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Matters of taste:

PATRICK ROTHFUSS '02 — WORLD BUILDER :: TASTE, AN ACCOUNTING IN THREE SCENES ::
PASSING THE SMELL TEST :: HOW WASHINGTON TASTES — THE APPLE MEETS COUGAR GOLD





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I'd be lying if I claimed not to prefer the golf swings of Bobby Jones or Sam Snead to that of Tommy "Two Gloves" Gainey. So I guess I'm a snob. *by Bill Morelock '77*

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On the cover: "Snow White" by Jung Von Matt for Ed. Wüsthof Dreizackwerk KG.

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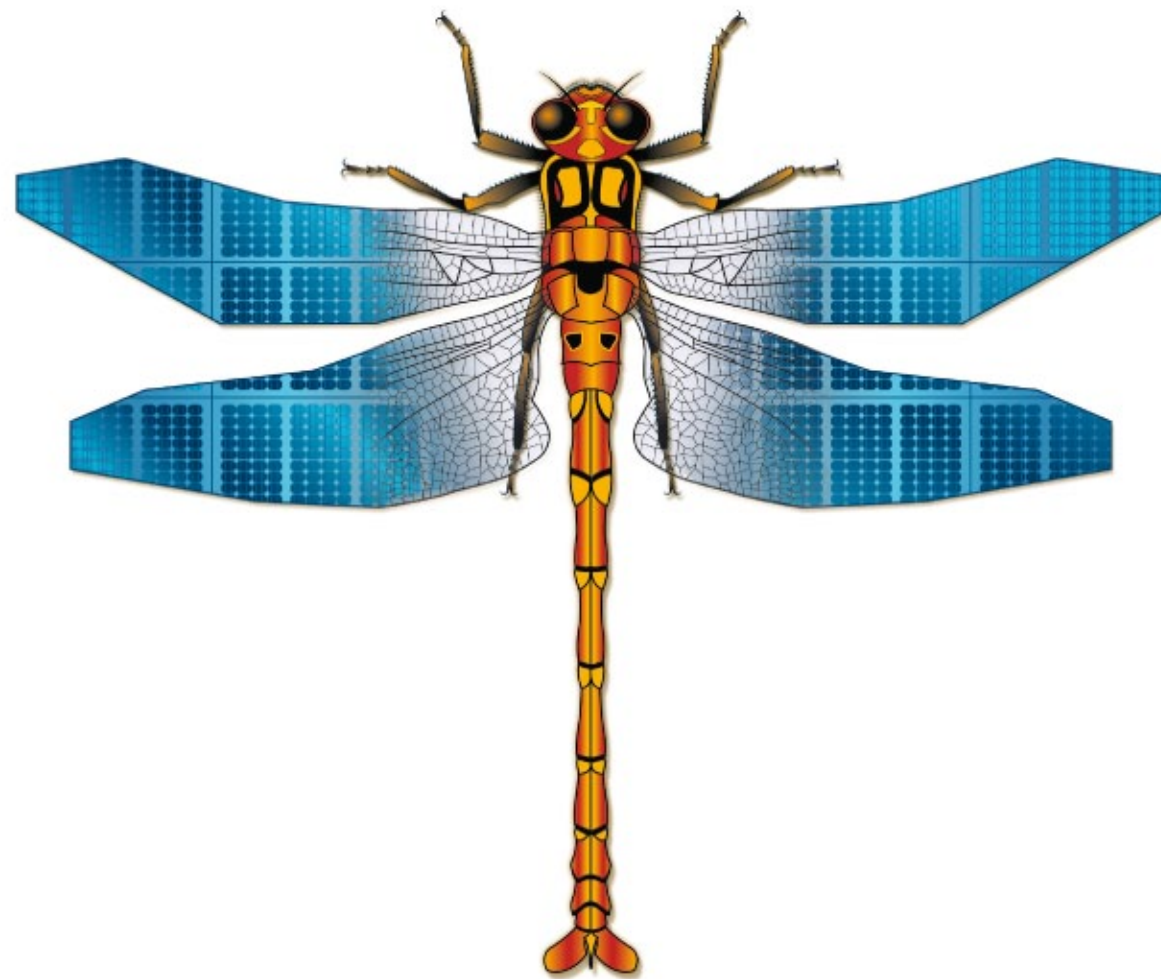
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first words

Tastes like Beethoven :: The 1909 National Apple Show in Spokane featured competitions, band concerts, vaudeville shows, and 1,525,831 apples. Spokane schools closed for a day so all the students could visit the exhibition, which spread across three and a half acres and featured intricate displays such as a giant American flag composed of apples and boxcars full of neatly packed apples.

Growers, shippers, bankers, and hundreds of the merely curious from around the Northwest flocked to the exhibition to revel in the fruit that Washington grew so well. When everyone had had their fill of the spectacle, the whole show was packed onto a special train and shipped off to Chicago.

A little more than a decade later, the epicenter of Washington's fruit industry had shifted to Yakima and Wenatchee. Although the first commercial orchard in Wenatchee was established in 1884, it took a while for growers in the rest of the state to accept that there was no better place in the world to grow apples.

Irrigation helped that movement, of course. Work on the Sunnyside Canal began in the Yakima Valley in 1885. In Wenatchee, the Gunn Ditch project began in 1896 and the Highline project in 1902.

By the 1920s Washington surpassed New York as the leading apple-producing state. According to Amanda Van Lanen '04, in her fine dissertation on the early history of Washington's apple (*"We Have Grown Fine Fruit Whether We Would or No"*), the industry's success was due to an unprecedented combined effort of railroads, real estate boosters, agricultural colleges, and growers.

But as Van Lanen explains, that growth required a tightened focus and a resulting reduction in diversity. From the dozens of varieties represented at the National Apple Show, by the 1930s standardization of management, packing, and shipping had reduced the apple diversity of the state to four key varieties.

On the surface, this seems a classic case of cooperative capitalism leading not only to high quality and consistency, but also to a bland standardization. But like many generalizations, it's kind of true, but also not.

The Washington apple industry, albeit not single-handedly, has provided the world with high-quality apples all year round. And such a feat requires a tradeoff. Fortunately, that tradeoff is not all that egregious. Since the available varieties reached such a low point in the 1930s, the varieties available now have bounced back nicely.

Although the dominance of the Red Delicious did indeed for a while undermine our gustatory enjoyment, the market, fed by foreign competition and creative breeding, has created new varieties and new tastes.

Better yet, a yearning for more diverse tastes has led to a rebounding availability of older varieties, mostly available locally. Grimes Golden, for example, which has a far more complex flavor than its offspring the Golden Delicious, but tends to crop irregularly, is now increasingly available from small growers not dependent on an international market.

There is something wonderful about creating flavor and taste, a task enjoyed by our apple breeder Kate Evans and her crew. Allow me to conflate music and gastronomy through the older concept of "gusto." Perhaps her latest as-yet-unnamed creations have not yet achieved the gusto of Beethoven's last quartets. Even so, as Bill Morelock observes in his essay (p. 35) on how "taste" is transcended by Beethoven, "... I believe we should resolve to be proud."

Tim Steury, Editor



Three Great Ways to Belong to One Great Organization.

There are over twice as many members of the WSU Alumni Association (WSUAA) today than there were just a few short years ago. They joined to support student scholarships, take advantage of all the incredible member benefits, and connect with other Cougars. We extend our thanks to all the alumni, students, friends, faculty, and staff whose membership has helped the WSUAA claim its rightful place among the finest and fastest-growing alumni associations in the country. We salute our Annual, Life, and now Platinum Life Members.

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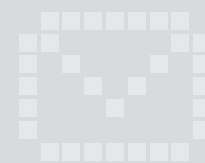
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posts

Patrick Siler

I was thrilled to see the feature on Patrick Siler in your fall 2012 issue. I am a proud fine arts graduate from WSU and as a former professor of mine, Patrick Siler had (and continues to have), a huge influence on me.

I never considered myself a natural artist. I was drawn toward computer arts, that is until I took Patrick Siler's drawing class. My advisor warned me that he was hard, but I am so glad that I took it. During the class he not only gave me invaluable feedback, but he, in his quirky way, encouraged me toward a more imaginative way to look at drawing and art. His own work has inspired me and helped me find a niche in my own chosen career path. I am now a graphic designer and much of the illustration I do in my daily work harkens back to the style I picked up in Patrick Siler's class. I now realize that fine art comes in many forms.

I am so excited to see that he has done a large installation in Pullman and I look forward to visiting the mural when I am in town next. Thank you again for the great feature!

Go Cougs!

Sally Waldburger Balt '06
Edmonds

Heart

I watched the Heart concert (after reading the article) with interest. Was at WSU working on a speech master's then; didn't see that show (but have picked out friends in the audience).

Has anyone looked in the station archive to see if [Kathi] Goertzen's senior TV project is still there? I was featured/interviewed in that piece (by [her friend] Charlie DelValle). It was a piece about disco; I ran the disco in Moscow (PW Hoseapples); Chuck worked there for me; he and Kathi were there a lot. I got some dancers to come over and do the piece too. Would be a BLAST to see it. We miss her. Thanks.

Ed Lamoureux '80 MA

Master Plan

I am sure that the new master plan is well done. Do not mess with Ferdinands.

Dick Allen '56

Chris Dunagan

A great story about a fine environmental reporter. He is a hero to many of us readers of *The Kitsap Sun*.

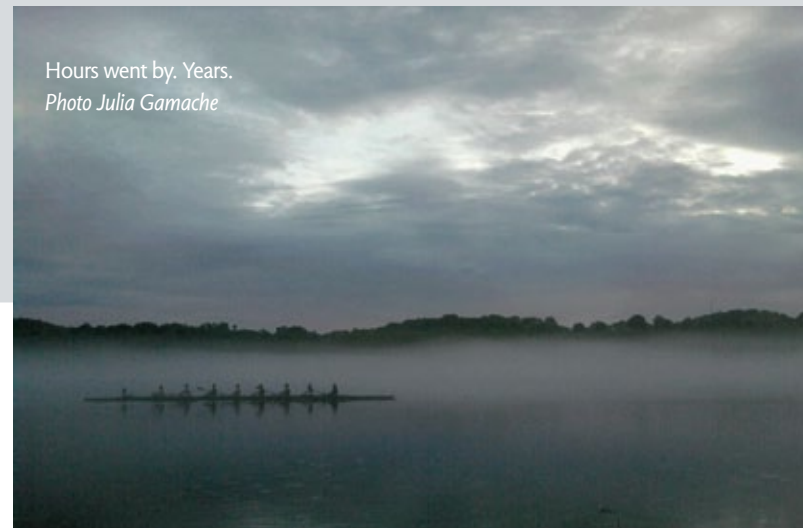
Rosie Atkinson

A Stroke of Perfection

A vignette by Andrew Wilcox

The absence of the moon intensified the stars shining over their stretch of the Snake River. Were it not for the resistance he felt on the handle and the sound of the water as his blade caught, he would have guessed they were flying. They may not have been moving at all. He was somewhere in between motion and a complete lack thereof. Barely able to see the men seated a couple feet in front of him, he pulled the handle with

Hours went by. Years.
Photo Julia Gamache



a controlled and powerful stroke. Countless hours of practice had taught him to balance his effort; not to give everything he had so quickly, but rather to give just the right amount of himself to each stroke so he could die at the appropriate time and not a moment sooner.

Eight men feathering their blades in unison made a beautifully mechanical sound. Beyond this the movement of their slides, the beating of his heart, and the eight oars entering the water as one were the only things to reach his ears. The coxswain made few calls as they glided across the still black water, which provided a skewed mirror of the night sky above. The stars moved left and right as the wake disturbed the heavenly image caught on the surface. In the distance the boathouse light destroyed the illusion of solitude and reminded them of that to which they would inevitably return. The light was their lifeline and their guide that would see them safely to the world.

"In two," she said, "weigh enough. One, two." She may as well have whispered it.

One last perfect stroke and they gunwaled their oars. Silence greeted them, save for the faint sound of water rushing past the fiberglass shell. With no reference point to gauge distance, there was no telling

how far their glide took them; it may have been miles. Nobody spoke, happy in their silent recognition of each person in the boat.

"Thank you," he would have said. "Thank you for being here and for making it and allowing me the opportunity to be here as well." But he did not utter a sound. He was too busy trying to perceive everything around him and nothing at the same time. He strove to exist between the conscious and unconscious and all that the row took out of him, was replaced by the universe above and below him. The oars hung in the space between, inches above the river, balanced by the practiced hands of the men commanding them. Water beaded off them and into the water, creating dozens of small expanding circles, which were constantly interrupting each other.

Hours went by.

Years.

The coxswain gave the command and they feathered their oars; letting them fall to skim across the night sky.

Andrew Wilcox's sister Laura Ambrey (née Wilcox) '06 sent us this reminiscence. Wilcox '09, a member of WSU's crew team, is currently serving as a Marine 1st Lieutenant in Afghanistan.



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video

A Gentle Goodbye. “Grief is the price of loving,” said Leo Bustad, former dean of the College of Veterinary Medicine. As human relationships with their pets have become more enduring and complex, so has grieving over the loss of a pet. Watch a video about that relationship and WSU’s Pet Loss Hotline at wsm.wsu.edu/extra/pet-loss-hotline.

WSUDiscovery

Give someone a spaceship, they can go to the moon. Give them a 3D printer, they can build a house on the moon. <http://nbcnews.to/U3sDwc>

Retail dollars and scents: Simple smells motivate sales. <http://t.co/OU5VT7EF>

#WSU’s Schillinger: “It might potentially become too dry for some Washington state farmers to grow anything.” <http://bit.ly/QmfpIk>

posts

Seven WSU graduates teamed up to play full-court basketball at the Huntsman Games in St. George, Utah, this past October. Three of the players formerly played for the Cougars in the Pac-8 conference. Ray Stein and Ted Wierman played in the late ‘60s and Dan Steward played in the early ‘70s.

From left to right: Terry Nealey ‘69 Bus. Admin., Darryl Olson ‘63 BS Animal Sci., Ray Stein ‘68 BS Math, Ted Wierman ‘69 BA Bus. Admin., Tedd Nealey ‘69 BS Ag., Joe Pettit ‘68 BA Edu., and Dan Steward ‘72 BA Edu. *Courtesy Tedd Nealey*

What’s new?



COURTESY KENNEDY-WILSON INC.

WSU West recently moved its downtown Seattle offices to 901 5th Avenue. It is headquarters for a number of WSU Foundation employees, the Cougar Athletic Fund, Government Relations, and the Small Business Development Center—the space sees many uses.

» panoramas

DAVID WHEELER



Believe it or not

by Larry Clark ‘94 :: When a public policy issue, say climate change or health care reform, becomes politicized, people with strong partisan leanings sometimes have a hard time dealing with facts.

Douglas Blanks Hindman, an associate professor in the Edward R. Murrow College of Communication at Washington State University, researches this effect, which he labels the “belief gap” between knowable and testable claims and partisan perception of those claims.

Communication researchers have long had a theory about a knowledge gap, which says the mass media does not distribute information about science and public affairs equally, and over time the difference between what highly educated and less educated people actually know grows considerably.

Hindman started questioning a few years ago whether something else—political leanings—was also affecting the acceptance of facts. “I’d been hearing my children coming home from school saying, ‘My friend’s parents think there’s no such thing as global warming.’ That was a shock to me. I knew these were highly educated people and I didn’t understand that.

“I wondered what is going on here. How can highly educated people be having perceptions that are at odds with what are objectively defined or knowledge claims that nonpartisan sources have made?”

Hindman theorized that perhaps we’ve gotten so politically polarized as a society that now instead of a knowledge gap, we have a belief gap based on political affiliation as opposed to educational level.

He tested his ideas using national survey data from the Kaiser Family Foundation on the actual contents of the contentious Affordable Care Act. The surveys, fielded before and after the president signed the bill into law, asked people about four components of the bill: if it requires all Americans to have health insurance or pay a fine; if it closes the Medicare drug prescription “doughnut hole” coverage gap; if it imposes a tax on insurers who offer the most expensive, Cadillac plans; and if it creates health insurance exchanges for marketplaces.

“I don’t care whether you agree with it or not. Is there a difference in how Republicans and Democrats perceive the facts, or does education predict knowledge?” says Hindman. “It turns out the difference was predicted entirely on political affiliation, not by educational level.”

» panoramas

He has been working with communication researchers in other states on the belief gap hypothesis. One colleague says the way questions are framed will sometimes activate partisan sentiment. “For example when asked if it would ‘require Americans to have health insurance or pay a fine,’ Republicans would say yes, that’s in the bill, because it makes Democrats look bad. Democrats might say, oh no, it doesn’t do that,” says Hindman.

The danger of a belief gap is that it could hinder problem-solving on some of the most pressing issues facing the country, he says. “It’s a



Douglas Blanks Hindman. Photo Robert Hubner

case where short-term political gain is interfering with distribution of knowledge in ways that can help people solve problems. It’s better to disagree on solutions; at least then you can find something in between. But if you disagree on whether the problem exists at all, you have nowhere to go.”

Another example comes from global warming. Scientists achieved a kind of consensus, and Hindman believes an early public opinion survey would have found a knowledge gap.

Once issues like this become politicized, however, Hindman says a belief gap can form, and those claims often get challenged by an industry that depends on the public not knowing, or being confused about, particular facts. He quotes Upton Sinclair to illustrate the point: “It is difficult to get a man to understand something, when his salary depends upon his not understanding it.”

Perceptions of the economy show how quickly the belief gap can change between partisans as well. In early fall 2008, studies showed most Republicans felt the national economy was

“sound,” just as Senator John McCain claimed, while Democrats said the economy was in the tank.

“Guess what happened after Obama was elected?” asks Hindman. “Pew data showed that despite jobs numbers and other factors, Democrats thought the economy was doing much better than Republicans did.”

Hindman makes it clear that he does not think facts alone make public policy, but rather it should be tempered by values.

“It’s not that we should acquiesce to science or to some authority without holding science to ethical standards or values,” he says. “My issue is when politicians adopt these issues for political gain and the partisan followers fall in line without giving it thought.”

He also doesn’t blame the media entirely for the problem, even though they could reject a false equivalence which gives the same importance to two sides of an issue even when they clearly don’t have the same factual underpinnings. “For example, some people say smoking is bad for you, some people don’t, as if they are equally weighted,” says Hindman.

One way the media could help would be to improve public understanding of nonpartisan sources of information, such as the Congressional Budget Office or the Federal Inspectors General. “The Bureau of Labor Statistics doesn’t care who benefits from lower unemployment figures or not. They just do their work,” says Hindman.

In the future, he would like to test his theories against perceptions of the nutritional value of organic foods, misperceptions about the health effects of marijuana, and beliefs about inoculation.

The forgotten forest

by Tim Steury :: Early successional forests, the stage following a major disturbance such as fire, windstorm, or harvest, have typically been viewed in terms of what is missing. Considered by the forest industry as a time of reestablishment or “stand initiation,” these early successional forests have been studied from the perspective of plant-community development and the needs of selected animals. Neither view fully grasps the diverse ecological roles of the early successional stage, argue WSU forest ecologist Mark Swanson and colleagues in a 2011 paper in the journal *Frontiers in Ecology and the Environment*.

Forest management throughout the twentieth century focused at first on wood production



and later on conservation and development of mature, late successional forests. Early successional forests were considered as only an unfortunate intermediary stage. Such an approach ignored both ecological benefits and historic precedent. Historically, says Swanson, forests on the west side of Cascades and in cooler, wetter parts of the interior West were broken up by large disturbances. Caused by natural occurrences such as fire, storms, and volcanic eruptions, these disturbance patches would move around the landscape. Organisms that rely on early successional habitat would follow.

Instead of a continuous closed canopy across the landscape, the forest would comprise patches of rich early seral conditions interspersed with young forests and patches of old growth.

“You need that to maintain maximum forest biodiversity,” says Swanson.

“If you have an entire forest landscape in just one age class, you’ll be losing biodiversity that occurs in other age classes. You need a balance of age classes, especially at large spatial scales.”

Many species rely on early successional forest conditions.

Birds such as black-backed woodpeckers, mountain bluebirds, three-toed woodpeckers, and lazuli buntings thrive in early seral conditions.



Clockwise, from upper left: Post-fire landscape in Yosemite National Park. Courtesy Mark Swanson. Mark Swanson in the Mount St. Helens blast zone. Photo Yasmeen Sands. Many plant species don’t flower or fruit abundantly until provided with open conditions in the early successional phase. Photo Justin Haug ’02

At the national convention of the Ecological Society of America in Portland this August, Swanson reported that 8.8 percent of threatened and endangered species in Washington depend on old growth forest. While not universally accepted, neither is the figure surprising. But Swanson also found that 6.6 percent of threatened and endangered species rely on early successional forests. Furthermore, nearly half of forest-dwelling species on Washington’s list of state-level threatened, endangered, or monitored organisms use the early successional forest for at least some part of their life cycle.

In order to enhance early successional habitat following harvest, Swanson and his colleagues urge leaving some large live trees, leaving or creating snags, and leaving woody debris and some intact understory vegetation. Also, they argue against spraying brush with herbicide and rushing into replanting at high density, at least in landscapes where maintenance of biodiversity is a priority.

One of Swanson’s co-authors on the study was Jerry Franklin, a professor of forestry at the University of Washington and Swanson’s doctoral advisor. Franklin is widely known for his influential work toward understanding successional stages beyond standard timber management.

» panoramas

He was instrumental not only in creating awareness of old-growth forest and the values it had to offer, but in greatly influencing policy and management practices. Previously, says Swanson, people tended to devalue old growth, considering it not biologically rich, mainly because it did not provide a lot of game animals. But Franklin called attention to old growth's role in watershed protection and importance to specialist species like spotted owl and anadromous fish.

Swanson muses, "I wonder if we're not at the stage with early [successional] forest ecosystems where we were 30 or 40 years ago with old growth in terms of really recognizing how important it is."

Sick stocks

by *Hannelore Sudermann* :: It's cold and flu season. And no one is immune, not even Wall Street.

That's the notion Brian McTier, a WSU Vancouver-based business school faculty member, and his colleagues explored when examining the impact of influenza on the U.S. stock market. McTier has been examining external events that might affect the stock market that weren't normally modeled. Those effects include class action suits in securities, electronic funds transfer errors driven by sentiment, and the flu.

For the study, which is being published in the *Journal of Financial and Quantitative Analysis*, the authors started with the hypothesis that high rates of influenza could affect trading as key people could be out sick or on family sick leave. Those people could be the New York-based analysts at firms like J.P. Morgan and Goldman Sachs. These are the experts who are reviewing companies and reporting the news that could drive a stock up or down, and cause trading activity to increase.

McTier mined data on the New York Stock Exchange as well as reports of flu from the Centers for Disease Control. What he found was the greater the incidence of flu in the area of New York



City, the lower the number of trades, the lower the realized volatility. But he and his co-authors also found that a higher incidence of flu nationally has an effect on the bid-ask spread, or the difference between the highest price a buyer will pay and the lowest price a seller will sell. That means that things don't move as smoothly if you want to sell your stock during a time when there's a national incidence of flu, says McTier. "It's harder for you to sell because there are fewer people to sell to."

McTier also explored whether an outbreak in the community where a company is headquartered had an impact on the stocks. It would be as if Columbia, the sportswear manufacturer headquartered in Portland, suffered lower stock prices if there was a flu outbreak in Portland. "We did expect a more local influence," says McTier, "but didn't really find it."

Finally, he and his cohorts looked at how a pandemic, like the 1957-1958 outbreak known as the Asian flu, a category 2 pandemic flu that originated in China and spread to the United States by 1957, would affect equity



New York Stock Exchange. Photo iStockphoto/staff. WSU Vancouver faculty Brian McTier. Photo Laura Evancich.

returns. "It is reasonable to conclude that a large outbreak would take a large amount of participants out of trading and would strongly affect the liquidity of the market," he says.

