Palouse,” as one of her favorite professors, Raymond Mose, called Pullman, was a dream from the time she “was in fourth grade. I fell in love with history and I tried in my brain that WSU had the best history department in the state.”

Her education taught her to see how projects evolve—like civilizations—over time. “I have the global view of an analyst,” she says, and uses her position to make sure people benefit from lessons learned in previous projects.

She says that her 40 years as a public servant are born of a “deep dedication to giving back.” She pauses for a moment and then adds, “State government takes an amazing amount of work.”

Langen muses on the importance of an efficacious state government. From roads and parks to health insurance, “all
The building on the other side of the plaza houses Nextdoor.com, a different social media company that connects users based on their physical neighborhoods. It’s the former workplace of Steve Wymer (’01 Comm.), who until recently headed up communications and policy for the company. Wymer married and started a family in D.C. After nearly a decade in the non-stop world of politics, he decided to get into the private sector. After an introduction to the CEO of TiVo, he was hired following a 90-minute interview.

The family moved to San Jose, California, and that gave Wymer a chance to dive back into community. He enthusiastically joined nonprofits and organizations in the Bay Area, and eventually that passion became professional when he took on the Nextdoor.com position.

Wymer speaks exuberantly about the importance of community-building. Riffing on the 2000 book Bowling alone by sociologist Robert Putnam, he notes that local anonymity can be a real danger.

“We feel connected to our brother who lives in Germany, because we can stay in touch with him and we see real images. It makes us feel like community hasn’t disappeared but, in fact, real community isn’t as strong as it used to be,” says Wymer. “And we see that near its head in the face of a catastrophe. You get a hurricane or a flood, neighbors don’t know each other, and a community is in a really bad spot.”

Wymer didn’t jump right into the technology world, but he did understand community from a young age. He grew up as part of a large family in the small, tight-knit town of Cheowah, in the forested northeastern corner of Washington state. Wymer never really thought about college until high school, and then he set his mind on Washington state university.

It took an extra math class at a community college in nearby Colville, but Wymer made it into WSU. Along the way to a communications degree, he became the only ASWSU president to serve three terms, from 1998-2001, and led the effort to build the new Student Recreation Center on the Pullman campus.

Wymer went to work for former WSU athletic director Jim Livengood at the University of Arizona, but soon pursued politics. He first returned to Washington state to join the staff of Secretary of State Sam Reed (’63, ’68 Polk, Siu.), then moved to Washington, D.C., where he worked on John Smith, Wayne Allard, and Mike Johanns. Wymer married and started a family in D.C. Still, both Tanuja and Wymer are hopeful their role in the industry can make some difference in the world and their communities. As Tanuja says, “I want to be part of doing work in technology that can have a big impact. I’ve always tried to use a litmus test of where I can find the most meaningful impact in the industry and hopefully in society.”

Instead Wymer wants to find ways to connect physical interaction with technology, something Nextdoor.com wants by building local-only social networks. Although Wymer left the company to join eBay in January as senior vice president and chief communications officer, he still holds true to his desire to hire people together and get them to care about what’s happening around them. It could possibly stave off some of the bitter partisanship in the country, says Wymer. “People have all these opinions that other people or politicians are either angels or devils, but they don’t know the person who actually impacts their kid’s bus stop. They don’t know the school board members.

“This is a different kind of political process. It’s called community.”

Technology’s not a tool anymore; it is a part of the environment,” he says. “It’s like oxygen; it’s like water. Whether you’re pursuing a passion in art, in science, or in an industry like mine, technology, I think there has to be an understanding of technology. Looking through silver rimmed glasses past his office window in Foster City, south of San Francisco, Tanuja reflects not only on tech, but on how he grew to love the community at WSU.

“I have a very soft spot in my heart for the school,” he says. “Everybody I met at the University welcomed me. It’s a community; it’s like an extended family.”

Alumni mentors from WSU and his interest in tech brought him to Digital Equipment Corporation, Microsoft, and then video game giant Electronic Arts. In 2013, Tanuja became executive vice president of technology at global payments technology company Visa, Inc.

“I’ve always tried to use a litmus test of where I can find the most meaningful impact in the industry and hopefully in society.”

Visa comes with heavy responsibilities, such as protecting data, ensuring secure transactions, and possibly implementing new technologies. There’s a level of power in technology that must be weighed carefully, says Tanuja.

“Any technology has the ability to be used for good and for not so good, so we have to think about it very carefully. Not just technologists but artists and others need to work through the implication of this power,” he says.

While he sees Nextdoor.com and it’s focus on community, Tanuja says, “We need to be part of doing work in technology that can have a big impact. I’ve always tried to use a litmus test of where I can find the most meaningful impact in the industry and hopefully in society.”

Visa’s chief technology officer Rajat Taneja (’92 MBA) are facing fundamental questions: Can technology build community? What role should it play?
Irrigation in south-central Washington started with a flood of activity. The Yakima Reclamation Project started flowing in 1910. A few years later the Washington Irrigation Institute formed up, including among its members photographer Aashel Curtis. The group quickly robbed the newly elected state representative from Yakima, Ina P. Williams, to push a bill creating an irrigation experiment station.

Williams’s bill proposing a research station was signed into law in 1917, and implementation fell to Washington State College. President Ernest Holland’s site selection committee picked 200 acres in Prosser that was appropriate for irrigation research.

In 1919, animal scientist Roy Bean became the station’s first director. Bean made friends fast and soon had over 100 volunteers onsite for two days “grubbing” the sagebrush (and, no doubt, shooting dinner as rabbits made a break for it), clearing the land for planting and building. Buildings went up: sheds, an office. Crops went in: potatoes, corn, millet, in the fall, alfalfa, winter wheat, rye, sweet clover. The harvests were used in part for livestock feeding research.

While the new station was being built out, Bean and his tiny staff shared space downtown with the Prosser Community Club, a jumping part for livestock feeding research.

1935 | Walter Clore is hired. He works summers as a horticultural assistant, and spends the academic year in Pullman, earning a graduate degree. Clore (’47 PhD Hort.) will have an illustrious career, conducting research on a wide variety of crops. Thanks to his work proving that the chilly eastern desert could produce excellent wine grapes, he’ll go down in history as Johnny Grapevine, the father of the Washington wine industry.

1937 | One of the earliest crops researched at Prosser was corn. Detasseling of corn was done by girls riding horses down the rows.

1937–1945 | Prisoners from the state penitentiary at Walla Walla were given jobs pulling weeds from vegetable crops at Prosser. Clore was their supervisor. He guided all of the prisoners to take field notes and become botanists. “Even the most hazardous field jobs we have ever seen,” it must have been good practice, because after the prisoners’ release they built a quarter, the site for the Quarter for writing hot checks.

1937 | The station buys an International 12 tractor, the first change from horses and mules to power. Years before, Bean had obtained a Fordson tractor but, Singleton reports without elaboration, it was deemed too hazardous to use. With their spiked metal wheels, Fordsons looked like battle vehicles from a Mad Max scenario.

scene with frequent luncheons and meetings. To get some work done, the irrigation crew moved to a quieter office, inadvertently taking a couple of the club’s “easy chairs” with them. “Soon,” writes Harry Singleton (19,’25 MS Ag.), then a research assistant but who would someday become station director, “the Secretary of the Club appeared with the Sheriff, who was a good friend of ours, to repossess them and a good laugh was had by all.”

The early days of what is now the Irrigated Agriculture Research and Extension Center were bare bones. Until 1930, the station owned only a Model T runabout and a Model TT one-ton truck. Electricity didn’t get to the station until 1926.

