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Western Washington University

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farming the natural way

LETTER FROM THE EDITOR

In an era when time seems to pass at a break-neck pace, staying current is an important part of any publication's day-to-day operation. How can we stay current as a publication when societal trends and global issues seem to pass in a matter of days and weeks but we only publish twice a quarter? ■ Klipsun stays relevant by telling the stories that matter not only to the people who pick up the magazine the day it comes out, but also to those who will read it years from now. For Klipsun, staying current means more than just keeping up with the times. The means in which stories are brought to readers is constantly changing. Readers are no longer passive consumers of media. The single downstream approach to storytelling is changing,



allowing for reader participation and influence in what they read. We are trying to reach out and involve our readership throughout our process and allow them to help shape our final product. Our readers should know what life was like and what issues were worthy of being published when our staff sat down to plan the magazine. We want Klipsun to be a portal into what was important to the staff and community when the magazines were neatly stacked around Bellingham. ■ We want to convey to both present and

future readers that finding clean energy alternatives and reducing waste is of paramount importance to our readership and staff. We want people to read about how technology is moving into an ever more digitally dominated realm while some people still hold on to analog methods. We want readers to connect with stories of people as they break world records, give death new life and live every day with a neuropsychiatric disorder. ■ These are the stories we have decided to tell in this issue. We want them to interest, enlighten and fascinate you. Staying current for our readership is important, but being current is as much about looking to the future and learning from our past as it is about observing the present. Take the time to read through Klipsun and see what our Current issue is all about.

KLIPSUN
 KLIPSUN IS AN INDEPENDENT
 STUDENT PUBLICATION OF
 WESTERN WASHINGTON UNIVERSITY

MINDON WIN
 Editor-in-Chief, Klipsun Magazine

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TAKING CHARGE

Electric highway connects state

TONI SIMS KNOWS WHAT IT'S LIKE

when the gage cluster on the dashboard of her Nissan Leaf shows 4 percent power left before shutdown. She has had her husband quickly check MapQuest to see how far away home is. They have pulled into the garage in the nick of time to plug the compact electric car into a 110-volt outlet to charge for the night.

"It's quite stressful," Sims says. "You can't call someone and have them bring you a gallon of gas."

Sims, a Bellingham resident, began leasing the all-electric drive Leaf in October 2013. It is the perfect car for getting around town— but they haven't been gutsy enough to take it on a longer trip yet, she says.

Sims is experiencing "range anxiety," the avoidance of driving long distances. Nissan coined the term after the company observed soon-to-be electric car drivers. Potential drivers worried about driving all-electric cars and the possibility of running out of power, says Matt Newman, sales

associate at Bellingham Nissan.

The West Coast Electric Highway, a network of direct current, fast-charging stations for electric cars, was installed to help drivers such as Sims travel between communities, says Tonia Buell, project development and communications manager for the Washington State Department of Transportation (WSDOT).

Electric vehicle stations are located in 12 communities: six are along the Interstate 5 corridor from Bellingham to Vancouver, Wash., four stretch east to Wenatchee, Wash. on U.S. Highway 2 and two on Interstate 90, approaching Cle Elum, Wash.

The project's original goal of electrifying I-5 from border to border has been reached, but the work is not done, says Jeff Doyle, director of public and private partnerships for WSDOT.

Doyle, a Western alumnus from the class of 1986, was a key player in the development of the West Coast Electric Highway concept and continues to be a proponent for extending the network.

"What we really want to do next is make sure all [Washington's] main highway corridors are electrified," Doyle says. "We have our fingers crossed."

WSDOT has also worked closely with Oregon and California in hopes to connect the network from Vancouver, BC, south to Baja, Calif., Doyle says.

Gov. Jay Inslee's budget proposal includes \$5 million to fund the extension of the electric network throughout all the major highways in the state, Doyle says.

A state energy program grant through the U.S. Department of Energy provided funding for the project that was completed in May 2012. The groundbreaking took place at the Sehome Village station in December 2011, Buell says.

AeroVironment, a technology company primarily focused on energy systems, used grant funds to install and provide the electricity for the 12 DC fast-charging stations. Stations cost an average of \$125,000 each to install and the charging service was free to the public through March 2013, Buell says. Since then, regular users have had to sign up for a subscription through AeroVironment or pay a drive-up fee.

Whatcom and Skagit counties have fast-charging stations at the Sehome Village shopping center and The Outlet Shoppes in Burlington.

A southbound rest stop in Blaine, Wash., near the Canadian border crossing, is visited by almost 500,000 people a year and is home to two level-2 (medium speed) charging stations, Buell says. At this station, electric car commuters from British Columbia can learn about other charging

locations in Washington. It takes at least two hours at this lower voltage station to fully charge each car. At the fast-charging stations in Bellingham and Burlington, users can charge their cars to 80 percent in about a half an hour, Buell says.

One benefit to all-electric drive vehicles is they use no gas and require no oil changes, Newman says. An electric car would act the same if it ran out of charge as a gas-powered car would if it ran out of gas—it would die on the road, he says.

People will learn their limitations and adapt to the new automobile technology, Newman says.

"You're not going to go to Seattle on a quarter tank of gas," Newman says. "You're going to plan accordingly."

Buell expects usage of the charging stations to rise in the coming years, with 13 new models of electric cars expected to hit the market in 2014.

Pickup truck and SUV-style vehicles will soon be available in all-electric models. Buell recently saw a 40-foot, all-electric bus. Companies such as Frito Lay are now using all-electric delivery trucks as part of their fleet.

"We have among the highest usage of any public network in the nation," Buell says. "These stations have been very effective."

The Sims family was spending \$312 a month to fill up on gas, and now experience an increase of \$30-35 a month on their energy bill instead, Sims says.

With more consumers enticed by new all-electric models hitting the market, few spikes in home energy costs and the installation of the West Coast Electric Highway, the electric car movement is charging its way into the future. **K**

STORY BY ALEX PETERSON

photos by Margaret Degman

PADDLING THROUGH DOUBT

Bellingham man achieves world record



(left) Brandon Nelson paddles out of Bloedel-Donovan Park onto Lake Whatcom. He has

trained on the lake since 2003.

AFTER 18 HOURS OF PADDLING, putting every ounce of effort into breaking the Guinness World Record for farthest distance traveled by canoe or kayak on flat water, Brandon Nelson did something completely unfamiliar to him: he questioned himself.

"All of a sudden I woke up and went, 'What am I doing in the water?'" the 42-year-old Bellingham resident recalls.

He was halfway through what would be one of the longest 24 hours of his life.

Nelson had just fallen off of his Surfski, a lightweight kayak with an open sitting area, into Lake Padden. All the logistics of measuring the course,

training for months and carefully planning his food intake meant nothing in that split second in August 2013 as the dehydrated Nelson tried to collect himself.

Before he realized what had happened, his close friends David Jacobson and Michael Medler had jumped out of their boat and were swimming next to Nelson in the water, reassuring him that he could take a minute to calm down and still break the record.

"With 0.0 seconds spent doubting myself, it was probably the scariest second of my life," he says. "It's like the equivalent to you driving your car to work and it doing a backflip on its own."

This was not the first challenge Nelson had experienced trying to break the world record, and it wouldn't be the last. More than six years of Nelson's life had gone into preparing for the attempt.

Nelson was introduced to kayaking when he moved to California from his home state of Michigan in 1992 to become a whitewater-kayaking guide. In 1998 he met his wife, Heather. They learned additional kayaking forms together. The couple began doing ultra-marathon paddles and other extreme expeditions together, including one excursion from Canada to Cabo San Lucas, Mexico.

"Some couples like to go to dinner. We go for a training paddle," Heather Nelson says.