The take-away from this study is that flu costs money. If you're trying to sell a stock, for example, you might not get as good a price because there's simply less activity in the market and fewer buyers may be willing to meet your price. But by the time you know it's happening, the effect is already in. "Flu impacts trading and impacts returns during that period [of outbreak]," says McTier. But if you are making trades, what the flu might cost you is so small, "I don't know that it should stop you from doing what you're doing."

Tiny cracks, big effect

by *Eric Sorensen* :: Of all the troubling images evoked by the Hanford Nuclear Reservation, the nation's most contaminated nuclear site, the plume of uranium-tainted groundwater seeping into the Columbia River comes near the top of the list. Millions of gallons of radioactive waste were processed at the site and, starting in the '40s, government scientists detected it in the area's groundwater.

One site, called the 300 Area, has a plume of several million gallons affecting a 3,000-foot stretch of the Columbia River shoreline. Monitoring wells and riverbank springs have had uranium levels in excess of drinking-water standards set by the Environmental Protection Agency.

The river provides drinking water to nearly a dozen water systems, including Richland, but so far, levels in the river itself have been negligible. Still, federal Superfund law requires that groundwater be returned to its "beneficial use." In other words, it needs to be drinkable again.

For a while, government scientists, cleanup contractors, and regulators envisioned a scenario where that would happen on its own. They removed and disposed of the top-most layers of contami-

nated soil in the mid-'90s and figured fluctuating groundwater levels would in effect wash away the remaining uranium, carrying it to the river at low enough levels over the course of a decade or so.

That has not happened. Kenton Rod ('12 PhD) looked closely—very closely—at the soil beneath the 300 Area and found it has a way of holding on to uranium, slowing its release into the environment.

"Nothing is going to happen fast here," he says.

Just why that is gets at the curious nature of soil, which Rod notes is "one of the most complex mediums that a scientist can investigate."

Sitting in a common area of the WSU Tri-Cities campus, he explains how soil has a mix of physical, biological, and chemical properties, while at the same time serving as an interface of solid, liquid, and gas.

"You try and pick those elements apart and it's not an easy task," he says.

In the case of the 300 Area's uranium waste, a byproduct of the process that made plutonium for the Nagasaki-bound atom bomb "Fat Boy" and the Cold War arms race, Rod saw something very small—the chemistry and structure of individual soil particles—having an inordinate effect on the area's 300-plus acres.

The soil, says Rod, wants to hold on to a certain amount of uranium all the time and will

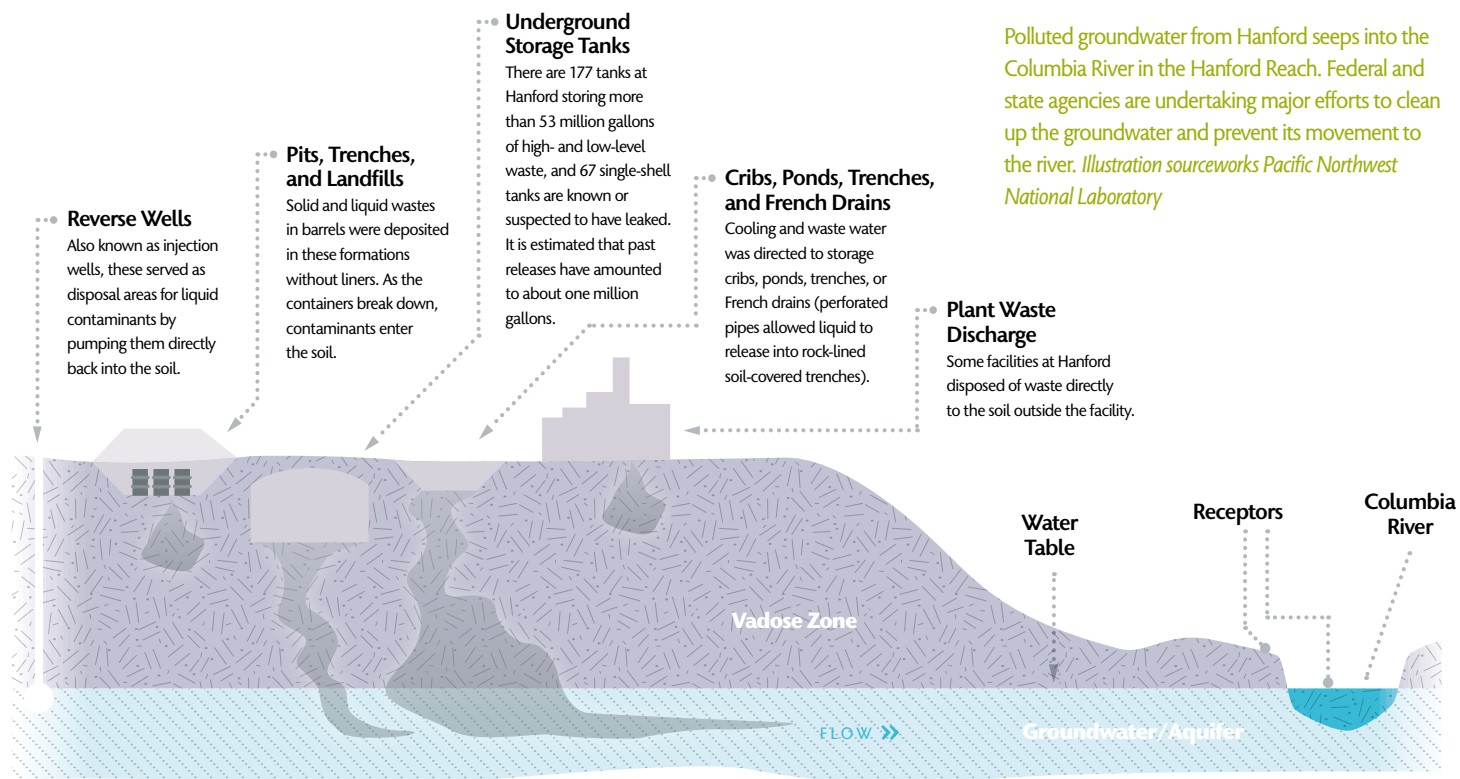
resist efforts to be rinsed clean. There is also a limit to how much uranium the water will want to pick up, just as there is only so much sugar you can put in your coffee before it's saturated.

But having a far greater effect, Rod found, are cracks in the soil particles. They are nanometers thin, which is to say they are measured in millionths of a millimeter. And once uranium enters, the crack is like a bottle in a dishwasher: water has a hard time getting it out.

"Add all those up and that's what helping these uranium plumes persist in the groundwater," says Rod. "But it's letting enough go, that it's keeping the groundwater above EPA standards. It is letting it go, just very slowly. It's a very slow process. It's going to be a while. People are keeping their eyes on it."

Indeed, in 2011 the Department of Energy released a draft proposed plan for remediating the 300 Area and noted that scientists were not seeing an expected decline in groundwater uranium levels.

"There's a continuing source," says Mike Thompson, a department hydrogeologist working on the area. The department is now proposing to put phosphates in the groundwater and soil above it. The phosphates will attach to the uranium, says Thompson, converting it into a more stable, less mobile, and otherwise insoluble mineral.



Polluted groundwater from Hanford seeps into the Columbia River in the Hanford Reach. Federal and state agencies are undertaking major efforts to clean up the groundwater and prevent its movement to the river. Illustration source: works Pacific Northwest National Laboratory

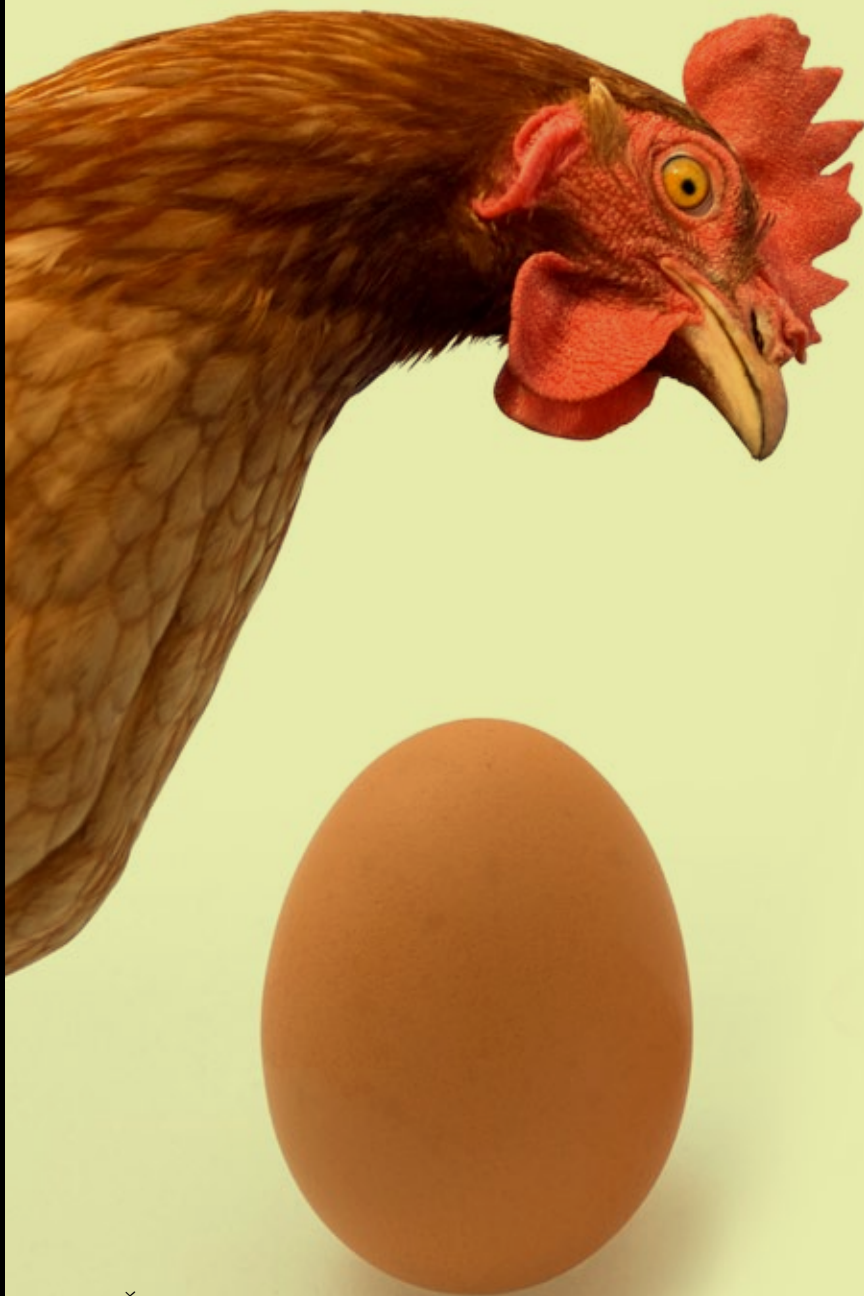
Our Story

Jean Gleason Witt '43 tells about a memorable and rainy geology field trip to Idaho mica mines :: ANOTHER Buck Bailey Story by Eric Roberts '52 :: Memories of Rush 1963 by Gail Tustin Bacon

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WSM Spring 2013



SHUTTERSTOCK

THE ESSENTIAL EGG

by Hannelore Sudermann

MORE THAN A CENTURY AGO one man's longing to live in the country led to a course in chicken farming offered through Washington State College, laying the groundwork for one of the largest and oldest egg operations in the Pacific Northwest. Along with just a few other large egg companies, the family-run Wilcox Farms is now a pillar in Washington's 1.9 billion-egg-a-year industry.

In the early 1900s, a Canadian transplant named Judson Wilcox settled in Seattle. He had a home on Queen Anne and a hat shop in Pioneer Square. But city life wasn't for him. In 1909 he visited a site east of Olympia in the Nisqually River valley. He hiked among the giant trees, rowed on a lake, and fell in love with the area. First using his home as a down payment for the 240-acre farm, he returned to Seattle to break the news to his wife Elizabeth.

Judson and Elizabeth's grandson Barrie and great-grandson Andy relate this story as we stand in their family home just a few feet from where the founders of the farm once lived. Large picture windows frame Judson's prized view over a valley of farmland to Hart's Lake and Mount Rainier beyond. Around us are the historic barns and buildings, and a little further off, modern chicken houses that have recently been converted to cage-free facilities.

The 1900s Wilcoxes built their new life with the help of the Washington State College experiment station in Puyallup. To make their farm profitable, the couple enrolled in a wintertime six-week poultry school led by WSC employee George Shoup and his wife. They took turns attending classes. One would go to Puyallup for a week while the other stayed home to care for the children and manage the farm.

Using Shoup's plans, they built their first chicken house, a structure with a long open front. They had a rough start, losing about half of their 500 birds that first year. But eventually they managed healthy flocks of laying hens, raised other animals, and maintained a large garden. They sold their eggs and produce to nearby logging camps.

The Wilcoxes were not alone in early chicken ranching. Washington history is enriched with eggs. The 1945 bestseller *The Egg and I* features a small farm on the Olympic Peninsula. Author Betty MacDonald drew heavily on her misadventures as a young wife in the 1920s on a Chimacum-area chicken ranch.

While she didn't much love raising chickens, MacDonald enjoyed using their product. "... there was always on my pantry shelf a water bucket of double-yoked and checked eggs to do with as I would... a source of constant delight." She tried "rich, egggy old fashioned recipes" that she found



The original Wilcox family farmhouse. Courtesy Wilcox Farms. The book that made Washington famous for chicken ranching. The barns at WSU's research station in Puyallup. Courtesy WSU Extension. Baked egg in a ham cup. Photo Monica Bennett

in an old cookbook: cakes, doughnuts, and cream puffs among them. The Northwest's egg connection was enhanced a few years later when the book was made into a movie starring Claudette Colbert and Fred MacMurray.

While Washington has always had a small piece of the national egg scene, WSU made some key contributions to egg research in the 1960s and '70s thanks to John V. Spencer '52, '54, the first chair of WSU's food science program, who spent most of his career researching eggs and poultry and examining flavors and shelf life. He looked at things like whether the age of the hen and the fertilization of the egg affected the egg's level of cholesterol (they don't) and the hatchability of fertilized eggs held in plastic bags at different temperatures.

Though it no longer has a poultry research program on the Pullman campus, the University still works with poultry and egg farmers throughout the state and maintains the Avian Health and Food Safety Laboratory at WSU Puyallup.

From the time Judson and Elizabeth Wilcox built that first hen house, egg production and consumption in our state have in many ways changed but in some ways stayed the same. For the Wilcoxes change meant dropping the dairy side of their business and moving their egg production from mainstream to more niche categories like cage-free and organic, not unlike the way the original Wilcoxes farmed. People are more interested in how their eggs are produced than they were just 10 years ago, says Andy Wilcox, who runs the business with his brother Brent and cousin Chris Wilcox.

Now Washington has just a few major egg producers like Wilcox and National Food that maintain more than 500,000 laying hens. They are, according to the National Agricultural Statistics Service, responsible for most of the 6.7 million laying hens in the state.

At the same time, says Chris Benedict, a member of the WSU Small Farms team and WSU Extension, there's a growing number of very small operations with fewer than 1,000 hens. People want to be closer to their food sources, and be more certain of the conditions in which their food is raised, he says.

Following in the footsteps of those Puyallup extension agents a century ago, Benedict has co-organized several poultry-raising courses. When it is offered, the class always has a waiting list. So many people are interested in raising their own birds, whether just for home consumption or for small-scale farming. "Now nearly every city between Everett and Olympia has its own ordinance dealing with chickens," he says. "That's a sign that there's a change."

He's seeing more people, especially in urban areas, add two or three chickens to their home garden. "It's not that economical," he says. Building a coop and finding feed requires some effort. "And it can take upwards of six months to get your first eggs." And it takes two years before the birds reach their peak production of an egg a day. But these folk are keeping the hens as pets, with the benefit of having fresh eggs and maybe teaching their kids about raising animals, says Benedict. "It's not about the money."

In more rural areas farmers with a few acres are scaling up from raising eggs just for themselves to selling them off their farms or at farmers markets. "For diversified vegetable farmers, it gives them something to offer year-round," says Benedict. "It's about hooking consumers with one more product."

And what a product. Eggs are an inexpensive source of protein and useful in so many recipes. Just a sampling from some of the menus from WSU's Feast of the Arts dinners shows the diversity of uses. The egg appears in dough for the Tuscan ravioli, the goat cheese flan, the meringue topping for cherry rhubarb compote, the pumpkin spatzle, the crab cakes, and the cornbread stuffing for quail.

"The egg is probably the main staple in the kitchen," says Jamie Callison, the executive chef for the WSU School of Hospitality Business Management. "It's a component in every cuisine and a workhorse in nearly every meal. We just made, for example, pad Thai," a stir fried dish with rice noodles and scrambled eggs. "We cannot go one day without eggs here. They add richness, they thicken sauces, they work as a binder, they make mayonnaise," he says. "They're kind of a bridge item. Without them, things just wouldn't come out." ☒

Tips:

Home eggs should be collected daily and stored at below 45 degrees. Clean and refrigerated eggs can last for several months. Fresher eggs perform differently than older eggs. The fresher eggs are more flavorful and can offer a fluffier omelet or lofty meringue. Older eggs, once cooked, are easier to peel. Callison teaches his students to look for grade and age. The more expensive eggs are not always the freshest. "It depends on the store," he says. "In some the costlier organic eggs don't move as fast."



Down Under to Pullman

by Larry Clark '94 :: The crowd at Beasley Coliseum calls out, "Aussie, Aussie, Aussie! Oy, Oy, Oy!" for the Australian basketball players on the court, but one key to the Down Under connection sits on the sidelines.

Assistant WSU coach Ben Johnson played professionally and coached in Australia for six years, and has been instrumental in bringing standout players Aron Baynes and Brock Motum from there, as well as up-and-coming players Dexter Kernich-Drew and James Hunter.

Johnson, who has been at Washington State for nine seasons, says, "Through that time, I was able to build some good networks and contacts over there in Australia. And the Cougar fans have

really embraced it. They know these guys are a long way from home, and they've made them part of this community."

After growing up in Stevens Point, Wisconsin, Johnson played college basketball at the University of Wisconsin-Green Bay alongside future WSU Coach Tony Bennett and under future Coach Dick Bennett. In 1993 Johnson crossed the Pacific to Cairns, in the northeastern state of Queensland, where he played and coached for three years. He then worked as an assistant coach for Wisconsin-Green Bay Coach Mike Heideman, currently head of WSU men's basketball operations. In 2003 Johnson returned to Australia for three more seasons as a coach, when

he was named the 2003 Australian Basketball Association Women's Coach of the Year. He came back to the United States to join Dick Bennett's staff at WSU in 2004.

Johnson's time in Cairns—pronounced "Canz"—made an immediate impact on the Cougars, with Australian center Aron Baynes joining the team in 2005. Baynes, an outstanding player also from Cairns, was a favorite of many Cougar fans for his energy and passion.

"He's a great success story, but he had the obvious warts that high school big men come over with. The speed of the game was an adjustment for him. But the one thing Aron had was a work ethic and a fierce determination, and that eventu-

ally turned him into a great player," says Johnson, who remains in close contact with Baynes.

Baynes played on the Australian national team in the London Olympics last summer, and now plays professionally for Union Olimpija in the Slovenian capital of Ljubljana.

Johnson also helped recruit Motum, current WSU forward and a senior psychology major from Brisbane, who led the Cougars in scoring last year and was tapped as one of 50 preseason candidates for the 2012-13 John R. Wooden Award.

Motum started playing basketball when he was seven, but it wasn't really a big sport in Australia. He didn't see an NBA game until he was 16, instead idolizing Rugby League player Darren Lockyer with Motum's hometown Brisbane Broncos. But basketball drew in Motum, and he played at the Australia Institute of Sport for a year and a half before heading to Pullman. It was not an easy change for the guy from subtropical Brisbane.

"At first it was not good," says Motum. "It was cold—I'd never been this cold, and I'm from a town of two million people. It was a bit of an adjustment my first year."

Sophomore guard Kernich-Drew, from Melbourne with a population of four million people, also says the move to the quiet college town on the Palouse took some getting used to. "Campus was great, and it was different because back home we don't really have a college atmosphere like you do over here in America. There are no college sports," he says.

Kernich-Drew says communication can be tricky sometimes, too. "Australia is very laid-back, we say pretty much what we want," he says.

One of Johnson's roles is helping the Australian players adjust to life far from home, but he says his Australian wife Nicky, a former professional basketball player whom he met in Cairns, does a lot for the team. "I think she's been a godsend. We have the occasional meal and have some of the guys over, whether the Australians or others like DaVonté Lacy. She's helped to bridge that gap," says Johnson.

Their American teammates have connected with the Aussie players, too. Motum became good friends with the American Cougars, like Xavier Thames, Klay Thompson, and Charlie Enquist, whose parents "took in Brock in like he was their own," says Johnson. "That's part of being in the Cougar family."

The players' families have appreciated the support as well, says Johnson. Motum, Kernich-Drew, and Hunter have all had parents and siblings visit the campus. When his parents visited last year, says Motum, they loved it. "Especially my dad. He's from a small town of 15,000," he says.

The sport of basketball is somewhat different in Australia as well; it's more athletic and physical in the United States, notes junior college transfer forward Hunter. "There are a lot of tall guys here. There aren't a lot of seven-footers in Australia," says the Sydney native.

"The game is definitely faster, more physical, especially off the glass," says Johnson. "You see globally in Europe and Australia, I think they shoot the ball better, and have more of a perimeter game. These guys have all had to adjust, Brock, Dexter, they've had to get physically stronger."

All college basketball players face some transitions, says Johnson, with a work load on

and off the court that's quite a bit more intense than high school. For players from across the ocean, that adjustment can be heightened.

"They may have had a serious girlfriend, and now they're 8,000 miles apart and trying to figure out how to have this college experience and have this girlfriend back home," says Johnson. "Those are issues, and they're real."

Johnson says the rest of the WSU team got to experience some of the cultural differences when the Cougs took a tour to Australia this past August. "For our players to see where Brock, Dexter, and James grew up, and meet their families and friends was a once-in-a-lifetime experience. We went to the zoo and held koalas, toured the Great Barrier Reef, and went to an Australian Rules football game when we were in Melbourne."

The team also practiced at an indoor training facility open to the general public while they were there, which Johnson says helped expose both the Australians and possible future Cougars to the squad.

Basketball has grown in popularity Down Under, say Motum and Johnson, particularly with the success of NBA player and 2005 national college player of the year Andrew Bogut. Johnson says more NBA games are on TV and even the college game has more exposure.

"It's become very competitive to recruit kids out of there," he says. "A lot of people want to get in there and find the next Andrew Bogut or Patrick Mills type of player."

"We are anxious and hopeful to add the next great Australians to our program here at WSU. Because of the success of our former and current Australian players we hope that continues to open those doors," he says. <<

Opposite: Cougar basketball fans cheer on the Australian team members. *Photo Robert Hubner.* **Below, from left:** Australian players Brock Motum, Dexter Kernich-Drew, and Aron Baynes '09. *Photos Jayne Kamin-Oncea/USA TODAY Sports, Kirby Lee/USA TODAY Sports, and Michael Ignatov/Arizona Daily Wildcat, respectively*



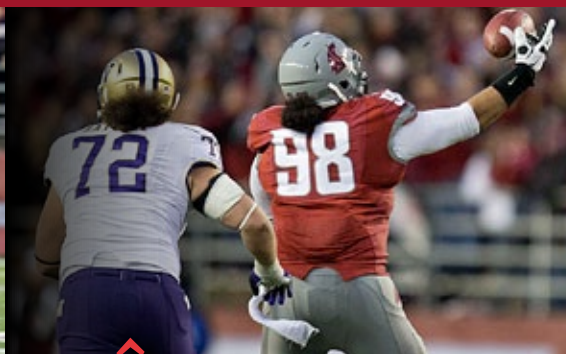


WILLIAM MANCEBO/GETTY IMAGES

One happy ending It was the biggest comeback in Apple Cup history. The Cougs were down by 18 points going into the fourth quarter last November. The team dug deep, persevered, and achieved a 31-28 victory in overtime, behind the running of senior Carl Winston III (*above with his mother*), and the play of every defensive and offensive WSU player on the field. Jubilant Cougar fans poured onto the field after the win to celebrate with Coach Mike Leach and the team.