Singleton’s short history of the early days of Prosser records Bean’s sudden, tragic death in 1929. Bean was wrangling a bull when the animal slipped the staff. The animal tossed Bean against the side of the barn: “He died within an hour.”

Bean gave his all to build robust research programs at Prosser. Since then, farmers have taken advantage of the results of the work of Bean and many others. The once arid south-central part of the state is now one of the most fertile and productive regions in the world. *
Managing diabetes can be a real pain. From constant finger pricks to insulin pumps and injections, living with the disease can sometimes seem daunting. At Washington State University, researchers are working to take the sting out of daily management with sophisticated new technologies and personalized medicine.

With at least 30 million Americans currently diagnosed with diabetes and an estimated 84 million more at risk of developing the disease, Joshua Neumiller, Allen I. White Distinguished Associate Professor of Pharmacotherapy, says the need for simpler treatments is urgent.

"One of the difficulties of diabetes is that it can feel overwhelming to have to take pride in blood sugars and poke your finger several times a day. I think some of the exciting advances in glucose monitoring and time-release medication can make it less burdensome on a day-to-day basis."

Neumiller ('03 Phys. Sci., '05 DPH Pharm.) was recently selected as chair of the Professional Practice Committee for the American Diabetes Association, which in 2019 released updated guidelines. The section discusses subjects like the use of sensors and continuous glucose monitoring sensors. Neumiller says some new technologies and personalized medicine.

"In the 2019 version of the guidelines, for the first time, we added a chapter devoted to insulin pumps. "In some systems, the pump talks to these continuous glucose sensors and automatically adjusts insulin delivery based on what the blood sugar’s doing," says Neumiller. "So, it’s getting us closer to automating insulin delivery similar to what a normal healthy pancreas would do."

Improved drug formulations are another hot topic. Extended time-release prescriptions, for example, can reduce dosing frequency to just once weekly. And, medications that were available only as injectables may soon be offered as tablets or capsules.

"I think it’s a really exciting area right now," Neumiller says. "There are many new medications-delivery technologies that simply the ability of people to use them and be adherent to treatment."

And, thanks to a group of visionary scientists, in the WSU Voinland College of Engineering and Architecture, more user-friendly products are in the pipeline.

Yuehe Lin, professor, and Arda Gozen, George and Joan Berry Assistant Professor in the School of Mechanical and Materials Engineering, are among those working to create the next generation of wearable, flexible electronics for monitoring health conditions like diabetes.

They are collaborating with Subhanshu Gupta, assistant professor in the School of Electrical and Engineering and Computer Science, who has developed a tiny biofuel cell that uses the body’s own glucose to power sensors. The device will eventually be able to measure changes in things like EKG, EEG, cancer cells, and glucose levels.

Gozen and Lin are developing physiological sensors that can be coupled with the biofuel cell. Lin, who specializes in nanobioelectronic devices, designs the sensors and Gozen manufactures them in a unique 3-D printing process.

"Our 3-D printed glucose sensor will be used as a wearable sensor for replacing painful finger pricking," says Lin. "Since this is a noninvasive, needleless technique, it will be easier for children’s glucose monitoring."

Gozen says their 3-D printed sensor, which is about the size of a paper punch dot, is more stable and sensitive than those made with conventional methods, and is also non-toxic.

"3-D printing can enable manufacturing of biosensors tailored specifically to individual patients, for personalized medicine," he says.

This plan is to create a small device that can be implanted or fastened to the skin—something that will send alerts to a smartphone or other device when blood glucose levels change.

"Our ultimate goal is to make them economically feasible and thus, available to the public where it would significantly impact societal health," says Gozen.

"MICRO ADDITIVE MANUFACTURING OF GLUCOSE BIOSENSORS: A SIMPLE ADDITIVE MANUFACTURING APPROACH TO IMPROVE THE RELIABILITY OF GLUCOSE BATTERIES."

"With the next generation of wearable devices, it’s not uncommon to hear: ‘I want a sensor that can tell me what’s going on inside my body.’ But the challenge is to design a sensor that is noninvasive and can work well in real-world clinical settings."

The sensors need to be small enough to be used as a wearable sensor for replacing painful finger pricking, says Lin. "Since this is a noninvasive, needleless technique, it will be easier for children’s glucose monitoring."

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"When I was homeless, my cat was my lifeline," says Broomhall. "We counted on each other. Taking care of her was difficult, but the tool care of me, too. I couldn’t have coped without her."

Broomhall’s cat, Babesie, died a few months ago at age 14. Her new puppies are her family now.

Yet homeless pet owners face some surprising barriers in finding healthcare.

"When pets are pets, they’re people, too. They’re family. But for homeless people, it’s a nightmare," says Broomhall. "You know what’s scary? When you know pets are in the shelter system, they can get sick and die. It’s a scourge."

Roman, a purebred German Shepherd, has a heart condition.

"We’ve seen so many animals suffer," says Broomhall. "They’re dying. We try to keep them alive."

"Our ultimate goal is to make them economically feasible and thus, available to the public where it would significantly impact societal health," says Gozen.
As the veterinary exam rooms fill up inside the clinic, community nursing professor Gail Oneal tells me how many homeless people refuse to go see a doctor, even when it’s free. Medical offices don’t let pets inside. And if a doctor visit means leaving a beloved companion alone and vulnerable on the street, they just won’t go. It makes sense. I wouldn’t leave my cat in that situation either.

Oural (’92, ’04 MS, ’11 PhD Nursing) and College of Nursing dean Joyce Griffin-Sobel saw that disconnect firsthand at homeless outreach clinics. About two years ago, they realized that WSU had a unique opportunity to solve it. So Oural called Ryan Slinker, dean of the College of Veterinary Medicine, and pitched their idea: human and veterinary medicine together in the same place.

As a longtime proponent of the One Health movement, Slinker (’80 DVM, ’82 PhD Vet. Sci.) immediately saw the potential.

The One Health approach recognizes that human and animal health are linked, so it focuses research in areas where the two connect most closely. For instance, WSU researchers are working in Africa to prevent livestock diseases, eradicate rabies, slow the spread of antibiotic-resistant bacteria, and control the spread of diseases like the Zika virus, which infect human and animals alike.

But the One Health concept also matters much closer to home, and Oneal tells me why many homeless people refuse to go see a doctor, even when it’s free: Medical offices don’t let pets inside. As Broomhall helps her boisterous puppies pretzel themselves back into what used to be Babesie’s cat carrier, she voices what the nursing truth of this—the strength and necessity of the One Health approach.

For WSU Tri-Cities psychology students examine causes of homelessness: magazine.wsu.edu/extra/homeless-causes

The University’s One Health clinics and the associated research are beginning to answer these questions.

“The hypothesis behind all of this,” says Slinker, “is that we will get better human healthcare when we also care for the animals people are bonded to.”

When stated so simply, it seems obvious. But it’s a surprisingly revolutionary idea. WSU is among only three U.S. universities to deliver integrated human and animal healthcare.

Eventually, Slinker says, he envisions establishing best practices and a body of knowledge that will convince lawmakers to allocate public funds to similar clinics statewide and nationwide. Nonprofit organizations would step in too, at some point—and some already have.

The February clinic in Spokane was partially funded by a grant from MultiCare Community Health Foundation, which owns Deaconess and Valley hospitals. The foundation also helped provide sterile supplies and a pet food bank.

If the idea of treating people and their pets together catches on, it could revolutionize the way society brings healthcare to those who live at the margins.

