WHO PULLS THE STRINGS?

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When I graduated from high school, I couldn’t wait to go to college.

I wanted to continue my education, of course, but I also wanted to move out of my hometown. Growing up in a community of about 10,000 people, I was ready to expand my social circle.

My dorm room at Montana State University had a phone, but you had to call collect for any long distance phone calls. Therefore, I only called my mother a few times in my first semester and I called her less and less over time. I couldn’t afford to make collect calls to my high school buddies so we wrote a letter or two and called it good. Thus, my mother and my high school friends weren’t connected to my daily life while I was in college.

That doesn’t happen today. Technology has connected us in new and profound ways.

These devices, an important tool in our everyday lives, have become our everything. They are our email inbox, our cameras, our notepads, our lists. They allow us to listen to music, geolocate, and even make phone calls. Cell phones connect us on a daily basis to the people who matter most—and that’s a good thing.

But I suspect cell phones may also hinder our ability to make new connections. When I was in college, I made new friends through the dorms and in my classes. Walking across campus, I often see students buried in their cell phones and not interacting with people who are walking beside them or leaving the classroom together. And that makes me worry because I want every student at USU to thrive.

Robert Wagner, USU’s vice president for academic and instructional services, says that incoming students who meet one or two people they can do something with during their first two weeks on campus are twice as likely to come back the next semester as students who don’t. That makes sense to me. Who would want to return to a place where they feel alone?

National survey data indicate college students today experience higher rates of depression, loneliness, and anxiety than previous generations of college students. At USU, we have a multitude of services for students, faculty, and staff who may find themselves needing additional support. Aggies help each other—that’s what we do. So, if someone is struggling, I hope with all my heart that someone reaches out to them.

We’ve likely all heard advice to “Try something new every day” which forces us out of our comfort zone. But a person can still be lonely when trying something new. For today’s students, I think the advice should be to “Reach out to someone new.” So, this fall I am issuing a challenge to all USU students: Put your phone down and talk to someone you don’t already know. Ask them how their day is going. Ask them how they like USU. Ask them if they’d like to go to lunch. And in that way, be present with each other and expand the Aggie family.

Noelle Cockett
USU President
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Where is This?

The Aftermath of US
After a forest falls to fire, when all that remains are naked trees, charred in every direction, an eerie feeling rises: What next?

First right answer wins Aggie gear. And while you’re at it, letters to the editor are always welcome!
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When I consider what it means to be resilient, I think of the woods where I grew up, abundant with elm and birch trees, and not far from where Robert Frost loved to wander on his farm in Derry, New Hampshire.

He described the trees I played in, birches that bowed so long they never righted themselves—trunks arching among the trees, “… trailing their leaves on the ground like girls on hands and knees that throw their hair before them over their heads to dry in the sun.”

Bowed, but not broken.

Here in the West, our quaking aspens are often confused for birch trees, but actually belong to an entirely different family—a very large family—thanks to their extensive root system. For more than a decade, USU’s Paul Rogers has been studying Pando, an aspen clone near Fishlake National Forest that is believed to be the largest living organism on Earth. It has been around for thousands of years, a testament to its hardiness. This issue, under the broader canopy of resiliency, looks at what has kept this great forest growing and what threatens it today.

We delve into the human spirit, as well. The ability to draw from deep wells of strength, as does former Aggie quarterback Eric Hipple in his battle with depression and Brittany Frank’s steady resolve to redefine herself after an accident that left her in a wheelchair.

But machines, too, play into this. The way in which artificial intelligence is testing human resilience through the emergence of deepfakes: the manipulation of human thought and actions. We see the university stepping up with the creation of a new Center for Anticipatory Intelligence with a mission to teach resilience in helping people better cope with the unintended consequences of emerging technology.

Try taking that class a century ago.

And on the eve of the 100th anniversary of the ratification of the 19th amendment, the university is launching the Year of the Woman. It will be a year of resilience on display. A year of celebrating those, who among the bowing branches, have enabled us to stand a little taller.
For Idena Ward ’09, finding a private space on campus to nurse her child was a real challenge. It’s no surprise then that she was impressed to support the library’s new lactation room.

Because of Idena, expecting students like Rachel Passey are confident that theirs will be a more infant-friendly campus. Nothing is more personal than caring for a new baby. And for Idena, it’s also a momentous reason to give.

CROWD-GIVING OPPORTUNITIES AT USU.EDU/AGGIEFUNDED

That’s why you often ask yourself, “How can I brighten others’ lives as much as they have mine?” For many Aggies, the answer includes a planned gift to Utah State University. Even a modest gift from your will or trust can change a person’s life.

Enjoy this time. And while you’re thinking of the future and the impact of your life, please consider a gift to USU.

Would you like to know more? Let Ben or Karin help. Already included USU in your plans? We hope you will let us know.

USU Gift Planning Team: Ben Stahmann & Karin Hardy
435-797-7191 | giftplanning@usu.edu
I don’t know how people first started making chocolate, but it is the most lovely thing human beings have made.

—Jessica on the story “The Art and Science of Chocolate”
The Sweet Stuff

I read the article on chocolate. I am a lover of the brown, sweet stuff. Very good article. I also enjoyed several others, especially the students who get up so early for their bakery jobs, etc. Keep up the good work.

—Gary Rawlings ’69

Surprise!

I finally picked up my Utah State spring magazine and started reading. Imagine my surprise to see you giving a shout-out to Kathy’s Corner!

Thanks so much, John. It was a great endorsement to our efforts out in the field.

—Kathleen (Kathy) Riggs
USU Extension Professor

A Shame

Regarding your “Becoming A Master Gardner” article: The writer is misinformed about glyphosate. It’s a shame that a publication by USU would contain false information about the well-known and documented health risks of glyphosate.

—Paul Wightman ’83

(Editor’s Note: Thank you for bringing this to our attention. The editorial team tries to provide readers with information that is as accurate as possible. As we went to press with the spring issue, a jury found Bayer/Monsanto liable for glyphosate causing a California man’s non-Hodgkins lymphoma. However, the chemical is still considered non-carcinogenic by regulators in the United States (EPA), Canada, and the European Union. Though controversial, chemical pesticides are a component of integrated pest management (IPM) approach to managing agricultural and horticulture pests. Utah State University promotes and disseminates non-biased, research-based information. Our inclusion of the chemical (glyphosate) was in no way a specific endorsement of the product. We will continue to follow how safety commissions review glyphosate in the future.)

Memory Lane

I very much enjoyed your spring edition. Food is important. I’m farming now so I know the role that the land grant universities play, even with the lower funding levels now versus back then.

The article about the university’s dining services brought back memories. I lived in Richards Hall from fall ’68 thru ’70, graduating in 1972. I remember the dining hall halfway between Richards Hall and a big multi-story dormitory high rise and have vague recollections of the menu: standard breakfast items, numerous casseroles, and something students called mystery meat—19-year-olds will complain about food that they don’t have to prepare themselves.

Looking back, it was pretty good for 1960’s institutional food. Spaghetti with meatballs was as exotic as it got. I have no memories of the cafeteria in the Student Union building, but I do remember the downtown Blue Bird Café had a branch across the street from the Student Union. It had closed when I visited Logan in 2003. I used to study there. They served good coffee but chased you out if you stayed too long. The ice cream in the old dairy building on the Quad sticks in my mind, although I often didn’t have the cash to indulge.

When I had to fend for myself, I ate rough. There was a mom-and-pop grocery store just West of Richards Hall towards the canyon, just past a pizza restaurant—19-year-olds will complain about food that they don’t have to prepare themselves.

Where is Science Education?

I read with interest “Got Climate Angst?” (Fall ’18), mapping the regional distribution and evolution of American attitudes toward climate change. While the reactions to weather events are interesting, the headline is rather buried. According to Professor Howe’s map, 63% of Cache County residents “believe that global warming is real.”

The salient question is how American science education could fail in such spectacular fashion that 37% of county residents deny this reality. Even this is generous, since the “belief,” as worded, allows for the recent but equally fictitious right-wing formulation that “climate is changing, but we don’t know if humans are contributing...”

Since Howe’s map closely resembles that of general party affiliation, we must also interrogate why a major party has adopted the abject denial of scientific reality as a cornerstone of its program, and persuaded its voters to erase their memory of physics, chemistry, and geology class to conform.

—Jim Steitz ’03

From the Web

“This girl rocks. She has welcomed us back to the real world of humanity.”

—Erin on the story “Food Connects”
“There’s a difference between giving up and letting go ... I’m ready to appreciate the abilities I have now.” —Brittany Frank
realized she was good at running while training for a marathon in high school. She liked the burning feeling in her lungs. “That just kind of ignited this fire, this passion that helped me become who I am,” the former Utah State University steeplechaser smiles. “I felt like I lost that part of myself after my injury.”

Frank radiates joy, even while baking in the June sun in the parking lot outside Maverik Stadium. Her blue eyes sparkle when she smiles, which is often. When her 19-month-old son William drops a marker from his perch on her lap, Frank sets the brake of her wheelchair, and effortlessly snags it with one long muscular arm. She has found new strength since a 2012 rappelling accident broke her back.

“That’s one of the hardest things—seeing people after they just lost a part of themselves, a part of who they are,” says Frank’s teammate Marissa Moran ’11, a physical therapist specializing in neurological rehabilitation. Moran doesn’t tell patients “everything happens for a reason,” she says. “People have to find a reason.”

Frank nods in agreement. “There’s a difference between giving up and letting go,” she says. “I’m ready to appreciate the abilities I have now.”

Frank spent two years in physical therapy hoping she might run again. She hit the proverbial rock bottom. Mountain boarding helped Frank dig her way out. “It’s the closest thing I’ve found to running,” she says. “I’m pushing with the strength of my own two arms. It’s me.”

In the years since, Frank has had her share of big moments. She competes in marathons, got married, had a baby. But competing in Ragnar with 11 former USU teammates was a homecoming. Wearing matching Aggie tank tops they ran a reunion lap at the track where they spent hours running in lockstep, pushing each other forward.

“This place, it formed us,” Frank explains. “We have so many memories of this place, but we’re about to make so many more.”

By Kristen Munson
Idalis Villanueva’s mission is to upend engineering education. The assistant professor is one of just .2 percent of Latinas with doctorates in the field. But the first-generation college student doesn’t believe it’s because minority women aren’t interested in engineering careers. She studies hidden curricula in engineering—the idea that disciplines have a culture with certain academic rules, social norms, or other knowledge, which may not be obvious to individuals from nontraditional backgrounds, but may inadvertently leave them behind.

Villanueva also wants to transform how engineering is taught and evaluated. The field has undergone little change since the mid-1800s. Updates are needed, she says, and could boost retention rates—only about half of all engineering undergraduates nationwide complete their degrees. Villanueva was recently rewarded for her efforts with a Presidential Early Career Award for Scientists and Engineers (PECASE)—the highest honor given by the U.S. government to scientists and engineers.

“I am simply humbled and honored to be representing my island of Puerto Rico and my home institution Utah State University, on this presidential award,” she says.

Awards
Two Undergraduate Researchers Named Goldwater Scholars

USU Honors students Bryce Frederickson and Ethan Hammer were named 2019 Goldwater Scholars for their outstanding achievements in science and mathematics. Recipients receive one or two-year scholarships of up to $7,500 per year toward annual tuition and expenses.

“Goldwater Scholars are selected from among the nation’s top STEM undergraduate scholars,” says USU President Noelle Cockett. “This well-deserved recognition is a testament to the exceptional achievements of our students in academics, research, and service, as well as the outstanding mentorship by our faculty.”

Frederickson studies combinatorics, a branch of mathematics that analyzes patterns in discrete objects. He was selected as the College of Science’s 2019 Undergraduate Researcher of the Year. Hammer has spent two summers investigating bighorn sheep disease ecology and conducting camera surveys to inventory and monitor wildlife for the National Park Service at Cedar Breaks National Monument.
Experimental Social Impact Bond Projected to Save Millions

By JoLynne Lyon

In 2013, Utah embarked on the first-ever social impact bond focused on preschool education in the United States. Investors paid for high-quality preschool for at-risk children, in return for an anticipated payout from the state.

Mark Innocenti, director of the Center for Persons with Disabilities’ Research and Training Division at Utah State University, helped design the social impact bond and is its sole evaluator. He is also one of the architects of a growing trend, which encourages innovation while allowing taxpayers to fund only those that provide a return on the investment. If outcomes are disappointing, investors absorb the loss.

The majority of state legislatures in the United States have passed laws allowing social impact bonds to be implemented. And in 2018, Congress passed the Social Impact Partnerships to Pay for Results Act, creating a $92 million fund to encourage pay-for-success programs to “improve the lives of families in need.”

In Utah, the return on private investment was conditioned on the program’s success in keeping children out of special education. Investors Goldman Sachs and J.B. Pritzker put up $6.5 million to deliver high-quality preschool education to more than 4,000 children for five years.

The bond targeted children who scored in the bottom three percent on the Peabody Picture Vocabulary Test, a language assessment that has been used as a predictor of later school outcomes. The preschoolers, mostly located in the Granite School District in Salt Lake County, came from low-income backgrounds and faced other risks, including exposure to violence, crime, and substance abuse in the home.

“The kids we were reaching were the riskiest of at-risk kids,” Innocenti says. While results will continue to be calculated over time, based on performance to date, the United Way of Salt Lake reports that investors are projected to receive a return of about $1.5 million over the initial investment, and the state is expected to save $5 million in avoided special education costs. Looking back, Innocenti points to the program’s successes and has identified some things he would change, such as including other metrics, like third grade reading scores.

“The bond reached a population in need that would otherwise not have received services,” says Innocenti. “It met the expectations of the investors and of the state, and had an effect on preschool services in Utah. The state legislature has passed two bills to expand preschool to families with at-risk children since the bond began.”

The program was managed by the Utah Governor’s Office with United Way of Salt Lake serving as the intermediary, linking investors with the programs. Five years after the Utah experiment began, the U.S. Department of Education adopted a “pay for success” model in several projects.

Maura Hagan Elected to National Academy of Sciences

Utah State University Science Dean Maura Hagan is among 100 U.S. scientists and 25 international associates elected this year to the National Academy of Sciences. The academic institution provides science advice to the U.S. federal government and other national and international policy-making organizations.

Hagan’s research focuses on downward penetration of space weather effects in the Earth’s atmosphere as well as the impact of meteorological weather on the near-Earth space environment. With fellow physics professor Mike Taylor and colleagues at USU’s Space Dynamics Laboratory, Hagan is pursuing a NASA-funded project to study space weather from the International Space Station.

Lisa Berreau Named a Fellow of the American Chemical Society

Lisa Berreau, an inorganic chemist serving as interim vice president for research, is one of 70 scientists elected to the American Chemical Society in 2019. Earlier this year, she was named the 2019 Faculty Researcher of the Year for USU’s College of Science.

Berreau is recognized for developing synthetic systems for examining biologically relevant non-redox and O₂ activation chemistry involving first row metals, and for the development of flavonol-based carbon monoxide-releasing molecules. Her work investigates the role metal ions play in human health, the environment, and catalysis.
Campus News

$15 Million for Business Faculty Professorships

Utah State University’s Jon M. Huntsman School of Business and the Huntsman Foundation established the $15 million Huntsman Fund for Faculty Excellence to create a permanent endowment for named professorships.