In 2002, when Brandon Nelson first heard of the distance world record, he knew it was something he could beat. After moving to Bellingham in 2003, he worked with Western's Vehicle Research Institute to develop a more aerodynamic boat to attempt the record in. By 2006, the boat was ready.

The day before his paddle, he found out his mother had been diagnosed with terminal cancer. He initially planned to honor her with the record, but after the call, decided to put the attempt on hold so he could spend time with her before she died.

In the time Nelson was visiting his mother, word got out about his upcoming attempt. He used the publicity to raise \$20,000 for Hospice care and early cancer screening when he returned to break the record. But with all the coverage of Nelson's attempt, someone else had heard about it and beat the record three days prior to his paddle. Nelson didn't find out his attempt was not enough anymore until a few days after his paddle.

"It became this unresolved, unfinished project in the back of my mind for seven years," Nelson says.

(below) Brandon Nelson broke the Guinness World Record for farthest distance traveled

by canoe or kayak on flat water in August 2013. Photos courtesy of Dougal Brownie.

In those seven years, Nelson trained with Olympic rowing coach Carlos Dinares. He made sure he had everything lined up with his equipment and satisfied the record-keepers at Guinness by having Medler, a geography professor and chair of environmental studies at Western, and Tom Brewster, a surveyor, map out and set his course on Lake Padden by survey and GPS.

When the day of the second attempt arrived, Nelson was focused on fulfilling his goal. He didn't doubt his ability, planning or gear, but he knew it was still going to be a struggle.

"The first 12 hours were totally awesome and pleasant," Medler says. "It was just a killer day with friends, destroying the record. You always suffer in an [ultra-marathon paddle]. I was right where I wanted to be, doing the thing I wanted most that I had promised to my mom in her honor."

Nelson's friends told him he might shatter the world record at the pace he was going. But eventually he got off his planned nutrition schedule and suffered from dehydration. He entered a "zombie state" mentally, but his body kept going.

Then, still traveling ahead of the world-record pace, he slipped from his Surfski into the water.

"I thought it was over," Medler says. "I thought we were done. I thought we'd just be limping back. The water kind of snapped him to, though."

Before the next lap, they tried to put Nelson in a bigger, heavier, wider boat, Medler says. Nelson

“
I WAS RIGHT WHERE I WANTED TO BE,
DOING THE THING I WANTED MOST
THAT I HAD PROMISED TO MY MOM
IN HER HONOR.
”

was too tall to fit, so he continued on his smaller, more agile Surfski. He fell off again, but similar to the first time, he recovered and pushed on.

"I started out taking breaks every couple of hours, but it was about every 15-20 minutes toward the end," Nelson says. "There were people all around the lake cheering, even at 3 a.m. People ask why I did it at Padden. It's because I need those people."

With about 20 minutes and 100 yards remaining, Nelson fell one last time.

"I was so done. My body was just in revolting pain from being dehydrated so long," he says. "I remember hearing one of my friends saying, 'You have plenty of time, you just need to pull your legs into the boat.' I was able to pull them in and get



an extra mile and a half [past the world-record mark]. Before that it was every negative thought — fear, confusion, doubt — compressed into one second, then transformed into clarity to keep going."

He took his time and made it back on the Surfski before pushing his body the rest of the way to set a new Guinness World Record of 151.87 miles traveled on flat water by canoe or kayak.

After more than six years of training and three falls from his Surfski, Nelson was congratulated with a trip to the emergency room at the finish, but he had accomplished his goal and paid homage to his mother.

Nelson spent three days recovering from dehydration after the paddle. Medler and Brewster sent more than 95 pages of evidence that Nelson had broken the record, including six DVDs of the paddle. Nelson received his Guinness certification soon after.

As he was lying in the hospital bed, not even an hour after breaking the record, the paddler who had previously held the record emailed Nelson, saying he was going to try to break it again in a month.

"I hadn't even wiped the blood off my hands yet," Nelson says.

Nelson is still working back to the level of fitness he had before breaking the world record, but doesn't feel like he needs to do it again. He thought about trying a new record, but would prefer to spend time with his family, Nelson says.

"My five-year-old says things like, 'I'm going to break a record someday,'" he says. "Those kinds of comments are the real reward." ■

PAST LIFE, PRESENT UNDERSTANDING

Regression therapy uses introspective hypnosis

MAX COLLETTE SEATS HIMSELF IN THE brown leather recliner, pressing against the material and easing into the curve of the seat's back. He pulls an ash gray blanket over his body up to his chin and places a navy blue eye mask on his forehead, scanning the group of people sitting in a circle around him.

"See you guys later," he says as he pulls the mask over his focused eyes. The light streaming into the room catches the gold ring he wears on his right hand.

He leans back farther, releasing into the support of the chair slowly, but naturally. This isn't his first time. His chin, nose and mouth are all that's left visible. Cyndy Sheldon, a past-life regression counselor, tells him to breathe deeply, to release himself further. Sheldon speaks in a low, calm tone, telling Collette to envision floating in space. She told him before to imagine a silver cord connecting him from the top of his head to the top of the sky, and from the bottom of his feet to Earth's center.

"You're in space," Sheldon says. "It's dark and the stars are out."

Sheldon's hand rests gently under her chin as she eases Collette into hypnosis. While Collette is in a hypnotic state, Sheldon asks him to look at his feet, which are covered by white socks.

"I see bare feet," Collette whispers.

He continues, saying he envisions he is a man in his 20s living in Burma. His name is Amam.

As Sheldon asks questions to determine where Amam might live, the emotions Amam felt during his lifetime overcome Collette. He feels a deep

connection, through Amam, to one particular man who served as Amam's mentor in this life.

"I just feel safe around him," Collette says.

Collette's depiction of Amam's life is vivid. He describes the shape of buildings, Amam's feelings toward others in his lifetime and where Amam works as a swordsmith.

Sheldon tells Collette to move toward the end of Amam's life, and he ultimately expresses how Amam dies. Collette breaks into laughter and tears, expressing the joy Amam experienced in his afterlife.

"Jesus, this is better," he says, still in his hypnotic state.

REGRESSION AS THERAPY

Past-life regression therapy is one means by which participants can gain a better understanding of their present state.

This kind of therapy can reveal traumatic events that happened to some participants in their past lives, Sheldon says. The process of drumming up what some people believe to be memories can be emotional, but Sheldon reminds participants while they are in a hypnotic state that they choose whether or not to experience the emotions or events.

Sheldon has studied past-life regression since the '70s. Studying past lives gives her the sense people are comprised of a lot more than their current state, she says.

"I always had a foot in the whole world of psychic phenomenon," Sheldon says.

(below) Two photos combined in Photoshop stimulate a photographic double exposure

effect, representative of past-life experiences.

“
THE VOICE TELLS THEM TO
TRANSPORT THEMSELVES TO ANOTHER
TIME, ANOTHER BODY.
”

Sometimes it's easier for people to understand themselves while in another form, place and time, she says.

"You don't have to believe in past lives to have this be meaningful," Sheldon says.

This particular course in past-life regression therapy is two days. The first day, her students undergo group hypnosis. The second is more personal. Sheldon guides each person through his or her past life one-on-one, while the rest of the group observes. Sheldon allows students to express important moments of their previous lives, people who may be a reflection of people they know in their current lives and, ultimately, the point at which they die.

On the first day of class, eight people sit in a circle in a silent room. Some sit on wicker chairs or recliners, others on a beige couch. Their eyes are closed and their breathing is slow as their minds concentrate on the task at hand. Sheldon tells them to imagine they're floating in space, peaceful with the dark sky surrounding them. The next task is more daunting. The voice tells them to transport themselves to another time, place and body.

40 years ago, Sheldon attended a weekend women's group in California with 15 others, guided by a woman named Helen Wambach. Wambach, now deceased, was a researcher in the field of past-life regression during the '70s when Sheldon experienced her first therapy session.