“A whole generation of health-care providers may have a different understanding of the larger field of medicine, having seen people and animals treated together,” says Slinker.

But starting a sea change isn’t easy. The very idea of providing veterinary care to the homeless sometimes meets reflexive resistance.

Carin Turbeville, who is one of two supervising veterinarians at today’s clinic in Spokane, says that some of her students didn’t see the point of it at first.

“They thought homeless people were being irresponsible by having pets—that these were people who just couldn’t take care of an animal. But when the first group of vet students got here and saw the pets and talked to the owners... after that day, minds changed.”

I hear a similar story from some of the nursing students who are on hand to do health checks and vaccinations for the clinic’s human patients. They weren’t sure at first that treating pets and people at the same time would be worthwhile.

As Andie’s examination ends, a volunteer with a clipboard hovers on the brink, unsure. The cat remains calm and pliant. Her owner, a shy teenager with pink and blue hair and a well-worn hoodie, replies to every question—she has wanted to bring her cat for a checkup but hesitates to commit to a visit. The teenager’s examination ends, a volunteer with a clipboard immediately engages her youthful owner in conversation, taking periodic notes. The cat, meanwhile, twines happily around her human’s ankles.

Andie is a gorgeous tortoiseshell cat. As Kuehl is mostly hands-off. The student is in his final clinical rotation, and Andie seems to have decided that as long as her human is okay with this, she can deal.

The clinic has all the business it can handle. Wedging my large frame into the corner of a small, crowded room in the homeless shelter, I take notes as unobtrusively as possible while WSU veterinarian Katie Kuhl helps a veterinary student examine Andie, a gorgeous tortoiseshell cat.

As Andie’s examination ends, a volunteer with a clipboard immediately engages her youthful owner in conversation, taking periodic notes. The cat, meanwhile, twines happily around her human’s ankles.

I realize that what sounds like a casual conversation about pets is actually very carefully crafted to collect data on the nature of medical care and pet ownership among the homeless. But research isn’t the only point. The cat has had her checkup, and the clinic’s staff want her human to see a health-care provider too.

When the nurse practitioner’s door opens, Andie the cat makes the decision by walking right in. The teen reaches for her human and looks back at her human’s face. “What, are we waiting for?” "
Spinach

BY ADRIANA JANOVICH

These leafy greens were fit for a queen. An American president, too. And, of course, a beloved comic strip character who became a pop-culture spokesman for the stuff.

Spinach

B Y A D R I A N A  J A N O V I C H

Spinach is full of vitamin ‘A’ and that’s what made it a favorite of America’s third president, the patch of the White House garden was planted in honor of America’s third president, the patch included prickly-seeded spinach.

Today, California—America’s top spinach-producing state—is one of five—its Skagit, Snohomish, and Whatcom Counties—as the Willamette Valley in Oregon grow about 90 percent of the U.S. spinach seed crop, or about 20 percent of the world’s spinach seeds, according to WSU plant pathologist Lindsey du Toit. She’s been doing research for nearly 19 years. “If you want to grow spinach seed you have to make it flower,” she says. “There’s no other part of the country that has the right conditions.”

Washington and Oregon are the only spots in the country that has the right conditions.

Spinach is a versatile vegetable that prefers cool weather and sandy soil. It’s a quick-growing crop with an 80-day growing season. In the summer, I like to add it to soups, casseroles, pasta or pizza sauces, and use it as a “bran” for salads. “In the summer, I like to add it to soups, casseroles, pasta or pizza sauces, and use it as a “bran” for salads.”

Spinach is a super source of non-heme, or plant-based, iron. Cooking could help. According to the U.S. Department of Agriculture, 100 grams of raw spinach contains 2.73 milligrams of iron while 100 grams of boiled spinach has 3.57 milligrams.

Spinach is also a super source of vitamin K as well as a good source of manganese and folate. Most of the iron in spinach, however, isn’t absorbed by the human body. Parking spinach with foods high in vitamin C—

Spinach sirloin is a quick-growing crop that prefers cool weather and sandy soil (so be sure to water it thoroughly). A member of the beet family, it’s closely related to chard. It enters spinach through its roots and is rich in beta-carotene, which our bodies convert to vitamin A, in turn, helps support vision, the immune system, cell growth, and healthy skin and bones.

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How may we help you?

The train rattles along the tracks as colorful graffiti flashes by my window on the Link Light Rail heading toward downtown Seattle. We pass through a progression of neighborhoods—Rainier Beach, Columbia City, Beacon Hill—and it soon becomes clear that some districts are more prosperous than others.

Debarking at the underground University Street Station, a gritty little elevator delivers me up into city skyscrapers and rain-soaked streets. Waiting for the light, I catch a glimpse of curious silver architecture peeking from behind the rows of dark towers. There, like a candle in the window, sits the Seattle Public Library.

Unique, surprising, and stunningly beautiful, the library is one of Seattle’s top tourist
Waiting at the reference desk on the main floor of Seattle Public Library, Linda Johns ’82 approaches me with a friendly smile. Dressed in a classic houndstooth sheath and low heeled boots, she deftly leads me on a tour of the facility.

Built in 2004, the expansive, geometric steel and glass building exudes an air of order and tranquility. On the third floor “Living Room,” patrons, homeless or not, are quietly seated reading or working on laptops. Rugs, individual lamps, a large planter box, and small coffee shop give the space a homey ambiance. “I love this building,” says Johns, reader services librarian and author of a dozen children’s books, including the Harriet the Horticulturist West mysteries set in Seattle. Instagram just named us the most Instagrammable library.

As we turn the corner to ascend a ten-story fluorescent-yellow escalator, it’s easy to see why. Designed by Dutch architect Rem Koolhaas together with Seattle-based LMN Architects, the colors and textures resemble a set from Star Trek more than a typical book repository. On level four, for example, stairs descend into a shadowed, curving, red hallway that holds a series of meeting and conference rooms. Stainless steel floors throughout the building are adorned with flower-like vents which increase air flow and diffuse problems with musty books, humidity, and poor hygiene.

On every floor, people are busy at computers, intently searching for jobs or housing, conducting university research, or just using email or Facebook to keep in touch with family and friends—relationships that, for the homeless, often fall by the wayside. “We have about 4,000 visitors each day to the Central Library,” says Johns as she points out features along the way. “People are still excited about books and circulation is strong. In addition, the library offers an astonishing assortment of online features ranging from free museum passes and concerts to local musicians to tax preparation assistance for those with incomes up to sixty thousand dollars. As the housing crisis has grown over the last five years, however, Johns says the library has shifted its attention toward equity, social justice, and removing obstacles such as lack of income or education that prevent people from succeeding in society.

“Throughout the SPL system, our librarians have a large focus on outreach—being out of the building and working in the community,” she says. “Whether that’s bringing hot spots to tent cities, signing up people for library cards, providing free meals at after-school programs, or teaching a class in a housing project, it could be anything.”

“We even have two courtesy phones for public use. It seems like a basic thing, but few pay phones are available anymore and if you don’t have a cell phone, you’re stuck.”

As we turn the corner to pass by a dark gray wall, Johns turns a key that seems to magically open a door to the library staff offices. Down the hall, she introduces me to Hayden Bass, SPL outreach program manager, who, for the last four years, has overserved many of the library’s social initiatives. “At their best, public libraries are engines for equity,” says Bass. “We try to eliminate barriers to library services and community resources for low-income populations as well as immigrants, communities of color, and others.