The initial named professorships established are: The Karen Haight Huntsman Endowed Professor, which will support a female faculty in any department of the Huntsman School; the David B. Haight Endowed Professor, the Douglas D. Anderson Endowed Professor; the Harry M. Reid Endowed Professor; and the Stephen R. Covey Endowed Professor of Leadership.

“My grandfather was a teacher, and my father believed that great teachers played a crucial role in the lives of young people,” says David Huntsman, president of the Huntsman Foundation. “It is my hope that this fund will help Utah State University recruit and retain talented faculty who can have an outsize impact on students for generations to come, and thereby contribute to our community and the world.”

The Huntsman Foundation has provided over $55 million of support since 2007 to expand opportunities for students through direct scholarships and enhanced program offerings.

USU Extension Partners with Google

The National 4-H Council received $6 million from Google to bring computer science education to underserved youth across the country. Utah State University Extension’s 4-H program has been a key partner in co-creating the computer science curriculum and tools for educators to implement the new Computer Science Pathway program, which reaches nearly 6 million youth in the United States.

Google’s support will equip 4-H educators with new funding, curriculum, training, devices, and access to Google computer science experts. USU Extension 4-H supports the 4-H Computer Science Pathway by providing training for 15 4-H programs at several land-grant universities to develop and implement computer science education programs that align with local interests, needs, and resources.

Rachel Nardo to Lead the Caine College of the Arts

In July, Rachel Nardo, an early childhood music expert, became the second dean of the Caine College of the Arts. She replaces Craig Jessop, who served as dean since 2010 and who will return as a faculty member in the music department.

Nardo joins USU from California State University, Office of the Chancellor, where she directed a multidisciplinary, international summer arts program for seven years. She served as an innovative media arts specialist with the Creative Kids Education Foundation of Los Angeles. Nardo will hold a faculty appointment in the music department.

“I strive to foster an academic and artistic community wherein faculty, staff, and administration are highly engaged in each student’s development, their own artistry and scholarship, and that of colleagues,” she says.

USU Receives $2.8 Million to Train Middle East Water Engineers

Faculty at Utah State University are part of an international initiative to improve education for water resources engineering students in Egypt and the Middle East. USU will receive $2.8 million over five years to develop innovative instructional tools and curricula and participate in an exchange program for researchers. The effort is funded by the United States Agency for International Development.

USU professors Kurt Becker, Ryan Dupont, Mac McKee, and David Stevens will lead the effort, along with more than a dozen collaborators at the Utah Water Research Lab, the University of California, Santa Cruz, Washington State University, and Temple University.

“When you look at global climate models and the population growth expected in major cities in this region, you start to see the need for improved training,” McKee says. “Delivering high-quality instruction is one of the most significant moves we can make.”
**Research Highlights**

**A Biting Backfire**

The evolution of pesticide resistance allowed the mosquito *Wyeomyia abebala* to benefit from the application of the pesticide Dimethoate by colonizing habitats with reduced numbers of predators and competitors, according to a recent study by Utah State University researchers Jennifer Weathered and Edd Hammill. Their findings were published in the journal *Oecologia*.

“Our toxicity bioassays showed that *W. abebala* from agricultural areas had 10 times the Dimethoate tolerance compared to non-agricultural *W. abebala*,” says Weathered. Additional analyses indicated that the loss of a predatory damselfly, *Mecistogaster modesta*, from pesticide-treated locations allowed pesticide-resistant mosquitoes to colonize these habitats.

“Our results show that the addition of novel chemicals into natural systems may lead to the opposite result of what we’d expect, and that we must think about effects on whole communities of species,” says Hammill.

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**Call for Citizen Scientists**

Do you have an eye for alfalfa? Then consider participating in a five-year National Science Foundation-funded evolutionary ecology study exploring plant, insect, and microbial interactions on one of the region’s most important crops.

“We’re asking science enthusiasts of all ages to share their observations of any invertebrates on alfalfa around our community and around the West,” says Utah State University ecologist Lauren Lucas. “All you need to be able to do is identify an alfalfa plant, watch for critters interacting with the plant, capture an image with your camera, and then upload the image to our page.”

Lucas, USU researcher Zach Gompert, and colleagues at four other institutions will perform DNA tests on plants and bug specimens and use computer modeling to project global changes in biodiversity. Visit to participate: inaturalist.org/projects/bugs-on-alfalfa.

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**Ecologist Awarded Nearly $300,000 to Study Carbon Cycling**

Utah State University ecologist Bonnie Waring heads a two-year $295,967 grant awarded by the U.S. Department of Energy’s Terrestrial Ecosystem Sciences program to examine how climate change scenarios affect carbon cycling in soils.

“Earth’s carbon is stored in three main places: the bodies of plants and animals, the atmosphere, and the soil,” says Waring. “And there’s more carbon in soil than the first two combined.”

Soil microbial respiration, or carbon dioxide release, plays a key role in global carbon cycling. Waring has developed a new technique to create synthetic soil to study carbon cycling in the lab. Waring and her team will use this method to investigate the roles of varied components of soil, including minerals, organic matter, and microbes.

“From our findings, we can develop models to predict how climate changes affecting the soil will influence the carbon cycle,” she says.

HOLDING TIGHT while LETTING GO by Julene Reese ’85
**“WHY IS THERE COOKIE DOUGH UNDER THE BED?,”**

my 15-year-old mind wondered as I searched for my shoes, but found a pan of carefully made, aging dough balls instead.

“Did you just want to see me, or did you really need a ride?,”

my friend joked as I got into his car. We were both surprised to see my car sitting in the driveway since my mom had said it was gone.

“Why are we getting notices of unpaid bills?” puzzled my dad as he opened the mail. My mom had taken meticulous care of the family finances for over 35 years, and this had never happened.

These peculiar events took place circa 1978–1983, and my family and those around us had answers to none of these questions. We were baffled as Leah Smith, my very capable mother in her early 50s, began doing curious things that went beyond just being forgetful. She began to talk less because she got confused, and it was easier to stay quiet. The delicious Christmas dinner and carefully thought-out presents she loved to give didn’t show up one year. As we rushed to find something to cook for 30 people and gifts to wrap for the grandkids, we realized there was something terribly wrong because she would never just forget Christmas.

In 2019, Alzheimer’s Disease is familiar and formidable; but in the early ’80s, most people couldn’t pronounce such a word, let alone know of the horrific challenges and heartache it would bring. Luckily, or unluckily, for us, ignorance was bliss.

My fiercely tenacious father, Jay Smith, began searching for answers, starting with our family doctor who wondered if she had a virus attacking her brain. My dad would later try a dozen or so pathways as he fought to keep from losing his beloved wife as he knew her. They visited doctors in every specialty he could think of, tried vitamins and juices, massage therapy, and holistic approaches. He read everything he could get his hands on.

As our search for answers continued, I graduated from high school and attended Utah State University, which was only blocks from our house. I worked on campus and lived at home so I could help my parents. Just before my sophomore year of college, I became engaged to my high school sweetheart, Todd, who grew to be an amazing, lifelong support to me and our family.

As I started making wedding plans, my sisters who lived away helped from afar. But as I watched engaged girls I knew shop for wedding dresses with their mothers and visit reception centers together, loneliness sunk in. Todd was a great help, but he had never planned a wedding, and I longed for the expertise of my mother of six who had extensive experience in this area. Though she looked like she could help, her memories, skills, and personality were fading. In spite of my sadness, I resolved to move forward and involve her as much as I could. It often ended either in tears or laughter, and I soon learned that laughter would serve me best.

When we shopped for her dress for the wedding, she tried one on and stood in front of the three-way mirror. I could see the look of confusion on her face as she looked at her reflections, and I realized she couldn’t process how to get out of the mirrors. I helped her, and the clerk, who my mom had known for years but didn’t recognize, asked if she had been sick. Not knowing how to answer, I said something about a virus and fought back tears as I helped her dress and led her out of the store.

On the flip side, as I addressed wedding invitations, I thought she could help put stamps on the envelopes. I showed her how, and she seemed to understand. I left the room briefly and came back, only to see stamps stuck all over the table, envelopes with five or six stamps going in all directions, and some with stamps on both sides. We wasted a lot of money on stamps, but she started laughing and so did I, and that felt much better than tears.

The day of my September wedding, she was very quiet. I wanted to think she was feeling contemplative about her youngest child getting married. However, I knew it was her best coping skill for not getting confused when she spoke. My dad did all the talking as people came through the line, and she just smiled her sparkly smile.

In November of 1983, after four years, she finally got a diagnosis from a doctor at the University of Utah. She had a deteriorating brain disease called Alzheimer’s. They still didn’t know much about it, but it seemed there was no cure. My parents cried when they called and told me. But, as per usual, my dad quickly snapped into his tenacity mode and continued his research on vitamins, exercise, and what doctors around the country were saying.

As he did this, my mom’s decline continued, yet he still had several years before retirement. Todd and I did what we could to help while juggling school and work, and my siblings helped fill in, but my mom needed full-time supervision while my dad worked.
Gratefully, my mom had amazing, life-long friends who saw my dad’s stress levels increase and came to his aid. About a dozen women were organized into four-hour shifts to be with her while he worked. I know it was heartbreaking for them to see someone they had known and loved for years no longer recognize them. But they bravely forged ahead and took her for walks and rides, shopped with her, and took her to their homes. These selfless women did this for nearly two years until safety became a concern.

One stormy night, my mom wandered out of the grocery store while shopping with my dad. He was panicked as he searched for her. Finally, because of a flash of lightning, he could see her silhouette in the parking lot. She was drenched, cold, and confused. He was distraught that she didn’t even know how to come in from the rain. Another time, she started a small fire in her friend’s kitchen by turning on a stove burner that had paper on it. Her situation was becoming dangerous, and it was time to make yet another change.

We heard of a new program at Logan’s Sunshine Terrace care facility called an adult day center. It was made for families like ours that needed help during the work hours. The director, Bonnie Smith, became our dear friend, and she was the brains and heart behind the program. She provided enjoyable, stimulating activities, and music therapy. My mom loved it there, and we loved knowing she was safe and cared for.

My thoughts have focused less on if this will happen to me, and more about simple GRATITUDE—

for every day I get to have,
for my amazing husband and family, wonderful friends, my great job, and my health. I have also become appreciative of what I’ve learned.
memories of my grandchildren’s hugs, the feelings of accomplishment that come after doing something hard, time spent with family and friends, and biking in nature? Would my close friends, too, feel sadness at me not knowing them after 20–40 years of friendship? Would I put my children and husband through the same sorrow and exhaustion I had gone through?

These feelings became intense, and I worried my way through ages 52 and 53. As 54 approached, the anxiety eased some, and I took comfort knowing none of my siblings had the disease. After recently turning 55, my thoughts have focused less on if this will happen to me, and more about simple gratitude—for every day I get to have, for my amazing husband and family, wonderful friends, my great job, and my health. I have also become appreciative of what I’ve learned. It was painful to begin losing my mom when I was just 15, but in hindsight, it has shaped who I am. I learned patience, empathy, that people are so kind, and that it’s okay to feel angry and frustrated. I learned we should cut everyone a little slack because we don’t know what they’re going through, or have gone through, and that every day should be cherished.

A friend who served in the Army and saw his share of sadness and tragedy said it best when he returned: “Every day is a holiday; every meal is a feast.”

Leah Smith on Christmas, mid ’70s, before the symptoms of Alzheimer’s began.

Caregivers for individuals with Alzheimer’s Disease or other forms of dementia often experience a range of challenging emotions and can become mentally, emotionally, and physically fatigued. Research shows that if caregivers understand dementia and what to expect, they do much better over time, both physically and mentally. Learning coping strategies helps them find more personal life balance and helps them function better as caregivers.

Because of the need for effective stress management, ACT (Acceptance and Commitment Therapy) for Caregivers, a web-based online program, was developed to help teach caregivers research-supported techniques for managing difficult situations that can be applied to the caregiving role or general life stressors. ACT for Caregivers was developed by Utah State University researchers Elizabeth Fauth, Joshua Novak, and Michael Levin, who have collective expertise in both traditional and online delivery of ACT and in dementia caregiving. The project is funded by USU Extension.

Fauth says that while caregivers report rewards for taking care of a family member with Alzheimer’s Disease or a related dementia, there is significant stress in this role.

This can include up to 24-hour care, navigating difficult behaviors like them repeatedly asking the same question, being agitated, wandering, and losing the reciprocity in the overall relationship they once had with that person, she says. “There is often grief, even though the person is still alive, because the person’s abilities have declined from what he or she could remember and do before the disease. In addition, there is often one person doing the majority of the care, and few people are formally ‘trained’ for this role, leaving them feeling under-prepared and isolated.”

When people are under stress, they often have negative thoughts, Fauth says, and because these thoughts are uncomfortable, many people avoid them or allow the thoughts to guide them in unhealthy behaviors.

“ACT teaches caregivers to recognize unpleasant thoughts, recognize that they are just thoughts, and encourages behavior in ways that align with what is important to them.”

The web-based course is set up so that caregivers can take it at their own pace in 10 sessions that take about 20 minutes each to complete, with a few days between sessions to practice what they learned. There is also an online library of resources, videos, and articles for caregivers.

“We understand that caregivers have a hard time getting out and going to a class, so an online presentation seemed like the best fit,” says Marilyn Albertson, USU Extension associate professor of family and consumer sciences. “This is a research project, so caregivers who participate are asked to fill out several surveys.”

For information about enrolling in the study, please email ACTforCaregivers@usu.edu.
A Table to Fill

By Tim Vitale ’91
I promised myself
I wouldn’t talk about the food.

At least I wouldn’t foodie-fuss the meal for the guests. Nor the wine picks. Eat the grub; drink the grapes. Let them speak for themselves. The good ones come through on their own.

Author Rick Bass ’79 was back in Logan for a reading and coming to dinner at my house to discuss, or not, his latest book, The Traveling Feast: On the Road and at the Table with My Heroes. Thematically, our dinner design was set by his book—around a table, and people with something to say. A plagiarist’s dinner. Bass had cooked individual dinners for 14 or so of his literary heroes, among some of the finest word savants, while also hoping to imbibe in their ideas about literary mentorship and how the hell they do what they’ve done so well. Write themselves, that is, but also how they helped him become a writer with 32 books and something to say.

So, a repeat at my dinner table, easy enough. Talk about the book and mentorship. Or not, which often was how Bass’s book moved in the moments.

The problem was my favorite aunts. My favorite aunt stories are all food stories. Food magic is in Italian aunt blood, but my memories are about food awakening, about how passions boil around food. They are about how food-fashioned brains match tastes, smells, settings, moods, contexts, and then send all synapses firing maniacally at the pungent inhale of browning garlic, at the smoky acridity of charring Oaxacan chiles. I am genetically wired to talk food.

At least I wouldn’t foodie-fuss the meal for the guests. Nor the wine picks. Eat the grub; drink the grapes. Let them speak for themselves. The good ones come through on their own.

My cousin posted a picture on Facebook not so long ago of a table, a crackled old beast with a ceramic top edged in embossed flowers and genealogical might. “Any of the cousins remember this,” he asked? I didn’t remember the flowers; I remembered the flour, not flowers, and aunts, not cousins—aunts in flowery aprons tossing flour through and on and into handmade, knife-cut pasta on Grandma’s table. Rolling pins and spreading dough, dust clouds everywhere, and love. Always love cooked in. Sunday, Sunday, Sundays.