Wambach initially ventured into the research in the '60s in order to debunk reincarnation. She conducted a survey of 1,088 people. The survey included specific questions regarding their past lives: the time period, their footwear and currency. From her findings, Wambach concluded people's recollections of the periods in which they had lived were overwhelmingly accurate.

"I don't believe in reincarnation — I know it," Wambach once said, according to a handout Sheldon read in class.

Some people think therapists or counselors who conduct hypnosis influence regression therapy.

The way participants view the treatment depends on whether participants believe they will be helped by the hypnosis, psychologist Arthur Janov writes on his website.

Janov cites a study conducted in 1982 by another psychologist, Robert A. Baker, in which 60 undergraduates were put through a past-life regression.



(below) Cyndy Sheldon displays her turquoise rings, which some people believe are

talismans of good fortune.



Participants were divided into three groups. Two groups listened to taped suggestions either in support of or against past-life therapy. In the group exposed to the supportive tape, 17 of 20 reported returning to another life while under hypnosis, compared to two members from the group exposed to a message ridiculing regression therapy.

Baker concluded if people expect to have a past-life experience, they will, and if they do not expect to have one, they won't. Most people under hypnosis are "influenced by the hypnotist's voice, tone and attitude" and past-life regression is the result of hypnotists' suggestions, subjects' expectations and demand characteristics of the hypnoidal relationship, Janov writes.

AN EMOTIONAL RETURN

On the second day of the course, Camila Frey-Booth, another student in Sheldon's class, is flushed with emotion after her past-life experience. Her chest rises up and down as she goes deeper into a hypnotic state, and she feels as though she's out-of-body. She finds herself as a woman in her 20s living in Central America. The woman, Juanita, struggles with self-confidence. She is overweight and only feels comfortable in academic situations. Frey-Booth, 21, can sympathize, because many girls look in the mirror and feel unsatisfied with their reflections, she says.

"I feel very emotional," Frey-Booth says, her cheeks glistening with tears from under the folds of the eye mask.

“
THAT REALLY RESONATED WITH
ME — JUST LETTING GO OF
THINGS I’VE HELD ON TO FOR SO
MANY YEARS
”

While under hypnosis, she could feel wind against her skin and see vivid images that captured her previous life, she says.

After her regression therapy session with Sheldon, Frey-Booth gained a better understanding of herself through her past life as Juanita. It puts a lot of perspective into her feelings, such as self-consciousness, and how they hold her back in her current life, she says.

"That really resonated with me — just letting go of things I've held on to for so many years," Frey-Booth says.

As he transitions from a past life to the present at the end of regression, Collette sits up and slides the eye shades down from his face. Tears still hang from the corners of his eyes, and his cheeks are flushed.

Sheldon asks if Collette experienced anything as Amam that may relate to his current life.

Collette says his pride in his work and his emphasis on craftsmanship in his daily life are traits most consistent with Amam's characteristics and feelings. He thanks Sheldon as he raises himself from the chair, smiling and glowing with a better understanding of himself and who he may have been. **K**

STORY BY FRANCINE ST. LAURENT
photo illustration by Paul Bikis

(below) Some people put currant jam in tea for the medicinal benefits of its antioxidants.

THE CURRANT RAGE

One berry to rule them all



BENJAMIN SOLODYANKIN SWIRLS A silver spoon, collecting a pool of raspberry and black currant jam. He lifts and dunks the blob into his tea and the berries' seeds rapidly disperse.

"When you get sick, put the jam in tea with lemons," says Natasha Solodyankin, Benjamin's wife.

Benjamin and Natasha, who live in Ferndale, buy black currants for about \$1.50 per pound from Whatcom County farmers when the berry is in season toward the end of July and early August. They make currant jam, adding strawberries or raspberries, and freeze extra berries for fruit punch and smoothies.

The size of a pea, black currants are packed with antioxidants and vitamins A, B, C and E. Black currants offer four times the vitamin C as oranges, according to a 2010 study by U.S. Department of Agriculture.

Their high vitamin content makes them comparable to acai and goji berries. Black currants are high in anthocyanins, which give them their dark color, and have been shown to lower risk for cardiovascular disease, according to a 2010 study by Oklahoma State University.

"They are hardcore bitter," Benjamin says. "You'll eat them just to grow some hair on your chest."

Currants, a cousin to the gooseberry, grow in white, red and black varieties native to Europe and Asia, according to a 2001 study by the Washington State University extension in Mount Vernon. Black currants are the most common variety in Europe and North America.

The berry's value is in its dark color, says Linda Banks, a behavioral nutrition specialist in Bellingham. With few dark fruits to choose from, currants are a good option for people who strive to eat a colorfully balanced diet.

"The current trend is moving away from refined foods and sugars to slower digesting foods such as fruits and berries," Banks says.

Baked goods, desserts, juices, liquors and stews can contain currants.

Darcy McGuirk, who manages the bakery at Bellingham's Community Food Co-op, uses black currants in muffins and Irish soda bread.

"[Dried currants are] similar to raisins," McGuirk says. "They are a little bit more tart."

The Co-op soaks dried currants in water before use to prevent them from pulling moisture from baked goods, McGuirk says.

While fresh currants are in season for a short period in late summer, dried currants can be enjoyed year-round. **K**

GAME ON

Independent game developers play by their own rules

DRESSED IN A DARK SUIT AND

matching fedora, Western alumnus Alexi Pors bears a striking resemblance to the film noir characters on the cards he deals out in neat stacks on the four empty tables in front of him. Pors stops every now and then when he comes to a new suit of cards, making new stacks until five piles of cards sit next to short poker chip towers and a rulebook.

The cards belong to a game called “The Big Fix” Pors designed and presented at a prerelease event on Jan. 25 at Bellingham’s Dark Tower Games. Unlike many of the tabletop games lining the walls of Dark Tower Games, Pors created “The Big Fix” without a publisher.

Independent game development is not as hard as it used to be, Western senior and computer programming major Adam Murgittroyd says. Thanks to free software for video game design and crowd funding websites such as Kickstarter, independent game development has exploded in the last five years, Murgittroyd says.

That explosion has led to saturation in the gaming market, Pors says, although he doesn’t consider market saturation a problem. If anything, it’s a motivator for Pors to make his game stand out from the rest.

“My talent is seeing where there’s a hole in the market,” Pors says. “I designed [“The Big Fix”] because there was no other game like it.”

More than 400 supporters on Kickstarter successfully financed “The Big Fix.” The \$13,000 Pors got from the Kickstarter campaign was more than enough to cover the costs of publishing nearly 400 copies of his game on high-quality materials.

Releasing “The Big Fix” is Pors’ dream, but his lack of a reputation in the industry makes selling a new game challenging.

“The first time someone plays the game is my only chance to get them interested,” Pors says.

Some people are willing to buy a tabletop game even if they don’t enjoy it initially because they trust the maker, he says.

“I don’t have that luxury with ‘The Big Fix,’” Pors says. “Nobody knows who I am. It’s only cards. There are no figurines. It’s a pretty small box.”

Pors designed the gameplay of “The Big Fix” and tightly controlled its film noir feel and experience, but Kevin Maxon drew the unique art adorning every card. Maxon, a Western alumnus, is no stranger to independent game design.

“EIDOLON”

Maxon is the lead designer of “Eidolon,” a video game he used as his thesis before graduating Western in 2013 with a degree in game design.