Senior quarterback Jeff Tuel scrambles and keeps his balance to throw a crucial first down pass to Isiah Myers.



Defensive lineman Kalafitoni Pole intercepts a pass from Washington quarterback Keith Price in overtime, as Price was hit by linebacker Logan Mayes. Pole nearly returned it for a game-ending touchdown.



Kicker Andrew Furney kicks the game-winning 27-yard field goal in overtime. *Photos Dean Rutz/The Seattle Times*

Replays for all

by Larry Clark '94 :: The idea of having control of his view of a sporting event struck Sankar "Jay" Jayaram in 2009 while he was watching a Seahawks game on TV and wishing he was in the stands.

"I had never been to a Seahawks game and I wished I could put on a 3D headset and be in the stadium," says the Washington State University mechanical engineering and computer science professor.

Fortunately Jayaram, an expert in virtual reality modeling, had been working for several years on an immersive 3D experience for use on exercise machines. His startup firm 3D-4U holds patents on the technology which creates 180- or 360-degree views with multiple panoramic cameras and sends the video to processing. Users can then put on a 3D headset, and control their view of a recorded scene, switching between cameras, panning left or right, and zooming in and out and pausing when they want.

In addition to exercise experiences, Jayaram and his team created a prototype and filmed a museum in Utah in which viewers can walk around a dinosaur and examine it in 3D. The idea was to show that viewers could do things like virtually tour the Louvre or ride a stationary bike through the Alps or Africa.

The company started to focus on sports in 2009, placing cameras around fields and arenas. The first test came in 2010 with a National Basketball Association game between the Washington Wizards and Atlanta Hawks, followed by Major League Baseball games and a Virginia Tech football game.

It wasn't always an easy task. "We filmed the Apple Cup two years ago when it was here," says Jayaram. "It was 14 degrees. The night before, our fiber optic cables froze and our camera had stopped working, and in the morning water was dripping into our production truck. Ice had formed on the inside of the truck and water was pouring onto our servers." Nonetheless the engineers made it through the day.

They next had a test run at the World Series in St. Louis in 2011. Jayaram and the company decided it was time to launch an in-venue application, and approached WSU about recording the Cougs' home football games in 2012.

"When the opportunity came along to put it in at WSU, I was ecstatic," he says. "I'm a season ticketholder of Cougar football for many years. My son and I don't miss a single home game

unless we're traveling, so for me to put it here was huge."

In three short months toward the end of the Martin Stadium renovation, the company put the 3D-4U cameras and technology in place. Guests in each of the new luxury suites had access to racks of 3D glasses, the four unique 3D-4U camera feeds, and flat screens connected to video game controllers, with which they could control

Jayaram. "When I was showing them, everyone from the 75-year-old grandma to the teenagers wanted to have it."

"Fans are begging for more opportunities to see replays and this puts it right in their hands," says Andersen. He adds that a concierge service built into the mobile app will show statistics, scores from other games, and even products users can buy, such as tickets, clothing, and



A young Cougar fan tries out the 3D-4U system while Sankar Jayaram (*back right*) explains it. *Photo Rajah Bose*

both live views as well as playback of any of the four camera perspectives.

"Each camera is situated in such a way that it can see from end zone to end zone," says Martin Andersen, vice president of production and marketing at 3D-4U. "They can control [the view they receive from] any one of these cameras."

Another feature debuted last fall at the UCLA-WSU game was a mobile app for iPad and iPhone. Although it wasn't 3D, people attending the game could still access the multiple views, pause the game, zoom and pan on their devices. It has been universally popular, says

food. When you register your app, merchants will know your seat number. You will be able to send in your order, pay for it on your iPad, and they will bring it to your seat, he says.

Jayaram says the response to the 3D feeds has been positive, but varies with age. "The younger people are glued to this in 3D. A lot of the older people don't like the 3D because it bothers them with their bifocals."

Now that the WSU football games have shown the technology works well, 3D-4U and Jayaram have been talking to National Football League teams, other universities, and ice

» panoramas

hockey and soccer teams in Europe and the Middle East.


Beyond sports, the 3D-4U system has potential for education, with virtual field trips. And, Jayaram says, virtual 3D concerts might be the next application.

Security could be another use of the technology. “We could have one of these systems set up at the presidential inauguration and have a room full of Secret Service people, each looking at a different aspect of what is going on in the crowd,” says Jayaram. “It’s like having eyes all around and feeding the view to as many people as you want.”

Even though the 3D-4U technology has global opportunities, the company and its staff

have strong ties to Pullman and WSU. In addition to being housed at the WSU Research Park, many of the engineers and staff are WSU alumni or are otherwise connected to the University, including Jayaram’s wife Uma, a WSU engineering and computer science associate professor.

Jayaram says 12 of 13 engineers have a degree from WSU. “Our university has some really sharp students. I understand why a lot of people in industry like our students,” he says. “I like to hire from WSU because I find them very grounded and very practical and very innovative.”

 Watch a video of the 3D-4U system at wsm.wsu.edu/extra/3D-4U.



One of the panoramic 3D-4U cameras at Martin Stadium. Photo Rajah Bose

Coordinates

Tastes of Washington, an In Season map of the state’s food ::
Coug wineries in Washington.

wsm.wsu.edu/coordinates

Spinach is suspect: A pathological mystery

by *Hannelore Sudermann* :: The case started a few years ago when a farmer approached seed pathologist Lindsey du Toit at WSU Mount Vernon wondering what was damaging his spinach seed crop out in the field. He had planted on clean ground that hadn’t had spinach before. He wondered if maybe the stock seed had a problem.

“It didn’t make sense,” says du Toit, explaining that what happened to the plants didn’t fit with the known diseases. At the time, du Toit and one of her graduate students were looking at fungal pathogens in the seeds of spinach plants. About 75 percent of the spinach seed grown in the United States comes from Skagit, Snohomish, and Whatcom counties, with an annual market value of about \$24 million.

They tested for a common disease called Fusarium wilt, but didn’t find the pathogen. However, while testing a sample of the stock seed, du Toit observed that a lot of it was infested with the fungus *Verticillium*, a soilborne fungus which is common in other crops but in only a few reports has been linked to spinach. Du Toit then inoculated healthy spinach plants in a greenhouse with isolates of the *Verticillium* that she got off the seed to see if the fungus might be pathogenic on spinach. No signs of the disease. “I was going to throw the plants out,” says du Toit. “But then I stopped and thought about how *Verticillium* wilt develops in potato crops.” In potato *Verticillium* wilt causes the plant to shut down late in the season, which is why the disease is also called “early dying,” says du Toit. Maybe in the spinach the disease also occurs late.

Du Toit lengthened the time of light in the greenhouse to 18 hours a day, effectively telling the plants it was high summer and time to go into their reproductive phase of flowering and setting seed. “In three days we started to see symptoms of wilting,” she says. She wanted to be sure she wasn’t jumping to conclusions, so she tested the plants and then their seeds. She found the corky material surrounding the embryo did contain the wilt fungus, but noticed it didn’t affect the plant until it was mature.

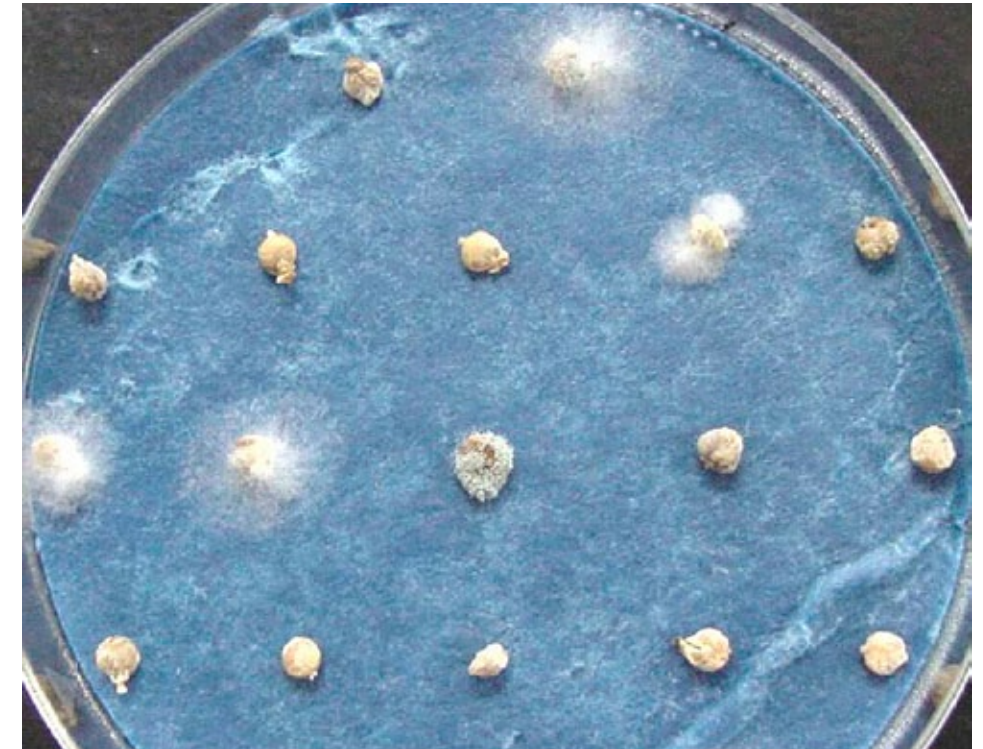
“Which explains why they never see the disease (in spinach) in California, Arizona, Arkansas, or Texas,” she says. In those states

spinach is harvested before the reproductive phase, either as baby spinach when the leaves are just a few inches out of the ground or the more mature bunching and leaf phases. The discovery prompted du Toit and her student to look at seed lots produced by a number of different spinach seed companies around the world. That produced a shock. “We discovered that 90 percent of the commercial seed lots had *Verticillium* on them.” Once the discovery was made known, a buzz ran down the coast.

Farmers in the Salinas Valley in California had been finding *Verticillium* wilt in their lettuce crops and were struggling to find the source. “You knew it was there in other crops,” says du Toit—pointing to peppers and strawberries as two key examples. “But until recently you never saw it in lettuce.” Hearing that du Toit had found it on the spinach seed, baby leaf spinach being a major crop for the California valley, Salinas Valley farmers were very interested in her results. “The connection was made,” she says. “Was the spinach infecting the soil?”

The California scientists believed they had found their culprit and even published several papers on it. “It makes sense,” says DuToit. “Except that a lot of other crops in Salinas Valley are also susceptible to *Verticillium* wilt.” Spinach may be involved, but then again it may not be the one to blame, she says. Or if it is, it may not carry the blame alone.

Du Toit shared her evidence, an entire collection of 700 spinach seed isolates of *Verticillium*, with her California counterparts. “Because of this concern, I wanted to help the research.” Spinach is now their key suspect.



Above: Spinach seeds infected with *Verticillium*. Courtesy Lindsey du Toit. **Below:** Wilt can damage plants, affecting their leaves. In another trial, du Toit shows healthy spinach plants next to those showing signs of Fusarium wilt. Photo Colin Diltz/Skagit Valley Herald

But du Toit is still not so sure. She’s hedging her bets. If the source of the wilt is spinach seed, then she’s hunting for ways to clean the fungus from the seed before it goes to the Salinas Valley. “There’s a wide range of conventional and organic ways to approach this,” she says. She has found one conventional fungicide treatment that is on its way to FDA approval by 2014, and one organic steam

treatment that could be adapted to spinach seed.

But that’s just half the effort. Meanwhile, du Toit and several Salinas Valley farmers have set out to see if the seed really is transmitting the disease to the soil and from the soil to the lettuce. They’ve completed two years of field trials: with planting infested spinach seed that was not treated or treated with fungicide against the wilt followed with a lettuce crop, and one treatment of just bare ground (no spinach) before the lettuce crop. In all cases there was no symptom of *Verticillium* wilt in the lettuce plots, she notes. “In two years there doesn’t seem to have been any difference.” So maybe the scientists should keep looking.

The issue has produced a few dividends for the scientists, among them several new avenues of investigation. Du Toit has also discovered that there isn’t an international standard method for testing spinach seed for *Verticillium*. While some labs found the fungus on the seed, others missed it entirely. So she organized workshops on how to look for the fungus on spinach seed.

It may be a while before the mystery of how the wilt got into lettuce is solved, but if through seed treatment and testing, seed producers can remove spinach seed as a potential source of the inoculum, “then we can, at least, take the blame away from spinach seed.” <<

How Washington tastes
The Apple meets Cougar Gold



by Tim Steury



OPPOSITE PHOTO BY CAMERAMAN, THIS PAGE PHOTO COURTESY NORM THOMPSON

+ Much of Carolyn Ross's work involves training people to quantify their taste. The sensory evaluation panels that she and her graduate students organize assess taste attributes in fruit and other foods and beverages such as sweetness, acidity, bitterness, and astringency. And "mouth feel," which contributes enormously to the taste experience.

But for these panels to arrive at a consensus of, say, how sweet a given apple is, or how tart, or how much it crunches in relation to other apples, everyone must agree on the intensity of those attributes.

Before the panel members can evaluate a given food, they will train for a number of sessions, tasting slivers of the same apple, for example, then going through an evaluation procedure, assigning each attribute a score on a 15-centimeter scale, over and over. Individuals must often adjust their scores to match the group's consensus, until finally, they pretty much agree on how tart that fruit is, how astringent, or how sweet. And then they will use those newly agreed upon standards to evaluate a given product.

Similar work is conducted throughout the cheese world. Tasting is an essential part of the WSU Creamery's daily routine. MaryAnne Drake '96 PhD heads the sensory evaluation program at North Carolina State University, which specializes in dairy products, and has developed a cheese flavor wheel and an exhaustive lexicon for cheddar cheese.

The object of Ross's scrutiny may be a raspberry newly released by Puyallup breeder Patrick Moore. Or a wine aimed at a specific segment of the market. Or an apple moved forward in apple breeder Kate Evans's trials. The sensory evaluation of Cougar Gold, on the other hand, will never produce another version, but rather ensure that it always tastes the same. Thus, the perfect pairing will endure.

SO MANY APPLES . . .

Although the apple has found its way into thousands of preparations, both sweet and savory, the whole unprocessed apple is still its most consumed and appreciated form.

But much has changed over the last decade or so. For years, the Red Delicious ruled, particularly in Washington. Although it originated as a chance seedling in Iowa in the nineteenth century, it adapted beautifully to Washington's growing conditions. In fact, so confident was the Washington apple industry in the "Red" that the state did not even bother with a breeding program. At its height, the Red Delicious represented more than 60 percent of the Washington apple crop. (Although it has dropped to approximately 34 percent of the state's crop, it is still the most widely grown variety. Indeed, there are still older strains of Red Delicious, not the purest red, that are quite good.)

And then, a couple of things happened. Over the years, growers became so enamored of the Red's color that they selected sports, mutant branches bearing redder apples, which they propagated toward a redder and redder fruit. (The original Red Delicious, the Hawkeye, had red stripes over a yellow-green background.)

A funny thing happens as an apple gets redder. Its flavor decreases.

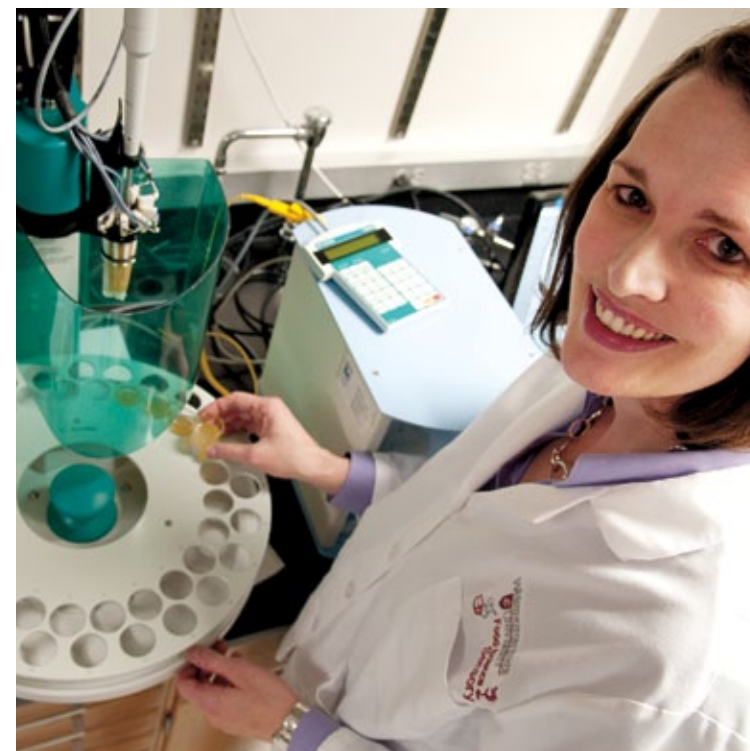
Although others had started to grow concerned over how little flavor remained in this admittedly gorgeous apple, it was post-harvest horticulturist John Fellman who figured out what was happening.

"We proved ... that as they selected for color, there's only so much metabolite to go around. Since the pigment is in a subset structure called the vacuole in the skin, metabolite gets grabbed and stuck as color.

"As that happens, it means less of the common metabolite for aroma chemicals."

At the same time, after years of decline in the diversity of apple varieties available in the market, people started to realize that there were indeed apple tastes other than the sweet cardboard that the reddest of the Reds offered. Marvelous-tasting apples from New Zealand started appearing in the grocery store, in late spring and early summer. Suddenly, stores that had once been limited to Red Delicious and the unrelated Golden Delicious started offering people a steadily growing choice.

Some growers became uneasy and started thinking outside the Red Delicious apple box. And Bruce Barritt, a raspberry breeder in Puyallup, moved to Wenatchee to start planting seedlings toward creating a Washington apple-breeding program.



TWENTY YEARS LATER, WSU's current apple breeder, Kate Evans, sits at a large counter covered with scores of apples waiting to be tasted. Yellow, green streaked with red in multifarious combinations, red with hints of green poking through, the apples are but a small sample of the offspring of Evans's breeding program. Every Thursday throughout the fall here at the Tree Fruit Research Station in Wenatchee, she and her laboratory assistants taste the fruits of their labor, searching for the next big thing.

The apples are a combination of seedlings, apples never tried before, apples that have been carried forward in the breeding trials, and controls. The Gala generally serves as a middle-of-the-scale control, both for production systems and sensory evaluation.

Evans is part of a large multi-scientist, multi-university, and USDA project, RosBREED, which aims to better understand the genomes of fruit throughout the *Rosacea* family, which includes apples, peaches, and cherries.

One of the initiatives within the project is to identify flavor gene markers. Geneticist Cameron Peace has been hunting down such markers in the apple that may eventually give breeders more control and precision in creating new varieties with desired flavors.

"The holy grail," says Fellman, "is to have a whole suite of these markers for breeders, so they can select without taking seven years to get fruit."



But that grail is so far undiscovered. In terms of aroma and volatiles, markers have proven elusive. However, says Evans, she does use such markers that indicate acidity.

"We have a couple of markers at a site on the genome, an area which has a lot of fruit quality traits," says Evans. That area includes a gene for malic acid, the principal acid in apples.

"There seems also to be some control of juiciness and crispness in that area, so it's a really interesting section of DNA that has got a fairly large contribution to fruit quality."

Even once the markers are identified, using that knowledge does not mean a breeder can simply pick a promising gene and insert it in a seed. Rather, it is a means of better understanding what traits are in the

germplasm. Evans uses the marker for acidity to weed out seedlings with insufficient acidity at the beginning of the selection process.

"We're more interested in applying it early, so we can screen out poor material without having to spend time and money propagating and growing them out for several years, putting them out in an orchard and waiting for the fruit.

"It's much more efficient."

So far such selection has been at the very beginning of the process. Evans does not use the information to move a candidate from phase one to phase two of the breeding program, simply because identifying a marker is only part of the overall picture.

"But it is something that Cameron is working on in terms of what he calls 'decision confidence,'" she says. "He's hoping that by putting more molecular data in with data that we're producing from tasting or instrumental measures it will help make a more complete case to industry."

Opposite: Carolyn Ross demonstrates her "electronic tongue," which can measure basic tastes. But as it requires extensive preparation of samples, can measure only one thing at a time, and cannot measure texture, it will not replace human evaluation any time soon. *Left:* Nial Yager and Russ Salvadalena rely on their sensory powers daily to make sure that what goes into a Cougar Gold can tastes like Cougar Gold when the can is opened a year or more later. *Photos Zach Mazur*

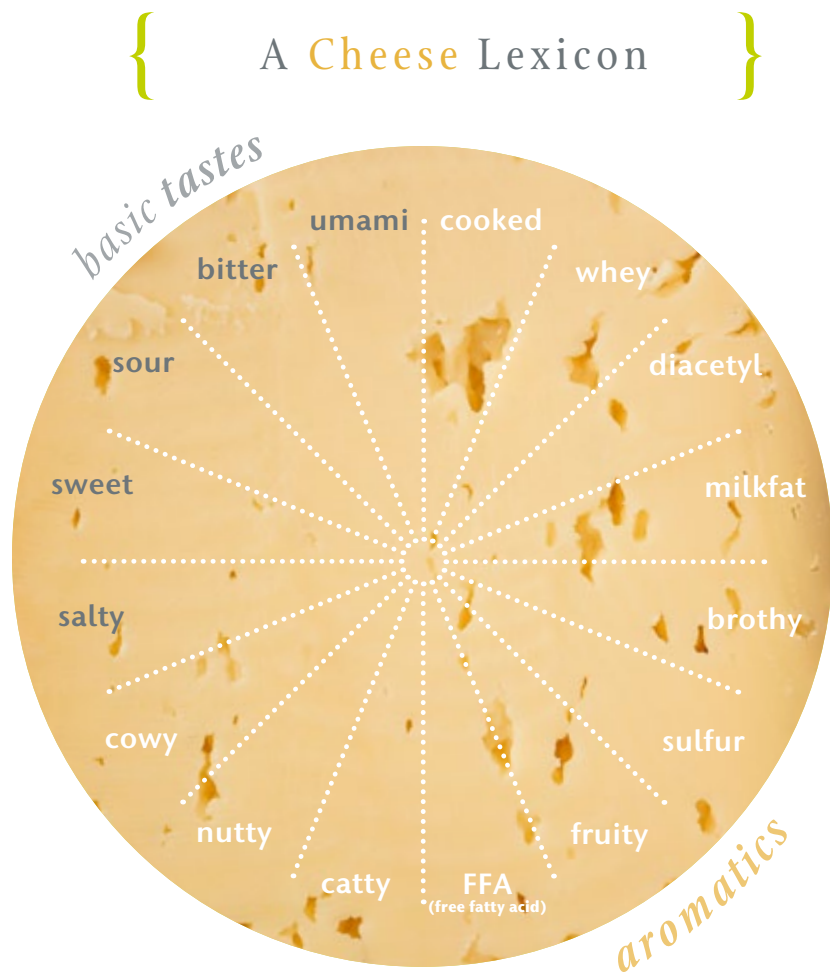
THE PERFECT PAIR

To some extent, looking for the perfect apple means looking for a perfect balance between acidity (tartness) and sweetness. A merely sweet

apple may please some palates, but is really quite boring. (Though I'm told there are actually people who like the Fuji.) With nothing to offset the sugar, an apple lacks depth and dimension. It is flaccid and dull.