I don’t remember who brought that memory deeply home to me. A definite push came at age 40 from author Jim Harrison, known mostly, and sorry to say, as a novelist, who grabbed me by the tasetestorones in the early ’90s in his meat-manly Esquire column, “The Raw and the Cooked.” Burton Anderson’s book Treasures of the Italian Table reeled seminal Italy back in, as did long talks with an auntie triumvirate—Concetta (my godmother), Maria (Mary), and Antoinette (Toni). Talks about the slow-heat evolution of fresh ricotta, a risotto’s patient moodiness, and about l’uccello barone, my grandmother’s endearing Abruzzese term, (very) loosely translated to “the big rooster” or, the big shot. My beloved Dad. My Dad, one of 12 siblings, loved aunt Evelyn’s risotto, served at regular Vitaliano lunch gatherings.

So, Rick Bass’s interviews and chapters, and now Bass himself at my own dinner table, lit shared across-boards passions, including shared author-love and mentorship reverence, some of it much less direct on my end. The pope, Denis Johnson, on the top of my top-shelf reads, foremost and early with Jesus’ Son. Jim Harrison, often and always. Peter Matthiessen, introduced to me by our mutual mentor in passion purity, USU’s own life-savant professor, Tom Lyon. A photograph on Gary Snyder’s wall and a photograph on my office wall, both jarring memories of a tragic Logan avalanche. Bearman Doug Peacock—Hayduke himself—a shared favorite Bandol and an almost-shared Yellowstone haul into bear fantasies. Barry Lopez and Barre Toelken, another USU maestro and his mentee. My mentors. My heroes. They who evoked passions.

I’m name dropping, I know. A reminiscence, for me for certain. But that’s my take on what Rick Bass had, in part, lived in his book. No, not just a look back for a dreamy fondness reminiscence. A look back, while deep into one’s career, to come home—a contemplative coming home as a respectful coming to terms with how we move into life. Not through life. Into life.

Who is it who slapped awake the slumbering-in-geology poet-to-be? Who made a cliché of youth take an artful turn to the Montana wilds and wolves and words to capture them, for us? And, perhaps most important of all, how could he, Bass, carry mentorship forward, to nurture his own students as they cut their way out of him, out of us, out of stuff already said, and into themselves?

In the book, alas, he is mentored, again, on that point by Snyder, who shakes up Bass’s sound altruistic sense of the situation: “But it’s never really been that way, has it? The spirit that makes great art has always gone its own way.” Yes. And no, because we move together and grow together and support each other, even when going our own ways. Right? Yes?

So, Bass did two things in each chapter of his book, and I told you part one: he interviewed his mentors. But part two was not an addendum. It was a different track, perhaps what Bass was really considering as his path forward. He was in a thank-you mode, certainly, as he cooked for his writing mentors, but, as important as those mentors were to him, he urged a responsibility to provide opportunities down the line. To give back. As part of each chapter, he had invited writing students, usually just one, to come with him, help him cook, and get into the thick of matters to come.

Our Logan dinner had the markings of that repeat too. The invite list, eight total, mixed writers young and old, and fans young...
and old. What to cook? Bass, with meat-man Harrison and maybe his Texas roots in his blood (and blood is the right word here), had his go-to hand-harvested elk backstrap as comfort food backdrop for his book meals. I was going to do a simple risotto. Because. A simple pasta, fresh, as bloodline would suggest. Some basic appetizers. Comfort foods to elicit table-gathered stories during the calm of the evening. Simple. Simple, no food talk. Then someone asked about culatello, and the passions of my genetic pooling unleashed.

We talked about culatello. Lardo. Olives. Cheeses from here, there. A last-minute frittata with pesto—representation from the chickens out back. The risotto—no, not the risotto; we talked about making the stock for the risotto. Water, bones, time turning into food crack. Pasta, but pasta with just egg yolks and flour—six yolks/a cup of flour. Rich, yellow arterial death. We were on. Books flying around the table.

Gary Nabhan’s Songbirds, Wolves and Truffles came for a moment. Talk, talk, talk. Wine with a nod to Peacock, a Bandol. Wine toast for Harrison, who had died two years before almost to the day. Balsamic tradizionale, 25 years old, then the 35-year-old. Passions, and not just me, OK? I don’t mean enthusiasm, or entertainment, or humor, or wit. I’m talking about discussions on how you draw breath or what’s in your blood, or your history, your self. Everyone, delve in. Take a bite. Tell that story. Tell your story.

Then our young writer, quiet to that point, spoke up.

Near the end of this full-sails, open throttle, stampeding-forward dinner, with stories and magic and tangential explosions of connectedness, one person—a graduate student—told this electrifying story that silenced us all. It wasn’t a piece. Not an essay, not something to ponder. It was an urgent, brightly detailed, colorful, mystical, mythical tale—a moment about a moment. There was a dead whale and a Buddhist nun, and lost/found, and still searching for the end … Man, a story, from someone in a zone that we could feel more than understand.

Rick Bass sat there just staring, mesmerized. I suspect THAT is what he wanted—to look back on his life and see that he had an impact on someone, young writers in his case, but someone exploding forth. Someone going, charged by life. He sat there, shaking his head, yes, yes, yes. Listening, intently, and maybe seeing something of himself. The learned, who once needed to learn, seeing a learner come of age?

Much too early the next morning we met with a room of student writers. Bass was queued into every question. But it had been a long evening, noted that morning only by two questions from Bass: (1) “Does anyone have any aspirin?” (2) “Does anyone know the name of the Billy Collins poem with Marco Polo, Marco Polo in it?” One Google-minute later, we find that the poem is called “Hangover,” and Bass read it, beautifully.

No, perfectly, which means he read it with the staggered non-enthusiasm of someone who had … missed some sleep. But he was all in for every question, every person, ready to offer 100 percent of himself to move them onto a path.

No, not just a look back for a dreamy fondness reminisce. A look back, while deep into one’s career, to come home—a contemplative coming home as a respectful coming to terms with how we move into life. Not through life. Into life.

After one student question, Bass paused, and paused, a long time for humans and silence to not-mix. Looking-down seconds, long enough for the student—an undergrad who had asked a complicated question—to begin backtracking: “Ah, maybe that wasn’t very well put. I’m not sure …” No, no, no, Bass cut in, with immediacy. “It was a great question! So great that I want to think about it.” He gives the question time, the answer time, and the student time, because that’s what he does. Give back.

About a month after the dinner with Bass and clan, I’m at a Montana cabin that skirts the northwest edges of Yellowstone. Harrison country. I brought up Peacock’s name on a hike near the Lamar River today: snow-way-laid plans from 20 years ago to go up Speci-
IT STARTED WITH A MISSING DATASET.

Brendan Murphy was listening to a talk about megafires in 2017 when a graph on a slide caught his attention. He tried tracking down the data about wildfires in the 20th century, but this one “mystery” dataset kept popping up instead. Murphy says tapping his laptop keyboard. “It’s pretty distressing.” He flips the screen to show a chart of wildfire acreage burned starting with a peak in 1930 and dropping precipitously by the ’50s.
Murphy, a research associate in watershed sciences, found himself wading through conspiracy theories floated online, he says. “I just wanted to know what this dataset was, and if it was real, because it was purportedly from the U.S. Forest Service … Sure enough, I found that original data and that is how it plots out.”

It combated the narrative he kept hearing that the area burned by wildfire out West was increasing. Murphy turned to Larissa Yocom, a fire ecologist at Utah State University, and asked if she could make sense of it. The two dug into the data and found that most scientists were focused on satellite-derived records beginning in 1984 to the present. Other researchers dismissed the dataset entirely.

“I was a little bothered by that,” Murphy says. “It’s data. It may have issues, but it is still data that someone collected, and it presumably tells us something. Something meaningful.”

So, he asked Yocom, is this record real?

**RETHINKING FIRE**

A framed poster “Northwest Native Conifers” decorates the wall above her desk. Lodgepole pine, Douglas fir, Jeffrey pine. Ponderosa—each evergreen etched on the page has an evolutionary strategy for living with fire.

Yocom places a sample of a tree core on the table.

“Basically, all of these little scars are from fires,” she says, pointing to a tree ring flecked with charcoal. “This tree is sort of a perfect record of fire because you know for sure that a fire burned in each of these years. Look, this tree lived through one, two, three,” she counts, “10 fires over two centuries.”

And you know the fires were low severity because the tree survived through 2009 when researchers cut a piece out with a chainsaw. The chronology of fire scorched into tree rings allows scientists to reconstruct historical conditions in a forest.

It can also tell us how they have changed.

Fires in some forests used to burn in more regular return intervals, Yocom explains. These were not fast-moving fires that swept into the canopies, but flames that crept along the ground, killing saplings and the underbrush until it was snuffed out by rain or diminished fuels. Fires were nearly everywhere out West, she says, but in many places they weren’t often severe.

In the late 1800s, early 1900s there was a national argument about fire in American forests, Yocom says. The fires of 1910 helped to decide it.

The Big Burn of 1910 spanned three million acres across northern Idaho and Montana and tested the members of the fledgling U.S. Forest Service. Rangers tamped the inferno with shovels, axes, saws, and prayers for rain. Seventy-eight firefighters died trying to wrangle flames from engulfing the towns and timber harvests in its path. Their efforts seared fire suppression tactics into the playbook of American foresters for more than a century.

We are still living with the consequences.

When a forest caught fire, firefighters tried to push it back and put it down. But instead of taming fire, we unknowingly created conditions allowing it to be the worst it could become and disrupted natural systems. Climate predictions for a drier, warmer west will further spark tinder box conditions.

“We’ve got way more trees, we’ve got more fuel, and so the fires are likely bigger—the biggest ones are without a doubt much bigger,” Yocom says, citing a series of Arizona wildfires that burned nearly half a million acres or more since 2000—some with high-severity patches stretching thousands of acres. “It’s not as if no trees ever used to get killed,” Yocom says.

“But the scale now—you’ve got crown fires burning through canopies for miles. That’s crazy compared to what these forests are adapted to.”

But the storyline—and solutions—are not the same across western forests. It goes back to understanding the history of a place and the species that evolved there. Some conifers, like lodgepole pines, have serotinous cones that need high heat to kickstart reproduction whereas trees like ponderosa pines evolved to withstand frequent low-severity fires on the landscape.

“Because they have different strategies and adaptations they can get screwed up in different ways,” Yocom explains.

Some management strategies such as thinning trees or using prescribed fires to reduce fuel loads could make fires worse in dense, moist forests because it could dry out fuels and reduce wind breaks, Yocom says. “Ecologically it doesn’t make sense—that’s not how these forests grow.”

But for other forests, think dry pine forests across southern Utah, Arizona, and Colorado, more managed fires on the landscape could be a path forward.

“If fires only can burn in the most catastrophic, most extreme weather conditions, you are basically limiting fire to the worst it can be,” Yocom says. “That’s just a really bad idea. Because everywhere will burn eventually. What people should be doing is choosing the type of fire they want to see, not whether or not they want to see fire.”

And that points to another critical factor influencing western fires—us.

“Ideally, you wouldn’t be managing fire at all—but there is so much WUI [wildland-urban interface] and the fuels are...
so different that we’ve created a really expensive mess,” Yocom says.

The 2010 U.S. Census revealed that more than 23 million people live on the fringes of western wildland. But most early settlers spurred westward had no idea what they were getting into.

**RECALIBRATING RISKS**

“We don’t really have a good sense of wildfire,” Murphy says. “People have just built their homes in places that historically would not have been a wise place. If you moved out here and saw fires burning 10 percent of the landscape every year, you wouldn’t put your house in the woods.”

But that’s not what they saw.

The West’s population boomed after World War II, just as foresters began excelling at fire suppression, Murphy says. “That just so happens to be the same time we were getting really good at building dams.” It also coincides with a period of relative quiet in terms of wildfire on the landscape.

Now, consider that problematic dataset Murphy and Yocom dissected.

The record only tells part of the story of wildfires in the United States. It lacks the context of long-term fire records. While the acreage burned by wildfire is lower than in the past, fires today are more severe, and, in some places, getting bigger. There has been an uptick in wildfire since the 1980s. In other words, limited records underestimate the growing threat.

“There is this idea of environmental amnesia,” Murphy says. “That if you didn’t live it, that you forget about it … and so you don’t take risks seriously.”

In 2018, Murphy, Yocom, and Patrick Belmont, a watershed science professor at USU, authored the paper “Beyond the 1984 Perspective: Narrow Focus on Modern Wildfire Trends Underestimates Future Risks to Water Security” to spotlight the threats wildfires pose to western rivers and reservoirs. Because the dangers from fire persist long after the last embers fade.

“When you think about the risks posed by wildfire, water is not what comes to mind—water is what puts out fire,” Murphy says.

But after a wildfire, particularly a high-severity one, the root structures holding soils and debris in place are gone. Rainfall can wash large sediment loads into streams and clog reservoirs downstream. Murphy and Belmont oversee a $480,000 National Science Foundation grant to analyze the risks to major reservoirs across Utah and recently devised a new model to estimate how much sediment from debris flows and hillslope erosion could enter downstream infrastructure.

SEVENTY-EIGHT FIREFIGHTERS DIED TRYING TO WRANGLE FLAMES FROM ENGULFING THE TOWNS AND TIMBER HARVESTS IN ITS PATH. THEIR EFFORTS SEARED FIRE SUPPRESSION TACTICS INTO THE PLAYBOOK OF AMERICAN FORESTERS FOR MORE THAN A CENTURY. WE ARE STILL LIVING WITH THE CONSEQUENCES.
“The sort of dirty secret of dams is that they all have a sediment lifespan,” Murphy says. “They were all designed knowing that the river flowing into it is carrying sediment.”

And over time, that sediment builds up.

Murphy and Belmont tested the model using data from Utah’s 2010 Twitchell Canyon Fire that wiped out Bonneville cutthroat trout populations within a Blue Ribbon fishery. About 650,000 thousand cubic meters of sediment—picture a football field with sediment stacked 400 to 500 feet high—was estimated to erode after the fire, Murphy says. Simulations showed that after seven years, the majority of sediment was stored within the watershed with just two percent transported downstream. Good news, right?

It depends on the storage capacity of downstream reservoirs, says Murphy. “If it was Glen Canyon Dam that was at the base then you’re probably fine, but if it’s these moderate-sized reservoirs that we have through-out Utah, they could be at serious risk.” For example, that same two percent of sediment could erase 22 years of sediment capacity in Logan’s First Dam reservoir.

With wildfire and sediment yields predicted to increase, the West could be on a collision course with reservoir storage.

“In the worst-case scenario, you could have catastrophic losses where with the right wildfire in the right place with the right reservoir, you could lose an entire reservoir,” Murphy says. “That’s not conjecture and fear mongering, that’s a real risk and has already occurred in places like Denver, Colorado.”

After the 2002 Hayman Fire, Colorado water companies spent at least $23 million to dredge a reservoir deemed too important to lose. That’s one expensive approach to dealing with sediment, Murphy says. Another way, he says, is to allow “more fire on the landscape where it can happen in a more moderate way.”