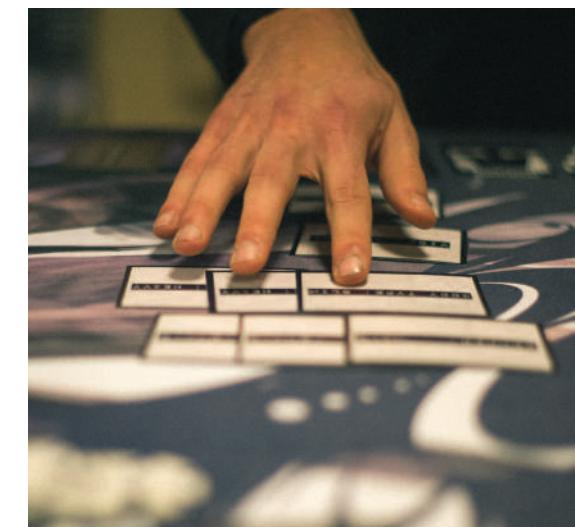
Several friends helped Maxon work on “Eidolon,” including Meagan Malone — a Western senior and English and theater double major — Murgittroyd and several other people from Western. Maxon and some friends formed the studio Ice Water Games, and each member of the team contributed to the creation of “Eidolon” with expertise in writing, history, sound, computer programming or graphic design.

After Maxon graduated, he continued to work on “Eidolon.”

“I get up in the morning and I work on it until dinner time and then I cut myself off from it at night,” Maxon says.

(below left) Gamers play “The Big Fix” at its prerelease event at Dark Tower Games.

(below right) Alexi Pors, creator of “The Big Fix,” sets up the game at its prerelease event.



“

*THE FIRST TIME SOMEONE PLAYS
THE GAME IS MY ONLY CHANCE TO
GET THEM INTERESTED.*

”

Maxon works on “Eidolon” 40 hours per week, and doesn’t plan to join a larger studio or sign up with a publisher any time soon. The game industry carries a culture of sexism and immaturity he is hesitant to embrace, he says.

CULTURE

Factors such as the anonymity of the Internet contribute to the game industry’s culture, and have influenced the stereotype of gamer demographics as white, middle-upper-class heterosexual males, Murgittroyd says.

“I think [the game industry] is portrayed as being more that way than it might necessarily be, and I think publishers are more afraid to push the boundaries because they’re being told the gamers are that demographic,” Murgittroyd says.

Other boundaries in the game industry, such as its disparity in gender representation, were among the reasons why Malone says she was interested in joining it. In addition to contributing to the story of “Eidolon,” Malone is planning a career as a writer in the game industry. She is a columnist and game reviewer for the website fanpup.me and is designing her own tabletop

game. She does not attempt to hide the difficulty of game design.

“[Your game is] going to be bad when you start,” Malone says. “No matter what. The thing you start off with is not going to be the thing you end up with.”

All the hard work put into a game’s creation won’t pay off if the game isn’t marketed correctly.

“People are going to have to realize that even if they make a bad game, if they market it well, it will still be more successful than a good game marketed poorly,” Malone says.

SUCCESS

One of the most exciting moments on the team for Maxon was the week after Ice Water Games released its first online trailer for “Eidolon.” News of the game spread on 14 online publications, including the popular Kotaku and Rock, Paper, Shotgun. Followers of the game’s Facebook page and the studio’s Tumblr blog skyrocketed. By Jan. 18, 35 people had pre-ordered the game online, and that number continues to climb, Maxon says.

At Pors’ prerelease event for “The Big Fix,” dozens of Dark Tower Games regulars and his friends played his game for the first time.

The event exceeded Pors’ expectations. Players didn’t struggle with the complex rules of “The Big Fix” their first time playing. Many had a genuinely good time as they huddled close to the cards and watched with excitement as the gameplay unfolded. **K**

INDUCED SHOCK

Treating depression with electroconvulsive therapy

IN A GRAY, WINDOWLESS ROOM, the ragged lines of an encephalograph rise and fall in amplitude, dancing to the brainwaves of the patient having a seizure on a stretcher in the middle of the room. Bellingham psychiatrist Henry Levine glances at the vital signs on the EKG machine to check if the patient is receiving the right amount of electric currents. This is one of the hundreds of electroconvulsive therapy (ECT) treatments he has administered.

ECT, formerly known as electroshock therapy, is a treatment for severe depression that sends an electric current of 800 milliamps from the top of the head to the right temple, causing the patient to seize, former ECT nurse Charles Shoecraft says. Eight hundred milliamps is about one-fifth of what defibrillators use to start human hearts, Levine says.

TREATMENT

Rob, a 59-year-old patient, lies covered in a stiff hospital blanket.

Diagnosed with depression in 1996, Rob has been treated with ECT since July 2013 and receives treatment twice a week. Rob's depression has improved since he started ECT treatment, he says.

Rob did not want his last name published because his depression is a personal issue.

ECT can be 95 percent effective, Levine says. Medication and psychotherapy are about 70 percent effective, he says.

An anesthesiologist pumps pure oxygen into Rob's lungs with an Ambu bag and places a mouthpiece in his mouth to prevent him from

swallowing his tongue while he is having a seizure.

During ECT treatments in the 21st century, an anesthesiologist pumps pure oxygen into the patient's lungs using an Ambu bag. Room air has about 20 percent oxygen. This way, enough oxygen gets to the brain and brain damage is less likely to occur.

"During seizure, the brain's requirement for oxygen goes up," Levine says. "But when you're having a seizure, you can't effectively breathe because your muscles are out of control."

Rob's right foot dances as the seizure begins, the only part of his body not infiltrated by muscle relaxers. This way, the team can ensure he is having a seizure.

ECT today uses unilateral treatment rather than bilateral treatment, which uses one electrode placed on each side of the patient's head. The left side of the brain is not as heavily affected, and short-term memory loss has decreased as a side effect, Levine says.

"In the beginning, the first ECT's were done with the kind of current you have in the wall, which is called alternating current," Levine says. "Our modern machines not only lower the dose tremendously, but they also change the form of ECT so now it's direct current rather than alternating current."

Direct current is the type of electricity created by friction, Levine says. Alternating currents have waves of electricity going in both directions, negative and positive, while direct current is only positive and much less dangerous.

"We know that it causes many changes in the brain, including corrections in chemical



(top) When in use, an ECT instrument delivers brief-pulse stimuli. (below & center) Specific rooms in PeaceHealth St. Joseph Medical Center are equipped for electroconvulsive therapy.

Joseph Medical Center are equipped for electroconvulsive therapy.

imbalances, and engenders the birth and formation of new cells in key areas of the brain that affect emotional control," Levine says.

Psychiatrists used to induce seizures without anesthesia and without constraining patients, which could cause patients to break bones, Shoecraft says.

"We use muscle relaxant medicine so there are no violent convulsions anymore. People don't break bones," Levine says. "They don't dislocate joints; they don't tear muscles."

Because doctors have reduced the amount of electricity used in ECT, the risk for brain damage has disappeared, Levine says. An ECT seizure usually lasts between 30 seconds and one minute.

HISTORY

The idea of ECT came about in 1938, when a bookkeeper at a psychiatric hospital discovered diabetic patients became less depressed than the rest of the population because they had insulin-induced seizures, Shoecraft says. When patients' blood sugar dropped too low, they would seize, and somehow this cured their depression. As time went on, doctors incorporated electricity into this treatment.

Doctors overused ECT and administered it for conditions it was not meant for, Levine says. Doctors also used it as a punishment for patients at state hospitals who misbehaved.

Hospitals and doctors used to give ECT to patients with behavioral problems, not for conditions such as depression, Shoecraft says. Many people still see ECT that way, so a large majority of the public is prejudiced against ECT because of its history, he says.

"When someone is referred to me for evaluation, I have to do a lot of education of the patient and the family so they can make an intelligent and informed decision and not a decision based on prejudice or stigma," Levine says.

Before the 1950s, ECT treatment did not include anesthesia, and patients received electrical shock while they were awake. Paired with the quantity of electricity used, this caused memory loss as well as broken bones, torn muscles and dislocated joints from having a seizure.