“We do this by providing access to education, job skills, Wi-Fi, and internet—things that are a daily part of life for many people. For others, there is a huge barrier to basic human needs like housing or applying for a job online.”

A key part of this effort involves bringing services to homeless encampments and day shelters, she says. Through city funding and private grants, they have installed Wi-Fi hotspots in tiny house villages throughout Seattle, including Georgetown with its tidy rows of brightly-painted homes.

To assist with the ever-growing number of requests, Bass says the library recently hired a full-time social worker to counsel patrons and connect them with emergency shelter, housing, food, childcare, healthcare, and other services. The social worker also helps people obtain identification cards and locate space to store their belongings. Through their overall personal experience has been positive, Johns and Bass agree that some citizens are put off by the sight of homeless people using the library. Indeed, there are occasional conflicts with staff or other patrons and problems with drugs, alcohol, and mental health.

“But, the regulars, the unhoused patrons who come in all the time, they want to do what’s right,” says Johns. “Those who respect and value the library want to help keep it safe and welcoming.”

“When you’re homeless, it’s so stressful trying to constantly figure things out and survive day to day,” she adds. “Shelters are very loud and there is no privacy. So, just having your own chair and a little perimeter of space around you as you read is so valuable.”

Like all libraries, SPL has posted rules of conduct but they’re basic common sense—you can’t smoke inside, in the restroom, or while listening to music, use headsets. No eating but you can bring your beverage in a covered container.

There are fifteen security officers on staff throughout the SPL system who Johns says is “instructed to be gentle and not aggressive. They greet patrons at the doors when we open at 10 a.m. and give them as many chances as possible,” she says. “They’ll often start a conversation by asking, ‘I don’t know if you’re aware of this rule but...’ They give them a chance to adhere to it—like you need to wear shoes inside the library.”

On the other side of the country, Tara Murphy ’05 faces many of the same challenges in her role as assistant director of information technology at the Free Library of Philadelphia.

Not to be confused with America’s first lending library—Benjamin Franklin founded the Library Company of Philadelphia in 1731 with his personal collection of 194 books—the Free Library of Philadelphia was created in 1899, and for the first time, gave average citizens free access to library materials and programs.

“With our library’s reputation as a public outreach efforts alongside her IT responsibilities at the Free Library of Philadelphia (FLP), says her city, like Seattle, is one of diverse neighborhoods and the library has a presence in 54 of them.
"The digital divide is incredibly high—59 percent of the population has no access to high-speed internet or computers in the home,” she says. That changes our role dramatically from being a place where people check out books to one where people come to apply for jobs and kids can do their homework. We have a free drop-in after-school program where we see around 2,000 kids every day throughout our system.

"Outside the library walls, the Techmobile—loaded with Wi-Fi, six laptops, and an internet-access similar ideas. We also have training on how to assist with ODs in our bathrooms and reading rooms. We have required training to leave their ID at the front desk when they use the bathroom because so many ODs happen there."

Murphy pauses and sighs. "Sometimes an overdose happens when kids are in the library and staff have to go over and administer Narcan. So, we have a lot of challenges.”

Like Seattle, the FLP has social workers on staff to help connect patrons to appropriate services, but Murphy says they could use a few more as the number of unsheltered people continues to rise. Beyond this aspect of their service, the FLP sponsors an immense array of programs and events spanning every imaginable topic and also provides 1,000 computers for public use. "The library is such a multi-faceted institution that it provides opportunities for education and development of students.”

Throughout their six branches, the FLP’s library already offers many nontraditional programs including STEAM technologies like 3-D printing and coding programs that may not be available in local schools. Additionally, the Downtown Library recently established a Library of Things managed by Cindy Wagner (’07, Ham.). She says the popular program allows patrons to check out items like snow-shoes, guitars, telescopes, sewing machines, energy efficiency kits, and much more. They even provide free music and voice lessons.

But, the library’s biggest effort, says Donovan, is an ongoing partnership with Spokane Public School District 81, the second largest school district in Washington. The collaboration has drawn national interest and stands as a role model for other communities hoping to implement similar ideas.

"This creativity is clearly on display at the Spokane Public Library's Hillard branch where a quaint old card catalog has been repurposed as a seed library for local customers. Each drawer contains assorted edible and ornamental plant seeds including heirloom varieties. “There are several common community gardens in Hillard and we hope to see people growing vegetables with their families to help reduce food insecurity,” says Librarian Cathy Bakken. The Hilliard neighborhood is a very low-income area.

"Hill-19 percent of Spokane Public School students live in poverty according to federal lev-
Seventy miles north, in the small timber town of Colville, I’m greeted by Sarah English (‘94, ‘95, ‘96), manager of the stately Colville Public Library. The ultimate Coug, English sports a red dress, WSU bracelet and watch, and crimson-rimmed eyeglasses.

Her cheerful soft-spoken demeanor is a bright spot in a county that has long been economically depressed. Access to computers, internet, and television are further limited by Colville’s mountainous terrain but English says the library helps level the playing field both in terms of technology and community spirit.

Such was the case with the 2015 Light Up the Park event held in nearby Chewelah when English was manager of Chewelah Public Library.

A newspaper survey had just designated Chewelah as the poorest city in Washington state, she says. Though the townpeople knew they were materially poor, they always believed there was wealth in their hearts. And, so, after discussion, they decided to take on the Guinness Book of World Records. The project started that spring when English handed out free pumpkin seeds at the library and enlisted Master Gardener Mary Sety to hold a planting class. Participants tracked their vines’ growth and compared notes. The mayor gave presentations.

Eventually, just before Halloween, Chewelah’s 3,000 citizens had grown and carved 1,951 pumpkins—each complete with eyes, eyebrows, a nose, and mouth—and trotted them to the park.

“There was a real sense of pitching in together to make a beautiful event,” English recalls. “People may think our city looks shabby, but, by gosh, we looked like a Hallmark movie that day. Hundreds of carved pumpkins glowing in a light evening mist.”

“We lined them all up in a serpentine formation and ended up with the world’s longest continuous line of carved and lit jack-o’-lanterns for one week. That’s a pretty heady thing when you supposedly live in the poorest town. I like to think the library had a big role in that.”

English says small towns typically have few places for community members to gather, and the library offers a chance for people to network, learn about the world, and feel a part of humanity.

“It’s a real cultural exchange,” she says. “We’ve even had a woman selling eggs and turkeys here.” At Colville’s library, public computers are loaded with Word, Excel, and databases like Learning Express that offer practice tests for jobs such as postal inspector and nursing, as well as for GRE, SAT, and citizenship tests. Printing and scanning services are provided and English even proctors tests for students in distance education courses, enabling them to get online degrees.

They also extend their wireless network into the library parking lot, giving citizens 24-hour internet access from their cars. The password is posted on the library door.

“No matter your monetary or housing status, there’s a place for you here—like all these books, you belong and contribute to the richness of the library,” she says. “I think our staff helps foster that idea by greeting people by name and being welcoming.”
“There are oysters out there,” says Ed Bassett, “and they are good.”

Out there are the mudflats of Henderson Inlet where a thriving community shellfish garden supplies delicacies for neighborhood parties and celebrations. Bassett (’89 Ed.) is standing in the eelgrass on the shoreline of Washington State University’s Meyer’s Point Environmental Field Station established in 2003.

He’s a science teacher at nearby Olympia High School (OHS), and has his students in the OHS Earth Corps, and Meyer’s Point facilities manager Chuck Cody (’84 MS Hort.) have been planting native trees here since then.