This summer, Yocom, Murphy, and Belmont submitted a proposal to the Joint Fire Science Program to study how traditional fuel treatments such as thinning and prescribed burns could reduce risks to watersheds, as well as a third method Yocom is investigating: aspen. Most firefighters will tell you that aspen knocks down fire, she says. Could aspen act as a natural firebreak?

And what if there is an additional, furrier way to increase resiliency in western watersheds?

RETHINKING BEAVER

The early waterways of North America were vastly different from today.

“They were cluttered,” says Joe Wheaton, a fluvial geomorphologist at USU. “Messy.”

That’s because the continent’s largest rodent did what beavers do across millions of miles waterways: build dams. They clogged creeks, trapping sediment in basins causing water to pool and spread across floodplains. An artifact of beaver home building is the expansion of riparian corridors that create more complex, more resilient habitat, and protect wildlife during forest fires.


However, beaver populations were decimated in the 1700 to 1800s as European fashion demanded their pelts for hats. Estimates suggest as many as 400 million beavers once crowded waterways across the United States. A tiny fraction of that figure exist today. Wheaton argues adding beavers to the landscape could improve the nearly “one million miles of perennial waterways out West that could use some love.”

He holds up a sticker reading: “Process based restoration low-tech.”

Humankind has excelled at dam building and moving water quickly and efficiently through forests into developed areas. We’ve winnowed valley bottoms so that water moves like a highway, Wheaton, says. Allowing streams and rivers to return to a more natural state is an inexpensive way to restore waterways on a larger scale. We can even jumpstart the process without beaver.

While Wheaton worked on water restoration projects with researchers Nick Bouwes and Michael Pollack, they noticed that post-fire habitat recovery was accelerated when beaver were present. We were not the first researchers to recognize this, Wheaton insists. In the 1950s, the Forest Service air dropped beavers into riparian zones in Idaho.

“These ideas go way back,” he says. “We forget.”

RESTORING PROCESSES

About a decade ago, Jay Wilde changed how he ranched after he discovered high intensity grazing restored some native grasses. Around the same time, he noted changes in the once perennial flowing stream on his Preston, Idaho property. It was drying up in mid-June. Wilde took measurements and snapped photos. He puzzled about the cause. Were cottonwoods sucking the streambed dry? Were the losses due to evaporation? One morning at the kitchen table it dawned on him.

“We didn’t have any beaver,” he says. “We didn’t like beavers back then—no one did.”

Wilde changed his mind after researching beaver. “The more I looked into it, the more it made sense—we have to have beaver in the watershed, not just for the water, but for the habitat they preserve.” He tried introducing beaver on his land twice. Both efforts failed.
In 2014, he came across a news story in which Wheaton described the benefits of beaver. Wilde searched the USU directory and zipped off an email. Within weeks, Wheaton had a pilot project of four beaver dam analogs (BDAs)—manmade structures latticed with logs and sticks to mimic beaver dams—installed on Wilde’s land as a demonstration project to show that the simple structures could create a habitat where beaver could thrive. They added 19 more BDAs and nine beaver to the landscape the following year. Because as Wilde had learned, simply releasing beavers on the land doesn’t always work.

“It was about us trying to create refuge so the beavers aren’t floating hotdogs for mountain lions,” says Nick Bouwes, assistant professor of watershed sciences, while steering his pickup north along I-89 past irrigated fields with hillsides turning gold.

Beaver are often considered a nuisance species. Which is true. Their proclivity for dam building can gum up canals and flood nearby roadways. But beaver activities may also buffer the effects of hotter, drier summers. Their presence is not always a black and white issue, Wheaton says.

His lab recently modeled 100,000 miles of Idaho waterways to determine how many beaver dams could be supported in the region and identify problematic sites, Wheaton says. “It’s kind of a broad brush planning tool.”

Just in Utah’s 15,000 miles of streams, you can fit, 250,000 beaver dams, he says. “We are about one percent of that capacity. Historically we estimate it to be about 350,000 beaver dams that could have been supported.” The model maps proximity to roads and trails—land uses where there could be beaver-human conflict—and tries to identify where we have capacity for dam building, Wheaton explains. “That is really helpful for building people’s confidence.”

Getting Jay to tell his story also gives people the confidence to break from nostalgia, Wheaton says. Wilde regularly speaks at conferences about the impact of beaver on his land. Five years into the project, about 130 beaver made dams clog his childhood stream. Wilde couldn’t be happier about it.

“Cows need two things: something to eat and something to drink,” he says, thumbing the black suspenders holding his Wranglers in place, a toothpick propped between his teeth. “You have to have water in these pastures.”

Beaver dams stop up streams and fan water across a floodplain. They saturate the water table at higher elevations and perform a similar function as snowpack, says Bouwes, Ph.D ’98.

“There is a lot of water storage here,” he says, hiking up a decommissioned Forest Service road to inspect the BDAs on Wilde’s land. “We are only seeing part of it. The rest of it is underground. And that water trickles out in the summer.”

Projections indicate Wilde’s stream will have 25 days of additional water this year. Wilde studies a beaver dam that appeared on the site two years ago. A small trout zips between fallen aspen trees.

“The beaver keep building up and spreading out and activating these side channels,” he says, pointing across the creek. The biggest changes he’s noticed, Wilde says, is the increased presence of Bonneville cutthroat trout.

Wheaton smiles. “The soundscape is different.”

Before the flow was uniform, he says. As the beavers blockaded the stream they altered its flow speeds. The forest sounds different. Wheaton points to the team’s first postless BDA erected after taking design cues from the furry engineers. This means crews don’t have to haul heavy equipment into remote areas. “This opens up so much more territory,” Wheaton says.

This also bodes well for Wheaton’s mission to quickly improve eroded western waterways on a larger scale since BDAs are about one tenth the cost per mile than traditional restoration techniques.

“It is fun to see what we can do to kick things off,” Wheaton says, but, he adds, it comes back to respecting the process, which means letting nature take over.
YOU ARE BOTH RECENT HIRES AT USU. WHAT MADE YOU WANT TO JOIN A UNIVERSITY IN THE SPOTLIGHT?

Emmalee Fishburn: I was impressed with USU’s transparency during the interview process. I’ve worked on campuses before and came to USU because the university seemed intent on making good at its promise to do better. When an incident happens on a campus, it teaches you what your gaps are and what needs to be fixed to support students, faculty, and staff. The response is what matters.

Hilary Renshaw: I came because I got the sense that USU was going to invest in the necessary resources and hire people with the appropriate background to address the challenges that lie ahead. In the past year, we have more than doubled the number of staff members who handle accusations of sexual misconduct. While the work began before I got here, I was excited to come help build something great.

DO STUDENTS FEEL SAFE AT USU?

HR: Part of helping people feel safe is being clear about expectations and addressing problematic behavior. We try to educate people where education is appropriate and sanction people when sanctions are appropriate. It’s about creating accountability across the system.

EF: In April, USU conducted its second campus climate survey and found that 92 percent of students felt safe on their campus—the same percentage from the original 2017 survey. We did see a 16 percent increase in the number of students who said they are aware of how to report sexual misconduct at USU, but only a third of students said they know what happens after a report is made. So, while more students know where to go to report a problem, they don’t always know what happens next. Clarifying the report follow-up process will be part of future education efforts.

HR: We do not have any sense of the timeline of when the DOJ review report will be issued, but we are not waiting for the report to make improvements. The DOJ review process helped us identify gaps in our response, which we’ve addressed by adding resources where they are needed. For instance, we hired staff who specialize in providing supportive measures for students who may need academic assistance after an incident, as well as a new executive director for the Office of Equity. We are in a different spot from when I came to USU one year ago, and that speaks to what we can do with time.

WHAT IS USU DOING TO PREVENT SEXUAL MISCONDUCT?

EF: In 2017, USU launched Upstanding, a bystander intervention program that teaches people both what it looks like when someone in trouble needs your help, and the skills to intervene. In the last two years, nearly 7,000 USU community members have been trained. That number will go up as incoming students and student organizations get trained in the next academic year. We’ve also made considerable progress in staff trainings. Since January 2017, we have had more than 3,800 employees participate in trainings concerning sexual misconduct prevention and responsible employee obligations—when to report a disclosure of sexual misconduct to the Title IX Coordinator.

HR: We are updating the university’s sexual misconduct policy. We are also working on developing an annual report that will show overall trends in reporting and the sort of cases we’re seeing. Federal education privacy laws restrict what we can say about individual cases, but in an aggregate report, we can explain what incidents were reported and how we responded to allegations. We are getting out of a reactive state and moving into a best practice state.

WHAT COMES NEXT?

HR: We are going to continue to educate students, faculty, and staff on boundaries and consent, and give students the vocabulary and the toolbox to navigate these issues. At the end of the day, it’s about creating a healthy environment of dignity and respect to set people up for success.

EF: Everyone is impacted by issues of sexual harassment, sexual assault, stalking, and domestic violence—either personally, or through someone they know. This isn’t a USU problem, it’s a society problem, and we need everyone, including alumni, to help address sexual misconduct by talking about healthy relationships and saying something when they see or hear things that aren’t okay. Our goal is to normalize conversations about these topics because the less openly we talk about sexual misconduct, the easier it is for it to continue in our communities.

For more information about these efforts, go to: sexualassault.usu.edu.

TIMELINE

SPRING 2016
• New Sexual Harassment Policy 339 adopted by USU.

SUMMER 2016
• Salt Lake Tribune publishes a story, showing gaps in sexual misconduct prevention and response efforts at USU.

FALL 2016
• USU launches campaign defining sexual consent.
• USU awarded DOJ Office of Violence Against Women grant to create community-wide response to sexual violence.
• President Stan Albrecht creates a new Sexual Violence Task Force.

SPRING 2017
• USU conducts its first sexual misconduct survey for students.
• USU houses sexual assault resources on one landing page, sexualassault.usu.edu.
• More than 4,000 USU community members sign the “I Will” pledge to stop sexual assault.

FALL 2017
• USU launches “Upstanding” bystander intervention program: 2,808 trained.
• USU mandates all new students to take online sexual assault prevention course.

SPRING 2018
• USU launches “Start by Believing” campaign to combat bias issues that affect survivor disclosures.
• USU overhauls its Title IX office.
• An independent firm hired by USU to investigate allegations of misconduct in its music department releases recommendations.

SUMMER 2018
• USU invests $100,000 to add more than 50 cameras across the Logan campus.
• USU creates Sexual Violence Prevention and Response Advisory Committee.
• Overhaul of USU fraternity and sorority life system to improve student safety and accountability begins.

FALL 2018
• USU hires a new fraternity and sorority life coordinator, a new prevention specialist to coordinate campus-wide sexual misconduct efforts, a new executive director of the Affirmative Action and Equal Opportunity office, and names a new Title IX coordinator.
• Two new positions (outreach coordinator and therapist) are funded and staffed at SAAVI office.
• 3,640 persons trained in Upstanding interventions.

SPRING 2019
• USU implements its second sexual misconduct survey for students.
• SAAVI releases healthy online dating social media campaign.
• USU launches a second “Start by Believing” campaign.

SUMMER 2019
• AA/EO changes to Office of Equity.

For more information about these efforts, go to: sexualassault.usu.edu.
PORTRAITS OF RESILIENCE //
The day before he addressed graduates at Utah State University’s 132nd Commencement ceremony, former Aggie quarterback Eric Hipples 80 spent nearly two hours chatting with university experts about a subject he is deeply passionate about. But Hipples, who spent 10 years in the NFL with the Detroit Lions, didn’t talk X’s and O’s with USU coaches and players on the football field. Rather, Hipples sat at the head of a large conference room table at the Sorenson Legacy Foundation Center for Clinical Excellence seeking information about what USU is doing to grapple with the challenges of mental health.

During the meeting Hipples spoke extensively about the challenges individuals who are facing transitional periods in their lives encounter, whether it’s leaving home to attend school, graduating from college, returning to civilian life after serving in the military, or, like Hipples experienced, taking on a new career after a lifetime of playing football.

“Life is a journey, and we go through some really difficult things,” Hipples noted. “But not any one transition or any one thing has to defeat us.”

After leaving the Sorenson Center, he was escorted across the parking lot to the Dee Glen Smith Spectrum, where Hipples hoped to better acclimate himself with the site of the following day’s commencement ceremonies. And yet, that simple, short walk had a heartbreaking moment.

“That’s where my son is buried,” Hipples said quietly, gesturing towards the Logan City Cemetery, which sits just southeast of the football field where Hipples starred for the Aggies from 1976 to 79.

It was a brief—but extremely sobering—reminder of some of the challenges Hipples has battled during this life, most notably the suicide of his only son, Jeffery Daniel Hipples in 2000.

Hipples was on a business trip at the time, and while he realized something was wrong with Jeff before he left, he didn’t understand just how bad things were. He told Jeff they would deal with his problems when Hipples returned home. Not recognizing the depth of Jeff’s anguish weighed heavily on Hipples, who battled his own bouts of depression while playing at Utah State—only he didn’t recognize it as depression at the time.

Interest of NFL teams heading into the 1980 draft plummeted after Hipples had surgery after a badly-timed knee injury during the annual Blue-Gray Football Classic on Christmas Day.

“When he retired, a scout for the Lions gave me my scouting report, which I thought was really, really cool. And it had me listed as a first-round draft choice,” said Hipples, who ended up being taken by Detroit in the fourth round. “So, even though my knee ended up being fine, my value just wasn’t as high and I had to go prove myself again.”

Hipples put together an outstanding professional career, despite the setback, taking over as the starting quarterback for the Lions during his second year in the NFL and being named team MVP in 1981.

But life after football was difficult, and the loss of Jeff was simply unbearable. Later, one day Hipples penned a quick note to his wife Shelly that simply said, “Sorry,” and then tried to kill himself.

Although he survived, Hipples continued to struggle with depression and turned more and more to self-medication with drugs and alcohol. That led to a DUI and a two-month-long stint in jail.

Finally, he turned to the Depression Center at the University of Michigan, and gained some measure of control over his demons. He also spent more than a decade at the facility telling his story and trying to help others. In 2008, he also published a book Real Men Do Cry: A Quarterback’s Inspiring Story of Tackling Depression and Surviving Suicide Loss that received national attention and received a publisher Presidential Award.

Hipples, who also served as the grand marshal of USU’s Homecoming parade in 2009, is a regular visitor to Logan, returning to campus in the fall every couple of years to take in an Aggie football game. However, this spring’s visit was very different.

“I came back this time to a totally different environment with a completely different mindset, as opposed to coming back as an athlete to watch a game and relive my time here as a football player,” said Hipples, who remained in Michigan after his career came to an end following the 1989 season.

“That’s great to have, but this side of it is really much more important and more meaningful to me,” he explained. “So, to come back and hear about what’s going on at the university in the arena of mental health just makes me that much prouder that I went here.”

Hipples continues to work in the field of mental health in a variety of different roles. He helped found After the Impact, a residential behavioral health treatment program that serves military veterans and former NFL players. Hipples, who was a finalist for the NFL’s annual Salute to Service Award last winter, also speaks at schools around the country and works as an outreach specialist for Transformations, a mental health/addiction treatment facility in Florida.

When asked what he hoped to convey with his commencement address, Hipples said he wanted the USU community to know that help was available for those in need and that battling life’s obstacles is absolutely worth it.