A merely tart apple, on the other hand, can be equally unsatisfying. The Granny Smith, a New Zealand apple that gained favor with the American public when all the good American cooking apples had disappeared from the market, is also generally picked too early and is just sour.

But when an apple is balanced sweet and tart—a well-ripened Golden Delicious, the Braeburn, Pink Lady, and WSU's new offerings, as yet unnamed—one realizes that perfection is indeed attainable here on earth. Particularly when enjoyed with our own Cougar Gold.



Mary Ann Drake '96 PhD directs the North Carolina State University Sensory Service Center, which specializes in the sensory evaluation of dairy products. She and her colleagues produced this cheese flavor wheel, as well as a more specific cheddar cheese lexicon. When asked to describe what distinguishes Cougar Gold from regular cheddar cheese, she says, "When ideal, its flavor profile should have a very large, round, robust flavor that's characterized by sulfur and beefy, brothy notes, with slight but definite under-notes of fruity and nutty flavors, a lack of bitterness and a flavor that finishes up quickly in the mouth and does not linger. That would be the ideal flavor profile of Cougar Gold."

Cougar Gold is what we do best. In searching for a culture to offset the production of carbon dioxide in a cheddar cheese so that it might be packed in a can and sent to troops in Europe, N.S. Golding, a professor of dairy husbandry, inadvertently discovered the "magic flavor culture" that moves an otherwise solid cheddar into the highest realms of cheese possibility.

The task of keeping it Cougar Gold, which represents 80 percent of the Creamery's sales, is not an easy one.

Russ Salvadalena, the director of the WSU Creamery, thinks of his operation as both artisanal and fairly large. What distinguishes it from many of the smaller cheese-making operations around the state is its diligent quest for consistency.

Surprise can be wonderful in an artisanal cheese. Yeast and bacteria abound, hanging out in nooks and crannies, floating through the air, waiting for the opportunity to alter a cheese's flavor.

What sets the Creamery apart from more industrial operations, many of which obviously produce very good cheese, is not only its unique quality and flavor, particularly of Cougar Gold, but also, again, its consistency.

When an eager customer opens a can of Cougar Gold, what he or she anticipates is exactly that: the taste of Cougar Gold.

Every day the Creamery folk analyze the milk that comes in from the campus herd of Holsteins, for butterfat and protein. Butterfat content is the easier to adjust, by adding cream.

Various factors throughout the year, including the feed the cows are eating and the temperature, can affect the milk's composition.

Once the milk is deemed appropriate, rennet, an enzyme, is added to break down part of the protein and enable the proteins to bind together around the butterfat globules.

A cheese culture of lactic bacteria is also added. This is actually one of four cultures that are rotated through the cheese-making cycle, says head cheese-maker Nial Yager. The reason the Creamery maintains four cultures, all of which do lead to the cheddar cheese that is the foundation of Cougar Gold, is their archenemies, the phages. Phages are viruses that attack the lactic bacteria and bring the fermentation of the milk to a halt.

Besides an extreme attention to cleanliness, Yager and his staff rotate the cultures, enabling them to prevent the phages, which are very specific to the individual cultures, from building up.

What sets Cougar Gold apart from an ordinary cheddar is what Yager refers to as their "magic flavor culture," the one discovered by Golding and nurtured carefully over the past 75 years.

This culture, a trade secret, breaks down the proteins in the cheddar cheese even further, mellowing the acids and giving it that unique Cougar Gold flavor.

Yager and staff transfer the culture from the mother culture to a culture bottle every two or three days, doing so in an isolating glove box to avoid contamination.

As an emergency backup, the culture is also preserved in liquid nitrogen at an undisclosed location on campus.

An added, and essential, daily task is to taste and evaluate the flavor culture to make sure it has not changed.

Although larger, more industrial cheese producers create good cheese, it is the hands-on labor, provided by student workers, that sets Cougar Gold apart, says Salvadalena. The "cheddaring" process is labor intensive. Once the developing cheese has coagulated, salt added to slow the fermentation, the curds cut, and the whey drained, the slabs of new cheese go onto the finishing table, where the workers cut and flip them continually until ready to drain and press and place in the cans. It is this process that gives Cougar Gold the needed attention to achieve the daily consistency.

Large cheese producers make their cheddar with an automated machine called the Cheddar Master. Whereas the Creamery produces one batch a day, the larger producers may do 30. Even under the best conditions, the action of bacteria can alter over the course of a day, and each batch might be slightly different in flavor.

Now, if you may, open a can of Cougar Gold. First, slice off a small bit and chew it slowly: creamy, salty, sharp, nutty, a little bitter. You may notice little crystals, tyrosine—an amino acid and the remnant of casein, the main protein in milk—breaking down.

Now take a bite along with a sweet-sharp Washington apple. This is as good as it gets.



Red Delicious



Golden Delicious



Gala



Granny Smith



Fuji



Braeburn



Cameo



Honeycrisp



Cripps Pink

Common commercially grown apples in Washington state. Besides new cultivars being developed by WSU, many older varieties are also making a comeback in local markets. For a gallery of some of these heirloom apples, visit wsm.wsu.edu/extra/heirloom-apples. Photos courtesy Washington Apple Commission

WHAT IS A WASHINGTON APPLE?

Washington's excellence as a place to grow apples is reflected by the fact that we produce better than 60 percent of the U.S. apple market.

"Cool nights and warm days and long hours of sunlight," says Fellman, summing up our climatic advantage. But there are subtleties involved. Because our nights get so cool during fruit maturation, he says, the carbon produced through photosynthesis during the day is preserved by the plant. It does not get used up through what is called maintenance respiration at night.

"So your net photosynthesis gain is very good, which is why things grow so well here."

"Also, nowadays, breeders are actually tasting fruit," he says.

"Well, that's always been the case," says Evans. "What happens is growers select for color."

Even so, there is some truth in Fellman's overstatement. Altering a plant's genetic signature always involves some tradeoffs. An apple might be the most delicious thing in the world, but if it does not ship well or hold up in storage or if it turns to mush three weeks off the tree, that wonderful flavor alone is not going to make anyone any money.

Indeed, to an extent, such is the case with many older varieties of apples. Varieties such as Smokehouse, Wealthy, Belle de Boskoop, Calville Blanc d'Hiver, and many others have wonderful, complex, and tantalizing flavors right off the tree, making them excellent for a connoisseur's backyard or local farm market. Indeed many older uniquely flavorful varieties are making a comeback, but if they don't

keep or travel well, no large grower with a bottom line in mind is going to plant them.

Developing an apple that tastes great and keeps well is Evans's challenge. And that challenge has grown greater with the increasing competition, Washington- and foreign-grown, in the market.

Add to that the challenge of producing a variety for Washington growers that stands out in the market. Not only must it taste great, it must grow well here, it must look great (the wow factor), and people must pay for it.

And they will take a bite and say, that must be a Washington apple!

Evans starts her breeding from varieties that do well here, she says. Typically, more varieties do well here than not.

"We look at the parents on an annual basis, look at how the fruit is doing and how the parents are performing in our climate."

But that is hardly straightforward. Even central Washington, where most of our apples—and grapes—are grown, is hardly homogeneous in terms of climate, soil, and other environmental factors.

Indeed, the test sites that Evans uses are fairly extreme, but they reflect the diversity of growing conditions. For Phase Two selections, sites include an organic orchard at Lake Chelan—high elevation, cold, exposed, late-blooming and late-maturing—and a site down toward Richland, which is very hot and early.

When an apple is chosen for Phase Three, which currently includes four "elite" selections, the sites become even more demanding: Brewster, Quincy, Mattawa, and Prosser.

But beyond the challenges of producing a delicious and profitable apple, Evans believes the importance of flavor is coming back.

The threats to flavor are great, prime among them mass production and consumer expectations.

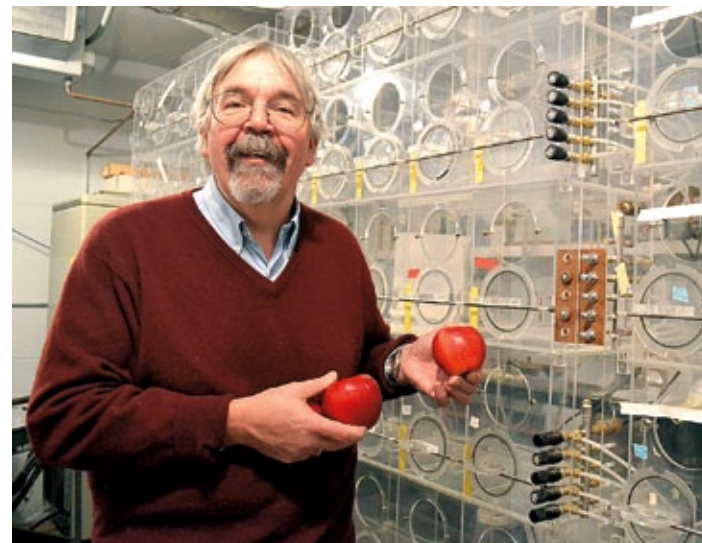
"We want our fruits and vegetables all year," she says. "We expect to have strawberries and tomatoes all year round, expect apples all year round."

In order to satisfy those expectations, apples are treated with 1-MCP (methylcyclopropene) to retain texture throughout storage. 1-MCP inhibits apple sensitivity to ethylene, a chemical produced by the apple itself that induces ripening. 1-MCP thus delays not only softening, but aroma production.

Fruit produces flavor volatiles only when it matures, Evans says. So producing fruit on such a scale is inevitably a great compromise.

But Evans seems primed for the challenge. In spite of the odds, but also with improving horticultural and genetic tools, Washington apples will continue to prevail.

And provide the perfect complement to Cougar Gold cheese. ☒



Above: Post-harvest horticulturist John Fellman holds new WA-5 apple. *Photo Maegan Murray/Murrow News Service.* **Below:** Kate Evans tastes the fruits of her breeding program. *Photo Robert Hubner*



Taste + aroma = flavor

Taste all by itself is what you experience when you have a really bad cold clogging the pathways that sense the more elusive aromas, says sensory scientist Carolyn Ross.

Sweet, sour, bitter, salty, umami. Sure, they're fundamental and promise seemingly endless combination potential, but a cold is a good reminder that basic tastes without the subtler flavors can get pretty boring.

Fortunately, we normally have two chances to experience flavor: before we taste and in conjunction with taste.

The initial aromas of a wine or an apple go up your nose, referred to as orthonasal olfaction.

You experience those aromas again once the wine is in your mouth, the retronasal.

You will taste the wine's sweetness, acidity, and slight bitterness. But the true pleasure of a fine wine lies in its more subtle aromas.

Much of your experience of aroma, says Ross, is played against previous experience. Whereas taste derives from a more fundamental survival origin, the sense of smell—the detection of aroma—is more tied into the limbic system and thus more associated with memory and emotion.

"When you smell something, you might recognize it or it reminds you of something, but you can't quite put your finger on it.

"It's called 'on the tip of your nose' in the sensory literature," she says, smiling.

HUMANS HAVE ABOUT 10,000 TASTE BUDS, variously distributed, mostly on the tongue, which detect the five basic tastes. Rabbits, on the other hand, have about 17,000 taste buds. Cows have 25,000. And catfish? 100,000.

Before you feel gustatorially or evolutionarily slighted, however, you should know that the chicken has only 17.

And we might consider what these numbers are all about. Think, for example, about the catfish's general situation. A bottom-feeder, the catfish must search through the gloom and muck for anything edible, let alone nutritious and delicious. It needs a lot of taste buds, many of them on its whiskers, to find its food in a muddy river bottom.

Given that cows consume primarily grass, one can only imagine the varieties of flavor and corresponding nutrition spread across ancestral grasslands that ultimately required that many taste buds to give cows their current discretion.

And given that humans are broadly omnivorous, feasting on an enormous range of food, from berries to pork chops, those 10,000 taste buds seem to have served us well indeed, at least from an adaptive and survival perspective.

Although we have only one or two taste receptors for sweetness, we have dozens for bitter, strongly suggesting that our tastes developed as a means of survival. Sweetness, a complex of many chemicals, indicates energy-rich nutrients, which are particularly important for feeding our brains.

Salt indicates necessary ions for electrolyte balance.

Bitter, on the other hand, generally indicates toxicity in the wild in many forms. Bitter compounds can include everything from peptides and esters to terpenes and methylxanthines like caffeine. Whereas one can taste saltiness at a concentration of one part in 400, bitterness can be detected at a concentration of one in two million.

Sour taste comes from acids, which can indicate both fermentation and rot. It can be tasted at a concentration of one in 130,000.

Umami, the most recently identified taste, indicates the presence of amino acids such as one might find in cheese or meat broth. Umami is generally savory.

For those of us who eat and imbibe for reasons beyond mere subsistence, those survival mechanisms have combined with the olfactory detection of subtler aromas and volatiles to give us flavor. ☒



PASSING THE SMELL TEST

by Eric Sorensen

The act of smelling starts out as chemical detection but often ends up as an emotional trigger

AMONG ALL THE MODERN variations on evolution are several hundred shoppers who two years ago wandered into a home decoration store in northern Switzerland. For most of them, it was just another chance to buy some plates or a basket, with the exception of a researcher asking them to fill out a questionnaire at the cash register. But after nearly a month of monitoring customers, researchers noticed that one group of about 100 spent on average significantly more money. The customers told the researchers as much, and receipts bore them out.

The bigger spenders shared one thing: They shopped while the air was filled with a simple, fresh orangey scent.

Other customers had shopped with no particular scent in the air, while a third group was exposed to a more complex blend of basil, orange, and green tea.

When it came time to buy, says Eric Spangenberg, dean of the WSU College of Business and the study's corresponding author, "What we showed was that the simple scent was more effective."

Throughout the living world, the nose leads the way, pioneering a course through the environment with a radar-like ability to spot perils and prizes. Pop open that Tupperware from deep in the fridge and the nose tells you in no uncertain terms that the contents are inedible. We find comfort in the musky nuzzle of a dog's neck, discomfort in a dog's breath, and in certain malodorous moments, reason to blame the dog.



In partnership with the tongue, our nose is a major arbiter of what we put in our mouth and how we enjoy it. Hold your nose while eating, or eat with a cold, and your meal becomes a bland, undistinguishable mush.

"Taste and smell are different sides of the same coin," says Ken Kardong, professor emeritus in the School of Biological Sciences, "because both of them rely on sampling of chemicals brought to their sensory systems either in the air or in water."

The tongue detects a limited suite of sensations: sweet, bitter, sour, salty, and the more recently confirmed savory taste called umami. The human nose is equipped with nearly 400 genetically distinct receptors attuned to specific chemical constructs. Working together, they can tease out an olfactory fingerprint separating one scent from the rest.

"You have no idea of the differences you can detect," says Joe Harding, a medicinal chemist in the College of Veterinary Medicine whose decades-long career of probing the brain started with a look at the nose. "If we put a row of 1,000 chemicals out there on a table for you, you could tell the difference between every single one, and a lot of them would be one carbon different from the next. It's insane."

Our olfactory system is the latest in a long line of chemical detection systems that living things have deployed in the ancient and endless surveillance for food, foes, and mates. It is remarkably powerful. Writing in *What the Nose Knows*, sensory psychologist Avery Gilbert notes that two-thirds of the humans in a University of California-Berkeley study could follow a 30-foot chocolate trail using only their noses. The human

PASSING THE SMELL TEST

sensitivity to methyl benzoate, a product of hydrolyzed cocaine, is as good as a drug-sniffing dog's.

"Dogs have great noses," Gilbert writes, "but it's time to stop the trash talk and give ourselves more credit."

The nose is also a powerful portal into the world of emotions conjured up by, say, the smell of fresh-cut grass, or moldering leaves, or your grandmother's house.

Such moments are the end product of an odd transformation. The compound or mix of compounds that hits our nose can be a hardcore reality, a clinically verifiable product like methyl salicylate, $C_8H_8O_3$. But in its conversion to an electrical signal and processing through the brain, it becomes the minty smell of a deep-heating liniment. Suddenly, the smeller is caught in a mix of memory and emotion, a bone-sore adolescent in a high school locker room.

Individual results will vary. The smell of a freshly cut pasture can evoke memories of a summer camp or time on a farm. But if it comes off a composting facility, it can trigger nausea and headaches.

It's an odd outcome of our species' refinement. Our noses can hold their own against some of the best in the animal kingdom. But one of the most profound things they betray is how easily our emotional judgments not only shape our world but *are* our world.

We have a lot in common with one of the world's oldest known single-cell organisms, you and I. They are from the branch of life Archaea, and Cynthia Haseltine, an assistant professor in the School of Molecular Biosciences, studies how some of them use three particularly human-like proteins to repair their remarkably human-like DNA.

And even though her archaeons don't have a nose, or a cell nucleus for that matter, they have an obvious chemosensory system.

"Archaea can definitely 'smell' things and are very chemotactic," says Haseltine. "One of the best examples is halophiles, the salt loving ones. They will swim toward good things like food and nutrients and away from bad things like phenol."

On top of that, they will swim toward oxygen, and the halophiles, which are photosynthetic, will also swim toward light. Haseltine might be stretching the definition a bit, but says this "is sort of like 'smelling' the good stuff."

It is not stretching things to say plants can smell.

Back in 1990, Bud Ryan and Edward Farmer in WSU's Institute of Biological Chemistry found that plants under attack will emit methyl jasmonate, an oil with the jasmine scent that Humphrey Bogart recalls smelling before he is knocked out in *Dead Reckoning*. Bogie had nothing on plants, who, in addition to emitting methyl jasmonate, put up defenses the moment they smell it.

David James, an associate professor of entomology at the WSU Research and Extension Center in Prosser, has documented plants giving off both methyl jasmonate and the minty methyl salicylate when attacked by predatory insects.

In essence, it's a bouquet, with a stronger *eau de* jasmonate arising in attacks from chewing insects and more methyl salicylate produced by attacks from sucking insects.

"People used to say trees talked to each other," says James. "It's true. Plants do talk to each other through smelling each other."

One way to appreciate the versatility and sensitivity of our noses is to look back to these and other early innovators in the evolutionary chain. One organism will have a set of systems that, for the most part, work, but over the ages will add on new features that work better. As the saga turns, increasingly specialized organisms emerge based on the previous iteration, but they often hang on to pieces of the past.

"Evolution is not a lot of new construction, in small steps anyway," says Kardong, who devoted much of his career to teasing out the 35 million-year evolution of a snake's venom-injecting fangs. "It's really a lot of remodeling, because remodeling is usually a lot easier because you've already solved a bunch of problems. So why invent another backbone when the fish did it pretty well?"



The sensing systems of our forebears did remarkably well.

Migratory fish, as Northwest residents tend to know, can literally smell their way from the ocean up their native stream, switching on the olfactory guidance system after using a compass-like magnetic sense to home in from the ocean.

"In the absence of olfactory cues, salmon move downstream, presumably trying to re-encounter the cues," says Jen McIntyre, postdoctoral research associate at the Puyallup Research and Extension Center.

Their terrestrial descendants, amphibians, developed a rudimentary vomeronasal organ that was made more sophisticated in reptiles and most mammals. Snakes can smell airborne odors, but some odors get embedded in the ground. The vomeronasal system lets a reptile tap the substrate, flick its tongue to collect a sample, and pass it across the organ on the roof of its mouth.

A snake's olfaction and vomerolfaction can be particularly handy in not only finding prey but tracking it down after it is injected with venom.

A wounded animal is a dangerous thing, so a snake will attack, then retreat to wait for the animal to die.

A few years ago, Kardong tested snakes' ability to follow the trail of a stricken mouse and found they preferred a trail with the highest concentration of odor. It probably helped that the snakes could detect a change in their prey's odor brought about by something injected, or the very process itself.

"They were simply amazing with what they could pick up even after 24 and 48 hours," he says. "The success rate went down in tracking the odor, but they were still able to do it. Which also by the way says some-



thing about their chemical memory, that they remembered. Because they tracked the trail of the mouse they struck from all other mouse odors out there. So they have some kind of memory of the particular odor gestalt of the mouse they struck."

SOME SMELLS are so compelling, they seem to leave no choice but to follow a certain course. Vince Jones, a professor of entomology, calls this a "programmed behavior."

"If a housefly lands on a sugar solution, almost automatically mouth parts start to dab the substrate to try to get at it because the tarsi's picked it up," he says.

The tarsi, by the way, is the lower part of an insect's leg, roughly equivalent to our toes. That's right, an insect smells with its toes.

But to continue:

"There are some very programmed behaviors that they have when they encounter certain smells and volatiles, and the way they move upwind to locate the exact source of these things is actually pretty spectacular."

With just a whiff of pheromone, a chemical attractant that says a female is upwind and ready to mate, a codling moth will start flying across the wind and up and down, zig-zagging from one edge of the plume to another, smelling its way to the female.

But as programmed as the behavior may be, says Jones, pheromones aren't destiny. Young males are more willing to fly, but are less

Opposite: Cynthia Haseltine sees early life forms "'smelling' the good stuff," like food. **Left:** Vince Jones has studied how insects smell food, prey, and potential mates. *Photos Robert Hubner*

successful. Older males find the female more often, but fly less. Not all males respond.

"It is an evolutionarily important drive for them so it tends to be a very conserved behavior," says Jones. "When they do respond to it, they can be very persistent or not. It just depends."

Moreover, insects can be trained to associate prey with a particular volatile.

"They're not little robots," says Jones, whose lab does work

on insect-chemical associations. "They learn to associate different things with different odors. It's a very complex environment, a lot more than we would have thought maybe 15, 20 years ago."

Like bugs, humans find certain smells can be an acquired taste.

Pius Ndegwa grew up on a small farm in Kenya with cows, goats, sheep, pigs, and their attendant odors. For the most part, the smells bring up good memories.

“It’s something you grow up with,” says Ndegwa, now an extension specialist in Biological Systems Engineering and a specialist on air-quality issues around agriculture. “It’s normal to you. It’s the people who come to the farm—you see them holding their noses.”

The same can be said for people who have the farm brought to them, like Central Washington residents who are seeing dairy operations move to their part of the state.

“Odor is an important problem,” says Ndegwa, “Actually, it’s the most important problem for animal agriculture, because that’s what attracts attention to these facilities. So we try to keep an eye on it. When we do our outreach engagement, we try very much to sensitize producers that if you can keep odors down, you’re going to have less problems from citizens.”

When complaints emerge, sorting out the offensive odors from officially regulated odors can be

Right: Pius Ndegwa is well versed in the pluses and minuses of ag odors.

Opposite: You smell pine, Tom Jobson smells monoterpenes. Photos Robert Hubner

problematic. The Environmental Protection Agency regulates individual gases like ammonia and hydrogen sulfide, which smell, but don’t necessarily account for the full body or aroma coming from, say, a feedlot.

“Odor is characterized by many gaseous emissions,” Ndegwa says. “It’s not just ammonia and hydrogen sulfide. So if you just measure ammonia and hydrogen sulfide, you can’t really say you’re measuring the odor.”

Ndegwa is currently studying whether anaerobic methane digesters, which convert manure and other waste to fuel, are a plus or minus in the odor equation. To that end, he and his team collect air samples in 10-gallon bags around a digester site and ship them overnight to Purdue University, where a panel of trained sniffers will gauge the contents’ intensity and offensiveness.

“That’s the most subjective,” Ndegwa says, “because you’re talking about how pleasant or how unpleasant a smell is. And this comes from your own experience. But with this particular panel, they’re trained so there’s at least some sense of homogeneity.”