At two- and four-year universities, 30 percent of students reported they felt "so depressed it was difficult to function" at some time in the past year, according to The American College Health Association in 2011.

As many as 25 percent of Americans will experience depression in their lifetime, Levine says. Some of those 75 million people will need treatment beyond medicine and psychotherapy, Levine says.

ECT TODAY

A person must legally consent to have ECT treatment or be ordered by a jury to receive treatment if they have been ruled incapable of making sound judgments for their own well-being.

People with severe psychotic depression can have delusions such as their body is rotting, so they refuse to eat, Levine says. These people may believe their delusions, and might not willingly consent to ECT because they see nothing wrong with their mind.

ECT is mostly effective for depression, but can also be used to treat Parkinson's disease, mania and forms of schizophrenia.

"There's a significant number of people who have serious depression other forms of treatment don't work for," Levine says. "That's where ECT comes in."

Most of the patients receiving ECT at PeaceHealth St. Joseph's Medical Center in Bellingham are between the ages of 40 and 88 and are evenly distributed between male and female. Older people are often more likely to be depressed because they experience more loss of family and friends, Levine says.

"I think most of [the patients] are going through a dark period of their lives when they were suicidal to a place where they feel much better in a relatively short period of time," Shoecraft says. "So we're kind of part of that journey and it's a real positive thing."

Rob, like many others, may continue the ECT treatments as a way to maintain his mental health.

Rob decided to weigh the benefits against the risks, and his decision to undergo electroconvulsive therapy paid off. ■



AQUAPONICS

The future of farming

STORY BY KRAMER JANDERS

photos by Paul Bikis

(top left) Evan Wolf, co-founder of eFISHent Aquaponics, adjusts vegetables grown in his soilless farming compound. Plants receive nutrients directly through a flowing stream of water. (top right) Plants absorb direct light in the eFISHent Aquaponics farm.

TWO SCHOOLS OF YOUNG BROWN channel catfish swim in a 7-foot tall water trough. Water cascades from the top of the trough two feet downward into an arm-deep, wooden grow bed full of gravel. As gravity pulls more water into the gravel, the water flows freely into another pool packed with floating rafts of green vegetables.

For Ken Block and Evan Wolf, organic farming makes sense and has led them to create their own farming business, eFISHent Aquaponics.

Aquaponics uses nutrients in a cycle, moving water with one pump and the help of gravity. The pump draws water from the bottom of a fish tank, where fish waste builds up, and uses gravity to siphon the water into plant grow beds. Depending on the type of plants in the grow bed, the roots

are either fully or partially submerged in water. Roots pull nutrients out of the water, purifying it for the fish.

Plants have to fight for nutrients in natural habitats, so they need to be adequately spaced out, Block says.

“In [our] case, when the system is matured, all the nutrients are just flowing past them,” he says. “That enables us to crowd so many more plants into such a small space.”

Aquaponics combines the growing techniques used in hydroponics and aquaculture fish-farm systems to eliminate wasted nutrients. In an aquaculture system, fish waste creates a buildup of ammonia in the water. With the help of bacteria, ammonia turns into nitrates, which must be filtered out of the water for the fish to survive. In

hydroponic systems, large quantities of fertilizers help the plants grow.

Aquaponics recycles water and nutrients, as do many natural systems, eliminating the negative effects of both hydroponics and aquaculture. The fish feed on organic fish food and their waste becomes organic fertilizer for the crops, which simultaneously filter the fish's water, resulting in a symbiotic relationship. Because the plants do not have to grow large root networks, they spend energy growing their foliage.

eFISHent began in summer 2012 as a simple barrel aquaponics system with two 55-gallon blue plastic barrels. One barrel, with a half-moon shape cut out of the top, sits upright to form the fish tank. The other barrel, cut vertically in half, sits sideways on top to form the grow bed. After



(right) Catfish feed on organic fish food. The fish's waste is used to fertilize crops.

getting a feel for aquaponics, Block and Wolf set their eyes on a bigger project. In May 2013, they began designing and building their 3,000-gallon aquaponics system.

Aquaponics offers a sustainable option for farming by avoiding fertilizers and saving about 90 percent of water used in traditional farming, Wolf says.

"We are recirculating one big body of water, and most of the water surfaces are covered, so little evaporation takes place," he says. "But that is the only water loss that does take place."

For example, one corn field could use the same amount of water every day that eFISHent has in its whole system, Wolf says.

Aquaponics is used both outdoors and indoors. Farmers use aquaponics in warm climates such as Australia as a way to save water, Wolf

says. In Hawaii, it is used to save space, Wolf says.

eFISHent uses a Bellingham warehouse for its system, demonstrating how aquaponics can be used indoors with LED growing lights. This system could be used anywhere in the world to sustain a supply of food throughout the year. The only electricity needed is to run the pumps and lights.

"We are just trying to be modest and make sure we are on top of everything, and we know everything there is to know about doing this before we take the next step," Block says. "We are excited about opening [eFISHent] up and sharing it. There is a lot of educational potential in this."

Currently eFISHent has two kinds of grow beds. The 2-foot-deep wooden grow box full of gravel is called a media bed. The box is lined with high-grade non-toxic plastic sheeting and is about 4 feet by 30 feet. The media bed is best suited for flowering plants because it allows the roots to grow as if they were in dirt.

As water exits the media bed, it pours into the other grow bed, a knee-deep pool called the deep water culture. The pool is filled like a puzzle with rectangular pieces of non-toxic housing insulation, which is used as rafts for the plants. The rafts have rows of holes to provide a place for the roots to dangle into the water while the plants float on top. The deep water culture, meant for leafy plants such as spinach and lettuce, can be crowded with plants because the roots grow directly into their nutrient source.

Block and Wolf started to grow their plants and first school of fish in November 2013. In six months they hope to grow 200-250 catfish and 800 plants in the deep water culture. The kind of media bed they use will depend on the type of plants they want to grow.

Staggering the introduction of new schools of fish provides the ecosystem with a balanced supply of nutrients for plants to grow consistently. Crops are harvested more regularly than the fish. However, growing both in stages provides a harvest of both fish and crops without upsetting the delicate balance.

Aquaponics could be the answer fish and hydroponic farms have been searching for to eliminate waste and maximize output.

Block hopes to build different size systems to show people aquaponics can work on any scale. But for now, eFISHent has three major goals, Block says.

"Growing the business, helping the community explore aquaponics and innovating the whole idea of aquaponics," Block says. **K**

STORY BY HANNAH JOHNSON

photo by Paul Bikis

PARKED PARKS

Green space visits urban streets

TWO BENCHES, WEATHERED BY THE harsh winter into a dull grayish hue, face away from State Street's arterial traffic in a puddle-ridden gravel parking lot. Flanking the ends of the deck that connects the two benches are large, circular planters. Their wavy edges and white speckled exteriors encompass the frozen, bare soil inside.

This miniature park, called a parklet, was Bellingham's first foray into expanding usable public space by creating a park in a parking spot.

Sustainable Connections partnered with the City of Bellingham and other local businesses to make the parklet project possible to utilize outdoor spaces, says Rose Lathrop, green building and growth program manager at Sustainable Connections.

La Fiamma Wood Fire Pizza first stationed the parklet outside its doors from August to November 2012. Dashi Noodle Bar then claimed ownership of the parklet and installed it outside its State Street establishment from April to November 2013. In fall 2013 the parklet moved again and now sits outside Plantas Nativa's sky blue barn on State Street.

In summer 2014, project volunteers will transport the parklet to its new home on State Street outside the Herald building, owned by Daylight Properties. There, it will continue to live up to the saying on its sign: "To make Bellingham a more sustainable place to live, work and play."