“No matter what happens, you can get through it,” Hipples proclaimed with a smile. “And not only that, but life is worth living. Life can be great.”
PORTRAITS OF RESILIENCE //
When Boeing gave their summer intern, Jorge Espinoza ’13, a project to remedy a problem with aircraft window shades on one of its most popular models, he already knew what he had to do: establish the parameters and begin testing.

He felt confident he could solve the problem, after all, this Utah State University master’s student in engineering has been successfully negotiating parameters and testing them since he was at least a junior in high school when he and his family immigrated to Utah in 2006 from Torreon, Coahuila, Mexico. A Boeing client that wanted to purchase a fleet of these planes complained about light that leaked into the cabins even after the window shades were fully drawn. He asked if they could solve the problem, not only to protect against light and heat, but for aesthetic reasons.

Espinoza responds to the methodical, incremental rigors of solving a problem—developing variables and seeing what the forces are, first in the X direction, and then in the Y. “I know I can do it because I’ve done a lot of hard things,” he says. “I just have to sit there, think about the problem, and develop a way to solve it.”

Hard things like moving from Mexico to Logan, Utah, when you are just 17 years old after watching your parents struggle for seven years trying to save their home and business from bankruptcy. “It was hard growing up,” he says. “It’s very, very hard to just get up and leave. You take nothing with you. You have no money. You leave your friends, your family, everything that you know when you go to another culture.”

Especially one separated by a border. Something marked, defined, and guarded. Something that demands a declaration: Where are you going? For how long? Why? A place beyond where both fear and hope await. A place today into which roughly 34 million other lawful U.S. immigrants have crossed.

With Espinoza’s help, his parents found an apartment in a quiet neighborhood near the Logan Temple. They had no beds. They had no car, which meant having to carry groceries, even in the dead of winter. Money for food and housing depended entirely on getting and keeping jobs—initially the sort of work that nobody else wanted to do—hauling rocks at construction sites, cleaning bathrooms at night.

It was hard to adapt to a new school. Espinoza knew some English, but it was far from perfect. He had a difficult time understanding in class because everyone spoke so quickly. He did not have friends and so he got up early each morning and read books from school. He did well.

He also worked doubly hard not to have an accent. He says he learned early that he and his family were judged because of their accent. Little things like saying kooky instead of cookie. “It takes a toll on you psychologically,” he says. “It’s hard to explain, but it makes you feel bad about yourself in a sense.”

He says he tries not to, and fights feelings of being judged for being Hispanic. “I don’t like that,” he says. “I don’t like barriers. You have got to step over them.”

Like when Espinoza first applied to work at Boeing three years ago, making it through two interviews only to be rejected. Then lining up again the next year only to hear a Boeing recruiter announce that all the positions he wanted had been filled. “I’m like, I’ve been waiting in line for three hours, I’m not getting out of this line until they listen to me and hear what I have to say and offer;” he recalls.

The next day Espinoza got a second interview and a summer internship offer.

His ambition is what attracted his wife and Logan native, Deidre Nicole Chambers, to Jorge. “He just had goals and I liked that he was hard working,” she says. “He would always strive for more. I saw that in him, and I really liked it.”

Espinoza likely gets it from his parents. On the day before he left for Seattle for his second summer with Boeing, his mother was rushing off to work in her red SUV to a Logan automobile detailing business that she and her husband now own.

Espinoza completes his master’s program in December. This young father of two is still trying to decide whether to pursue a doctorate in engineering education or to return full-time with Boeing. No surprise, he is taking a systematic approach, testing things out to see what fits best. Like he did when earning his first USU bachelor’s degree in political science in 2013 that included an internship in Senator Mike Lee’s office. While earning a second bachelor’s degree in civil engineering in 2018, Espinoza came to realize how much he liked puzzling over engineering problems, like how to solve for light leakage.

He says he put his experience at USU working with 3-D printers to good use by creating models for the Boeing airplane windows. “I went in and had someone do a mold of where the reveal goes,” he says.

Espinoza discovered that even though window designs had changed on the aircraft, the grooves in which the reveals go, had not. The solution was hiding inside the problem.

“It actually showed that it was wrong. The reveal was square, but the windows were not. They did not match all the way. We changed that.”

By John DeVilbiss
I am honor bound to go and serve. I would go even if I knew I would die.”

Major Brent Taylor wrote those words shortly before departing for Afghanistan. His hand-written journal sits on a bookshelf in the North Ogden home that he and his wife, Jennie Taylor ’07, shared with their seven young children. Reading his words, one might wonder if he had a premonition that he would not come back from this tour. But though wartime casualties are a keenly-felt possibility for all U.S. service members, Taylor says that Brent never worried about dying. “He gave 100 percent. I asked him if he was coming back to me, and he said yes. I’m grateful that he felt he would return. He didn’t choose between God and country and family—we are one.”

When Brent was deployed for his third overseas tour with the U.S. Army, his youngest child, Caroline, was only a few months old. Brent was serving as the mayor of North Ogden while completing his doctorate at the University of Utah. Taylor’s whirlwind life as a mother of seven could barely be paused to think about the possibility of him not returning. But 10 short months ago, Taylor and her family received the devastating news that Brent had been killed by a rogue Afghan security officer.

Family members and friends, dignitaries, mourners who lined the roads for hours holding American flags, police and civilian motorcycle brigades, and the throngs of servicemen and women who escorted Maj. Taylor to his final resting place, have continued to offer love and support to the Taylor family. “Brent has provided for us,” says Taylor. “He helped and served so many people, and now they are the ones helping us.”

Neighbors, family, and strangers are welcomed into the Taylor home and into the stream of their daily life; Jennie manages the constant flow with a gentle grace. Asking for and accepting help is a vital tool for healing. “Stop thinking you can do this alone,” she says. “There’s a beautiful power in feeling the love and support of someone who wants to help. People we’ve never met will drop off a casserole or candy or a blanket at just the right moment. Our gratitude has softened our grief.”

She and Brent carefully searched for the right family home before settling in North Ogden—Taylor’s childhood community. One of Brent’s greatest joys was working in their garden. “The roses in our front yard are Brent’s. It’s always the little things that unlock a flood of grief; sometimes it snags me in the face like it’s brand new that he won’t see them bloom this year, or the year after that.”

Humor is a tool that Taylor and her children use daily to cope with their loss. When Father’s Day came, they bought an assortment of Brent’s favorite candy. Their oldest, 14-year-old Megan, was shopping with Taylor and wanted to add popcorn to the cart. She turned to her mother and said, “Dad wants me to have this popcorn.” They both burst out laughing. “We laugh every day, and we cry every day, too.”

As her community and her country now rally around her, they also frequently request Taylor’s leadership, and she has risen to answer that call. She speaks at universities, devotionals, military events, Independence Day parades, Girls State programs, and veterans’ centers. She turns heartache into comfort by inspiring others with the ideals she and her husband worked together to embody. “Brent and I love this country, and we felt we had a duty and an obligation to serve. We can all give something, no matter how small and humble. We owe it to those who have given their lives. Even if it’s too painful to think about, you can’t give that gift back. You can only honor what has been paid.”

As her deeply-held patriotism soars vividly to life, Taylor’s sincerity can sweep her audience off its feet like a rushing wave. At the same time, her grief is raw and painful, like a baby bird whose fragility is so palpable you can feel its heartbeat against your fingers.

“I want people to feel the reality of Brent’s sacrifice. I can tell you about being at Dover Air Force Base in the middle of the night with a flag-draped casket. Most Americans don’t see that, but I’ve been there, so I can tell you about it.”

When asked what else she wants Americans to know, Taylor emphasizes the values of both sacrifice and compromise. “Listen to someone who sees things differently than you do, and then shake hands at the end of it. That’s how our founding fathers got things done,” she says.

Taylor earned her master’s degree in education at Utah State University while Brent was in basic training. “Education is the foundation that builds our future leaders. I haven’t taught high school since my kids were born, but I use those skills every day—teaching has prepared me to speak in front of a group.”

She allows herself to be carried on the unceasing tide of demand for her presence and passion. Taylor was a guest at the 2019 State of the Union address and recently visited the Pentagon and the White House with her oldest sons. Back at home, she soothes her youngest, Caroline, into a much-needed nap, helps three-year-old Jonathan right his overturned bike, and welcomes a group of volunteers who have just arrived to weed the flowerbeds.

She quickly responds to a request from six-year-old Ellie by finding a place for the child’s watch on her own wrist. Taylor then smiles good-naturedly for our photo shoot before hopping into the family van and rushing off to the next task that requires her time and energy.

The older children will soon learn to drive the large white van. Brent’s roses will fade this summer and bloom the next. And the tide will carry Taylor onward.
this day, Nathan Geer, an accomplished Utah State University mathematician, cannot read many words if you single them out. Put them together in a paragraph, though, and they suddenly take on meaning.

He loves relationships. Like what happens when you take Calculus 1 in the second semester of your freshman year and you are not doing very well in it until you meet a girl that you want to impress in your study group. You prepare by doing all the problems beforehand. You learn it so well that by the time the study session begins, you can teach her the material.

Geer laughs as he tells that story on the third floor of his cramped corner office in the Animal Science Building overlooking the Quad. He lost the girl but got an A in class. “I think it made a difference in my continuing in math,” he says. And the deeper Geer delved into abstract mathematics, the more he began to excel. His specialty, topology, focuses heavily on the relationship of ideas and words.

Relationships mean everything to Geer. His relationship with his father who took him to the local symphony, his relationship with teammates in sporting activities and who would read with him. Geer’s relationship with an elementary school principal, who himself had dyslexia, and who took him to get help with reading. Geer’s relationship with an elementary school principal, who himself had dyslexia, and who would read with him. His relationships with teammates in sporting activities where he could be himself, and did not have to get up in front of a classroom of peers and try to read something.

It’s in the simple interaction with others that he shines, like when he challenges you to play a game with him involving 10 to 12 columns and rows crudely drawn on a piece of paper. You move coins (or in this case, paper clips) up and down the page with the goal of trying to get your opponent to run out of moves before you do. His only hint: what happens in those first two actions are of optimum importance. Despite the clue, he proceeds to crush you anyway. You console yourself knowing that this Einstein who just clobbered you with his paper clip is also an international leader in the field of quantum topology, who, after six long years, created the theory of re-normalized invariants. To try to wrap your head around that, you might want to imagine transforming a donut into a coffee cup.

What is not hard is to picture Geer as a professor, although he looks more like a Tour de France racer than an academic. In 2015, he won a prestigious CAREER award from the National Science Foundation, a five-year, $450,000 grant to develop his renormalized quantum invariants theory.

Geer has an easy smile and hearty laugh. If he can’t make a point, he may resort to a game, or a story, or just some quiet space for you to talk. He understands what it feels like to be overwhelmed by symbols and letters. What it is like to confront pure mathematics “that is rooted in words and ideas rather than numbers and algebraic equations,” as he described in a 2013 talk he gave for his College of Science University Faculty Researcher of the Year Award. “At first glance, these words and ideas seem foreign and unrelated to the natural worlds. However, pure mathematics is the language of modern physics.”

He has a complicated relationship with language, but he has grown to appreciate it for being the messenger, not the enemy, and for being the last essential stop on the train of thought. And he loves to think. It was a liberating discovery that college afforded him. “When I got there,” he says, “I thought, ‘Oh, this is amazing! I want to just keep thinking and learning.’”

Calculus was his path, and eventually, its more rigorous form—mathematical analysis. That is when he first encountered proofs. In calculus you have what is referred to as limits, which is what happens when something gets arbitrarily close to another point. So while “arbitrarily close” can be a theoretical notion in the real world, it can be a precise, useful concept in mathematics, he says.

It is the precision and playing with those relationships that he loves. Newton, through calculus, solved planetary motion and, in the process, provided a tool for predicting all kinds of different things in the world. As a result, a completely new field of classical mechanics and physics was developed that gave humans a universal language for abstracting more ideas.

“And so what happens when you abstract calculus? You make it in more dimensions,” Geer says. “You talk about different relationships between a distance and two points. It amounts to a different kind of geometry that Einstein used to describe what we now understand as relativity.”

Einstein is also thought to have suffered from dyslexia. He once told his friend, psychologist Max Wertheimer, that “These thoughts did not come in any verbal formulation. I very rarely think in words at all. A thought comes, and I may try to express it in words afterwards.”

Geer never mentions that.

What Geer does talk about is getting stuck and how he tells his students not to feel badly about it when they do. Even if you’re the most brilliant mathematician, there are going to be problems you are not going to be able to solve that you will dwell on, sometimes for years. That is what being a mathematician is all about—making sense from disorder, like words on a page.

“It’s mostly constant confusion,” Geer says. “But then, every once in a while, you have this amazing insight, like you have this point where it all comes together, and it’s perfect.”
IT'S MONDAY, NOVEMBER 2, 2020.
Polls open in 24 hours for the next presidential election after a grueling campaign season. While thumbing through the news app on your phone, a viral video of your candidate pops up on the feed of a major television news broadcast. Your presidential pick is caught saying something so over-the-top outrageous, any chance of winning has evaporated. You heard it. You saw it.

Except it never happened. The video was fake. Not created by a talented editor, but by a machine. An intelligent machine. Although this scenario hasn’t yet materialized, the use of artificial intelligence (AI)-generated fake news being unintentionally broadcast by mainstream media could happen. And soon.

Readily available technologies that produce realistic images, audio, video, and text already exist and make differentiating these digital fakes from real content increasingly difficult. The use of Generative Adversarial Networks (GANs)—a machine learning system where neural networks compete to generate new, improved data—make it easier for bad actors and provocateurs to spread disinformation.

Should this scenario come to pass: How does the Fourth Estate recover from the loss of trust that is so vital for democracy?

DEEPFAKES EMERGE

The manipulation of photographs for political purposes has been a phenomenon since President Abraham Lincoln’s head was placed onto the body of South Carolina statesman John Calhoun’s body in a lithograph in about 1865, if not earlier. AI technologies are the next frontier.

In December 2017, Motherboard was the first media outlet to write about AI-assisted fake videos. The story focused on Deepfake, a Reddit user who used GANs to produce illicit videos by swapping the faces of celebrities to actors in an existing pornography video.

Since the story was published, technologies to effortlessly manipulate images and videos have developed at a breakneck pace. Commercially available, easy-to-use products such as FakeApp—created by Deepfake—allow individuals with relatively little technical expertise to swap faces on videos or transmit in the voice of virtually anyone, including world leaders. In April 2018, it took just hours for a nontechnical person to create a lifelike video mimicking former President Barack Obama using source video of another person. A new deepfake algorithm from researchers at Heidelberg University can render more accurate human physical behavior, essentially creating virtual body doubles.
Unfortunately, there's more.

The creation of entire synthetic news reports and scientific papers written in the hand and vernacular of human beings is the latest deepfake technology. For example, OpenAI, a San Francisco based nonprofit founded by technology entrepreneur Elon Musk, debuted a news story written by an AI program that is striking in terms of its composition quality and alarming in that none of the facts within it are true. The program worked so well that a recent story in Ars Technica described OpenAI researchers restricting the public release of the code in an attempt to curb the use of the technology for harmful purposes.

The technology used to create deepfakes is relatively straightforward. The technique uses a machine learning method that relies on patterns and inference. The GANs used in the creation of deepfakes consists of two artificial neural networks that simulate biological neural networks and compete against each other in a form of unsupervised, iterative learning. One GAN generates a candidate, and the other GAN evaluates the generated candidate. Each GAN learns from the previous interaction and makes improvements based on what it has learned. Plainly, GANs enable the construction, deconstruction, and reconstruction of video frames until the end image is nearly indistinguishable from a real image.