In the end, there may be **NO SUCH THING** as an objective smell. But you could start looking for one on the top floor of Dana Hall. There, members of the Laboratory for Atmospheric Research tease out the contents of air samples with not one but two machines: a proton transfer reaction mass spectrometer and a gas chromatograph mass spectrometer.



The first machine adds a proton to organic compounds in an air sample and separates the compounds by their mass-to-charge ratio. It won’t identify specific compounds, but can get researchers in the neighborhood. Lukas Märk, CEO of this machine’s manufacturer, Ionicon Analytic, says food companies use it to quantify aroma and flavors, “sniffing” the aroma of instant soup, for example.

The second machine blasts molecules with an electron beam, producing ionized fragments whose unique spectral signatures can be matched to a National Institute of Standards and Technology library.

As a demonstration, Tom Jobson, an associate professor in civil and environmental engineering, opens a large brown-tinted bottle of

PASSING THE SMELL TEST

methanol, the most abundant organic compound in our atmosphere after methane. I smell nothing.

But ten feet away, a small tube has picked it up and the proton transfer spectrometer is showing it as a spiking blue line on a graphic display. Jobson does a quick calculation and figures the spectrometer smelled about a quadrillion molecules.

We take turns breathing into the tube. He has more acetone in his breath. I have more methanol.

“You don’t have much isoprene,” Jobson says. “What I’ve come across is people who are missing gall bladders don’t produce much isoprene.”

Were I a smoker, the sensor would have picked up acetonitrile, a byproduct of burning vegetation, like tobacco.



“Insurance companies can nab you right away if you tell them you’re not a smoker,” Jobson says. “All they have to do is sample your breath.”

In some cases, the nose is more sensitive than the machine. But regulators need numbers, and the two spectrometers can give them that. The smells of individual chemicals will also be masked and altered as they combine and enter the body’s chemoreceptor-brain nexus.

“We can take a look at a mixture, separate it into its components, figure out what the concentration in the air was, figure out from the literature what the odor threshold is, and assess: OK, what part of this mixture are people really smelling?” says Jobson. “But that’s kind of the problem. You mix a lot of things together, you get a unique perfume.”

Two years ago, Jobson was part of a team of WSU researchers tapped to look into odors generated by industrial compost facilities. For the most part, the facilities deal with things whose smells we

like: leaves, pine needles and branches, lawn clippings. But in certain quantities, like tens of thousands of tons, they can be a bit much, especially if you add food waste, which Seattleites now have to do.

Then things start to smell to high heaven, or at least to Marysville. Laurie Davies, program manager for the Department of Ecology Waste Resources Program, describes the smell on a bad day as “acrid” and “amazingly bad.”

The Laboratory for Atmospheric Research found the waste facilities were emitting formaldehyde, acetaldehyde, methanol, and benzene. They are hazardous air pollutants regulated by Ecology and the EPA, but it is unclear if they were at problematic levels. Davies says the samples are, in effect, “one data point.” Ecology now plans to do more sampling.

But the Puget Sound Clean Air Agency, meanwhile, can use a different sniff test.

In 2009 and 2010, agency inspectors responded to complaints from neighbors of Cedar Grove composting facilities in Maple Valley and Everett. Like moths flying upwind to a pheromone, the inspectors zig-zagged from the homes to the compost facilities and graded the smells, variously described as “sweet silage” and “putrid compost,” on a scale of zero to four. Zero is no smell; four is “so strong that a person does not want to remain present.”

All rated the smells as being at least two: “odor is distinct and definite, any unpleasant characteristics recognizable.”

The agency fined Cedar Grove \$169,000, reduced in a settlement to \$119,000.

The complaining neighbors won by the nose.

Joe Harding wasn’t really interested in olfaction.

But he was interested in how peptides could act as signaling molecules, and three decades ago, one of the best places to look at them was in primary olfactory neurons. His work led to a paper with Jay Wright in the prestigious journal *Science* showing how neurons in the main olfactory pathway of a mouse regenerated after being cut.

Harding has since moved on to other studies, including the development of a drug that builds new neuronal connections, a huge finding with implications for Alzheimer’s and Parkinson’s disease and traumatic brain injury.

But all these years later, he can easily sketch the bewildering cascade of processes behind odor signaling, or describe the signal’s journey over nerve fibers of the olfactory epithelium, through the bony cribriform plate into the olfactory bulb, where mitral cells carry signals to the rest of the brain for processing.

“Somewhere, and this is even more magic, somewhere all of that is integrated, and you say, ‘Oh, that’s amyl acetate, that’s the smell of banana,’” says Harding. “What? It’s an incredible, absolutely incredible feat of nature’s engineering.”

And here’s a particularly intriguing part: Signals go to the neocortex for storage and memory, but some go to the limbic system, home of the hippocampus, steward of short-term memory, and other brain structures loosely tied to emotionality.

“I think a lot of us have experienced this, where a smell triggers a really powerful memory and it’s usually an emotional memory,” says Harding. “I think that’s the dual effects of the hippocampal and limbic function working.”

Think of it as a value judgment system. In a modern world that prizes rationality, that seems counterproductive. But in an organism whose ancestry reaches across the eons, a fast, subjective sniff test could come in handy, if not keep you alive.

“That’s what emotion is, it’s a value judgment system,” says Harding. “How important was this to me? Did I even notice it or did I not notice it? If I noticed it, it was emotional in one way or another. It was either good or bad. That’s how the system works.”



Left: Eric Spangenberg has seen consumer choices affected by simple and complex scents.
Photo Robert Hubner

Watch a video about Spangenberg’s work with scents and consumer reactions in retail at wsm.wsu.edu/extra/retail-smells.

Which brings us back to STORES THAT SMELL GOOD.

Eric Spangenberg first grew intrigued with the notion when he went into a wine store in Moscow, Idaho, and said to himself, “God, this place smells bad.”

But it sold cheese. The store was supposed to smell that way, a term researchers call congruence.

“I like to go to Les Schwab, smell the tires,” says Spangenberg. “Now if you went to Les Schwab and it smelled like the cheese store in Moscow, you’d say, ‘Oh, geez. I’m buying my tires at some other tire store. This place just didn’t wash its toilet or something.’ But if you went to the cheese store and it smelled like the tire shop, you’d say, ‘I don’t want to buy my cheese here.’”

Smell-oriented marketing isn’t all that new. Real estate agents have been baking cookies and cinnamon rolls before open houses for years. But Spangenberg took a scientific approach, comparing cookie-scented home sales to cinnamon-scented home sales, so to speak.

It’s still hard to say what was going through the Swiss shoppers exposed to the simple scents and the more complicated ones. Mapping brain activity with functional magnetic resonance imaging, or fMRI, might help, and Spangenberg is considering it. For now, he thinks the more complicated scent simply took up too much of some shoppers’ mental bandwidth, overloading their minds.

Or, for that matter, their limbic systems. It’s possible that they didn’t actually think that hard about their purchases as much as had a certain feeling about them, and that feeling was supported by a clean, fresh scent. For some, when it came time to spend a bit more, it just smelled right. ☒

PASSING THE SMELL TEST

by Bill Morelock '77 :: illustration by David Wheeler

{ Taste, an Accounting in Three Scenes }



QUESTIONS OF TASTE—let’s put it simply—can tire. Like a second colonoscopy. Like a second fall of man. Do we have to go through that again?

In the beginning, one is innocent of taste. Then, introduced to the concept, our new Adam and Eve realize their paradisaic minds contain no data concerning the charms of early polyphony, track lighting, or cocktail recipes using angostura bitters. Cover up!

Now some years back, the Spanish metaphysician José Ortega y Gasset had the audacity (bad taste?) to question René Descartes. “I think, therefore I am,” he said, was based on a false premise. For some reason it didn’t make the news, but wow! The foundation of four hundred years of Western thought, cracking and buckling like a fault zone. Ortega y Gasset said life comes first. “I live, therefore I think.” And what a relief, right? If life comes before thought, it certainly comes before taste, too.

I guess I have a bone to pick with taste. Culture-driven or inherent, it harasses with its apparent primacy, its ethos of improvement. *Ostendo impeccabilem gustus, ergo sum?* Not catchy, probably ungrammatical, but weirdly tyrannical.

What follow are three scenes, without metaphysical intent or merit, confronting taste from the perspective of one giddy with the possibility of living first, asking questions of taste later.

SCENE ONE: PARADISE LOST, REGAINED

I love commercial music. Maria always ridiculed me because I love commercial music. She had much better taste. Maria loved the blues. Maria loved Leonard Cohen, old-timey gospel, Elvis Costello, shape-note singing, Heifetz, the grunts of Buddhist monks. I love the Traveling Wilburys, the

{ Taste, an Accounting in Three Scenes }

Moody Blues, Frank Sinatra only after it was cool to, Fleetwood Mac with Stevie Nicks, James Taylor. Maria lived with me for three years before she left. She described herself as “long-suffering.”

She took with her: a lamb’s wool sweater, a long flowered skirt I’d bought her at a Renaissance fair when I had to get away from the good Elizabethan galliards, a CD of Gustav Leonhardt playing the Goldberg Variations, and my grandfather’s Gibson banjo. I was glad at least to find out she liked the skirt. It bothered me about the banjo.

“I need it,” she said.

“You don’t know how to play it.”

“I’m going to learn how to play it.”

My grandfather played in a YMCA band called the Swastikas. In the 1920s they toured the logging camps and little towns of the western Sierra slopes in Northern California. The swastika (Swah STEE kah) was then a symbol—borrowed from a Native American tradition—of the Young Men’s Christian Association. They displayed it proudly on their jackets and on a large banner they always hung above the bandstand. Strange. My grandfather always said, “Strange,” whenever he talked about the Swastikas. He had a picture of the band that he showed me once. They were good-looking kids, the Swastikas. Later he fought in the war. “Strange.”

My grandfather’s banjo also had a swastika on it, burned into the face below the strings. I smiled when I thought of Maria, with her good taste, hauling out that banjo at some coffeehouse in Portland to play a little anti-fascist air with her friends, the scandalous logo lurking beneath an improvised mask.

Even though not having taste in music maybe led me to lose Maria, I don’t really mind. It’s a matter of health. At one time I worked studiously to have good taste in music and many other things in the hope that Marias of all sorts might pay me some attention. A few did, and I was miserable. I didn’t like anything I claimed to like in the cultivation of taste. I didn’t like the masses of Guillaume de Machaut. I didn’t like mu tea or yoga. I didn’t like The Clash. I liked the music of my youth which I heard on the radio. Most accessible stuff, least common denominator stuff. It gave me hope. It turned the air to pure oxygen.

I have no taste. I have no girl. I’m pretty happy.

SCENE TWO: A LA CYRANO

Cyrano de Bergerac expounded upon his nose as more than just large, but multifarious. Taste just as vigorously amounts to,

“Oh, a great many things! Mon dieu, why waste Your opportunity? For example, thus”:

Aesthetic: A man stands in front of a Jasper Johns target at MoMA, nodding his head with apparent apprehension. Someone to reckon with.

Cosmetic: Queen Elizabeth I wore make-up combining mashed apples (pomade!), hog’s fat, and chalk for colorlessness. Absolutely *de rigueur* for the lady-in-waiting of taste.

Sensuous: Your chili is magnificent.

Sensual: Your lips are magnificent.

Oenological: Crabapple, with overtones of paraffin and rue.

Condescending: Oh, domestic ...

Hegemonic: “We are the makers of manners, Kate.” Shakespeare’s Henry V simultaneously pitching woo to his future wife and asserting his royal taste-making prerogative.

Decadent: One mark of Rome’s Decline and Fall: Chefs became celebrities.

Incomprehensive: History has nothing to teach us.

SCENE THREE: SPLEEN AND VARIATIONS, THE LAST BEING A FUGUE OF RECONCILIATION

I’ve been committing here a public display of resentment against taste. And of course, I’m a hypocrite. I, like you, distinguish the firm from the fitful many times a day. Mostly without even thinking about it. I’d be lying if I claimed not to prefer the golf swings of Bobby Jones or Sam Snead to that of Tommy “Two Gloves” Gainey, who hits it like a man wearing a tool belt around his waist, but still gets it done. So I guess I’m a snob. I also like raw oysters and the novels of Henry James. The rap sheet grows.

Nevertheless, I suspect taste mainly for what it often misses. Decorum distracts it. Decorum is simply that thing, act, or word that is expected in a certain situation. The tie rather than the tie-dyed (or the reverse). Speaking honey and not truth to power. Decorum is a dumb automaton, not a fine instrument, and it merely keeps you out of trouble. We sometimes reject as tasteless what is merely indecorous.

If you can, I wonder if you’d do something for me. First chance you get, find a recording of Beethoven’s last string quartet. No. 16 in F, Op. 135. It was one of five decorum-breaking quartets he wrote at the end of his life.

Beethoven, admittedly, was more or less a walking decoro-clast. But in this case it wasn’t just to be contrary or to shock the gentry. Hundreds of clever minds have devoted themselves to explaining what Beethoven was trying to do or say in these valedictory works. A completely unauthorized distillation: Dissatisfied with the musical rules he’d followed all his life and with the works derived under those rules, he looked deeply into the universe of his imagination. Somewhere out there (in there?) he found, to his ecstasy and his terror, that ANYTHING was possible.

So listen to the Op. 135, utterly incomprehensible then, and to a degree, even now. Listen to the nonsequiturs, the wall-bouncing, the silly dances. Lawless music! Now, the third movement: Let it play and let nothing interrupt you. It’s a document brought down from a mountain, curiously devoid of personality, but offering a supreme comfort. You won’t forget it and you’ll listen to it again. It is, to our eternal refreshment, beyond decorum, beyond taste. When we listen to this product—one of a multitude waiting for you to find them—of a human imagination, I believe we should resolve to be proud. A human being, one of our tribe, touched and helped us touch, the sublime. ☒

Bill Morelock ’77 is a classical music host (and frequent essayist) with Minnesota Public Radio.

Patrick Rothfuss '02



ILLUSTRATION MARC SIMONETTI

by Hannelore Sudermann

WORLD
BUILDER

Patrick Rothfuss, '02, has written two best-selling fantasy novels. A third is pending.
Courtesy Patrick Rothfuss



Fantasy writer Patrick Rothfuss ('02 MA) enters the sleek atrium of the Chicago Hyatt with aplomb—passing through a lobby packed with weird characters. A human-sized rabbit taps away on a laptop, a steampunk Victorian-era archaeologist hunts for her friends, a green-haired space alien stands in line for a latte.

These are Rothfuss's people. Or as he calls them, "Geeks of all creeds and nations."

Rothfuss also looks weird. He hails from another time or place—maybe 1970s America, since Simon and Garfunkel peer out from his black t-shirt, or maybe the Middle Ages where his unruly beard would suit him in any village. Or maybe sometime or somewhere else entirely, since two locks of his hair are curling down his forehead like little horns.

He turns to give a broad smile to a cherubic little boy in a stroller behind him. The contraption is being pushed by a woman wearing a t-shirt that says "Pat's minion." He bends and kisses the child, who in this crowd he calls Oot—names are significant to Rothfuss. His key characters have several. Even his own son must have more than one.

"Names are important as they tell you a great deal about a person. I've had more names than anyone has a right to," says Kvothe in *The Wise Man's Fear*.

Rothfuss waves goodbye to his assistant and then leads me to the escalator. We're on a quest for a spot to visit undisturbed by the writer's fans. But the prospect of finding one seems uncertain as we work our way downstairs and through the halls filled with attendees of the September 2012 science fiction convention Chicon. People wave him down to shake his hand and ask when part three of *The Kingkiller Chronicle* series will be printed. One young man drops his armload of papers and pulls a small purple book (another of Rothfuss's published works) from his backpack. "I have the princess with me," he says handing the hardback fairy tale to Rothfuss to sign. The author beams and thanks the guy for buying the book.

Rothfuss, a *New York Times* best-selling author, willingly breaks his focus for his fans. He took a leave from writing at home in Wisconsin to come to Chicago at his own expense and be available, answer questions,

and sign autographs. He also gets to see some of his own literary heroes. Authors like Neil Gaiman and George R. R. Martin are somewhere in the hotel along with dozens of other well-known writers, editors, and publishers from the science fiction and fantasy world. This, Rothfuss says, is the main industry event.

We finally tuck in to a quiet corner to talk about his life as a fantasy writer, his fairly newfound fame, his world in Wisconsin, and his dark days as a graduate student at Washington State University.

A STORY TO TELL «

While the expected science fiction and fantasy names often surface around Rothfuss—Joss Whedon, J.R.R. Tolkien, C.S. Lewis—some unexpected literary influences come up just as quickly. Rothfuss, who lacked cable TV as a child, was a voracious reader. He had a steady diet of books like *The Chronicles of Narnia* and *The Dragonriders of Pern*.

There's a kindness to this guy as he explains for perhaps the thousandth time that he may have always been in the process of writing a book. But what sealed his focus on telling the story of Kvothe, a warrior, performer, and magician, may have been, of all things, the 1897 play *Cyrano de Bergerac*. Rothfuss loved the poetry of the play, the marvelous character of Cyrano, and the deep tragedy of a man who died in the arms of the woman who for years he had loved from afar.

Rothfuss paints the scene of his awakening: "It was like this beautiful sunny Saturday. I had the house to myself. I'd been there in college for three years. I'm reading this play and its beautiful language.

"For the last quarter of the book, it's just heart wrenching. I'm reading it and I'm wiping the tears out of my eyes. I finished the play and I'm like 'Geeahh. I've got to move on with my life.' I go upstairs and I walk around and I'm just crying. I go back downstairs and I'm still crying.

"After I got control of myself, I wondered how come I've never read a fantasy book that is this good."

Around that time, he had picked up the autobiography of Casanova, an eighteenth century Italian nobleman who gambled, seduced women, and had many scandals and adventures. "It was amazing, the story of this man's life. He was so full of himself. He would take these incredible risks and make these huge mistakes," says Rothfuss. Again, he wondered why he had never found anything like it in fantasy. In some ways, Rothfuss's books are like Casanova's story, full of adventures and exploits, told in the first person by an imperfect hero.

Finally, when it comes to influences, Rothfuss brings up Gwendolyn Brooks, the African-American poet who won the Pulitzer Prize in 1950. Not only was he caught up with the music of her poems, but her live reading astonished him. "It was one of the first in-person readings I ever attended," he says. "Everyone was gripped." In between her poems, she would tell these great little stories about her life and how her poems came to be. "That's what I remember from that," he says.

As Rothfuss writes, he works in side stories and details of many of the things that fascinate him. His first book, *The Name of the Wind*, tells of a young hero's awakening. Born a precocious child of traveling performers in a bucolic Thomas Hardy-like countryside, tragedy strikes him. He loses his family, faces supernatural beings, and finishes his youth as a street

What is your literary taste?

Do you like detective stories? Or maybe you lean toward a historical romance? Or perhaps you'd like to escape into an adventure novel?

"Mysteries, westerns, women's romance, horror stories; these are all genres," says WSU professor emeritus Paul Brians. An expert in science fiction set in the post-nuclear holocaust world, Brians can also lend insight into how we got from early literary movements to our current fiction genres.

In his class notes on "Realism and Naturalism" (part of a Humanities 303 class), Brians delves into a variety of works of literature to explain the development of genres. The old-school romance—not quite like the steamy romances of today—is typically a compelling tale with exciting settings and fabulous plots, but few descriptive details.

"If you read Jane Austen," says Brians, citing *Pride and Prejudice*, "you may see that Darcy is devastatingly handsome, but you get no picture of what he looked like."

REALISM CAME AS A RESPONSE to romanticism. Authors like Honoré de Balzac, the grandfather of realism, changed the focus from the ideal to the everyday. His *La Comédie humaine* (the human comedy) is thick with specific details of life, clothing, and possessions. "His attention to detail was obsessive," notes Brians.

From Realism came Naturalism, a movement that took place in the late 1800s and into the 1940s and had characteristics of meticulous detail and a focus on environment. Émile Zola's *Germinal* offers a story of a coal miners' strike in Northern France. Life there is harsh and gritty. Naturalism is a fascinating trip, says Brians, starting with Zola and ending with the grittiest of genres, the detective novel.

The horror story has its roots in the gothic novel. Mary Shelley's *Frankenstein* with its hideous monster might fit into the Gothic or horror genre, but think again, says Brians. The monster is created with technology—electricity. "That makes it science fiction," he says.

Linda Russo and Buddy Levy of the WSU English Department have been dipping into these genres with their creative writing students. Sampling fantasy, horror, mystery/crime, romance, adventure, and westerns, Levy asks his class to not only try reading in these genres, but to take a shot at writing in them.

"Narrative is so ingrained in our culture," says Russo. "It's almost like they're so comfortable in it, you almost have to bump it up into a craft." So her students take things apart, looking at what goes into a story. She has them do exercises in realist microfiction, pieces of up to 1,000 words that exercise their descriptive skills, building scenes, and crafting characters.

When exploring literary genres, there's a lot out there to like, says Levy. As a reader, he has generally followed a diet of "Capital L literary fiction," he says. "But this class has taught me to loosen the reins." Often teachers, and readers, get stuck in one area. But they're missing out on works like the post-modern science fiction of Philip K. Dick, a fantasy like J.R.R. Tolkien's, or the mysteries of Elmore Leonard and Dennis Lehane.

Good stories with strong characters and gripping plots are, even though they may be locked into genres, awfully good reads. "What we're really talking about is the quality of the work itself. Just look at Cormac McCarthy and the western," he says. *Blood Meridian*. That may be one of the highest levels of literary skill. ☒

Ready to explore? For some experts' suggestions of seminal works from the different genres, visit wsm.wsu.edu/extra/Paul-Brians. Are you a sci-fi fan, or a former student of Paul Brians? Visit wsm.wsu.edu/extra/literary-taste about his volunteer work in the science fiction exhibit at Seattle's Experience Music Project.

urchin in a Dickensian city. In the end he finds his way off the street and into a school of magic. *The Wise Man's Fear*, book two, features the hero attending the university, a skilled but unruly student competing with his classmates and struggling with his finances. The third book, which Rothfuss is now editing and revising and about which he reveals little, is called *The Doors of Stone*.

PAT'S OWN DRAGONS

Universities are a theme in Rothfuss's life and his books. It seems he has always been on or near a campus since he started college at the University of Wisconsin-Stevens Point. He took courses in medieval history, theater, anthropology, and English. "Given my casual stroll through college, I was able to accumulate a lot of experience that maybe a lot of focused students wouldn't have had the opportunity to do," he says.

Most of the time, he was working doggedly on his trilogy, filling thousands of pages with the stories of Kvothe and details of the Four Corners world, which Rothfuss describes as another place, right now.

But if you hang around long enough, the school starts to notice. English Department Chair Michael Williams ('75, '85) called him into his office and told him he needed to graduate. Rothfuss thought about what he would like to do—and a life in academia seemed a good fit. After nine years as an undergraduate and seven years as a writing tutor, he was already off to a good start. So he set his sights on graduate school, and because some of the Stevens Point faculty, including Williams, had attended WSU, he aimed for Pullman.

"I had been a tutor in the writing lab for so long, I was training the tutors," he says. That surely factored in to his application, since as a graduate student he would be teaching and helping WSU freshmen with their writing. "I do not look like any sort of sensible applicant on paper," says Rothfuss. He was once on academic probation. He failed Math 106 several times because he didn't like the professor. "My record was spotty. It had character."

When he got to Pullman, he found most of his classmates were quite different. They were intense and focused; many had finished college in three years after testing out of the freshman courses. At graduate student orientation, the new students were asked who had taken English 101 as undergraduates. Only Rothfuss and one other raised their hands. That was Patrick Johnson ('98, '99, '02).