"Bellingham doesn't have a lot of — actually, almost zero — open space for people downtown," Lathrop says. "There are no public plazas, no parks, no town square or anything like that."

This program has its origins in PARK(ing) Day, a grassroots movement that originated in

(below) The Bellingham Parklet, designed for people to relax during the day, sits in the parking lot of Planitas near the corner of State Street and Laurel Street.



San Francisco in 2005 to turn urban parking spaces into temporary public spaces, according to PARK(ing) Day's website. Since its birth, PARK(ing) Day has gained global participation. The program inspired Bellingham and project supporters to provide more open space downtown for its citizens.

Bellingham Bay Builders, Plantas Nativa and Altity Art Studio dedicated resources and funds to materialize the parklet, Lathrop says.

However, transporting and maintenance on the parklet falls on the current owner, which the city approves, Lathrop says. That same business volunteers time, materials and money to maintain the parklet, Lathrop says.

The city requires fees and paperwork, as well as neighboring businesses' approval, to use the public space. Owners must complete an official application, found on the City of Bellingham's website, and a temporary right of way use permit. Permit-related fees total about \$1,000, Lathrop says. Parklet owners also pay \$6 per day to feed the parking meter, excluding weekends and holidays.

Western associate professor of urban planning Nicholas Zaferatos thinks this parklet is a great idea.

"[Parklets] transfer public space to be entirely used by people [and create] a barrier and a neat buffer between sidewalks and the street," Zaferatos says.

Zaferatos encourages more construction experimentation.

He would like to see a chessboard, some newspapers from local news outlets, and a Wi-Fi hotspot.

Wherever the parklet crops up next, though, Zaferatos encourages people to use the space. **K**



CHANGING REELS

*Film industry adapts
to new technology*

STORY BY MICHAEL LYDON

(left) A retired film projector is on display at Pickford Film Center.

ON AN EARLY SUMMER MORNING IN 2012, a 12-person film crew scales the side of Mount Baker, gradually slogging up the slope. One of the young men in the company totes a digital SLR video-capable camera; another schleps a small crane, an apparatus that uses weights to move the camera laterally.

Even without a counterbalance, a mechanism this size can weigh between 20 and 25 pounds, and the added heaviness isn't making the trip any easier. The trek will take them three hours. They hope to return the following day with a slew of new footage.

The assistant director, Western alumnus Robert Bojorquez, stresses the importance of showcasing Washington's natural environments and landscapes. The crew's project, "Pete Owens and the Trek of Destiny," is a tribute to Indiana Jones and other old expedition movies. For this shoot in particular, believability is crucial, and the filmmakers will have to craft their own adventure, Bojorquez says.

When the troupe reaches their destination — a rustic lookout near Mount Baker's apex — the vista could not be more ideal. They are flanked by the mountain's rear on one side and the sun-soaked peaks of the Cascades on the other. To Bojorquez, it becomes immediately apparent: they will get their shot.

The technical challenges of their intended cinematography may have been insurmountable 10 years ago, when shooting digitally wasn't a readily available option.

"I couldn't even imagine what we would do if we were shooting on film," Bojorquez says. "Even just keeping the film from getting exposed on accident would have been challenging."

Analog film stock is becoming increasingly obsolete at a break-neck pace. A decade ago, 90 movie screens in North America were equipped for digital projection, according to 2006 data released by Europa Distribution, a network of independent film distributors. By the end of 2012, the number skyrocketed, and 84 percent of theaters in the United States had made the transition, according to the Motion Picture Association of America. A handful of professional directors and cinematographers continue to shoot their projects on film, although many established figures, such as Quentin Tarantino, have been critical of the new format.

As this trend continues, the digital revolution is simultaneously granting new opportunities for exposure to young filmmakers and altering the definition of the word "movie."

(right) A digital projector's lens projects advertisements at Pickford Film Center.

STUDENT FILMMAKERS

Bojorquez, an active Bellingham and Seattle filmmaker who graduated in spring 2013, is the former coordinator of Western's KVIK program, an Associated Students resource for people who want to learn or participate in video production. Under his guidance, KVIK expanded its opportunities for first-time filmmakers by reinstating events such as the 48-Hour Film Festival, in which teams of participants shoot and edit short films in two days. Bojorquez attributes the success of these events, at least in part, to students' growing accessibility to digital technology.

It would be unreasonable to expect newcomers to master non-digital techniques in such a short timeframe, says Roxy Ewing, the 2013-14 KVIK coordinator. In this way, digital filmmaking is dissolving the barrier between veteran and novice filmmakers, a trend lends itself to pros and cons, Ewing says.

"Talented artists have more visibility today than they ever have," she says. "The downside is having access to a camera doesn't automatically make you a good filmmaker. It's more about having a vision and story than what equipment you own."

Recording on traditional 35mm film has not been a viable option for most students currently attending Western, Bojorquez says. Since the heyday of Super 8 — a cheap film format designed for home movies — declined in the early 1990s, videotape and digital recording have been the most accessible formats. Bojorquez would love to work on film for both the technical knowledge and aesthetic advantages, such as rich color reproduction in the image, he says.

Young filmmakers embrace digital media largely for financial and practical reasons, Bojorquez says. The costs of purchasing and developing film can be excessive, and the time investment in editing footage and preventing damage can cause massive setbacks for independent crews. At the end of the day, everybody has to work within his or her means, Bojorquez says.

CINEMA EXHIBITION CHANGES THE WORLD

The Pickford Film Center, named for the silent-era screen idol Mary Pickford, is built on history. It occupies a restored, 100-year-old building at the end of Bellingham's bohemian Bay Street.

Inside the movie house, a relic sits proudly displayed at the base of theater steps: an antiquated projector, capable of registering physical film prints.

The boxy artifact is about an arm-span across. A display strand of 35mm film suspended on the wall is wound into the device and artfully spooled around the exposed hardware. This is the medium through which the Pickford once exhibited all its movies. Today, the sounds of its metronomic clicks are replaced by the silent efficiency of the theater's new digital projectors.


Though the Pickford has been able to project digital content for 10 years, the theater's primary format for exhibition has traditionally been 35mm. This was because its equipment was not up to the industry-standard specifications for digital projection. However, this changed halfway through 2012 when 20th Century Fox announced it would cease distributing reels to theaters by the end of the year, opting instead for digital copies.

Following suit, the Pickford set out on a community fundraiser project to finance the purchase of two digital projectors, each costing \$75,000. The theater was able to afford its new equipment in a matter of months.

Both Michael Falter, the Pickford's program director, and Ryan Uhlhorn, the theater manager, are content with the new gear. Despite their preference for the rich color reproduction of 35mm prints, they say the new projectors improve the audience's experience by eliminating nearly all playback errors and allowing more flexibility in the theater's programming. Even seemingly minute tasks previously required a lengthy process of splicing and playback. Since the upgrade, these tasks are as simple as clicking a mouse.

"I think many of us in the business have a romanticized view of 35mm," Falter says. "As film lovers, we miss the look and feel of physical film. But as film distributors, we're absolutely thrilled with digital."

While the Pickford stayed afloat through community support, many other independent theaters across the country cannot claim the same. When James Cameron's "Avatar" became a runaway success in 2009, major movie studios created a system known as the Digital Cinema Package, whereby theater chains would be able to affordably accommodate projecting equipment that could reproduce the film's intricate 3-D



I THINK MANY OF US IN THE BUSINESS HAVE A ROMANTICIZED VIEW OF 35MM. AS FILM LOVERS, WE MISS THE LOOK AND FEEL OF PHYSICAL FILM. BUT AS FILM DISTRIBUTORS, WE'RE ABSOLUTELY THRILLED WITH DIGITAL.

effects. However, smaller venues were largely kept out of this conversation, and by the time this new arrangement became standardized, a considerable number of them were unable to upgrade, Falter says.