Unsurprisingly, concern has migrated from the victims of fake, profane videos broadcast in relatively obscure websites to content that may jeopardize national security and democracy.

AN IMMINENT THREAT

Earlier this year, the Director of National Intelligence testified before the U.S. House Intelligence Committee that bad actors from hostile nations are expected to use deepfakes to "sow discord and breed doubt." The ease with which deepfakes can be generated by bad actors upstarts, state-sponsored or otherwise, has created a sense of urgency within national security circles. Knowing how to identify and stop the dissemination of deepfakes as part of influence campaigns has become a priority. The range of hostile uses of deepfakes is limited only by the imagination.

Jeannie Johnson '93 MS '95, associate professor of political science and director of Utah State University's new Center for Anticipatory Intelligence (CAI), says a potential use of weaponized deepfakes would be to incite anger against United States armed forces.

“This would be an effective tactic for undermining public support of its military abroad, as we have seen in actual cases like Abu Ghraib,” she says. “It would be a very attractive tactic for those who cannot defeat our forces on the battlefield.”

Johnson, a former analyst at the Central Intelligence Agency, co-founded the interdisciplinary center with Matthew Berrett, a former CIA assistant director, and Briana Bowen '14, CAI's program manager. The new certificate program teaches students to identify the unintended consequences of emerging technologies. (Disclosure: I am a member of CAI, too.)

Berrett argues democracies need facts to deliver the greatest good for the greatest number—facts about the competence, values, and intentions of political candidates. He questions what would happen to the effectiveness of democracies, and their appeal to humanity, if facts are removed from voting and policy.

The democratization of state-of-the-art deepfake tools represents a paradigm shift in image, audio, video, and text manipulation once reserved to experts in software such as Photoshop and After Effects. Research has shown that intentionally false information diffuses significantly farther, faster, and deeper than accurate information via social media, meaning millions of Americans are vulnerable to potential influence campaigns by rogue actors. This poses a unique national security threat as experts worry deepfakes could be a useful tool to undermine democratic elections and sow confusion on the cyber battlegrounds. The Council on Foreign Relations, a think tank in United States foreign policy and international affairs, suggests deepfakes could also be deployed publicly in military operations or used to derail diplomatic efforts.

Propaganda attacks are hardly new to nation-states, which will have technical tools and intelligence means able to discern whether a piece of video or audio is real, Berrett says. “But, a deepfake emerging during international tensions, particularly in the increasingly fact-free, bias-driven political environment we're seeing East and West, could ignite popular anger to the point of forcing leaders to act more aggressively than they would otherwise.”

Some security experts warn that deepfakes will be virtually impossible to detect by the 2020 United States elections.

In the book Likewar: The Weaponization of Social Media, author Emerson T. Brooking reported that the St. Petersburg, Russia-based Internet Research Agency produced more than 2 million election-related tweets in the closing months of the 2016 election. At the Reagan National Defense Forum last year, former Secretary of Defense James Mattis said Russia is likely planning deepfakes to supplement an already robust disinformation campaign to incite chaos during the 2020 elections.

If a deepfake does make its way into the media, the damage may be irreversible even after it gets exposed as a forgery. There is no guarantee that individuals who view a deepfake on a particular candidate will see a correction or rebuttal. And even if voters are given unimpeachable evidence that a video that contradicts their point of view is fake, it may be inconsequential.

Often fake news serves to strengthen a preconceived idea or belief. In fact, particularly fervent ideologues may see attempts to discredit deepfakes that support their beliefs as a conspiracy.

How will the Fourth Estate protect itself from airing deepfakes?

A WEAKENED GATEKEEPER?

The role of the free press as a pillar of democracy in the United States is enshrined in the First Amendment of the Constitution. Traditionally seen as gatekeepers of information, the media’s attempt to produce completely accurate information is a demanding standard to
meet, and continues to be eroded by new modes of news consumption. To compete in the 24-hour media landscape, pressures mount to produce news as it happens and funnel targeted audiences to a directed source.

The American public has traditionally relied on the mainstream news media (MSM) as their primary source of information. While there has always been bias in certain sectors of the Fourth Estate, much of the media has attempted to provide accurate, unbiased information by which citizens are better-informed participants in public discourse and democracy. However, trust in mass media is diminishing. It went from a post-Watergate high of 72 percent in 1976 to a low of 32 percent following the 2016 election.

Most citizens do not trust the media to verify facts. In 2016, a Rasmussen poll of voters found that 62 percent of respondents believed that mainstream journalists misrepresented details to benefit politicians they supported. Similarly, a 2018 Gallup poll that rated America’s most prominent societal institutions showed that television news and newspapers ranked near the bottom of trustworthiness. Television news ranked just above the least trustworthy institution—the U.S. Congress. The ascent of fake news, together with decreased confidence in the MSM, underscores the importance of the MSM to distinguish itself and serve as a harbor for credible information.

The phrase fake news has become commonplace since the 2016 presidential election, but there is no consensus among scholars as to the definition of fake news.

As a public relations director within the space and intelligence industry and a couple of decades working closely with the media, I consider fake news as that which has been created with the intent to deceive the public for malicious reasons; a definition that does not extend to news that a particular individual simply finds objectionable. Purveyors of fake news do not adhere to ethical guidelines outlined in the Society of Professional Journalist’s Code of Ethics that have become the media industry standard—to seek truth and report it, minimize harm, act independently, and to be accountable and transparent.

In January 2019, Seattle Fox television affiliate KCPQ unknowingly aired a doctored speech of President Donald Trump’s Jan. 8 televised address from the White House. The altered video of the speech was made to make Trump appear as if he had carotenosis, and his mouth movements were slowed to create an effect where his tongue appeared to linger after he talked. In May 2019, another fake video of an American politician went viral on social media. This time it was a manipulated video speech of Speaker of the U.S. House of Representatives Nancy Pelosi altered to make her appear intoxicated as she slurred her words.

Matthew LaPlante, associate professor of journalism at USU and a veteran reporter, tells his students that “mainstream media” has never been mainstream and that fact-based reporting without fear or favor is a relatively new innovation. In fact, LaPlante points out that late 19th century New York congressman and media mogul Joseph Pulitzer helped lead us into the Spanish-American War with sensational stories and exaggerated tales of what was happening in Cuba.

“[Media] has always been a reflection of the needs and values of the people who own it and create it,” LaPlante says. “It has always been easier to tell lies than truths, and it’s particularly easy for those with the means of power to share stories.”
Sometime during the 20th century, Americans expected the news they consumed to be accurate, and without hyperbole. “People who are committed to telling stories that are true have always been at war with the forces that conspire to deceive us,” LaPlante explains. As to ensuring the media remains trusted gatekeepers of accurate information, LaPlante says, “If you’re going to share a piece of information, trust no one and trust nothing. Verify. Verify. Verify.”

Some news organizations are already buffering themselves against the rise of deepfakes. The Wall Street Journal has convened an internal forensics committee trained in deepfake detection using conventional video editing software and is exploring AI solutions with academia to expose deepfakes more precisely. Other large news companies have initiated similar pursuits.

“However, smaller organizations may have trouble keeping up with advances,” says Brookings of Likewar. “While there are technologies that can detect deepfakes, they may not be available to all newsrooms,” he cautioned. “And, given the intense time crunch that modern newsrooms face, they may not always employ these tools even if they possess them.”

One concern is that conventional journalists may not have the required knowledge and tools to keep up with advances in the way information is created, distributed, and consumed. If MSM loses the ability to produce trustworthy information, it will become irrelevant.

But, just as technology has created this problem, perhaps it can help solve it.

RESILIENCY IN THE MEDIA

At last year’s Institute of Electrical and Electronics Engineers’ International Conference on Advanced Video and Signal Based Surveillance, the use of forensic AI technologies such as recurrent neural networks, where a program learns to identify videos that have been manipulated, showed promise in the ability to detect deepfakes. And in 2018, the Defense Advanced Research Projects Agency reportedly spent $68 million on its media forensics program to detect deepfakes. However, it’s not hard to imagine an AI arms race where developers create increasingly sophisticated tools to create and debunk deepfakes.

“These sorts of things are what academicians, lawyers, and scientists should worry about,” says David E. Brown, an associate professor of mathematics and statistics at USU and an expert in the areas of AI and robotics. “A machine doing something malicious because it thinks like us will never happen.”

Malicious intents carried out by programs or apps designed by people answering a “could we” question, and disregarding a “should we” question, is feasible, and has been for a long time, he adds. “AI alarmists seem to be misdirecting our attention, the true threats are not on the horizon; they’re with us now and we’re doing a terrible job mitigating them.”

Relying on technology to uncover is not a foolproof solution. Some within the technology industry argue deepfakes will play an essential, positive role in business and entertainment, and that the intelligent automation of processes, such as writing and reporting, is a timesaving tool. But cracks in the foundation are showing. In their most recent Securities and Exchange Commission filings, Alphabet Inc., the parent company of Google, warned that their use of AI and machine learning could raise ethical challenges for them, signaling to shareholders the risk of potential ethical liabilities by using AI and machine learning in their services and products.

Often when one thinks of fake news, you think of content appearing on social media platforms such as Twitter and Facebook. While fake news in social media creates a unique environment where it thrives, MSM is not impervious to transmitting fake news, and the consequences of publishing fake news from bad actors is not evenly distributed. For the MSM, it may deepen public mistrust and is why resiliency tools are needed.

Some are, to some extent, already in place, including editorial discretion and emerging AI technologies to find deepfakes before they are disseminated. However, news organizations may need to be more aggressive in how they explain their methodologies and editorial processes to the public. While large news organizations have the resources to create committees and deploy technology to combat deepfakes, news organizations in small to mid-sized media markets must rely on other methods to detect fake news.

USU journalism lecturer Brian Champagne, a prolific stringer for local network news affiliates in Salt Lake City, relies on two independent sources for a single story to help ensure accuracy. He says one of the affiliates has an editorial board that serves as a gatekeeper for accuracy and the other local network affiliates rely on the judgment of the news directors and with informal discussions among other professionals in newsrooms to ensure journalistic integrity.

When fake news does occur in the MSM, several immediate and predictable steps should be taken to regain public trust: A retraction, in which the story is removed online, and a corrected print or broadcast story, possibly followed by another story containing an apology from the news organization, and potential procedural changes in the newsroom.

The most important aspect of resiliency for media is intense transparency, Brookings says. In the event of the inadvertent publishing or airing of a deepfake, the news organization should devote an entire special or series to explain how they were fooled. This would serve to illustrate the sophistication of modern deepfakes and double as a public awareness campaign.

Will it be enough? A

Eric Warren is a director of public relations at USU with two decades experience in the space and intelligence industry. He is a member of USU’s Center for Anticipatory Intelligence, and his academic research encompasses technology-driven disinformation campaigns and its effect on national security.
HOMECOMING WEEK 2019

See homecoming.usu.edu for all events.

FRIDAY
September 27
All Day – Day of Giving

4 PM
Campus Tree Tour

6-8 PM
Aggie Family Reunion
Downtown Logan

Midnight
True Aggie Night

SATURDAY
September 28

8 AM
Running of the Bulls 5k

10 AM Parade

2 PM Ag Day BBQ

5:30 PM
USU Football vs.
Colorado State

Experience A New Era Of Alumni Travel
Join us on these upcoming adventures, making Aggie memories with your family, friends, and fellow USU alumni.

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Peruvian Humanitarian Expedition – Feb. 15-22, 2020
Ireland – May 23-31, 2020
Aggie Escape to Baja – Jan. 15-19, 2021

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Crystal Maggelet remembers moving from a modest home in Brigham City to a much larger one, complete with a whirlpool hot tub in the basement. At eight years old, she had her own room and a bathroom she shared with her only sibling, Thad, for the first time. Their new house was in a neighborhood known as Snob Hill, “where the rich kids live,” she heard classmates whisper on the school bus.

Maggelet loved where she lived and felt loved by her family. It was not long afterwards though, that she began to sense something was wrong.

Five years had passed since her father, Jay Call, had started his Flying J gas station business in 1968. His entrepreneurial model of combining gas stations with convenience stores proved to be wildly successful with 23 such stations in California, Washington, Oregon, and Nevada. It required him to be gone Tuesday through Friday most weeks.

His absence, over time, caused her parents to drift apart. Within a year of moving to their new house, they filed for divorce. Their unhappiness caught Maggelet by surprise.

“The life that I knew was upended before I could grasp what was happening,” she writes in her new book, Building Value to Last. “My family—my picture-perfect family—was breaking into pieces.”

Maggelet saw her mother, Teddy, struggle to find her own identity and new life for herself after the divorce, that included remarrying, only to divorce again soon after. They bounced from Brigham, to Rexburg, Idaho, and then to Salt Lake City where her mother started a joint clothing
business venture, Reaggae Women. Despite her mother’s newfound energy in starting a new career, that later included a successful Diet Center franchise mostly in Texas, Maggelet remembers hating it. She resented her mother for leaving her and Thad to fend for themselves. “I promised myself then and there that I would never leave my kids to selfishly go to work.”

That was 44 years ago. Today, Maggelet praises her mother for her fortitude and tenacity. “That’s where my resilience started,” she says during an interview in Jon M. Huntsman Hall, following her last day of meetings as a Utah State University Board of Trustee.

Her own four children are now grown and out of the home. She smiles as she thinks back on her naive assessment of her mother. She was just trying to do the best she could—that is all. Which is probably why all through the ’70s she remembers her mom telling her that “it’s fine to date, it’s fine to have fun, but don’t get married; don’t get married; don’t get married—until you finish college.”

She took her mother’s advice to heart. At 27, she graduated from Harvard Business School, and two years later, she married a former Harvard classmate, Chuck Maggelet. She says in her book how glad she was that she took the time to get to know herself. “I had learned what I wanted in a partner as well as what I could offer someone else, and this union with Chuck was an answer to all the right questions.”

In 2015, she received an honorary doctorate from USU, where she completed her first two years of college in the early ’80s before graduating from Pepperdine University. Today at 55, she looks at home on campus with her Brunette shoulder length hair, blending in with Huntsman business professors. And yet—this is Crystal Maggelet—the same unassuming woman who purchased Maverik, Inc., a $2.5 billion fuel and convenience store empire, now run by her husband, Chuck, employing 6,500 people across 11 western states at more than 300 locations.

The same Maverik, with its non-standard spelling, that adorns Utah State University’s newly renovated stadium, thanks, in part, to her company’s $6.3 million donation. The same Crystal whose chain of hotels bears her name. A hotel business she started at 29 from the ground up, and that continues to flourish today.

This story might have ended happily-ever-after back in the early 2000s when she and Chuck had built up 11 gleaming Crystal Inns and felt like they were finally in a good place to step back and spend more time with their children. The death of her father in a plane crash in 2003, forever altered any plans for a respite. What followed over the next six years was Maggelet’s reluctant rise from board member to CEO and president of Flying J in January 2009. She was appointed to the position after Flying J’s CEO resigned following a series of poor investments that forced the company, just as the U.S. economy was tanking, to file for Chapter 11 bankruptcy. It was an announcement that seemed unfathomable to Maggelet and her company’s 11,000 employees who saw Flying J grow from $4.4 billion in 2000 to $18.6 billion in 2008. What Maggelet did from this point is really where this story begins.