WSU environmental scientist Steve Bollens is the director of the station. He calls Meyer’s Point a hidden gem and a too-well-kept secret. Bollens and his colleagues are determined to use the site to explore the urban-rural interface, that delicate balance between the resource-intensive and environmentally taxing human infrastructure of the built environment, and our growing awareness that things just aren’t right without a healthy environment in which to play, meditate, and raise kids.

The 95-acre site has nearly half a mile of shoreline, acres of marshy wetland, and an expanding forest that climbs a steep slope. At the top of the property is a 12-acre hay field. For WSU researchers, the mix of agricultural land with forest and shoreline tantalizes mathematicians modeling forests, biogeochemists seeking to understand how fungi partner with plant communities, and archeologists who inform the present with lessons from ancient Native residents. “There’s something for everybody,” says Bollens.

Bassett meanders through the restored forest; he offers a warning about the mud in his soft Georgia drawl: “You could find yourself in a seated position real fast.”

Bassett has been best friends with Cody since the 1980s. “We hit it off the day I was unloading my U-Haul,” says Bassett, “and Chuck stopped to help.” Cody was a graduate student in Pullman, while Bassett had come to take a job with James Cook, a wheat root disease researcher. As soon as Bassett graduated with his teaching credential, he landed the job at OHS and has been there ever since. Sometime in 2003, he got a call from Cody.

“He said, ‘I’m going to be in your neck of the woods. We have this property, and it needs a bit of work.’”

That, it turns out, was an understatement. What is now a 16-acre forest was then an abandoned dairy cow pasture that had been overrun by a vast tangle of blackberry vines. Where there weren’t blackberries, there were red alders. Cody wanted to accelerate the process of succession, with the goal of restoring a mixed-species native climax forest. Successive waves of Bassett’s Earth Corps students gave the old pasture many Saturdays over many years, tearing out berry brambles and replacing the alders with Douglas firs, grand firs, western red cedars, big leaf maple, Oregon ash, and, later, hemlocks that thrive in the protection of an established conifer forest.

The first planting, Cody says, was on Valentine’s Day, 2004. Those saplings are now 30-foot tall trees and one of Bassett’s former students has her own virology lab at Brandeis University.

That’s not the only success along Henderson Inlet. When Cody and Bassett first started coming to Meyer’s Point, there was no shellfish garden; the water quality was too poor. But a concerted—and expensive—collaboration between local residents and various state and local government agencies and nonprofits led to an upgraded infrastructure, including better septic and stormwater runoff management systems. By 2017, and “after more than 20 years of work,” according to a Washington Department of Ecology
assessment, “the results of the Henderson Inlet watershed partnership are among the most positive results in any Washington watershed.” That dramatic improvement in water quality has meant that shellfish gardening could move to the southern end of the inlet, including at Meyer’s Point. There, OHS students volunteer to help plant oysters in the local community garden. The Nisqually Tribe, too, garden and harvest the delicacies, which they sell to area restaurants.

Music of the mists
Meyer’s Point was a gift from Dr. Edward Meyer (’38 Pharm.). After medical school in Louisville, Kentucky, and service in the Second World War, Meyer returned to the area where he was raised to practice medicine. Doc Meyer’s shingle still hangs from one of the buildings at the station. Meyer bequeathed the property to WSU before he died in 1993, asking that it be used for environmental and arts research and education. He also left the University an endowment that established professorships in the arts and sciences. Composer and saxophonist Greg Yasinitsky is a former Meyer Distinguished Professor, and he was also one of the first faculty members to visit the field station.

Yasinitsky visited Meyer’s Point in the summer of 1995. He tromped around the property for a couple of days, shooting video and making audio recordings of wind, birds calling, shoes in mud, and the lapping of water. When he got back to Pullman that fall, he composed “Meyer’s Point” for flute and piano. The one-movement piece is a challenging showcase for Ann Marie Yasinitsky, a virtuoso flutist, and perfectly evokes the ethereal mists that hover over the salt marshes and the tumbling sky that deepens the perspective up the long northward reach of the inlet.

On another day, Bassett might hear another sort of music: the whine of Nick Strigul’s drone as it curls above the forest snapping high-resolution photographs.

A silicon forest
Strigul is a mathematician based at WSU Vancouver, 90 minutes south of the Meyer’s Point station. “A big part of my work,” he says, “is forest modeling, the self-organization of forest ecosystems.” That’s why his drone is circling the forest at Meyer’s Point, collecting data that both informs and confirms his modeling efforts.

The trick, he explains, is to gather together all the individual studies of ecosystems components into “a single, highly complex model.” A forest is not just trees: it is microbes in roots and branches, insects, birds, animals, forest-floor flora, all of which “operate on different time and space scales and yet interact in profound and important ways. The importance of bringing mathematics to bear is that it provides a path toward understanding the interactions and differing scales.” Getting all that data onto the same virtual page is just the first challenge. Any model, whether of climate or forest or shoreline, must be validated against reality.

“But to compare to reality, you need a data-intensive baseline to test against,” Strigul says. “It’s hard to find a particular place where you have sufficient data, where everything is measured. Where each individual tree, and all the fluxes of carbon, nitrogen, and trace gases, the soil nitrogen and carbon, where all that is known and measured.” Creating such a baseline is expensive and long term, he says. Harvard University has an experimental forest that has been monitored for decades. But there’s not really anything like that in the Pacific Northwest. Perhaps, he muses, Meyer’s Point could become a baseline for regional forest modeling.

Since the 1960s, he explains, researchers have been using computers to model forests. Foresters want to understand how to get maximum yields and wood quality, while ecologists wanted to grasp the entire system. Foresters aren’t interested in tree mortality, because they’ll harvest before a tree reaches the end of its natural life. And the same with pests: foresters try to wipe out the pest. But ecologists want the big picture. For decades, ecologists got the short end of the
computing stick simply because processors simply couldn’t handle the massive data required to model a real-world ecosystem.

Ecologists, Strigul says, ‘had to be very picky about what they put in their models. But now, computers are so powerful you can put it all in there.’

The value of a high-resolution model would be extraordinary. All manner of experiments could be run in silico, yielding quality results at the speed of microprocessors instead of commensuring decades of real-life. The effects of a warming climate, drought, fire, and much more could be modeled, informing decision makers and resource managers about particular courses of action.

Strigul says his goal is to “drive out the uncertainty” that exists in “models that do not completely reflect reality.”

As below, so above

Fifteen thousand years ago, the Vashon Glacier buried this region with meters of ice. The massive glacier shoved south of Olympia at its greatest extent. As the planet entered the warming Holocene, the glacier retreated, melting, filling the finger-like fiords of the Sound with water. Plants and animals rushed back in to the newly hospitable environment; biology abhors a vacuum.

Now, as the climate is changing again, Bollens and others consider how this jewel-like spot of earth might help us meet our future with grace. One of the values of Meyer’s Point is that it inspires awe and a love of nature. And that inspiration is a timely remedy to the angst and fear that permeates discussions about climate change. And while that fear is in some sense justifiable—if we’re not to burden today’s children with a grim, superstorm-ridden future, time is indeed short to make meaningful change—fear also paralyzes while love of nature energizes and motivates constructive action.

Someday, Bollens speculates, a trail system might connect this field station to other ecological reserves on Henderson Inlet. But, he cautions, public access has to be balanced with maintaining the integrity of ecological and archeological research sites. Bringing together the missions of research and public education in a place this fragile, Bollens says, “is a balancing act.”