Theaters still face the ramifications of the change. In November 2013, the National Association of Theater Owners estimated as many as 10,000 screens — 20 percent of all North America cinemas — might be forced to close if they cannot afford the conversion. Falter keeps a picture of a closure sign at a defunct art-house as a reminder of this phenomenon.

On occasion, the Pickford might feature revival screenings that utilize analog projectors, such as its November 2013 showing of the animated film "Heaven and Earth Magic" (1962). But Falter and Uhlhorn say this kind of exhibition will have a limited role in the future.

In a Jan. 8 letter to his daughter, director Martin Scorsese described what he foresees as the future of cinema, warning that the greatest challenge to emerging filmmakers is resisting "the temptation to go with the flow."

Similarly, Bojorquez and Ewing stress the competitive nature of a film community that is growing more inclusive. Distributing a movie project is no longer the chore it used to be, and a cinema screen isn't required for exhibition. Today, anybody with passion can put his or her whims through a camera lens. This inclusivity gives aspiring directors, writers and actors a new challenge: to make their work stand out in a sea of noise. **K**

“LIFE IS TOO SHORT TO PRETEND”

Student embraces her Tourette's



WESTERN JUNIOR MEGAN PHAN WALKS through Fairhaven Commons. One hand shakes, carrying a box of fries. The other holds a cheeseburger tight.

For many students, the path from the food counter to their table would be a causal walk. For Phan, it is a more treacherous journey. She doesn't know how much control she has left.

The clock is ticking. To save her lunch, Phan runs to the table as fast as she can. Three feet away from the table, she loses control. Tourette's forces her mouth to yell out and swing her arm up, causing her fried potatoes to fly in the air like in a fast-paced action scene. She does manage to save the burger.

Phan, a 22-year-old social butterfly, has Tourette's syndrome. Her childhood was filled with loneliness and confusion, paved by a long road of striving to understand her life, she says. She didn't have control over her own body. Her mouth spat when it wanted. She banged her head against the table for no apparent reason. People stared. As a kid, she just wanted to escape and hide in her room, she says.

Nowadays, Phan has learned to live with Tourette's. It is a tough life, she says, but she never thought of herself as an incapable person.

“Life is too short to pretend,” Phan says. “I have Tourette's, and I just have to accept it and embrace it.”

Tourette's syndrome is a neurological disorder, that causes repetitive and involuntary twitches, movements and vocalizations called tics.

Tics can be as simple as sudden and brief actions including eye blinking or grimacing, or as complex as specific patterns of actions including throwing objects, screaming, cursing or self-harming, according to the Centers for Disease Control and Prevention.

The exact cause of Tourette's syndrome is unknown. Scientists have not yet found a way to prevent the syndrome, according to the Journal of the American Academy of Neurology in 1993.

Phan was diagnosed with Tourette syndrome when she was six years old.

She describes having Tourette's as an erratic monster residing in her body. It does the opposite of what she wants to do. Tics are like itches or sneezes. She has an urge to release her tics similar to the way people have an urge to scratch their itches. It feels uncomfortable to fight, Phan says.

Studies performed in 2008 by Mary Robertson, emeritus professor of neuropsychiatry at University College London, suggest globally, 1 percent of children between the ages of 5 and 18 have Tourette's. However, only a few people with Tourette's continue to have persistent tics into adulthood. Most people who have Tourette's become better or tic-free in their early 20s.

At 22, Phan still has tics, including sudden screaming, stamping, spitting, cursing, clapping hands, kicking objects and banging her fist on the table.

In more severe cases, Phan bites her lips and tongue until they bleed. She copes with this by wearing a mouth guard or sucking a lollipop. She sometimes pokes and gouges her own eyes, which has caused her to need cataract surgery. Constantly banging and kicking objects leaves her with bruises; she usually needs to wear a thick long-sleeved sweater or wristband to protect her hands.

“I don't have tics when I sleep, thank God,” Phan says.

Although Phan usually has her tics under control, stress can sometimes worsen her behavior. Once, Tourette's caused her to punch a window. Pieces of broken glass cut through her flesh and she needed stitches.

“That window was weak, so I was able to punch through it,” Phan says with a laugh. “The windows on campus are pretty strong though.”

Phan's friend Geoff Henkel, a Western sophomore, has known her for three years. He has been smacked lightly on his face by Phan a couple times because of her Tourette's. It is not a big deal, he says.

“All I can say is that when she has utensils, I will keep a little distance, just in case, because I would rather not have a fork in my face,” Henkel says. “But it is also not very dangerous because she is cognizant of it.”

Kim Thiessen, Phan's accommodation counselor through Western's disAbility Resources for Students, says depending on the severity of the syndrome, most students with Tourette's don't need much assistance to live successfully on campus. They are as capable as everybody else, she says.

“The disability is not the important part of that person. Don't be afraid of them, don't judge them, don't look down on them,” Thiessen says.

Despite her tics, Phan has never thought of herself as any less than a fully capable person, she says. Worse things could have happened to her. She can still walk and talk and make friends, and she is grateful for that, she says.

On the bright side, because Tourette's always forces her to speak truthfully, Phan says she has learned to be more of an honest person. Because she has no choice but to be the center of attention in public, she has also learned to let herself free from people's judgment, she says.

“Those who mind don't matter, and those who matter don't mind,” she says, quoting Dr. Seuss. “If people really care about you, they don't mind who you are.” ❧

A BRIGHTER FUTURE

Students see solar power on horizon

WESTERN JUNIOR RADHIKA RAJ PEERS through her safety goggles and focuses on the clear liquid solutions she is mixing together, her hands and arms enveloped in large black rubber gloves. Her covered limbs float through nitrogen gas inside a specially designed glovebox. The final solution will light up when exposed to ultraviolet light.

The oily solids she makes from the solutions are put between two small pieces of plastic or other material that can change the way solar electricity is produced.

The plastic pieces are called solar energy concentrators, which collect and amplify sunlight. Researchers all over the world, including at Western, are working to advance solar energy concentrators. Combining chemistry, math and physics, David Patrick, John Gilbertson, Stephen McDowall, Brad Johnson and Janelle Leger have been developing these plastic solar energy concentrators for more than three years.

Within the concentrator, dyed molecules in the plastic capture ultraviolet radiation from the sun and pass it along to the edge of the concentrator. Photovoltaic cells are placed along the edge of the concentrator, where they will collect and convert sunlight into energy.

This different kind of solar concentrator splits up the two steps, allowing each to be more efficient. This means fewer photovoltaic cells are used, making solar energy cheaper and more accessible for the average person. Solar energy currently provides less than 1 percent of U.S. energy needs, according to a January 2013 National Atlas article.

Innovation in solar technology is especially important because it is where the majority of energy will need to come from, Patrick says.

"If you do the math and look at the potential contributions of the alternatives — wind, biofuels, hydroelectric — it's hard to see how you get more than halfway to the total needed to replace fossil fuels," Patrick says. "So either there is some unforeseen technological breakthrough on the horizon nobody has thought about — the miracle — or solar energy."

The raw materials for these concentrators are abundant and don't rely on rare earth metals. However, they are expensive because the technology is still being developed, Western research student Christian Erickson says.

This concentrator technology could be used to make windowpanes. Sunlight and heat would still pass through the window, but photovoltaic cells around the edge of the window would produce electricity. If someone installed these windowpanes in her or her home, he or she could hook them up to the electricity grid or central heating and cooling system.

If these concentrators were used to make windowpanes, the amount of energy produced would depend on the size of the building, Erickson says.

The concentrators can be built at any size. The researchers envision a future where large tractors roll out huge sheets of these flexible solar energy concentrators onto football-sized fields and use them to produce electricity.