Rothfuss latched on to Johnson, who had a similar tendency to linger around campus. "I was sort of addicted to Pullman school life," says Johnson, a Vancouver native who had by that time been in Pullman six years. "He saved my life," says Rothfuss. "Without him, I never would have finished graduate school." Johnson won't take that credit, but admits the two Pats helped each other. "I knew the WSU system. I knew the faculty," says Johnson. "I helped him find an instant group of friends."

Rothfuss wasn't hard to befriend. "Pat is one of the most charismatic persons that I have met," says Johnson. He remembers a time on campus when the two were walking past a demonstration on the Glenn

Terrell Mall. It was a rally about racism, says Johnson. The ASWSU president asked if anyone wanted to speak. Though he had only been on campus about three weeks, Rothfuss raised his hand and took the microphone. "He said, 'I like what I'm hearing,'" and went on to praise the group for being progressive and open minded. It wasn't much for content, says Johnson, "But he couldn't resist the opportunity to speak to a group of people."

The friends were good, but the rigorous schedule and the tenor of the graduate work didn't fit Rothfuss. "I'm not in any sense suited to be a modern day academic scholar," he says. "I probably would have been fashionable like 300 years ago or 2,000 years ago. Those are my sweet spots. The scholarship that is done these days, I really don't have

own efforts in fantasy were sometimes viewed with disdain. "There was definitely a stigma," says Johnson. "People were vying for who was going to be the best academic. Fantasy was not taken as seriously."

Still, few of them were lugging around a massive trilogy. "He was the novel guy," says Johnson. "He was always asking people to read it and give him feedback." He would print it out and make copies at the Pullman Kinko's, bind it with a black plastic binding, and then pass it around. "Nate [Taylor, Johnson's roommate] read it. Nate's dad read it. Tom [another friend] read it. One of his English 101 students even," he says. "You knew that he cared about it desperately."

The book was different, engaging, and "he writes jokes. That's a really rare treat in fantasy," says Johnson.



Rothfuss's first book, *The Name of the Wind*, has found readers around the world. His second, *The Wise Man's Fear*, was #1 in hardcover fiction on *The New York Times* bestseller list in 2011. Courtesy DAW Books

"Books are a poor substitute for female companionship, but they are easier to find," Rothfuss writes in *The Wise Man's Fear*.

Rothfuss lived in the world of the book. When he wasn't writing, sometimes he and his friends would play in the world—a role playing game similar to Dungeons and Dragons. "This was serious geek business," says Johnson. "Pat's world was so sophisticated and so nuanced."

Rothfuss guided the players through adventures in the realm he had invented. "It allowed him to think about his world as a real place," says

Johnson. He created money, had sorted out the crop rotations, devised languages, cultures, and folklore. They spent time there and could try out different ideas. “We got to play in his sandbox, so to speak.”

While attending graduate school, working on his book, and hanging out with his friends, Rothfuss was also struggling to find an agent or a publisher. In his words, his writing was “rejected by roughly every agent in the universe.”

» THE NAME OF THE WINDFALL

But then in 2002, a short story that Rothfuss had excerpted from his trilogy won the L. Ron Hubbard Writers of the Future contest. He was invited to Hollywood to accept his award at a ceremony. “He was so excited,” says Johnson. “He bought a tuxedo for the event.” Thanks to the award, “The Road to Levinshir” caught the attention of several book agents and ultimately led Rothfuss to DAW Books, a science fiction and fantasy publisher headquartered at Penguin Group.

After graduate school, Rothfuss returned to Stevens Point, settling into a life with his partner Sarah, teaching at the university part-time and writing. Once he sold his first book, his life changed, though his tastes didn’t. “Now I get to eat Chinese food whenever I want,” he says. “I can afford it.” He paid off his credit cards, bought a house with Sarah, and started thinking about other uses for his money.

The Name of the Wind got off to a good start, winning the 2007 Quill Award for Science Fiction/Fantasy/Horror and making the *Publishers Weekly* list of best books of the year. And it was getting great response from the sci-fi/fantasy world. Author Anne McCaffrey blurbled: “This is a magnificent book, a really fine story, highly readable and engrossing. I compliment young Pat. His first novel is a great one.” And a *Times of London* reviewer wrote, “I was reminded of Ursula LeGuin, George R. R. Martin, and J. R. R. Tolkien, but never felt that Rothfuss was imitating anyone. Like the writers he clearly admires, he’s an old-fashioned storyteller working with traditional elements, but his voice is his own.”

Hundreds of readers were turning out for each stop on his book tour, many of them also following Rothfuss on his blog. Rothfuss realized he now had some influence. “I got all this enthusiasm. I thought maybe I could make it mean something,” he says.

In 2008, while in the thick of editing his second book, Rothfuss started a project he named Worldbuilders to raise money for Heifer International, an organization that uses donations to supply families in needy countries with livestock like chickens, rabbits, and sheep. “It’s all about hope, it’s all about self-reliance,” he says of the nonprofit organization. He blogged that if his fans donated to Worldbuilders, he would match every dollar. “I pictured raising \$5,000,” he says. “But we hit \$5,000 in the first three days.”

He offered signed books and maps for the Four Corners world as incentives to fans supporting the project. By the end of that first fundraiser, the group raised more than \$50,000. Great for Heifer. Not for Rothfuss. “It completely wiped me out,” he says. “And I had forgotten as an author, they don’t take taxes out of your money.” For a moment, Pat’s bank

account looked dire. Broke college student dire. But then out of the blue, “I got a royalty check from Germany and that like saved me,” he says. He decided to keep Worldbuilders going.

Now in its fourth year, Worldbuilders is supported by a number of science fiction and fantasy writers, artists, and publishers. They donate books, t-shirts, calendars, and other things and the fans contribute cash. To date, the effort has raised more than \$1 million for Heifer.

With the books, the conventions, the fundraisers, the family, and the fans, Rothfuss says his life is now pretty full. “Yeah, it’s pretty cool to be famous,” he admits. “But it gets to a point where it’s weird.” He misses things about his pre-published self. “I was way happier poor in college.” He turns wistful. There were fewer people dependent upon him for their happiness. And he nearly lost something that was crucial to his creating the books—that old Spartan environment he had as a student when the only important thing was his story. “I like isolation. I like quiet,” he says. A few years ago he bought a house in which to write, an old two-story former student rental away from the comforts of home and of friends and family. “I put a desk in there and instantly my writing productivity went up by a factor of 10,” he says.

That lasted for a while. Now, thanks to Worldbuilders and some of his other endeavors, the writing house is a lively zone. His employees helping with the fundraisers and managing the business of letters, bills, and special projects fill the house with life and noise. He fights the distractions by making his second floor office sacrosanct. “Nobody goes in that room,” says Rothfuss. “If the house is on fire, I will smell it. Thank you.”

The Wise Man’s Fear trumped the first book’s success. In March of 2011 it was #1 in hardcover fiction on *The New York Times* bestseller list. When he posted about it in his blog, in true low-key Rothfuss fashion, he told his followers that he would celebrate with some macaroni and cheese and, since Sarah and Oot were already asleep, an evening playing the video game *Dragon Age II*.

As he starts revising *The Doors of Stone*, he must first reread the previous two books so they are fresh in his mind. “There are some scenes and I forget that I wrote them,” he says. The fault is in the sheer length of Kvothe’s story. “I wrote my three books thinking it was kind of one big really absurdly long book,” he says.

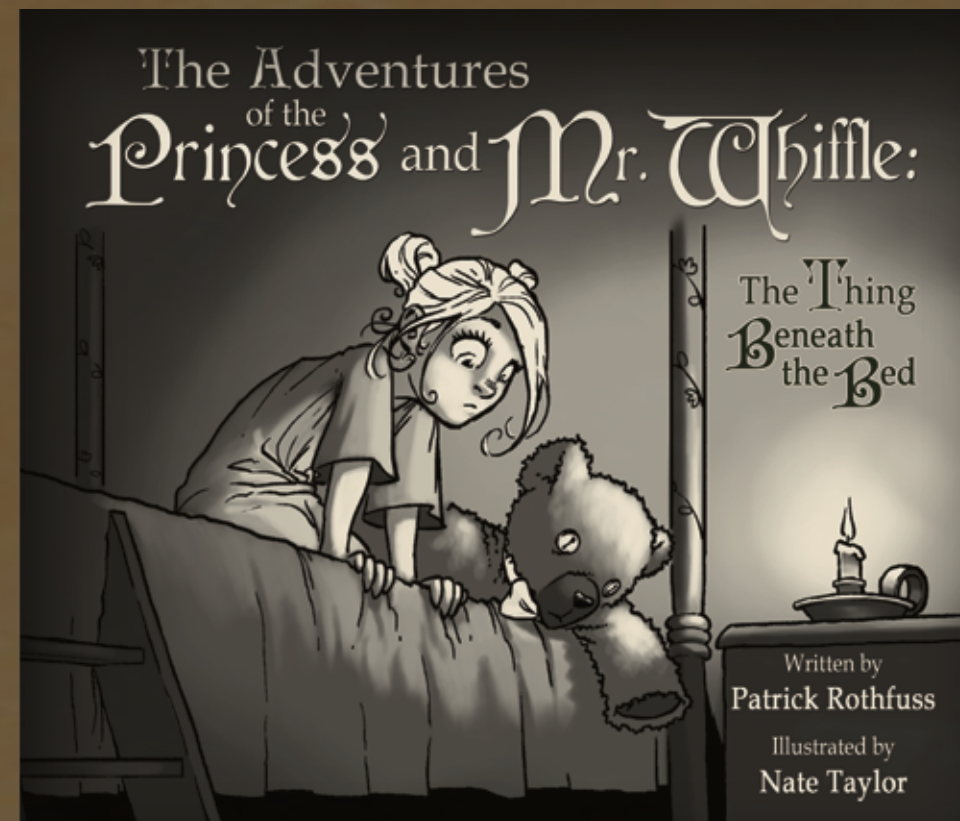
Now he revises, reinvents, and, as a distraction, concocts short stories. The third book is coming, he promises, maybe in two years. Maybe three. Maybe a hundred.

And then, there will surely be more stories set in this world, he promises. “The smartest thing I’ve ever done is keep writing.” ☒



COURTESY PATRICK ROTHFUSS

Patrick Rothfuss '02



The Princess Project

Patrick Rothfuss dreams up a lot of projects. Some of those dreams (or nightmares) come true.

The Adventures of the Princess and Mr. Whiffle: The Thing Beneath the Bed (Subterranean Press) got its start as a bedtime story that Rothfuss concocted for his girlfriend Sarah while in graduate school at Washington State University.

It’s the tale of a little girl who lives in a marzipan castle with her teddy bear Mr. Whiffle. In the first telling of the story, Sarah didn’t really like the ending. So Rothfuss tried again, making it a bit darker. Then he told a third ending, even darker. So dark that Sarah couldn’t get to sleep.

In many ways, it is an old-school fairy tale of the Grimm persuasion, dark, scary, and without a happy ending. It’s more for adults, Rothfuss cautions. “There’s something inside us that really wants to hear about the wolf in the woods.”

The next day, he retold the story to his friends. They loved it.

“Right away, I started picturing the princess,” says Nate Taylor ’02, an art major who lived next door to Rothfuss and years later would draw the map of the Four Corners world printed in Rothfuss’s novels.

Over the years, the notion of a princess book would come up, but Rothfuss, who was back in Wisconsin, was too busy with his novels to focus on it. Finally, after the first tome of the trilogy was published, Rothfuss sat down to work up a proper script. With that in hand, Taylor, now an illustrator in the Puget Sound area, fleshed out drawings of the little girl and her world, her castle, and her bedroom.

“I wanted to make it very cute, to accentuate the ending,” says Taylor. “The characters all have big eyes and big hearts.” He embedded little clues along the way to the story’s ending.

For someone whose second novel contains 152 chapters, *The Princess* is surprisingly brief. But it packs a punch. “It has gotten chuckles from everyone that I’ve ever shown it to,” says Taylor. “Except for my parents.” They laughed nervously and then asked, “What did you do?,” says Taylor.

The book has now had three printings and sold around 7,000 copies. The publisher released it in limited hardback edition last December as well as in paperback before the end of the year. It’s something of a dark and delicious bonbon—with a bite at the end. ☒



Take a look at a gallery of Nate Taylor’s illustrations at wsm.wsu.edu/extra/Nate-Taylor



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- The *Cougar Business Network* (CBN)
- No membership fee when joining the *Wine-By-Cougars* wine club
- Savings on Cougar gear at The Bookie, Crimson & Gray, and the Washington State Connections store
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1950s

Dale McKean ('57 Engl.) and his wife Penny recently celebrated their 50th wedding anniversary. They enjoy gardening and travel.

1960s

Darryl Olson ('63 Animal Sci.), **Joe Pettit** ('68 Ed), **Ray Stein** ('68 Math), **Terry Nealey** ('69 Bus. Admin), **Tedd Nealey** ('69 Ag.), **Ted Wierman** ('69 Bus. Admin.), and **Dan Steward** ('72 Ed.) played basketball in the Huntsman World Senior Games, in St. George, Utah, last October.

Barbara (Lof) de Michele ('66 Engl.) was named to the City of Issaquah Hall of Fame for her service on the Issaquah School Board, the Issaquah Arts Commission, and for serving as the Executive Director of the Issaquah Community Network. She also received the prestigious Golden Apple Award from the Issaquah Schools Foundation for her "sustained contributions to community youth."

E. Garry Hill ('69 Bio.) is the 2012 recipient of the Scott Davis Award for Excellence in Track & Field Announcing by TAFWA (Track & Field Writers of America). He was the stadium announcer at the Olympic Games in London, the fourth time he has served in that capacity. Hill, the editor of *Track & Field News*, has now announced track meets in 17 nations for the sport's international governing body, the IAAF, based in Monaco.

1970s

Marc Bates ('70 Animal Sci., '76 Bus.) is the manager of the Oregon State University cheese plant which just released an alpine-style specialty cheese, Beaver Classic, developed and produced by students using milk from the university's dairy herd.

Diana Ewing ('71 Engl.), who had a career in advertising and public relations, has written a book entitled, *The Baby Boomers' Guide to Grandparenting: An Irreverent Look at the Next Big Step*. She lives in Southern California with her husband David.

1980s

Joseph P. Thomas ('80 Pharm.) of Ulmer & Berne LLP was named 2013 "Lawyer of the Year" by The Best Lawyers of America, who designates only one lawyer per practice area as Lawyer of the Year in the nation's largest legal markets. His area is product liability litigation, representing the defendants.

Meg Carlson ('82 MBA) is president of Prosperity Organic Foods, Inc. of Boise, Idaho. The company

» tracking



Asif Chaudhry '88

The ambassador

by *Larry Clark '94* :: In 2008, when Asif Chaudhry became U.S. ambassador to the Republic of Moldova, the small Eastern European country wedged between Romania and Ukraine was in flux. As it moved from Communist rule to a free market, pro-Western government, the country was seeking a stronger relationship with the United States.

Chaudhry '88 PhD knew the new Moldovan government faced economic problems as well as social issues with human trafficking. He also recognized Moldova's importance as a former Soviet state and an economic partner with the European Union.

"The biggest challenge that we faced was a country that previously was not as strong in terms of the institutions, neither

for democracy nor for a strong economy," he says. As ambassador, he helped the new Moldovan government streamline business licensing, build infrastructure, enact justice reforms, and make a concerted effort to curb trafficking.

A circuitous route led Chaudhry from rural Pakistan, where he was born, to Pullman and Washington State University and later to the U.S. embassy in the Moldovan capital of Chişinău. He grew up in the village of Nindowal. "When I was going to primary school, there were five classes but the school had only three rooms. So two of the classes were always held outside under a tree, and we didn't have benches so we sat on the ground," he says.

He learned English from his father, a former officer in the British Indian Army. He eventually went to high school, college at the University of Punjab, and then to the American University of Beirut for a master's

Asif Chaudhry '88 PhD, former U.S. ambassador to Moldova and currently foreign policy advisor to the chief of U.S. Naval Operations. Video frames courtesy Urdu VOA News

degree. Along with several of his cohorts, Chaudhry sought a doctoral program in the United States. Meanwhile, civil war had broken out in Lebanon.

"For that period of time while I finished my master's, the airport shut down, there was no mail coming in. I had to escape from Beirut in a taxi to Damascus. From Damascus, I had no money, I went to the Pakistani Airline office and was able to get them to give me a ticket to go back to Pakistan," says Chaudhry. "But I had in my hand the acceptance letter from WSU."

Back in Pakistan, his brother-in-law gave him money for travel and one semester's tuition to start his studies in agricultural economics at WSU. Chaudhry credits economics

» tracking

professor Leroy Rogers for helping him find enough work to be able to pay in-state tuition and complete his degree.

The doctoral degree helped him build toward his future career, thanks to professors such as Doug Young and Tom Schotzko. He also credits the exposure to the international community on campus. “The quality of education I received laid a great foundation for me to have the confidence to go and do what I’ve been doing. There is no substitute for good education and I got that at WSU,” he says. “And if I had not had that international exposure, I may not have learned what America is about. It was this foundation that helped me become a successful Foreign Service officer.”

resources from universities and other sources to the Polish farmers.

“It was right at the time of transition from the old communist ways to a free market economy. As an agricultural attaché, a big part of my job was to help the Polish agricultural sector to transition from the old ways of collectivized farming to a free market agricultural system,” says Chaudhry, who during that time met President Bill Clinton, Vice President Al Gore, and former President George H. W. Bush.

He next moved to the U.S. embassy in Russia to serve as a counselor for agricultural affairs. The economy there collapsed in 1998. Chaudhry helped establish an assistance program from the United States to export commodities to the former Soviet Union and

was recently named a silver award winner in the Consumer Products Company of the Year category at the 2012 Stevie® Awards for Women in Business.

Kim Roberts (’82 Arch.), her husband Blain, daughter Carrie, and son-in-law Dana launched Westport Winery in Aberdeen in 2008. The winery was recently awarded the silver award for the *Seattle Business Magazine’s* Washington Family Business of the Year for 2012.

Pamela Cort (’83 French), the Las Cruces Public School District French teacher, was recently named New Mexico Teacher of the Year during a surprise celebration held in her school.

Dick Fohn (’83 Accounting) was recently selected president and chief operating officer for Seattle-based Moss Adams LLP, one of the largest accounting and business consulting firms in the nation.

Doug Watson (’85 Accounting) has rejoined the Grant Thornton LLP’s Seattle practice as the director of business development for the Pacific Northwest.

Kathleen T. Coleman (’87 Comm.) became Spokane-based *The Spokesman-Review’s* sales and marketing director on January 1, 2013.

Mike Utley (x’89), a former WSU and NFL football player, is featured for his charitable contributions in the book, *Everyday Heroes: 50 Americans Changing the World One Nonprofit at a Time*. The Mike Utley Foundation raises money for spinal cord injury research and education.

1990s

Carla Nellis (’90 Comm.) has written a picture book entitled, *WSU Cougars—from A to Z*, aimed at children. The former teacher reveals fun facts about WSU like how a class project led to the Cougar Fight Song and why live cougars once traveled with the football team. Nellis lives in the Northwest with her husband and three children.

Robin Starkenburg (’92 Ag. Comm.) is the marketing manager at Digi-Star LLC, a leading manufacturer of electronic weighing systems for feed mixers and livestock scales.

Taryn Kama (’93 Comm.), the founder of Go Get it Gal, was honored at the University of Washington Women’s Center’s annual “Women of Courage: Braving New Horizons” gala event recognizing those who made lasting contributions to the communities they serve by creating innovative ways to approach and solve social and political issues.

Mike Eller (’97 Bus. Admin.) of Electronic Systems Technology, Inc. (ESTeem Wireless Modems) has been appointed manager of finance and administration.

Leslie (La Motte) Archer (’98 Finance) and **Ken Archer** (’99 Lib. Arts), welcomed baby girl Elsie La Motte in July 2012. Elsie joins brothers Edward (4) and Sydney (2).

Scott Thurman (’98 Bus. Admin.) was recently named executive vice president of TenBridge

Partners, LLC., a Portland-based registered investment advisory firm.

2000s

Ellie Shahnian Baldwin (’02 EdD) has been appointed dean for the School of Education at Jones International University.

Raina Spence (’02 MS Plant Path.) is the director of industry outreach for the Washington State Potato Commission.

Kirsten (Shafer) McNeil (’03, ’06 MS Mech. Eng.) Foreign Affairs Specialist, U.S. Export Enforcement Support, Office of Nonproliferation and International Security, has been selected as the recipient of the 2012 Linton Brooks Medal for Dedication to Public Service.

Judy (Worker) Monhollen (’07 Hist.) and her husband, SSG Paul Monhollen, welcomed a baby boy Jonathan William in September 2012.

Jena (Kautto) Dyches (’08 Soc. Sci.) and **Zach Dyches** (’07 Accounting) recently married and instead of a traditional cake, they had a Cougar cake. The couple met while attending WSU.

2010s

Monica Mangis (’10 DVM) is the Ketchikan (Alaska) Veterinary Clinic’s only veterinarian. Mangis plans to become certified in herbal medicines for animals.

Hillary Nauss (’10 DVM) has joined the West Maui Animal Clinic staff, in Lahaina, Hawaii. Her interests include preventative medicine, internal medicine, surgery, radiology, and fish medicine.

Navy Seaman **Kyle E. Barker** (’11 Mvmt. Studies) recently completed the U.S. Navy basic training at Recruit Training Command, Great Lakes, Illinois.

Matthew Heatherly (’12 Soc. Sci.) earned his degree while being twice deployed to Iraq.

Navy Seaman **Nathan M. McQuarrie** (’12 Env. Sci.) recently completed the U.S. Navy basic training at Recruit Training Command, Great Lakes, Illinois.

Erica Norris (’12 Advertising) created an eccentric job-hunting video that went viral and resulted in a job offer from the nationally syndicated television show *Ellen*. Norris appeared on the show to accept her new position as a production assistant.

IN MEMORIAM

1930s

Anna McGlade (’30 Home Ec., Alpha Gamma Delta), 102, June 29, 2012, Spokane.

Herman C. “Andy” Anderson (’35 Chem.), 100, October 23, 2012, Boulder, Colorado.

Adolph R. Rygg (’37), 98, September 26, 2012, Everett.

Robert L. Clinton (’39 DVM), 96, May 4, 2012, Mount Vernon.

Deryle Newton Seely (’39 Agro.), 97, September 26, 2012, Kirkland.

separatist area called Transnistria, which complicated the ambassador’s work. Once, he and Senator John McCain were approached by a mother whose son had been imprisoned on trumped-up charges by the separatists.

“It was a very touching moment, and I personally raised the issue with the head of that separatist movement and asked him to be lenient and let this young man leave. Then Senator McCain promised he would come back to the U.S. and do what he can,” says Chaudhry. “For us to be involved as individuals and as representatives of the United States in protecting an individual’s rights, those are special moments.” Chaudhry later received an email from that young man thanking him for the help that led to his release.

Currently, Chaudhry is the foreign policy advisor to the chief of U.S. Naval Operations. He works with officers in their engagement with other countries on such issues as maritime access for trade. Chaudhry says he is learning a great deal about the Department of Defense and how foreign policy and national security interact.

Looking back, Chaudhry is still amazed at how full his life has become.

“To start from that village, where there was no electricity, no running water, sitting on the ground under the tree, it seems unbelievable that I would make it to the U.S.,” he says, “let alone come to a great institution like Washington State that prepared me to go into the Foreign Service and become a United States ambassador.”

George R. “Bob” Pettit ’52

A profile in persistence

by *Eric Sorensen* :: Every few days, Bob Pettit ’52 runs six miles. Now 83, he has done this since his late 20s, when he joined the faculty of the University of Maine and felt the mounting tensions of academic life.