“Virtually every field station has this tension between maintaining resources for researchers and wanting to open things up for the public,” he explains. “Some are so remote it’s a moot point. Not Meyer’s Point, here in the midst of millions of people. Is that balancing act daunting? Standing next to his car at the entrance gate, Bollens looks back down the slope to the shoreline and says, ‘It’s daunting in that it takes millions of dollars to build facilities and infrastructure. But this is a fabulous site and is already drawing tourists.’

But most of all, he says, is they just wanted to clean the place up and have it all of native plants and wildlife. Overhead, birds on the Pacific flyway call and then, as the sound of departing cars fades away, everything is quiet except for the music of the wind in the trees.
The Indian name of Annita Lucchesi (’16 MA Amer. Studies), who is a Southern Cheyenne descendant, is Hetoevėhotohke’e—which translates to the peaceful sounding Evening Star Woman.

But Lucchesi calls herself mé’ê´ sko’áe—a hellraiser girl, one who is always stirring things up.

In November 2018, Lucchesi produced a groundbreaking report that was published by the Urban Indian Health Institute, a division of the Seattle Indian Health Board. U.S. Senators Maria Cantwell and Patty Murray and Representative Derek Kilmer, from Washington state, attended a news conference unveiling the report.

It revealed that there were 506 cases, dating back to 1943, of American Indian and Alaska Native women and girls across the United States who had been murdered or are missing. Most of the cases had occurred between 2010 and 2018.

Based on that report, which was limited to certain American cities, Lucchesi estimates there are at least 25,000 such cases dating back to 1900 in the United States and Canada.

“We, as a community, already knew that this violence was occurring. But because there is such a lack of communication between law enforcement and the community on this issue, we knew it was bad, but we didn’t know how bad,” Lucchesi says. “And so, now that we have some concrete numbers, even though they’re an undercount, I think it’s really horrified and disturbed a lot of people and I’m really excited to see what happens moving forward.”

The main reason that so little attention is paid to missing and murdered Native females, according to Lucchesi, is racism in some law enforcement agencies.

“And that trickles down into the protocols and practices, that trickles down into negligence,” she says. “There’s all sorts of ways that that influences the way that police departments do—or don’t do—their job.”

Lucchesi is now a doctoral student in the Cultural, Social, and Political Thought program at the University of Lethbridge in Alberta, Canada. She says her independent research on missing and murdered Native females grew out of the master’s thesis she did at Washington State, which maps intergenerational experiences of genocide in Native communities.

“My experience is that families do report missing persons cases and they’re often turned away by law enforcement.” Lucchesi says. She says the families “are told, ‘Well, she’s probably just off partying—come back in a couple weeks.’”

“That’s illegal,” Lucchesi says. “They’re not supposed to do that; they’re supposed to take a missing persons report right then and there, but they’re not doing that.”

And when police agencies don’t take missing persons reports, that means there typically is no public announcement of the case and no news coverage of it, she says.
Lucchesi points to the case of Ashley Lovelace Haynesmore, who went missing from Montana Blackfeet Reservation in June 2017. The FBI announced in March 2018 that it was investigating the case. But according to Lucchesi, family members had been pressing local and tribal police agencies for months before that, with no results. "Know that they felt, and that the community has felt, that there wasn’t enough follow-up—too little too late."

The cases in Lucchesi’s report were identified from data on information requests made to law enforcement agencies, state and national missing persons databases, searches of local and regional news media online archives, public social media posts, and direct contact with family and community members who volunteered information on missing or murdered loved ones.

It cites problems with law enforcement jurisdiction disputes and lack of record keeping, as well as lack of media attention to such cases.

Lucchesi says. One step, which is included in federal legislation known as Savanna’s Act, would require police agencies that receive missing persons reports to notify tribes, so that they might help locate the missing person. “That’s free and easy to do and yet is not being done anywhere,” Lucchesi says.

It’s worth noting that a couple of months before the report was released, the Associated Press produced a lengthy article examining why Native American women go missing. The article said the issue is gaining traction among federal lawmakers.

Savanna’s Act is named for a young Native woman, Savanna LaFontaine-Greywind, who was murdered in 2017 in North Dakota when she was eight months pregnant. The bill failed to pass in 2018, but was reintroduced in January. It aims to clarify the responsibilities of federal, state, tribal, and local governments; to improve coordination and communication among them; and to increase the collection of data on missing and murdered Native females.

Conserving Hanford’s visual history

Harley Cowan (‘96 Arch.), on a tour at Hanford’s B Reactor a number of years ago, first heard about the old wooden swivel chair set in front of arched electronic panels from an original occupant. The tour docent, panels. McCullough’s story ran through his mind, so he asked to see the original chair and then captured it on film. Cowan had returned to Hanford as part of a research fellowship in 2017 to photograph historic sites within the new Manhattan Project National Historical Park. The original chair was one of many images that gave Cowan a feel for Hanford’s historic places.

It was a dream project to photograph B Reactor, including some areas off limits to tourists—and requiring protective gear—as well as around the rest of the Hanford site.

The first showing of the photographs was at Hanford itself in the spring. They even had a notable guest: former Secretary of Defense James Mattis, who was born in Pullman and grew up in Richland, and whose father worked at Hanford.

In addition to a display at Hanford Site, Cowan worked with WSU architecture professor Phil Gruen to contribute photography to the Washington State Archipelago website, a wiki for historic sites throughout the United States. Gruen and Robert Franklin, historian at WSU Tri-Cities and assistant director of its Hanford History Project, provided written content.

Franklin and Jillian Gardour-Andreas, coordinator of Hanford History Project, are also assisting Cowan with identifying new subjects to photograph to tell a broader story about domestic life around the Manhattan Project.

Cowan will provide ten to twelve prints for display at the Manhattan Project National Historical Park visitor center in Richland from April to October 2019, as part of the Manhattan Project’s seventy-fifth anniversary. He will also have a solo exhibition for the Manhattan Project photography at CameraWork Gallery, the nation’s oldest, continuously running fine art photography gallery, in Portland, Oregon, from August 3 to 30, 2019.

Dee McCullough, was one of 40 people who gathered in the control room on September 26, 1944, when the reactor first went critical. The former Hanford engineer told Cowan’s tour group that he had no idea what would happen next, nor even the reactor’s purpose.

“there were so many ‘wow’ moments,” says Cowan. “I was able to access areas I had never seen before.” At the Hanford Site, Cowan took photographs with a large format film camera, following the Secretary of the Interior’s 1993 guidelines for historic documentation, which continue to require black and white film, hand processed, for the Library of Congress archives.

Cowan, a professional architect and photographer, had long been fascinated by Hanford. He grew up in Richland and worked in the nuclear industry during high school and while attending WSU.
Once settled into practice statewide, however, Slack was caught off-guard when he found himself struggling to help clients and coworkers isolate so easily and many suffer in silence.

“Veterinarians enter their careers with the best intentions...”

Robert Slack '71 DVM thoroughly enjoyed his years as a veterinarian. An adventurous man, he chose to begin his career in Arizona and, later, traveled back to the United States on a camping trip through Iran, Turkey, India, and Pakistan. He even stopped off to run with the bulls in Pamplona.

He found himself struggling to help clients and coworkers isolate so easily and many suffer in silence. Slack shares those insights — along with tales of his own dogs, Shilo and Balter — in public presentations at humane societies, dog clubs, pet groups, and churches.

“Figure things out, but this reciprocity, this shared relationship with a pet — it’s something for people.”

* * *

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“Figure things out, but this reciprocity, this shared relationship with a pet — it’s something for people.”