The way the researchers arrange the dye molecules within the plastic affects how well they capture and concentrate solar energy. The group's research into the efficiency of the concentrators will be published in the science journal *Chemistry of Materials*.

The performance of the concentrators usually decreases as the size increases, Patrick says. Western's research team is trying to solve a key

(below) Christian Erickson demonstrates the fluorescence of luminescent solar concentrators under UV light.

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THE CONCENTRATORS CAN BE BUILT AT ANY SIZE. THE RESEARCHERS ENVISION A FUTURE WHERE LARGE TRACTORS ROLL OUT HUGE SHEETS OF THESE FLEXIBLE SOLAR ENERGY CONCENTRATORS ONTO FOOTBALL-SIZED FIELDS AND USE THEM TO PRODUCE ELECTRICITY.

”



problem that prevents the concentrators from being large.

"[Sizing capability] is key, because the concentrator needs to be the size of your window or the size of a football field if you're going to roll it out," Patrick says.

The team's manuscript on this research has been submitted to the journal *ACS Nano*.

Six Western students will bring the solar energy concentrator technology to the University of Washington Environmental Innovation Challenge in April 2014. The aim of the competition is to develop a solution to an environmental problem and create a prototype and business plan. The first place prize brings in \$10,000 for the team and attention from potential investors.

Western's six-student team, which is separate from the research team, includes three MBA students, one graduate chemistry student, an electrical engineering technology undergraduate student and an industrial design undergraduate student.

The business competition is a chance to take the technology out of the lab and closer to commercialization, Patrick says.

The 2013 team made a portable solar lantern/cell phone charger. That prototype earned the team honorable mention, the first time a non-UW team placed in the competition. This year's prototype will be a window that can be tied into a grid to produce energy, Erickson says.

"I think [the technology] is life-changing for the environment and for the business community," team member Blake Bishop says.

But before this technology can change the world, some problems have to be worked out. So Erickson continues his work in the lab, clad in safety goggles and denim jeans. Metal boxes, wires, lights and samples of the plastic litter his work surface.

Moving from lab room to lab room, Erickson mixes plastics, lets them harden and places them between transparent glass panes. He then tests them with lights, computer programs and other tools on his table in a black fabric-covered box to block out extra light. **K**

(right) Ryan Albachten solders a link for a necklace in her home studio.

the same woman came back and told Albachten the piece continues to serve as a concrete reminder that life moves on. It comforted the woman through another pregnancy that brought her a healthy son, she says.

Today, Albachten's eye for uncommon jewelry components has spread to those who surround her. Many friends, family, customers and online artist community members associate animal remains with Albachten's name.

"Once you start in a certain direction, people start to think of you," Albachten says.

Friends immediately call if they spot a dead swan in a nearby park. When Albachten's mother found the body of a fallen hummingbird, she kept the remains in the freezer for future jewelry projects.

Other collections have included badger toe bones, armadillo remains sent by a fellow online shop owner, elk teeth from her husband's hunting coworkers, a turtle shell from a North Carolina zoologist and delicate human ear bones.

Each time she finds or receives a dead animal, Albachten must facilitate the decomposition process before the skeleton becomes reusable — most of the time by burying the body and allowing nature to run its course, or, on one occasion, by relying on flesh-eating Dermestid beetles and hydrogen peroxide.

Pacific Northwest sea life is another common inspiration for Albachten, who loved to beach-comb as a child and now collects shells and crab molts with her own children. The nostalgia of youth is a significant player in Albachten's creative process. She often works with maple tree seedpods — whirligigs — she remembers throwing into the air as a child and watching drift to the ground like helicopters.

"I enjoy the fact that plants let go of their seeds, unlike animals, who stay attached to their young," Albachten says.

With a silver casting and a necklace chain or ring band, what may otherwise be left to rot or blow away receives new life. **K**



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*UNLESS BROKEN OR DISEASED,
WE WALK AROUND WITH THESE
HIDDEN OBJECTS THAT KEEP US
UPRIGHT, MOVING FORWARD.
[THEY] MAKE US WHO WE ARE,
YET WE DON'T SEE THEM. ONCE
OUR FLESH IS GONE, THEY
REMAIN TO TELL A STORY.*
”

STORY BY ISSAC K. MARTIN
photo by Isaac K. Martin

(right) A record turns during “Spending a Loud Night In,” Western senior Maxwell Evan’s all-vinyl radio show, which airs at 10 p.m. Tuesdays on KUGS, Western’s student-operated radio station.

FINDING THE GROOVE

The value of vinyl in a digital world

THE SMALL DISC JOCKEY BOOTH IS packed with records, and the casings are spread across the floor. Hardcore punk rock music by the band I Object blares from the speakers. Wiping dust from a record with his palm, Western senior Maxwell Evans places the next disc on the turntable and prepares to switch songs.

In the digital era, Evans still uses analog technology. He exclusively plays vinyl records on his weekly radio show, “Spending a Loud Night In,” which airs 10 p.m. Tuesdays on KUGS, Western’s student-operated radio station.

“I think using vinyl gives [the music] an authentic feel,” Evans says.

Evans moves between his dual-turntable mixing board and his logbook while on air. He must carefully take note of the song, record label and release year of each song he plays.

While Evans tries to make his show run smoothly, he still encounters into errors using analog technology. He embraces his mistakes.

“I like slipping up in my show a little bit, I like having the DIY aspect. I’m not up here doing everything perfect, I like to keep it feeling like it’s not a major production” Evan says.

Evans has two stacks of records in the order he will play them, and a list detailing each song and its speed.

Planning for his radio show begins the day it goes on air. Evans comes up with a theme or concept, then searches through his collection of more than 1,500 records to find songs applicable to the theme.

Evans started to collect vinyl when he was 12. He began to realize his taste in punk rock was so obscure he could not attain the music he desired any other way.

From there he began to hunt for records. He enjoyed the large, tangible aspect of a vinyl disc and artwork, the hunt for a rarity, and the A- and B-side format.

Culture influences his vinyl-driven passion. Through collecting eclectic punk records, Evans has made friends with connoisseurs whom he stays in contact with by buying, selling and trading punk records.

Evans loves to look through other record collections, even if they’re not punk.

“I go over there and I’m just scouring, just because it is fun,” Evans says.

At midnight, when his KUGS show is over, Evans packs up his records, tidies up the booth and lets the next DJ continue that evening’s musical programming. **K**



ONLINE EXCLUSIVES

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FROM POOP TO POWER

ANAEROBIC DIGESTERS CONVERT WASTE INTO ELECTRICITY

Anaerobic digesters convert things such as animal poop and pre-consumer food waste into electricity, livestock bedding and fertilizers. Eric Powell describes how these digesters work and why they are used.



SALMON RESTORATION

THE NOOKSACK SALMON ENHANCEMENT ASSOCIATION WORKS FOR THE VOICELESS

The Nooksack Salmon Enhancement Association has restored 120 spawning sites in Whatcom County. The NSEA restores wild salmon habitats, creating an environment where salmon can return and spawn every year.



ALL ABOARD

THE BELLINGHAM RAILWAY HISTORIAN EXPRESS

Bellingham has a unique history built on the railways. In the 1890s, logging and mining industries provided big business for the railways moving goods across the country. Into the 1970s, railroads were a major part of Bellingham's history, fascinating people of all ages with their size and power. Bellingham Railway Museum historian Dale Jones talks about his experiences and passion for the railroad.



PASTURE TO PLATE

AN ANIMAL'S JOURNEY

Eating local is a phrase people are becoming more familiar with. To many, the farm-to-table concept means shopping at the farmers market, eliminating highly processed foods from their diet, being aware of where food comes from and making choices that support local farmers. This piece looks at the animal's journey from the pasture to the plate.

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