“It’s a great release of stress,” he said this fall while visiting Pullman to receive the Regents’ Distinguished Alumnus Award, the highest honor for WSU alumni. “And I think aerobic exercise is the secret formula for longevity.”

Pettit’s running habit also speaks to his fortitude, whether he’s diving in waters

around the world in a search for natural cures to cancer, finding new ways to process tons of marine organisms, or rebuilding his career after an administrative firestorm that, in effect, deprived him of access to a massive endowment, thousands of samples, scores of notebooks, and a multi-million dollar lab.

“There are three ways to be successful,” he says. “Never give up, never give up, and never give up. Giving up is not my style.”

Pettit has been on the trail of a cure for cancer since his teens, when he first saw the ravages of the disease while working in a hospital pathology lab. At the same time, he was fascinated by the sea life around his home on the New Jersey shore. How is it, he wondered, that humans get cancer when these creatures never seem to? Somehow, he reasoned, they had developed anti-cancer compounds as they evolved over millions, even billions of years.

He earned a degree in chemistry at Washington State University before getting master’s and doctoral degrees at Wayne State University, where he studied with Carl Djerassi, who developed one of the first oral contraceptives. He started systematically collecting fungi at the University of Maine and continued at Arizona State University, broadening his searches to plants and marine animals around the world.

Off the Maldives, he collected black sponges and found in them spongistatin, a promising therapy for treatment-resistant cancers.

In South Africa, he collected the bush-willow tree, whose bark contains combretastatin A-1 and A-4, which are now being tested on cancers.

On the shallow reef off Mauritius, he collected sea hare, a mollusk, and isolated dolastatin 10, which led to the Seattle Genetis drug, Adcetris. He also developed a process to synthesize the compound to avoid using hundreds of tons of actual sea hare.

Overall, Pettit and his colleagues collected more than 14,000 marine species, as well as 3,000 plant species and 1,000 insect species. He attracted millions of dollars in funding. He founded the ASU Cancer Research Institute and designed its 60,000-square-foot building so a natural product could go in one end and a drug would come out the other.

He patented more than five dozen cancer-fighting compounds. A dozen drugs discovered by Pettit and his colleagues are currently in one phase or another of human cancer clinical trials. One is also in trials in



Ambassador Asif Chaudhry with his wife Charla and Moldovan Prime Minister Vlad Filat (front) as they are greeted by young residents of Leova Boarding School.

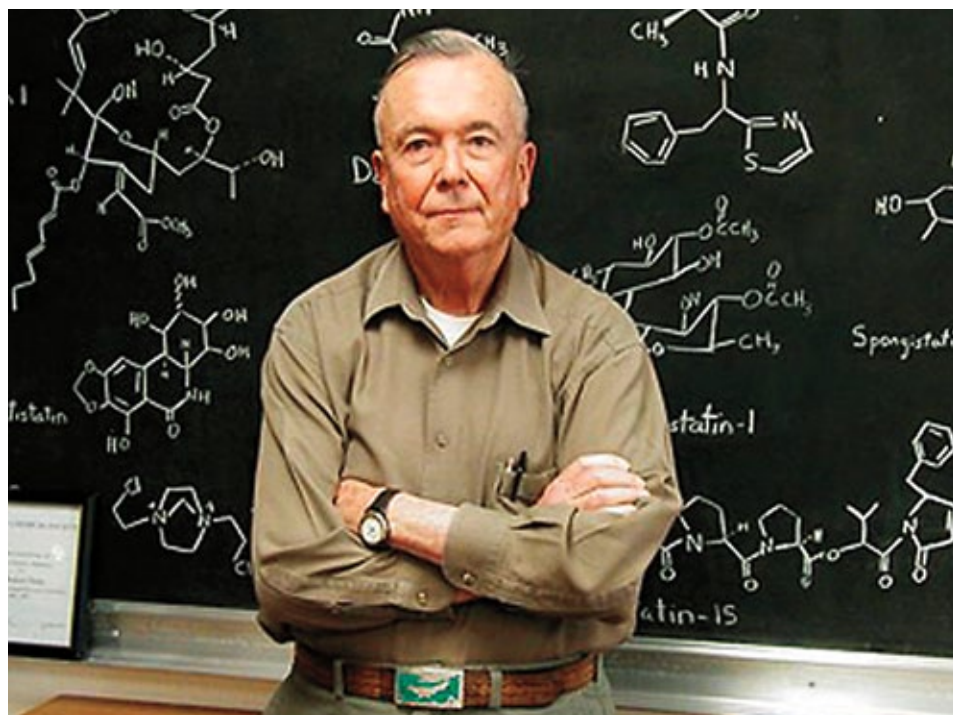
Chaudhry’s personal life changed, too, cementing his lifelong affection for the town and WSU. His wife, Charla (Carolus) ’85, was “a local girl, so Pullman has become a home. Even though her parents are now gone, for her and for me this is home.” The couple have two sons and a daughter.

After a short stint teaching at Montana State University, Chaudhry applied to the State Department’s Foreign Agricultural Service where he was hired and assigned to Poland in 1992. He helped form a ministry of agriculture and extension centers to bring

other Eastern European countries, bringing business to the ports, railroads, and processing, and sending proceeds to a pension fund for the elderly.

After Russia, he spent several years overseeing U.S. trade relations with five countries in the Middle East from the U.S. embassy in Cairo, then in Washington, D.C. at the Foreign Agricultural Service. In 2008 he was appointed U.S. ambassador to Moldova.

Among its issues with trafficking and economic transformation, Moldova has a



George R. "Bob" Pettit '52. Photo Peter J. Kiss

ophthalmology, another is in a trial against Alzheimer's disease, and trials are planned for a drug to fight pregnancy preeclampsia.

But in the late '90s, relations started to sour between Pettit and the ASU administration. Exactly why is unclear. A 2007 investigative report in the *Phoenix New Times* alludes to personality conflicts and differences over the direction of intellectual property, patent policy, and licensing agreements.

In January of 2006, the university froze Pettit's funds and fired 30 researchers in his lab. He was cut off from an endowment given specifically to him and denied access to his notebooks and thousands of samples. He was moved back into the lab he was given when he first arrived at ASU in 1965.

With litigation still in play, Pettit is guarded about discussing details. ASU doesn't discuss the matter.

Whatever the circumstances, the Pettit-ASU conflict became a national model for nasty academic disputes, cited by the *Wall Street Journal* in a page one story headlined, "Ivory Power." It's also the ultimate acid test of Pettit's doggedness.

It's safe to say most of us would have cried uncle, quit, retired, or looked for work elsewhere. Then again, most of us wouldn't comb the planet for various ancient life forms and probe them for compounds to test. Pettit

acknowledges as much and says he stayed at ASU, where he is a tenured Regents professor, out of a commitment to his fellow researchers and the cancer victims he hopes to help.

It's stressful, to be sure. But he has ways to deal with that.

"I run six miles every couple of days," he says.

 Read more about Pettit's struggle with ASU at wsm.wsu.edu/extra/Bob-Pettit.

John Bryant '88

Here for the beer

by Rick Bonino :: John Bryant's first taste of the beer business was pouring pints for fellow Washington State University students at the Cougar Cottage. Since then, the 1988 communications graduate has helped build microbreweries in Oregon and Colorado into some of the most successful and respected in the country.

Now he is hoping to do the same in Spokane with the recently rebranded No-Li Brewhouse. Since he arrived, sales have soared and the brewery is winning awards and attention across the United States and overseas.

1940s

William Howard "Bill" Burns (x'40), 90, September 2, 2012, Spokane.

Marjorie Crane Bue Nicklason ('40 French), 93, November 5, 2012, Casper, Wyoming.

Paul Alfred Wesseler ('41 Ag. Ed.), 99, October 6, 2012, Vancouver.

Frances E. Hurd ('43 Home Ec.), 90, July 24, 2012, Spokane.

Marvin Shappi (x'43, Sigma Chi), 91, October 7, 2012, Riverside, California.

Venette M. Hagen (x'44), 92, February 11, 2012, Lakewood.

John Emil Halver ('44, '48 MS Chem.), 90, October 24, 2012, Seattle.

Louise Hastie ('44 Comm.), 91, September 1, 2012, Bellevue.

Mary Ann (Whalen) Keller (x'45), 88, November 19, 2012, Vancouver.

Rosemary Francisco Sherwood ('45 Home Ec.), 88, October 11, 2012, West Lafayette, Indiana.

Betty Ann Jackson (x'46), 84, November 7, 2012, Burlington.

Marcia H. Andrews ('47 Speech/Theatre, Kappa Alpha Theta), 86, August 22, 2012, Everett.

Robert Richard Luhn ('47 Mech. Engr.), 87, September 22, 2012, Clarkston.

Leslie Ferris Lokken ('48 Journalism), 86, September 18, 2012, Prescott, Arizona.

Frances H. Anderson ('49 Music, Kappa Kappa Gamma), 85, November 12, 2012, Spokane.

Marion Budiselich ('49 Bus. Admin.), 92, April 30, 2012, Peoria, Arizona.

Chester Christenson ('49 Civil Engr.), 100, April 11, 2011, Carson City, Nevada.

Richard D. Clark ('49 Math), 87, October 10, 2012, Spokane.

Ada Alice Cook (x'49), 86, November 26, 2012, Redlands, California.

Allen O. Daniels ('49 Elect. Engr.), 86, October 15, 2012, Tacoma.

Chester Gisselberg ('49 Hort.), 90, November 8, 2012, Ellensburg.

Marilyn Frances Lewis ('49 DVM), 86, September 3, 2012, Sacramento, California.

William B. Lippincott ('49 Phys. Ed., Gray W Charter Member, Sigma Nu), 89, May 21, 2012, Chelan.

Frank E. Newman ('49 Elect. Engr.), 89, November 7, 2012, Vancouver.

Richard D. Nichols ('49 Speech & Hearing Sci.), 90, October 3, 2012, Caldwell, Idaho.

Edward Stilke Soper ('49 Ag.), 89, October 21, 2012, Arlington.

Pearl M. Votava ('49 Soc.), 84, September 24, 2012, Spokane.

James Ronald Warren ('49 Speech Comm.), 87, September 13, 2012, Bellevue.

Bill C. Wilson ('49 Bus. Admin.), 91, October 2, 2012, Vancouver.

1950s

Edwin J. Burgstahler ('50 Mech. Engr.), 87, November 8, 2012, Washougal.

Phyllis Ruth Carlson ('50 Sociology, Delta Gamma), 83, November 28, 2012, Boise, Idaho.

Harvey W. Cottle ('50 Phys. Ed.), 87, September 5, 2012, Yakima.

Robert Ivan "Bob" Marr (x'50, Sigma Alpha Epsilon), 84, October 26, 2012, Bellingham.

J. Dan Schoedel ('50 Bus. Admin.), 84, September 16, 2012, Spokane.

Harry Bruce "Doc" Bonallo ('51 DVM), 89, September 21, 2012, Blaine.

Charles Elton "Chuck" Childs ('51 DVM), 92, June 21, 2012, Lancaster, California.

John D. Curran ('51 Forest & Range Mgmt.), 84, September 17, 2012, Winlock.

William C. Houck Jr. ('51 Chem.), 86, October 5, 2012, Corvallis, Oregon.

Ray D. Hunter ('51 Ag.), 86, September 12, 2012, Hamilton, Montana.

John B. MacLean ('51 Elect. Engr.), 82, October 2, 2012, Santa Rosa, California.

Douglas G. McArthur ('51 Civil Engr.), 94, July 27, 2012, Longview.

Robert "Bob" Pickering ('51, '57 ME, '69 EdD), 83, September 15, 2012, Anacortes.

J. Keith West ('51 Arch.), 87, October 27, 2012, Lake Oswego, Oregon.

Eunice K. Franklin ('52 Ed.), 82, August 22, 2012, Port Townsend.

John Einer Sandberg ('52, '63 MA, '65 PhD Ed.), 83, October 24, 2012, Viera, Florida.

John Franklin "Jack" Talbot ('52 Elec. Engr.), 86, August 31, 2012, Lake Stevens.

Melford E. Boggs ('53 DVM), 83, September 3, 2012, Madras, Oregon.

John Earl Drumheller ('53 Physics), 80, October 6, 2012, Bozeman, Montana.

Jodie Norris (x'53), 76, August 10, 2012, Spokane.

Elvin David Taysom ('53 PhD Animal Sci.), 95, October 6, 2012, Tempe, Arizona.

Lois Esther Lane Christensen ('54 Lib. Arts), 80, September 5, 2012, Lakewood.

Nancy Christine (Brunberg) McKellar (x'54), 75, June 9, 2012, Mountain View, California.

Joseph Edgar Tugaw ('54 DVM, Theta Chi), 81, September 3, 2012, Murtaugh, Idaho.

Linden K. Virgin (x'54), 80, October 2, 2012, Fairbanks, Alaska.

Neil Austin Zehnder ('54 Pharm.), March 2, 1988.

"The guy is moving 100 miles per hour all the time," says Jeff Allen of the Odom Corporation, which distributes No-Li beers in Washington and Idaho. "He just knows the right people, the right buttons to push, the right avenues to go down." Adds No-Li founder and partner Mark Irvin: "When John Bryant comes to them with a brewery, people listen."

Bryant, 46, grew up on the Olympic Peninsula, the grandson of a lumberjack, the son of a teacher and football coach. A jeans-and-T-shirt type, he's plainspoken but passionate—passionate about beer, passionate about people, passionate about the word "passionate," which frequently crops up in his conversation.

His interest in the beer world began in junior high, when a friend invited him to the Olympia Brewery's employee picnic. "You saw all these families just laughing, having a good time," Bryant says. "Just seeing the smiles I think penetrated my psyche to say, 'Maybe there's something good going on here.'"

Then came college and "The Cougar." He flipped burgers, tended bar, and eventually lived

Bryant began his post-collegiate career in wine, with Gallo. But before long he landed a job with G. Heileman, which brewed Rainier in Seattle and Henry Weinhard's in Portland. The latter, a premium label, was a forerunner of the microbrew craze.

He parlayed his Henry's experience into a position with craft brewing pioneer Deschutes Brewery in Bend, Oregon. During his nine years there, production rose from an annual 17,000 barrels to 140,000 and Bryant worked his way up to vice president of sales and marketing.

In 2004, eager for a larger leadership role, Bryant moved on to Odell Brewing in Fort Collins, Colorado, where he became chief operating officer. His next stop was in Longmont, Colorado, as president of Oskar Blues Brewery. In both places, the pattern was the same: Sales increased, and the breweries began winning awards.

Bryant says he simply put into practice the lessons he'd learned: Treat workers well, break down "silos" within companies, create a common vision. "It's just like coaching a team," says the coach's son. "If you can respect the individual-



John Bryant '88 hoists an ale at the No-Li Brewery. Photo Bruce Andre

upstairs, helping to manage the tavern for then-owner Warren Holtz.

"I kind of just fell in love with the culture of that environment," Bryant says. "I loved the people who came in, I loved the people I worked with." He also fell in love with his future wife, Cindy Grashio '89.

ity in people but put them all together when you've got to come together, you can do a lot of cool things."

By summer 2011, he was ready to take a step back. The pace was getting to be a grind. His and Cindy's parents were aging, and a lot of her old friends were returning to Spokane. Their oldest

» tracking

son would be graduating from high school and their youngest from junior high (there's also a middle daughter), so the timing seemed right to follow suit.

Bryant found a kindred spirit in Irvin, whose small Northern Lights Brewery had survived since 1993 but was treading water. Last May, they launched the rebranded No-Li Brewhouse.



In its first three weeks, No-Li sold as much bottled beer as Northern Lights had the previous year. Bryant led teams "hand-selling" to customers in stores.

A favorable blurb in *Esquire* magazine was followed by awards in Japan, Germany, Belgium and, above all, a gold medal at the Great American Beer Festival in Denver, the nation's most prestigious beer event.

The approach is two-pronged, Bryant explains: convincing the local community that Irvin's beers are worth drinking, and spreading "Spokane goodness" to the outside world. That includes selling beer in a pair of strategically selected markets: Denver, home to the Brewers Association, and Washington, D.C., where the Visit Spokane tourism organization has an office.

Bryant, a former Brewers Association board member, is working to bring the National Homebrewers Conference to Spokane in 2015, with his long-range sights set on a bigger target, the Craft Brewers Conference. He has also initiated talks with other area brewers about joining forces to boost their businesses.

"How great would it be when people arrive (in Spokane) and here's your top 10 tourist destinations, two or three of them are breweries," says Bryant. "We've got a ways to go, but I think it can happen."

See a gallery of No-Li labels at wsm.wsu.edu/extra/No-Li.

Matthew Heatherly '12

Serving and learning

by *Richard Miller* :: When he graduated from Stadium High School in Tacoma in 1990, Matthew Heatherly decided to delay his college education in order to enlist and serve his country. He spent twenty years in the U.S. Army and in 2010 retired as a first sergeant. But an end to active duty didn't mean an end to his Army life. He has since become an operations manager at the Western Regional Medical Command on Joint Base Lewis-McChord. The Madigan Healthcare System based there serves 130,000 active duty service members. Heatherly's job is to help plan medical care for active-duty troops in the western United States, as well as Iraq and Afghanistan.

"My passion in life is soldiers," Heatherly says. "They are America's children who give of themselves to protect the ones we love."

Heatherly himself has given much. He was a medic on two tours in Iraq. He has also donated platelets, and volunteered at the Washington Soldiers Home and Colony in Orting. For his many efforts, the Puyallup resident received the Military Outstanding Volunteer Service Medal. The award was established in 1993 to recognize members of the armed forces and the reserves for outstanding volunteer community service.

He also organizes and participates in runs to raise money for charities like the local pediatric unit and a battered women's shelter. He took part in Race for a Soldier, a half-marathon in Gig Harbor to support soldiers with Posttraumatic Stress Disorder.

Several years ago, while still on active duty, Heatherly started thinking seriously about retirement. He realized a college degree would help him advance as an Army civilian employee. He had been urging other soldiers to get a degree, yet lacked one himself, even though he had taken a few college courses over the years.

Deciding to finish what he had started, he sought out a degree program that would allow him to work his classes into his military schedule, including his time stationed abroad. He wanted to be an example for his two sons, to be able to look them in the eyes and say,

Robin Anderson ('55 Home Ec., Delta Gamma), 79, November 1, 2012, Spokane.

Roderick Sprague III ('55, '59 MS Anthro.), 79, August 20, 2012, Moscow, Idaho.

Winthrop G. Dale ('56 DVM), 87, October 23, 2012, Thayne, Wyoming.

William M. Montgomery ('56 Arch. Engr.), 82, September 4, 2012, Calgary, Alberta, Canada.

Vern R. Nelson ('56 Agro.), 92, August 30, 2012, Olympia.

John Hamilton Rumely ('56 PhD Botany), 86, October 3, 2012, Bozeman, Montana.

Larry J. Widmer ('56 Industrial Tech.), 78, November 9, 2012, Dallas, Texas.

Ronald E. Thomas ('57 Arch. Engr., Gray W Charter Member, Kappa Sigma), 78, August 30, 2012, Vancouver.

F. Gene English (x'58) September 15, 2012, Camas.

Nicholas G. Popoff ('58 Arch. Engr.), 76, November 23, 2012, Oakland.

Devon M. Terry ('58 DVM), 84, September 20, 2012, Hurricane, Utah.

Gary Steer ('59 Business), 78, October 1, 2012, Phoenix, Arizona.

1960s

Nicholas A. Dodge ('60 MS Civil Engr.), 79, September 28, 2012, Portland, Oregon.

David Francis Brown ('61 MS Chem.), 77, August 13, 2012, Yakima.

Larry James Martin ('61 Mech. Engr.), 73, November 20, 2012, San Antonio, Texas.

Richard E. Matheny ('62 Polit. Sci.), 72, September 6, 2012, Seattle.

Charles O. "Charlie" Sells ('62 Bus., Phi Delta Theta, 3-yr starter men's basketball), 72, September 16, 2012, Mill Creek.

Judy A. (Shoemaker) Wooten ('62 Ed., Alpha Chi Omega), 83, September 12, 2012, Liberty Lake.

Michael Dean Pelton ('63 Zoo.), 71, September 24, 2012, Loveland, Colorado.

Margaret Love McAndrew ('64 Ed.), 70, November 5, 2012, Woodway.

Leonard A. Neubert ('64 Chem.), 71, October 31, 2012, Bremerton.

Fredrick R. Dunham ('65 Const. Mgmt.), 70, November 4, 2012, Disputanta, Virginia.

J. Franklin Howell ('65 PhD Entomology), 80, October 21, 2012, Salt Lake City, Utah.

Daniel V. Iyall ('65 MS Phys. Ed.), 84, August 6, 2012, Spokane.

Susan Jenny Covell ('66 Ed., Sigma Chi), 68, November 17, 2012, Tacoma.

Michael W. Hougan ('66 DVM), 73, September 7, 2012, Olympia.

David A. Nees ('66 Social Stud.), 69, October 2, 2012, Priest River, Idaho.

John Stanley Chapman ('67 Engl.), 69, May 30, 2012, Everett.

Kasper Carroll Marking ('67 EdD), 88, August 30, 2012, Elmendorf, Texas.

Steven Jay Wagner ('68 DVM), 68, November 19, 2012, Oak Hills, California.

Gary Axel Ferney ('69 EdD), 78, August 9, 2012, Spokane.

Judson R. Parkins ('69 Sci.), 65, September 26, 2012, Lind.

Duane O. Richardson ('69 EdD), 81, November 19, 2012, Tacoma.

Gerald Duane Sharp ('69 PhD Animal Sci.), 79, September 30, 2012, Rancho Cucamonga, California.

1970s

Emil Joseph Barycki Jr. (x'70), 64, November 14, 2012, Visalia, California.

Dan K. Toya ('70 Hort.), 64, December 23, 2011, Moses Lake.

Marjene Ann Simmons ('72, '74 MA English), 78, October 5, 2012, Salem, Oregon.

Mark R. Holcomb ('74 Sci.), 62, August 20, 2012, Seattle.

Anne Marie Popelka Kelly ('74 Police Sci.), 60, September 23, 2012, Olympia.

Betty Jean (B.J.) Young ('74 Speech Comm.), 72, September 14, 2012, Camarillo, California.

Diane Lynn Greaves ('75 Ed.), 58, September 26, 2012, Lacey.

William Hagan ('75 Elect. Engr.), 72, October, 2012, Poulsbo.

Theresa Cecelia Wall ('75 Ed.), 59, September 20, 2012, Olympia.

Gayle Lynn Benson ('76 Sociology), 59, November 18, 2012, Long Lake, Minnesota.

Michael James Scott ('76 Comm.), 65, September 30, 2012, Edmonds.

Aaron Karl Hixenbaugh ('77 Finance), 60, August 9, 2012, Bonney Lake.

William R. "Bill" Buzzi ('78 Biology), 57, October 6, 2012, St. Augustine, Florida.

Julia "Judy" Marie (Blunt) Smith ('78 Rec. & Park Admin.), 56, September 27, 2012, Longview.

Frank V. LaSalata ('79, '82 MS Geology), 60, September 1, 2012, Redmond.

1980s

Jeffrey W. Bruce ('80 Lib. Arts), 54, November 20, 2012, Tacoma.

John Eric Grigsby ('80 Econ., Phi Gamma Delta), 55, February 21, 2012, Birch Bay.

Robert Wayne Meline ('80 Ed.), 56, November 4, 2012, Tacoma.

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Matthew Heatherly '12 worked on his degree while serving overseas. Photo Brian Maki

"If I can get my degree in Iraq, you can get yours."

As he researched options for online education, he had one crucial criterion: "I wanted a degree that state employers would recognize as solid," he says. In 2004, he enrolled in the online degree program at Washington State University. Because he wanted an interdisciplinary degree that could lead to work in a variety of fields, he decided to major in social sciences.