* * *

When the Prussian Princess Sophia of Anhalt-Zerbst died (and possibly murdered) her husband, the Russian Emperor Peter III, she became Empress Catherine the Great. Catherine ruled from 1762 to 1796. She ushered in a golden age for the empire because she herself was obsessed with improving the health and quality of people's lives. She introduced many reforms that significantly improved living conditions for all citizens of the empire.
NEWmedia

BRIEFLY NOTED

Millenial Millennials: A Handbook to Crypto Investing
ZACHARY HOFMIEZER '07 BUS, TIMOTHY SUGGS, AND JOHN GRASSOY 2018

The authors, who successfully invested in cryptocurrencies, offer a better understanding of what crypto is, how to invest, and most importantly, how to find undervalued investments and exit in early.

A State of Grace
RITA CATCHING '03 MNURSING 2018

Retired nurse Catching’s debut novel follows the adventures of Eastern Oregon nurse Libby Clendenin, who runs up against a U.S. Senator and two murderers as she tries to fulfill the wishes of a dying patient. The book was selected as a finalist for a prize from the Crime Writers’ Association in 2016.

Outdoors Stupid from Around the World
F. ROBERT BELL 66 CIV. ENG. 888 PUBLICATIONS: 2016

Bell tells humorous tales of close calls in the outdoors around the world, related to him from guides, hunters, and outfitters who he met on his travels from Africa to Argentina.

Insects Did It First
GREGORY S. PAULSON ’90 PHD ENTM. 2018

The book highlights physical and behavioral capabilities that insects evolved before other animals; highways, domestic animals, flight, and even glue are among the more than 80 “firsts” from insects. It’s the second edition of a book by two WSU entomologists published in 1992. E. Paul Catts and Roger Alex. A portion of the sales will be donated to the E. Paul Catts Memorial Lectureship fund and the Roger D. Alex & Carl A. Johannsen Scholarship fund through the WSU Foundation.

Little Rhymes for Lowly Plants
PAUL J. WELLS ’50 MA, ’58 PHD
WHITE VIOLET PRESS: 2018

This new collection is comprised of botanical, biblical, somewhat cynical, and otherwise oddly sentimental verses in rhyme and meter, from Wells’s residency in North Cascades National Park.

Billy the Balloon
DANIEL MOORE ’94 AG. ECON.
ELM HILL: 2018

This illustrated children’s book tells how a farmer, his special needs grandson, and a young city girl are wondrously brought together for a benefit party by a balloon named Billy. Balloons caught in fences and laying in his fields caused Moore, a fourth-generation wheat farmer, to ponder wonderful questions he turned into stories for his young daughters. His special needs grandson inspired him 25 years later to turn those musings into a book.

Leading the Crimson and Gray
The Presidents of Washington State University

In Leading the Crimson and Gray, twelve writers brilliantly chronicle the lives and amazing legacies of those who served in one of WSU’s most visible roles—president. Despite significant challenges, their accomplishments were substantial: from launching the college to winning state legislative backing for a new medical school and numerous contributions in between, they left legacies that make the Cougar Nation proud.

Limited to 125 numbered copies, each collectible hardbound is signed by current WSU President Kirk H. Schulz and WSU Regent Scott E. Carson.

WSU Press books are available at bookstores, wsupress.wsu.edu, or by phone at 800-334-7760.

Washington State University Press, PO Box 649310, Pullman, WA, 99164-5310 | 509-335-3138

Leading the Crimson and Gray

When Thomas Graedel Studied at Washington State University in the Late 1950s, a Faculty Member Told Him That Chemical Engineering Graduates Could Do Anything. Graedel Took Those Words to Heart and Long Before Sustainability Was Part of Business and the American Consciousness, He Was Conducting Pioneering Research in These Fields.

“By training in chemical engineering I was more inclined to follow whatever interesting problems I found rather than stick to a specific definition of a career, says Graedel (’60 Chem. Eng.), the latest recipient of WSU’s highest alumni award. “In fact, I would say my career has been completely unpredictable.”

Graedel grew up in The Dalles, Oregon, and then Spokane, where he credits a teacher at North Central High School with getting him interested in chemistry. After WSU, he received a master’s degree in physics from Kent State University. Caught upon the excite- ment of the Gemini astronauts and prospects of a moon landing in the 1960s, he earned a doctorate in astronomy from the University of Michigan in 1969, then went to work for AT&T Bell Laboratories in New Jersey. During his time at Bell Laboratories, he first became interested in industrial ecology.

Several researchers were trying to ensure that the Bell system was meeting the environmental regulations of the 1971 Clean Air Act.

With his background in atmospheric chemis- try, Graedel became part of the environmental team studying the company’s atmospheric emissions. The group realized that in an industry that used a lot of energy and materi- als, they could find effective ways to increase manufacturing efficiency and minimize im- pacts, and do so in a more sustainable manner.

Graedel and a few colleagues, both at Bell Laboratories and in other industrial laboratories, began developing the field of industrial ecology, in which one aims to design processes and manufacture products in such a way as to minimize materials use, energy consumption, and environmental impacts. Interest in their work grew. In 1995, he and a colleague, Brad Allenby, published a textbook on their work, Industrial Ecology: The Foundation and Sustainable Engineering, in 2010. In their text, the researchers discuss how materials and energy are used, what gets reused, and what gets lost. Then they explain industrial product and process design to minimize impacts and promote recycling and reuse. Graedel developed a simple ma- trix that improved the existing methods of life-cycle analysis. Their work has become standard practice in industry.

“I think a background in engineering, in general, and chemical engineering, in par- ticular, provides a combination of knowledge and scholarship, but at the same time, the application of that knowledge and scholarship to real world problems, “ he says, “I think it’s been a good foundation for reaching out in directions that seem to be interesting and useful.”

For his contributions to environmental sciences and “the need to discipline of industrial ecology,” he was elected a fellow of the Ameri- can Association for the Advancement of Science in 1998. For his pioneering research and outstanding contributions to the engineering theory and practice of industrial ecology, he was named a member of the prestigious National Academy of Engineering in 2002.

His research career has been widely varied, including conducting research in solar physics, chemical kinetic modeling of gases and droplets in Earth’s atmosphere, corrosion of materials by atmospheric spe- cies, atmospheric change, and industrial ecology and sustainability science. He is an author or coauthor of 18 books and nearly 400 technical papers. His work has been cited more than 25,000 times.

Graedel also did pioneering work in atmospheric chemistry. He and colleagues at Bell Labs were the first to warn of urban methane and carbon monoxide increases in the late 1970s. Both gases are now un- derstood to be significant contributors to global warming. Along with Nobel laureate atmospheric chemist Paul Crutzen, Graedel wrote Atmosphere, Climate, and Change, pub- lished in 1994. The authors received the American Meteorological Society’s Louis J. Balan Award in 1995 for their work. He later joined Yale University in 1997 as a professor of industrial ecology.

For his contributions to the understand- ing of atmospheric chemistry and his work to develop the field of industrial ecology, Graedel, now professor emeritus and a senior research scientist at Yale, received the 2019 Regents’ Distinguished Alumni Award, the University’s highest alumni honor.

“Dr. Graedel is a trailblazer in his field,” says WSU President Kirk Schulz. “His research not only has significantly improved industry efficiency and provided the world with a diverse supply of metals, and many everyday products require alloys that are made of scarce elements, such as tungsten, gadolinium, or vanadium.