It is a story that consumes most of her 246-page book. It is a story of a daughter who was never very close to her father, but who desperately sought his approval, and greatly admired his business skills, integrity, and trust in those who worked for him. He built a family business empire with their family’s reputation attached to it, and that, ultimately, meant more to Maggelet than all of the money her father’s company had amassed. Without even knowing how she could make good on her promise, she vowed to her 6,000 creditors that Flying J would come out of bankruptcy and pay them all back in full.

“From that moment on, I never quit working to exit bankruptcy successfully,” she writes. “I was ready and willing to do whatever it took to get out of this mess. No longer would I be sitting on the sidelines watching as the company unraveled.”

The case studies she pored over in business school came to her mind, but the difference was that this case wasn’t going to end when class was over. Maggelet knew her decisions would affect thousands of lives.

Sitting with her in Huntsman Hall, knowing that she managed to keep her promise and move on to purchase a new chain of gas and convenience stores from a family cousin, is to look certitude square in the face. A person who struggled through a financial nightmare while dealing with personal challenges, including the death of her brother. Maggelet may have experienced the satisfaction of paying back her creditors, but in the process, also personally had to console hundreds of employees who would lose their livelihood when Flying J merged with Pilot.

She hopes never to fail her employees again, for failure “is making a mistake and not recognizing it was a mistake and learning from it,” she says.

Her story does not end here, any more than Maggelet’s ambitions to expand her portfolio of companies and holdings. If she has learned one thing, it is to expect the unexpected, and to have a backup plan. She learned that from her mom: prepare yourself through education.

“There’s a lot of women that became resilient not because they planned on it,” she says. “Preparation leads to independence and confidence. If you have confidence, you can get through about anything.”
Clockwise from top: Six students from Red Barn Academy take a break from their daily chores to pose for a photo; Mike Haws is the director of Red Barn Academy; Rich Haws and family have tried to put the "farm" back in Farmington.
LIFE GOES ON PRETTY FAST NEAR RED BARN ACADEMY.

Cars whiz by the road directly to the west, carrying people to the subdivisions and commercial areas surrounding Farmington Bay. To the east, the FrontRunner train speeds up and down the Wasatch Front as traffic on the southbound lanes of Interstate 15 barrels towards Salt Lake City at 70-plus miles per hour.

And on a warm day in early September, Mike Haws ’00 is trying to keep pace with what’s going on around west Farmington. The former Utah State University golfer has been on the run all morning, having just returned from an oral surgeon’s office where a Red Barn student named Taylor had all of his wisdom teeth removed. And as soon as Haws has Taylor safely in bed to recuperate, he’s back in his truck, on his way to pick up a Red Barn lawn-care maintenance crew.

But Haws is hardly a stranger to sustained effort.

Although he plans to golf later in the day with his father, former Utah State basketball star Rich Haws, ’75, Mike rarely gets out on the links these days. Instead, Haws, who is built more like a tight end than a golfer, prefers to compete in marathons, triathlons, and the infamously grueling Spartan Races designed to push competitors to their absolute limits.

“I don’t like who I am on the golf course,” Haws declares. “I’m too intense for that now. I get more bang for my buck when I’m there running races.”

Because of that, hustling now has a whole new meaning for Haws. For a good part of his life, Haws admits that when he was “out there running and gunning” he wasn’t seeking a medal and a sense of accomplishment.

“There were three things that I was chasing: drugs, money, and sex,” Haws proclaims.

Haws’ first job coming out of college was as a pharmaceutical representative, which gave him access to a lot of physician’s drug closets.

“That’s a great job for a drug addict, right?” Haws notes. “So, I would sit in the drug closets, and if the bottle said: ‘Don’t crush this,’ I would crush it. And if it said: ‘Don’t mix this with this,’ I would mix it. And I even got to the point where I had access to doctors’ DEA numbers, so I was calling in my own prescriptions because at that point I was taking 30 or 40 pills a day.

“That’s a lot of lot of prescriptions that you’ve got to go out there and get filled,” Haws continues. “So, I became really kind of sneaky, and I behaved like the rules didn’t apply to me.”

Even though he’s all but hung up his clubs, you might say that Haws has gone back to his golfing roots when it comes to rules.

The enforcement of rules is extremely important in competitive golf, and that includes having enough integrity to call a penalty on yourself whether or not anyone else may have witnessed the infraction. That’s why the 43-year-old gets up at 5 a.m. every morning and shaves—even while on vacation—because those are just a couple of the rules that students at Red Barn Academy are expected to adhere by.

“I tell these guys, I’m not here to be your friend. I’m here to save your life. So, if you like me, I’m probably not doing my job,” Haws says.

As the director and co-founder of Red Barn Academy, Haws’ primary job is to find men who are desperate to change their lives after years of criminal behavior brought on by drug and alcohol addiction. Ideally, they spend the next two years at Red Barn, working to the point of exhaustion every day while slowly putting their past lives behind them.

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“Let’s give them one last shot because when they get here, they’re humbled and appreciative.”

Of course, not every student embraces the Red Barn way. Haws says he’s had individuals tell him that they just wanted to go back to prison because “I do better in the system.” But if they’re able to stick it out past those difficult early months, Haws says it’s easy to see a difference.

“Most of them are like a deer in headlights for 60 to 80 days,” Haws says. “But right around six or seven months you start to see this change happen, and it’s magical.”

Kade Lundgreen was the second student to ever sign on for the Red Barn Academy experience. A Richmond native, Lundgreen started “experimenting with various things” at the age of 18, and ended up spending a lot of time in jail over the next 10 years.

Finally, after being arrested again in August 2017, his sister came across a newspaper article about a completely new option. Lundgreen paid a visit to Red Barn Academy and found the facility comfortable after growing up on a farm.

He arrived on Oct. 3, 2017—two days after the academy opened—and admits that he didn’t really know what he was getting himself into. Lundgreen initially committed to just one year, but has since decided to complete the entire two-year program … and probably beyond.

“With everything that has been given to me, I would like to stay even longer and give back,” he says.

As of May 2019, Lundgreen was serving as the farm manager at Red Barn, while also being in charge of newcomers.

“I know I’m safe here, and I know I’m not going to get into trouble,” Lundgreen says. “Here we focus on the behaviors and lay it out rough. And I’ve learned it wasn’t necessarily the addiction I had a problem with, but it was the manipulation and the justifying, and that made me not feel so good about myself so I coped with it through drugs.

“And changing all of these behaviors boils down to one core value and that’s integrity,” Lundgreen adds. “That’s what we believe in is honesty and integrity.”

A success like Lundgreen means an awful lot to the Haws family. The death of Mike’s 21-year-old brother, Dustin, from a drug overdose on June 29, 2012, was not only the driving force behind him finally getting serious about his sobriety three weeks later, but also the impetus behind the creation of Red Barn Academy. Dustin was living in a transitional home in Salt Lake City after completing a stint in rehab when he died. But Dustin and two other men left the unsupervised home one night and acquired heroin.

“One fled the scene and when the other one came to, he tried to revive my little brother, but it was too late. He was gone,” Haws recalls.

“I don’t like to talk about the organization because I really believe they have good motives and were trying to do the right thing, but we said to ourselves, ‘We’re faced with two options here. The first option is to continue in denial that there is a problem in Davis County and here in Utah. Or we could use Red Barn and our resources to become part of the solution.’”

Rich Haws left a basketball career behind to earn his master’s in economics. He became a successful real estate developer, helping to create the mixed-use planned development in the area of north Farmington that lies west of I-15. While creating Station Park and Park Lane Commons, Haws decided he wanted to keep the “farm” in Farmington and set aside a large piece of land and built a red barn on it in 2008, not knowing exactly what to do with it until Dustin died.

Then the structure became a gathering place for support groups, and the whole idea of Red Barn Academy picked up steam as Mike got sober and completed a degree in social work so he could serve as a licensed drug and alcohol counselor.

“I was a lot worse than Dustin was when he died,” Haws says. “So, you can only imagine the guilt and shame I felt around my little brother dying from an overdose while I was still very active in my unhealthy behaviors.

“I had already lost my best friend two months earlier, so when I lost Dustin, I just had this ‘Ah ha’ moment of ‘Holy s***! I’m next!’”

Mike Haws will never forget taking his first drink of alcohol during his junior year of high school.

“I was a late bloomer,” he says. “I was
“I don’t even try and pretend to guess who is going to be successful here or not because some of these guys just plod along, one day after another after another, until that light goes on and he’s on fire.” – Mike Haws

short and chubby and just didn’t fit in with the cool kids,” he recalls. “And I was a golfer. We were always teased that we were wannabe athletes and golf wasn’t a real sport.

“But when I had that first drink, all of those insecurities went away, and I remember thinking, Man, [I’m] going to do this a lot because when I drink, I feel taller and stronger and felt like I could go talk to the girls.”

Haws went to Utah State for a year before serving a two-year mission for the Church of Jesus Christ of Latter-day Saints in Ecuador. During his first year back in Logan, Haws was playing on the Aggie golf team when he says he decided to start working out.

Unfamiliar with proper weightlifting techniques, Haws was deadlifting when he says he “felt something pop in his back.” Diagnosed with a herniated disc in his lower spine, Haws received his first pain pills from the team doctor. Muscle relaxers came next as the doses were increased.

“It didn’t take me long to figure out that, ‘Oh, I can use these for the insecurities. I can use these in lieu of drinking. I can mask the pain and maybe depression and anxiety, and all of the pressure of going to school and trying to get good grades,’” Haws says. “I quickly started to develop not just a physical dependence on prescription medications, but a psychological, spiritual, and emotional dependence. I started using them when things were going good, and I started using them when things were going bad.”

During the dark days of his addiction, Haws says he went to jail “at least 16 or 17 times,” but never went to prison, something he feels very fortunate about.

“There’s such a big difference between sending a person to prison and sending them to jail. That kid right there,” he points across the room, “If he would have gone to prison, that would have completely changed the direction of his life and it wouldn’t have been good.”

“That kid” is John Benjamin Bell, a.k.a. Benny, a young man Haws talked a judge into letting come to Red Barn rather than going to prison. Although Benny couldn’t comprehend working on a farm and was “depressed and lazy,” he eventually embraced the hard work and structure the program provides in order to acquire vital life skills that he likely wouldn’t have had after a stint in the state penitentiary.

Benny recently started training to compete in his first Spartan Race in July alongside Haws.

“That’s what’s interesting about what we do here,” Haws says. “I don’t even try and pretend to guess who is going to be successful here or not because some of these guys just plod along, one day after another after another, until that light goes on and he’s on fire.”

Back in September 2018, Jason Webb was just starting to smolder, while Anthony Widner was still looking for a spark.

At the time, Webb was a Red Barn veteran, having arrived the previous April at the rather unusual age of 44. As part of the program’s “200 percent accountability” rule, Widner was paired up with Webb to work alongside each other practically from dawn to dusk during his first three weeks at Red Barn.

Widner, 27, was in and out of jail for five years and had been to rehab twice when he was arrested in Davis County for possession with intent to distribute.

“That’s when I decided to come here to change my life because I needed something different,” Widner says. “And I feel very, very blessed to be here. It’s so humbling to be here around people that care about us and want us to do better.

“That’s the whole thing, they want to change lives.”

In May 2019, it’s easy to see a difference in Widner. Once confined to the farm, he’s now on a landscaping crew and says his focus has slowly turned away from worrying about himself to trying to help newcomers.

“They say don’t get too comfortable because this place is made to make you feel uncomfortable, but it’s like every day is a little bit easier,” explains Widner, who made it through the pain of hernia surgery last January on the strength of just ibuprofen and willpower.

“It’s a two-year program, but I plan on staying here longer than that just to make sure I get this down and don’t go out there and mess it up.”

Meanwhile, Webb couldn’t be happier to have gotten his driver’s license back in the spring—the first time he’s had a valid license since 2010. The Utah County native, who says his drug addiction cost him his wife and three children, first got hooked on painkillers after having heart surgery in 2001.

“There’s no way you could deal with it without some sort of medication, but it’s so much medication that you’re pretty much addicted when you recover,” says Webb. “Cough with a wired-up sternum, and it’s a whole new level of pain.”

Webb is now part of a Red Barn crew helping to build a nearby middle school. In addition to construction and farm labor, Red Barn students are also involved with commercial and residential landscaping and a moving company. The academy is also partnering with the Slaymaker Group on a new restaurant venture called Sticky Bird, the first of which will be staffed primarily by Red Barn students.

Construction is underway on a three-story building nearby which houses additional office space, as well as the Arbinger Institute, a group helping develop a training program for family members of Red Barn students. There are also plans to build a new bunkhouse to more than triple the amount of student beds available and someday add women to the facility.

“There are huge things happening here, and it’s really cool to be a part of this,” Widner says.

Big things have happened in Haws’ life, as well. He married Tawni Goldsberry five years ago, and the couple has a one-year-old son named Maverick. Now seven years sober, Haws knows he has to stay the course because “I don’t have any other option. I don’t have another relapse in me. If I do, you’ll probably read about me in the obituaries.”

“But,” Haws adds, “I know that if I stay the course, my son will never have to see his dad drunk or come visit his dad in jail. I’ve got to be a good husband and father, and also be a good example for the guys at Red Barn. I feel the weight of that and it motivates me every day.

“It really does just come down to discipline and integrity.”

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PAUL ROGERS IS COMFORTABLE WITH MESSINESS.

Before he was a researcher monitoring the health of western forests, before he became a disturbance ecologist, Rogers studied geography. This is where things tend to get muddled. Because the study of place is also the study of people. People put lines on maps. People affect landscapes. And sometimes, people harm them.

Rogers’ research examines the human impact on the environment, primarily, the ecology of quaking aspen. The species is found across the northern and western reaches of North America. While it doesn’t provide good timber, what aspen lack in economic impacts they make up for in biodiversity benefits.

“Aspen are believed to be second only to riparian zones in western environments for biodiversity,” says Rogers, ’83, Ph.D ’07, director of the Western Aspen Alliance. And lately, the global picture for biodiversity isn’t pretty. In May, the first global assessment of wildlife found one million species threatened with extinction and that most of the planet is “severely altered” by human activity.

Rogers witnesses these changes every time he visits one of his primary research sites, the Pando aspen clone near Fishlake National Forest. Pando, Latin for ‘I spread,’ is believed to be the largest living organism on Earth—at least, for now. When Rogers first visited the aspen stand about a decade ago, it was clearly in bad shape and on a bad trajectory, he says. The problem? The forest was old.

Aspen primarily reproduce asexually and live, on average, about 100 years. The species evolved to favor reproductive speed over longevity. An extensive root system connects the above-ground stems and powers the whole operation through nutrient exchange. New suckers emerge to replace dead trees. This is how the 106-acre Pando clone operated for millennia. But walking through Pando, Rogers noticed the younger generations—needed to succeed the 47,000 older stems that are dying—were missing.

Aspen are a finicky species. With thin bark that easily scars, aspen are vulnerable to infection and burns. Aspen get “injured by everything all the time,” Rogers says. But that vulnerability is also the source of strength. “Aspen thrive on death. It’s what happens next that is critical,” Rogers says.