When Heatherly was deployed to Iraq, he took his online courses with him. He studied in combat zones, and sometimes was interrupted

by artillery fire. He also found comfort in the world of academics. "Studying kept my mind off being across the world from my family," he says of his wife, Holly, and sons, Nathaniel, now 18, and Aaron, now 16. He completed his degree last December.

Having reached that milestone, Heatherly is already looking ahead with plans to earn a master's in criminal justice, again through WSU's online program.

"A degree means that you get to choose your life," Heatherly says, "instead of having your life dictated to you." <<

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WSU Impact

Informed Advocates of Washington State University

Andrea Conklin Bucklin ('83 Bus. Admin.), 50, June 20, 2012, Mercer Island.

George Herbert Nelson ('83 Phys. Ed.), 95, October 10, 2011, Gresham, Oregon.

Gregory Scott Tredway ('84 Fine Arts), 54, September 22, 2012, Bothell.

Dave D. Curtis ('85 Finance), 49, October 9, 2012.

Don H. Hansen ('85 Bus. Admin., Phi Kappa Sigma), 49, September 13, 2013, Arlington.

Laurie A. Iverson ('85 Comm.), 50, October 2012, Los Angeles, California.

Michael Edward Newton ('88 MBA), 57, September 26, 2012, Seattle.

1990s

William McKay "Bill" Gnaedinger ('90, '01 ME Ed.), 59, September 18, 2012, Pullman.

Chris Eric Anderson ('93 Const. Mgmt.), 41, September 17, 2012, Seattle.

Michelle Ann Stevenson ('93, '94 Ed., History), 39, June 24, 2010, Yelm.

Kenneth James "Ken" Trimmer ('95 MA Accounting), 64, November 26, 2012, Pocatello, Idaho.

Stana Landon (x'96), 35, November 22, 2012, Tacoma.

Debra Jo Franck ('97 Nursing), 48, October 9, 2012, Selah.

Ronald E. Wargo ('98, '00 MED), 57, February 22, 2012, Vancouver.

2000s

Eric Walswick (x'03), 26, March 3, 2012, Vancouver.

Spencer George Warfield (x'06), 24, October 14, 2012, Everett.

Erin M. Lilly ('07 Soc. Sci.), 33, October 28, 2012, Auburn.

2010s

Kenneth D. "Kenny" Hummel (x'12), 18, October 27, 2012, Lynnwood.

Zachary Lynn Martinez (x'12), 28, November 29, 2012, Vancouver.

Faculty and Staff

Cyndy Diane Aichele, 55, Admin. Svs. Info. Systems 1987-2012, September 2, 2012, Moscow, Idaho.

Harold Beckham, 100, Radio-TV Service 1962-1975, June 10, 2012, Pullman.

Wesley "Wes" Calvert, 85, Student Publications 1964-1982, October 30, 2012, Olympia.

Lloyd Carstens, 89, Mailing Services 1960-1984, August 29, 2012, Pullman.

Orpha Christenson, 102, Phys. Ed., 1945, June 2012, Carson City, Nevada.

John P. Fertakis, 84, College of Business 1966-1993, November 13, 2012, Pullman.

Debra Jo Franck, 48, College of Nursing 2004-2012, October 9, 2012, Selah.

Mary Ann Gass, 76, Int'l Programs Global Services 1965-1992, September 23, 2012, Boise, Idaho.

Raymond L. Griggs, 87, December 28, 2004, Moscow, Idaho.

Robert F. Harwood, 85, Entomology 1954-1992, October 14, 2012, Pullman.

Demy Hicks, 103, November 7, 2012, Pullman.

Phyllis B. Hinkins, 79, Tri-Delta & Theta Nu House Mother, November 11, 2012, Wilbur.

Peter Hooper, 81, Geology 1971-1996, April 21, 2012, Reading, England, United Kingdom.

Roland K. Huff, 70, English 1978-1983, October 2, 2012, San Antonio, Texas.

Lorraine M. James, 78, 2012.

Donna M. Juve, 84, Conner Museum 1956-1982, July 17, 2012, Moscow, Idaho.

Kathleen J. Koger, 95, October 5, 2012, Pullman.

Barbara J. Krahn, 50, WSU Vancouver 2008-2012, November 4, 2012, Vancouver.

Robert R. Kunkel, 99, Horticulture 1957-1982, October 25, 2012, Pullman.

Alphonso "Al" Liotta, 91, ASWSU Recreation 1956-1982, October 26, 2012, Colfax.

Edna MacPherson, 94, Nuclear Radiation Center 1968-1984, November 1, 2012, Spokane Valley.

John C. Neergaard, 79, July 14, 2011, Sultan.

Dorothy Olds, 86, WSU Mt. Vernon NW Rec 1976-1988, October 28, 2012, Mt. Vernon.

Elsie Arlean Pattison, 102, September 25, 2012, Lacey.

Delores Power, 82, University Publishing 1965-1992, October 12, 2012, Moscow, Idaho.

Raymond E. Qualey, 81, Fac. Ops. 1979-1995, August 13, 2012, Moscow, Idaho.

Michael Rench, 61, Capital Planning & Development 2006-2007, October 29, 2012, Moscow, Idaho.

Kathleen Ann Vogeler, 52, Information Technology Consultant 1984-2012, November 19, 2012, Palouse.

Phillip Wilder, 68, WSU Tri-Cities 1986-2006, September 24, 2012, Prescott.

Patrick E. Wilkins, 73, WSU Fire Chief, November 16, 2012, Pullman.

Thelma Willett, 75, Civil & Env. Eng. 1986-2002, August 27, 2012, Pullman.

Kenneth W. Wright, 68, Recycling 1973-1992, September 21, 2012, Spokane.

WSU Alumni Association News

Steadfast Cougar Spirit

Golden and Diamond Graduates Reunion

A lot has changed in 60 years. Six decades ago, Washington State University was still called the State College of Washington. Todd Hall, Holland Library, and the Compton Union Building were newly built. Legendary coach Jack Friel helmed the men's basketball team, and the college belonged to the Pacific Coast Athletic Conference.

Today, campus landmarks include a new Paul G. Allen School for Global Animal Health and a freshly remodeled Martin Stadium. One thing remains unchanged: the Cougar homing instinct. No matter when they graduated, Cougars love returning "home" to Pullman. This April, hundreds of WSU graduates from 1953 and 1963 will do just that, celebrating their fiftieth and sixtieth college reunion at the 64th annual Golden and Diamond Graduates Reunion.

In 1949, the Washington State University Alumni Association held the first Golden Graduates Reunion, welcoming back four of the seven students from the first graduating class of 1899. The reunion grew steadily over the years, drawing over 270 graduates and guests in 2012. It is still hosted annually by the WSUAA.

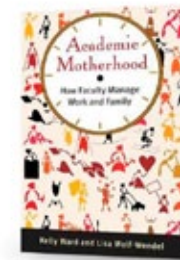
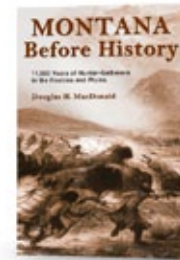
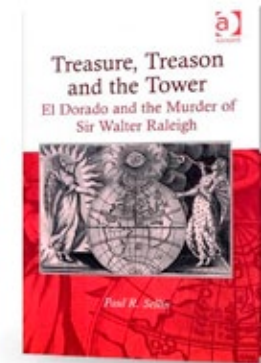
"We've carried on this tradition to honor the alumni who are such a rich part of the university's history," says WSUAA executive director Tim Pavish. "Some travel to Pullman often, and some haven't been back in decades."

At the two-day reunion, graduates explore a modernized campus that retains every ounce of its brick-ensconced, hilly, collegiate charm. They meet former classmates, tour buildings both familiar and new, take part in college luncheons, and choose from a menu of activities including a Veterans Memorial Presentation, Classes Without Quizzes sessions, small group reunions, and a social hour and banquet. The reunion is open to Golden (50-year), Diamond (60-year), and Platinum (70-year) graduates and their families, as well as former WSU students and those who graduated with other classes.

"Our sixtieth reunion certainly embodied the WSU motto of 'World Class, Face to Face,'" says Laurel Morgan of Quincy, Washington, who attended the 2011 reunion with her husband Rex. "We heard so many favorable comments from our fellow grads—everything from the attention to detail, the efficient service, the excellent food, and the many over-the-top ways that WSU catered to our comfort and enjoyment."

That type of response is music to Pavish's ears. "So much has changed, and the university has many new reasons to celebrate, but our Cougar spirit remains the same," he says. "It's an honor to reintroduce our graduates to the university and see them get excited about the amazing work taking place here today." This year's reunion takes place April 24 and 25, 2013. For more information, please contact reunions@wsu.edu or call 1-800-258-6978.

For more information about WSUAA and alumni chapters visit www.alumni.wsu.edu or call 1-800-258-6978.



Treasure, Treason and the Tower: El Dorado and the Murder of Sir Walter Raleigh by Paul Sellin '52 ASHGATE, 2011 :: Review by Hannelore Sudermann :: Years ago while doing research in Stockholm, Sweden, Paul Sellin, a scholar who specializes in literature and history of the sixteenth and seventeenth centuries, chanced upon some correspondence about Sir Walter Raleigh and gold that he may have found in South America.

Sellin, who studied history at WSU and then went on to the University of Chicago to complete a doctorate in English, is a professor emeritus at the University of California, Los Angeles. His expertise and language skills helped him recognize that documents previous scholars had passed over could change how history views one of the more interesting and colorful characters in Elizabethan England.

An explorer, Walter Raleigh was a favorite of Queen Elizabeth I. He was knighted by her in 1585, and appointed captain of her guard in 1587. He fell out of grace in 1591 when he secretly married one of her ladies in waiting. To regain the queen's esteem, he set off for the new world to find new fortune for England. He wrote of his travels in *The Discoverie of Guiana*, in which he claimed to have found an abundance of gold while traveling up the Orinoco River.

But other than his own accounts, there was little evidence of his finding treasure. When Elizabeth died in 1603, her successor James I charged him with treason and locked him in the Tower of London.

Raleigh was released in 1616 to mount a second expedition up the Orinoco. It ended after his men attacked a Spanish outpost in what is now Venezuela and Raleigh's own son Walter was killed. He returned to England where he was tried for treason on charges that the mine was a lie and that he was attempting to foment a war between England and Spain. In 1618 he was beheaded.

The correspondence Sellin found led him to further evidence that the King of Sweden and the Duke of Buckingham may have colluded to find the gold that Raleigh was accused of lying about. And that the charges against Raleigh had been trumped up.

So Sellin undertook his own expedition, using *The Discoverie of Guiana* as his guide. He found that Raleigh's account of the journey "was remarkably accurate." He even believes he found the site of Raleigh's mine. "Hence my conclusion that he was a victim of a most unjust murder by royal attainder manipulated by the Duke of Buckingham," he writes.

This book will certainly be of interest to scholars and history buffs. But it could also tempt someone who likes a good historical mystery with a heady dose of international intrigue. ☒

Montana Before History: 11,000 Years of Hunter-Gatherers in the Rockies and Plains by Douglas H. MacDonald '94 MOUNTAIN PRESS, 2012 :: Review by Tim Steury :: The oldest archaeological site in Montana, the Anzick Site near Wilsall, has been

carbon-dated to 11,040 years ago. It is, writes Douglas MacDonald in this fine survey of Montana archaeology, the only Clovis site excavated in Montana. Apparently a ceremonial burial site, it contained the oldest human remains found in North America.

Whether or not they were a coherent "culture," the Clovis people are known for their common use of distinctive stone tools first discovered near Clovis, New Mexico, early in the twentieth century. Clovis tools have since been discovered throughout much of the contiguous United States, including a significant find near Wenatchee, and into Mexico and Central America. The tools have often been found with bones of mammoth, mastodon, giant bison, and other species of megafauna.

And then, just a few years after that Montana Clovis site was established, the megafauna were gone. Many ideas have been proposed regarding their demise. MacDonald dismisses one of the most controversial, that the Clovis people hunted these animals to extinction. There is,

argues MacDonald, little or no evidence for this overkill hypothesis.

Rather, he embraces the idea that a climate-changing asteroid explosion ended the era of North American megafauna—and the Clovis people.

Thus, MacDonald moves effectively between a fairly exhaustive cataloguing of Montana archaeological sites and the broader context of North American prehistory.

MacDonald earned his master's and doctoral degrees under Bill Andrefsky, an authority on lithic, or stone, technology. MacDonald's resulting expertise is evident in his engaging description of fluting, or grooves, in the stone points made by the Folsom people, who followed the Clovis. The Folsom period in Montana dates from approximately 10,900 to 10,200 years ago.

The fluting of the Folsom points is perplexing. "... Folsom flintknappers took Clovis thinning and fluting to an extremely sophisticated level," writes MacDonald.

In spite of their elegance, however, the fluted points seem to be no more effective at killing game than the non-fluted versions that the Folsom also made. Besides, inscribing such a groove carried considerable risk in the manufacturing process. The question of the fluting's purpose, like many archaeological questions, may never be answered.

Indeed, MacDonald ends his survey with a long list of questions to be answered by future archaeologists. Montana provides an excellent place to contemplate hunter-gatherers, as it is unique in being untainted by the social complexity that agriculture and permanent villages bring. Montana's prehistory is pure hunter-gatherer.

But that purity is merely relative, as hunter-gatherer cultures leave us their own multitude of unanswered questions. Indeed, MacDonald might have considered beginning his book with his provocative list of questions, as they provide an intriguing coherence to an enormous range of time. ☒

Academic Motherhood: How Faculty Manage Work and Family by Kelly Ward and Lisa Wolf-Wendel RUTGERS UNIVERSITY PRESS, 2012 :: Review by Julie Titone :: Kelly Ward, a Washington State University professor and co-author of *Academic Motherhood*, contends that a "don't ask, don't tell" culture still prevails in academia when it comes to pregnancy.

Sometimes that keeps women from reaching their professional potential and getting the personal support they need.

"Department chairs fear saying the wrong thing, so they say nothing," says Ward. "The pregnant woman ends up not understanding medical leave policy or not being prepared to have someone assume her teaching duties."

Ward and her University of Kansas colleague Lisa Wolf-Wendel based *Academic Motherhood* on a decade of interviews with more than 100 women who are both mothers and faculty members, talking with them in both early and mid-career. The book is getting national attention

from media and policy makers. It concludes that, despite ample challenges, female academics can indeed have it all.

"A lot of women get tenure, have families, and live to tell about it," says Ward, who chairs WSU's Department of Educational Leadership and Counseling Psychology. "Not only that, they're healthy, happy human beings."

Tenure—the attainment of a permanent, top-level faculty position—makes a higher education career especially challenging to women, Ward says. It requires an intense six-year review process in which assistant professors who have already spent years earning a doctorate prove themselves through research, publication, teaching, and service.

With tenure comes the title of associate professor and the chance for a higher-paying, high-prestige full professorship. It's an up-or-out system. Those who don't make tenure must leave their institution.

"Because the average age for women to earn their doctorate is 34, the tenure

clock is ticking simultaneously with their biological clock," says Ward, a mother of three. "Compared to doctors and lawyers, academic women are the professionals least likely to have children." ☒

That One Spooky Night by Dan Bar-El, illustrated by David Huyck :: KIDS CAN PRESS, 2012 :: Review by Larry Clark '94 :: Strange things can happen on a Halloween night, as the young protagonists find out in the three stories of this illustrated book. Populated by sea monsters in the bathtub, witches, vampires, and pranks, author Dan Bar-El's funny and, of course, scary tales get an excellent graphic treatment by David Huyck, an instructor at Washington State University and Moscow, Idaho-based artist.

With stories titled "Broom with a View," "10,000 Tentacles Under the Tub," and "The Fang Gang," the amusement level is cranked up, but the rambunctious and playful heroes of the tales also face some pretty spooky situations, particularly with the long-suffering father and his

two adventurous boys who have a bath to remember. The pictures strike a nice balance between the silly and the eerie, and Huyck's illustrative style really enhances the atmosphere of *That One Spooky Night*.

As preparation for this review, I read the book with my seven-year-old son, an arbiter of taste for kids' books (at least at our house). He followed every page with rapt attention, enjoying both the visual and textual storytelling. When asked about his thoughts on the book, "It was too spooky for me," he said with a smile. Then he wanted to read it again. ☒

new & noteworthy

The Baby Boomers' Guide to Grandparenting by Diana J. Ewing '71 :: 2011 :: An irreverent look at the new generation of baby boomer grandparents whose kids are having babies of their own, this WSU English grad's humorous volume is packed with pop culture trivia, quizzes, and wry observations. ☒



Fruitful history

APPLE PRODUCTION was initially spread more evenly across eastern Washington. The planned agricultural community Vineland (see “The perfect city,” WSM Fall 2012) included more than 900 acres of continuous apple orchards. According to *Lyman’s History of Old Walla Walla County* (including Asotin County), Vineland and adjacent Clarkston had “every conceivable advantage of soil, climate, scenery, water supply...” Apples grown there included Winesap, Yellow Newtowns, Spitzenberg, Jonathan, Rome Beauty, and “assorted varieties.” The September 12, 1916, edition of the *Spokesman-Review* reported that 60 carloads of choice apples were about to be packed in Vineland, Clarkston, and Lewiston, Idaho, for export trade: “The first carload will be packed and forwarded this week, and will be Winter Bananas...” *Photo Asahel Curtis/Courtesy WSU Manuscripts, Archives, and Special Collections*

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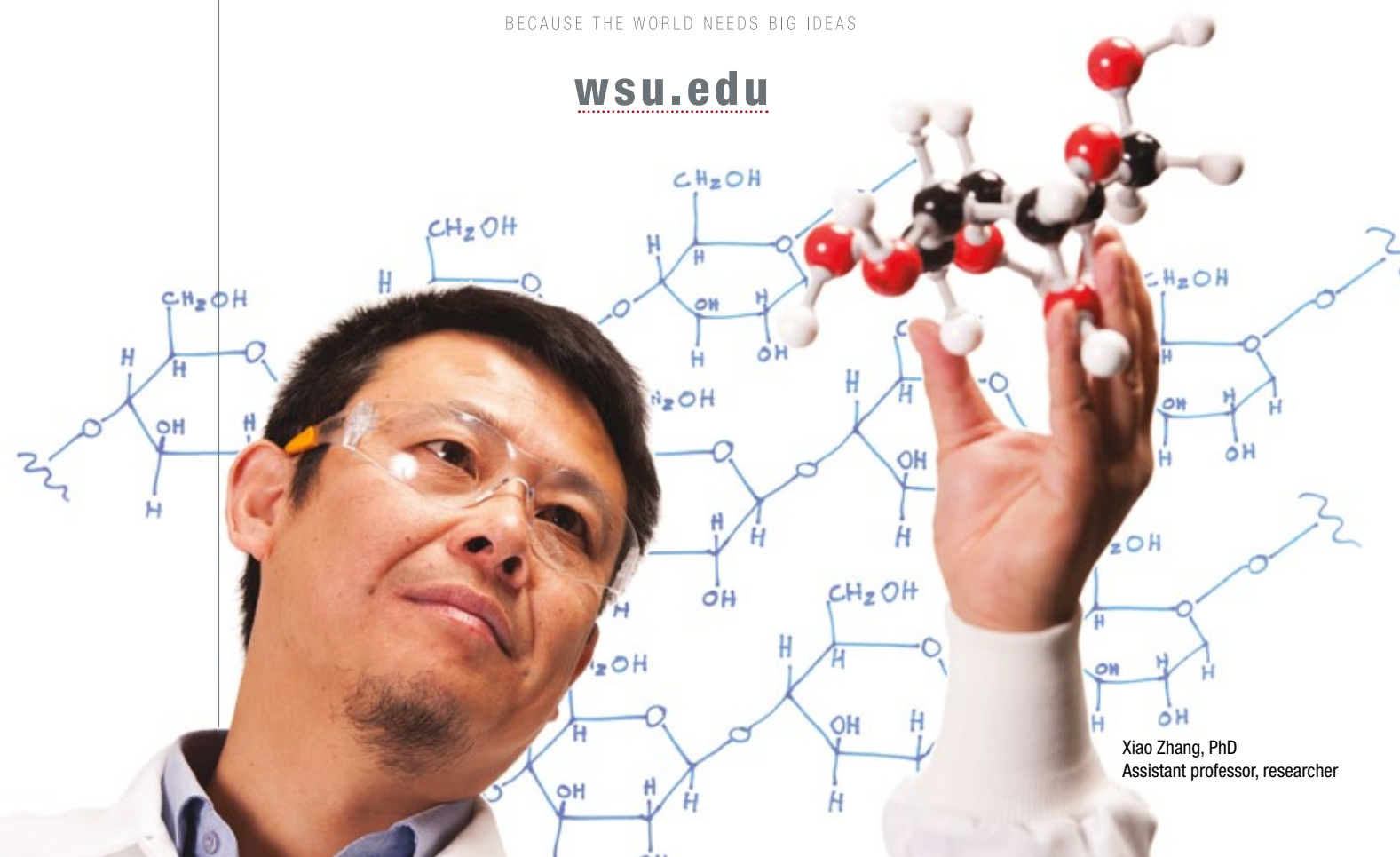
When jetliners routinely fly coast to coast on fuel derived from sticks, branches, and bark left from timber harvests and thinning, we'll have pioneer researchers like Washington State University's Xiao Zhang to thank. Dr. Zhang, a leading expert in converting non-food woody biomass to biofuel, is working hard to make the process cost-effective and sustainable.

It's all part of our search for a clean, renewable energy future—here in Washington state ... and beyond.

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Xiao Zhang, PhD
Assistant professor, researcher

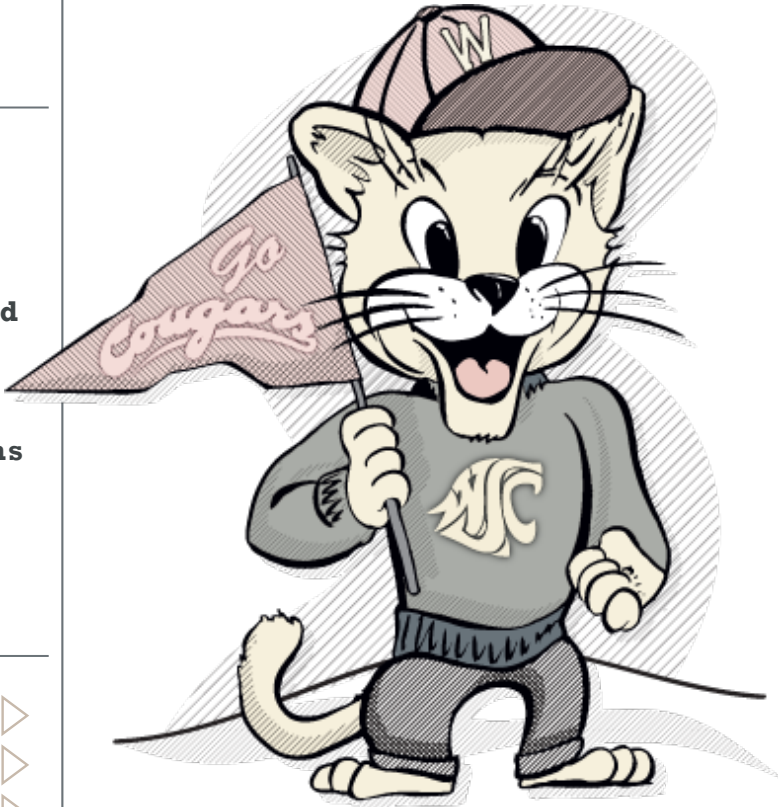
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BECAUSE THE WORLD NEEDS BIG IDEAS

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