“Every time we think about resource sustainability in detail, we trip over the fact that we don’t know enough about uses and losses across the full periodic table,” says Graedel. “It’s an issue that hasn’t been appreciated.”
Alumni Association News

Making history

Last fall, the WSU Alumni Association launched a new membership drive with the goal of reaching 40,000 members by 2020. The membership drive, known as “40by20,” is more than a little ambitious. However, its success is confidently based on the fact that Cougs join the Alumni Association because they love WSU.

Why 40,000 members? More members mean more support for WSU. For the University, Alumni Association members make the world go around. According to university research, members are more involved with WSU and provide more generous support to WSU.

Being a WSUAA member is much more than a small rectangle of plastic in your wallet (although who doesn’t love seeing that Cougar logo every time you reach for that card?). Membership, at its core, is a reflection of the deep commitment members have to our great University. Membership makes it possible for the WSUAA to host 70+ alumni events each year across the country, manage the Cougar license-plate program that generates over $650,000 in student scholarships annually, engage over 40,000 members each year as they engage in WSUAA events and programming, and more.

THE WSU ALUMNI ASSOCIATION’S 40BY20 MEMBERSHIP DRIVE

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Tangible rewards are certainly a benefit of membership, but the early success of the “40by20” campaign shows that Cougs are joining the WSUAA for much more than that. Simply put, they join because of the heartfelt connection they have with WSU. The WSUAA launched the drive by including an online mosaic tool where Cougs can search or upload their favorite WSU photos and memories—and members can share their cherished WSU connections to inspire other Cougs to join. These alumni and friends have expressed their affection and appreciation for WSU and the WSUAA for so many happy life moments. If you haven’t already shared your own WSU photos and memories, we encourage you to do so at alumni.wsu.edu/40by20.

Since the launch of the drive, membership has jumped by nearly 8 percent—a huge step toward 40,000. To all the Cougs who have already joined the WSUAA, you are helping the Association edge closer to the 40,000-member goal. To those who haven’t yet joined, see what all the excitement is about at alumni.wsu.edu/40by20, and help WSU and the WSU Alumni Association make history.

40,000 MEMBERS BY 2020

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*Well, Cougs overachieve, but you get what we’re saying.
Perfect for Graduation, a Special Occasion, or Tuesday
How often can you give a gift that puts a smile on your recipient’s face and supports your alma mater all at the same time? You can do just that when you purchase a gift membership in the WSU Alumni Association.

Recently, we heard from an alumna whose father bought her a WSUAA Life Membership as a graduation gift…in 1947. She told us she has treasured the gift and her father’s thoughtfulness throughout the 70 years since. How many gifts can do that?

How many gifts can do just that when you purchase a gift membership in the WSU Alumni Association. For more information, visit AuctionofWaWines.org

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120+ WINES TO TASTE
30 DAILYLOTS TO BID ON
8 GUEST CHEFS
Enjoy music, games of chance and more!

BRENDAN PAGE (’91 Poli. Sci.) has been promoted to president and CEO of Bryant Group, a leading executive search and talent development firm specializing in the advancement field in higher education, healthcare, and not-for-profit institutions. BRYAN GRENON (’89 Soc. Sci.) has been promoted from captain to brigadier general in the Washington State National Guard. He is now the land component commander and will be responsible for the training of over 6,000 soldiers.

DAVID BEACH (’91 Poli. Sci.) has been named city manager of West University Place, Texas. He has worked in the community since 2005.

MICHAEL CHRISTENSEN (’91 Soc. Sci.) was recently named golf director of Circling Cherry Growers’ Cherry Institute in Yakima on January 18. He began his career picking cherries in Orondo in 1969. Williot returned to the state in 1989 when he went to work with WSU Extension in Yakima as a service agent for tree fruit and integrated pest management. He plans to retire in June.

JOHN MARTINS JR. (’82 Ham.) received first place in the Family/Teen/Animation category of the eleventh annual StoryPros Awards Screenplay Competition for his script Antone Samue.

KELLY FURHMAN (’87 Nur.) opened Lakeside Medicine and Aesthetics in Sandpoint, Idaho. She aims to solve the patients’ immediate medical needs whether or not they are covered by insurance. Furhman, a nurse practitioner, previously worked at Holy Family Hospital in Spokane and then for a Sandpoint doctor.

SALLY BRYANT-DECHENNE (’89 Engls.) was recently promoted to president and CEO of Bryant Group, a leading executive search and talent development firm specializing in the advancement field in higher education, healthcare, and not-for-profit institutions.

JAMES M. MALCOLM JR. (’88 Crim. Jus.) was appointed to the role of director of probation services for the Skagit County District Court in Mt. Vernon.

SEYI ONAGORUWA (’99, ’01 MS Mech. Eng., ‘05 MS, ‘07 History, Soc. St., ’13 PhD Agric. Sci.) has been appointed to the role of CEO at the Johnson Cherry Growers’ Cherry Institute in Woodinville. He has extensive experience in administration for regional critical access hospitals.

CAROLINA TORGES (’01 MS, ’05 PhD Hort.) has been named WSUWSL’s first endowed chair in tree fruit postharvest systems. Her main responsibilities will include helping Northwest tree fruit growers and packers bring their best produce to consumers more profitably and sustainably.

ADAM ORTH (’99 Comm.) was promoted to vice president of sales, sports, and automotive for iHeartRadio in the Pacific Northwest region. He will oversee advertising sales and strategic partnerships for sports radio and is responsible for leading teams in the automotive category throughout Washington, Oregon, and Alaska.

Merrill Lynch announced that TROY BRAGA (’04 MBA) has been awarded the certified financial planning advisor credential offered through The National Association of Plan Advisors. He is based out of Coeur d’Alene, Idaho. SEAN MCCALLISTER (’03 Health Policy & Admin.) has taken on the role of CEO at the Johnson County Healthcare Center in Buffalo, Wyoming. He has extensive experience in administration for regional critical access hospitals.

MEAGAN BAKER (’06 Arch.) has been promoted to an associate position with SotoDiment Architects. She has over 12 years of design and planning experience and is currently working on the new Meadow Ridge Elementary School in Mead, Washington.

BRAD LIEBERFELT (’07 History, Soc. St., ’13 PhD) has been named chief information officer at the Oregon State University System. He has over 20 years of experience in higher education technology and information systems.
Nicaragua: The Outlaw State
In addition to his book, Reagan’s War on Terrorism in Central America: The Nicaragua Contras, is also the author of the
copies of his award-winning book, "Nicaragua: The Outlaw State," which is currently in its second edition. His research focuses on the validity and measurement of the Political Risk Report, a publication that analyzes and ranks countries based on their political stability and risk.

Just in time for the upcoming election, Gaskins is working on a new book that will provide insights into the political landscape of Central America. The book will cover the events leading up to the 2016 election and explore the impact of the election on the region.

Gaskins is also working on a series of articles for the Oxford Encyclopedia of Latin American History, which covers topics such as political stability, economic growth, and social issues in Latin America. The articles will be available online and in print, and are expected to be published in the coming months.

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Correction: In the Spring 2019 issue, “Donald Amos Houck” listed in In Memoriam should have been Donald Amos Houck (47 Ed. Sec.), 94, October 1, 2018, Bellevue.
Do you want to make a tax-smart decision while supporting the next generation of Cougs?
We can help. After you turn 70½, you’re required to withdraw from your IRA annually.
Transferring those funds directly to the WSU Foundation supports the areas you’re passionate about, and you avoid paying income tax. It’s a win-win.

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or visit foundation.wsu.edu/ira to learn more.