In ecology, there is a theory that in diversity there is resilience. Although genetically the same, aspen clones have diversity in the various ages of their stems, making the organism more resilient to threats. But a clone is only sustainable if enough suckers survive into adulthood. Rogers wanted to understand why Pando’s weren’t. In 2013 and 2014, researchers fenced off two plots within Pando to test various experimental treatments and to limit browsing from herbivores like deer and cattle. Then they waited.

Four years later, the scientists found mule deer had breached the 2014 fencing and browsed new suckers to nubs whereas new growth was thriving in the 2013 enclosure where ungulates were kept out. The researchers published their findings in PLOS ONE, along with aerial images of Pando between 1939 to 2011. The most extreme changes occur in the ’60s and ’70s. So, how did an organism that coexisted with herbivores for thousands of years begin failing because of them?

“It clearly points the finger back at us,” Rogers says.

Human decisions shape landscapes, sometimes with cascading effects. Rogers suspects humans disrupted the balance between the deer, cattle, and aspen regeneration through management decisions. For instance, today there are significantly higher populations of elk in the West than in the past. There is an economic incentive to do so, Rogers explains. And the establishment of recreation areas
can also create de facto “safe zones,” where hunting is not permitted. Coupled with the eradication of apex predators once present in the region such as wolves, aspen clones like Pando can become a salad bar for ruminants. New suckers get browsed over, leaving a forest of old stems. “It’s not a matter of no elk, no deer, no cattle, or no sheep,” Rogers says. “It’s a matter of the right numbers and movement.” He recently proposed culling deer populations using professional sharp shooters to reduce numbers and increase their movement on the landscape. Keeping elk and deer on the run gives emerging aspen growth a chance, because walling off Pando isn’t an ideal long-term solution.

Fencing requires upkeep and won’t fix the root problem. Rogers says, “It’s kind of a big sign that says ‘We humans can’t handle the difficult part of this. All we could come up with is a giant band-aid.’” He views Pando as a test for humanity: “If we can’t figure out these 106 acres, how can we figure out climate change or managing aspen out West? This is symbolic, but it starts here.”

One May afternoon, Rogers stood in an empty computer lab in the Biology and Natural Resources building toggling his laptop. He was giving a presentation to state foresters meeting in Hawaii and clicked to a slide showing a cluster of aspen seedlings growing after a wildfire. “Just 10 or 15 years ago we didn’t think aspen seedlings had anything to do with aspen ecology,” Rogers says. “It was just sort of a novelty if we ever found them.”

The science has changed. Aspen seedlings have been found after several western wildfires. They’re just tricky to identify from suckers if you don’t know what to look for. To add more complexity, aspen don’t seed every year, the seeds are only viable for two weeks, and they require specific growing conditions. But now that scientists “have the right glasses on,” they find them routinely, Rogers says. “There are a lot of ecological ramifications. Obviously, it increases genetic diversity and makes the system more resilient.”

Afterward Rogers walks across the hall to his office to meet with a Spanish filmmaker. Since the PLOS ONE paper went viral last October, an East Coast financier has arranged for a private tour of Pando, and two children’s book authors have contacted Rogers to learn more. Why do people seem to care about this gigantic aspen stand in central Utah that doesn’t even have a sign marking its existence?

“Part of it is the simplicity, kind of the Guinness Book of World Records thing—biggest,” Rogers says. “That gets people’s attention.” It’s also what meaning people ascribe to Pando. “I almost cannot help thinking about communities of people. Are we connected or are we a bunch of individuals? This thing has stayed alive and been so successful for so long because of this growth pattern, because of this connection … It’s often used as a metaphor and that’s attractive.”

The filmmaker, who writes under the pseudonym Matías Cañorotto, has written Pando into his latest project, a tragic comedy. Cañorotto describes the first time he visited Pando three years ago. He wept.

Rogers hands him a piece of bark collected from Pando—a “talisman” for his project, he says. “It is a powerful place,” Cañorotto says. “There is something happening there, something sad.”

For more info on Pando, go to: western-aspen-alliance.org/pando.
Nothing says style quite like a Fort Rock Sandal with its distinct close-twined sole. At 9,300 years old, this rugged sagebrush bark footwear is a true classic. Veronica Villhard ’19 was well aware of these sandals, and many others throughout human history, when she set out to design superior ones—at least better ones for slick surfaces. She graduated in May with a bachelor’s in outdoor product design and development, and now works in the footwear division of Under Armour. The unique USU program teaches students the process of creating new outdoor products from concept to prototype. In Villhard’s lengthy portfolio, one of her projects was to create a sandal with an outsole to better disperse water from under the foot.
“Measurements of stress hormones, respiration, heart rate, and sweating suggests that short doses of nature—or even pictures of the natural world—can calm people down and sharpen their performance.” — Florence Williams

Waves turned into tributaries, islands, fish, and…

That led to...

The tributary, river, and mackerel fish combine to inspire an outsole design that allows for water to disperse from under the foot to make for a better grip on wet surfaces. This is where the sandal is made to perform.

And finally, the ultimate product...

Images courtesy of Veronica Villhard.
WAR, GENOCIDE, INFANTICIDE, GANG VIOLENCE. These subjects often filled Matthew LaPlante’s notebooks while reporting for outlets like the Salt Lake Tribune and CNN. But the daily dose of bad news wore him down.

“I was sad and angry and I didn’t like me very much, but I felt what I was doing was important,” the associate professor of journalism says from his office overlooking Logan Peak.

LaPlante saw baby animals as a path out of the darkness. “I was never a science person,” he says. “I loved the idea of it, but I had trouble speaking the language.”

A newborn elephant at the Hogle Zoo changed that. Zuri, a 251-pound calf, was the perfect introduction to science writing for the former national security reporter. Covering her birth marked the beginning of LaPlante’s fascination with nature’s superlatives.

Zuri is the world’s largest terrestrial mammal. But what of its smallest organism? What of its fastest. Its oldest? What can humankind learn if we pay attention to biological extremes?

All too often, it’s the middle of the bell curve that gets noticed by the scientific community, LaPlante says. LaPlante’s exploration of nature’s outliers resulted in the book Superlative: The Biology of Extremes. He visited a dolphin research center to glean what scientists know about their emotional intelligence. He examined how studying ant navigation may help engineers improve driverless vehicle technologies. He even tried skimming whale poop out of the Pacific Ocean to aid researchers monitoring their hormone levels.

LaPlante worries that just as scientists unlock secrets of organisms we’ve known about for centuries—African elephants—for example, that others will disappear entirely. Some before we ever stopped to reach between the leaf litter and wonder, what on earth could this be?

“Nothing larger has ever existed in 65 million years and we just figured out a few decades ago how elephants communicate,” LaPlante says.

In 2017, he flew to observe a census count at Mago National Park in Ethiopia—a place where just three years earlier about 170 elephants had thrived. “We couldn’t find them.” —KM

The following excerpt is from Superlative: the Biology of Extremes by Matthew LaPlante.

People long suspected the peregrine falcon was the fastest bird in the world—and the fastest animal of all, in terms of absolute speed. Its top velocity was long theoretical, though, because falcons operate in a vast, unpredictable, and very three-dimensional environment that makes a good radar-gun fix quite difficult. As recently as the late 1990s, we didn’t really know for sure how fast Falco peregrinus could fly.

That didn’t sit well with Ken Franklin. The professional pilot, master falconer, and amateur scientist knew birds had played an essential role in human flight. The Wright brothers extensively studied avian aerodynamics before taking off at Kitty Hawk, and Orville Wright later wrote that “learning the secret of flight from a bird was a good deal like learning the secret of magic from a magician. After you know what to look for, you see things that you did not notice.” And yet, Franklin lamented, we didn’t even know what the fastest of all birds was capable of, because we weren’t looking.

So he decided to find out. And, since radar guns weren’t going to get the job done, he decided to take a different road. The high road, as it were.

Others had tried to calculate falcon speed by what was observable from the ground. But Franklin knew that peregrines often soar several miles in altitude—far past heights at which ground observations were possible. So, starting from a few thousand feet and moving progressively higher, Franklin and his falcon, whose name was Frightful, began a training regimen that culminated in both man and bird diving from a Cessna 172 at 17,000 feet.

Franklin wore a video camera. Frightful wore a half-ounce recording altimeter. Pursuing a lead-weighted lure that Franklin dropped once they were both diving together, Frightful tucked into a dive and reached a speed of 242 miles per hour.

At that speed, he was falling the length of a soccer field every second.

Franklin was hopeful the data he and his team gleaned from the Frightful experiments might help aerospace engineers better understand how to reduce drag and turbulence. And he worked hard to convince them to take a deeper look at the peregrine’s body shape, wing contour, and feather configuration during high-speed dives.

It turned out to be a tough sell. The writer Tom Harpole, who spent years following the exploits of Franklin and Frightful, thought for sure he’d found someone interested in understanding what airplane makers could learn from birds when he met Jim Crowder. Crowder
was, after all, a senior technical fellow at Boeing whose specialty was studying airflow to improve the performance of planes. Crowder was also an amateur birder.

But while Crowder said he believed that “birds do all kinds of things that are unknown and potentially worth finding out about,” he also warned Harpole that the aviation industry saw itself as “a mature business” that had moved past birds as sources of knowledge for flight. Crowder lamented the conventional wisdom that, if there were aeronautical discoveries yet to be had, “someone would have found them by now.”

“Looking back, I do understand where they were coming from,” Franklin later told me. “I didn’t have a PhD. These people had spent their whole lives trying to quantify the mathematics of flight and, from their perspective, I was the new guy on the block who was throwing birds out of airplanes.”

Frightful passed away around 2012, and Franklin has retired from the skydiving game. He keeps pigeons these days instead of birds of prey. “Frightful and I made more than 200 jumps together,” he said. “We took it as far as we could.”

For more than a decade after Frightful set the animal air-speed record, falcon free-fall got little more than a passing look from the aeronautics set. That finally changed, though, in the early 2010s.

That’s when a team of German scientists realized that maybe it wouldn’t be such a bad idea to at least take a look not only at how peregrines manage to go so fast, but also at how they withstand the high mechanical loads that push and pull against the birds’ 2-pound frames when they maneuver at such speeds. After all, when pulling out of an extreme dive while clutching a lure weighing nearly as much as she did, Frightful was confronted with more Gs than the limit for the US Air Force’s F-22 Raptor.

Building from observations taken during Frightful’s falls, the Germans trained a group of falcons to dive in front of a 200-foot dam. At that height the birds couldn’t reach maximum acceleration, but they did tuck into the same body and wing configuration Frightful had when falling much faster. Because the dam offered a high-contrast background, the researchers were able to reconstruct the bird’s exact flight path and body shape using multiple high-speed video cameras. With those images, the team built a life-sized model of one of its falcons, slathered it with oil paint, and put it in a wind tunnel. The streaks of paint showed how air moves around a falcon’s body during a fall.

And that’s when the German team noticed something interesting: regions of the model along the back and wings where paint had accumulated, indicating a separation of wind flow. When they went back to look at images of their birds, and honed in on that area, they noticed a series of small feathers that were popped up from the falcon’s body at the exact same locations the paint had pooled on the models. They hypothesized that the arrangement of feathers prevented the flow separation seen on the model. Somehow, it seemed, the birds knew which areas of their wings were not moving air as efficiently, and had figured out a solution to the problem.

That finding excited Marco Rosti, then a doctoral student at the University of London. The young Italian aeronautical engineer was part of a team looking for novel ways to address the issue of stall, which happens when the direction of an aircraft wing and the direction of the oncoming airflow get too far out of parallel, causing significant airflow separation and loss of lift. The problem is as old as aviation; Otto Lilienthal, a pioneer in glider flight, died in 1896 after a crash caused by stall. The century that followed has given us a tremendous number of innovations in aviation, but we haven’t “solved” stall.

Falcions seem to have solved it, though. So, building off what had been learned in the falcon experiments, Rosti and his fellow researchers devised a flap that could be hinged on the top side of a wing with a torsion spring. The self-activated flap was designed to pop up, just like the little feathers on a falcon’s wings, to disrupt the airflow separation. Rosti said that the entire time he’d been studying aeronautics he was told the same sorts of things about animal flight that Ken Franklin had been in the wake of the Frightful flights. “What we heard was that perhaps some animals like insects were good to help us identify completely new ways of flying,” Rosti said, “but not for helping us improve the way we already fly.”

And yet interest in his team’s falcon-inspired solution to stall was red hot—and the enthusiasm was coming not just from airplane designers, but from the helicopter community as well, which also faces that age-old problem, albeit in different ways.

Rosti remains cautious. There are a lot of remaining hurdles, not the least of which is an aviation culture that is wedded to ideas about how airfoils are supposed to work, even when those ideas begin with the premise that, in a lot of situations, airfoils won’t work.

Ultimately, Rosti said, he accepts that his team’s design might not revolutionize air travel. But if it makes it a little less bumpy for some folks, he said, it will be worth the effort.

Perhaps more importantly, though, the bio-inspired design has proven people like Franklin right. We may be more than a century into our era of aviation, but falcons are millions of years into theirs. The idea that there’s nothing more to be learned from birds when it comes to human flight is pure hubris.

It’s just a story we’ve told ourselves. And stories aren’t always true. A

“Those people had spent their whole lives trying to quantify the mathematics of flight and, from their perspective, I WAS THE NEW GUY ON THE BLOCK WHO WAS THROWING BIRDS OUT OF AIRPLANES.”

— Ken Franklin

Superlative: The Biology of Extremes was published in May 2019 by BenBella Books, Inc. To purchase a copy visit benbellabooks.com.
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“These people had spent their whole lives trying to quantify the mathematics of flight and, from their perspective, I was the new guy on the block who was throwing birds out of airplanes.”
— Ken Franklin
Lynn Thomas walks in the spitting rain to the Daryl Chase Fine Arts building. His keys jingle as he describes growing up in Hyrum during the height of the Cold War—a time when neighbors erected fallout shelters in the mountains and classmates performed duck and cover drills in school. Mid-sentence Thomas stops to point out the telltale yellow fallout sign drilled into the brickwork of the arts building. “A relic of another time.”

Thomas, ’73, director of production services for Utah State University’s Caine College of Arts, heads down a flight of cement stairs and unlocks the basement door. Racks of blue marching band costumes line the path to a chain-link fence. Thomas tracks further into the bowels of the basement to a room marked 001A. Thomas twists the knob and the first thing one notices is the darkness. Until about four years ago it was full of old survival kits, he says. “They kind of thought of everything.”

The packs were cylindrical, about the size of an office garbage can, and stacked to the ceiling, Thomas says. The interior was packed with military rations, plastic-wrapped hard candies—“the kind your grandma gave you”—and heaters to warm the food. The bucket itself was a personal latrine. Today, the shelves of the former fallout shelter store electric cords, microphones, cables, lighting—items rendered largely useless during a nuclear attack. “We probably should have saved one [kit] for old time’s sake,” Thomas says.


The first hydrogen bomb was detonated on the island of Elugelab in the Marshall Islands in 1952. The only thing that remained of Elugelab was a crater one mile wide and about 170 feet deep. Over the next decade the United States and Soviet Union amassed war chests filled with thousands of nuclear warheads. It seemed humankind might just blow up the world.

On July 20, 1961, three months after the failed Bay of Pigs operation in Cuba, President John F. Kennedy issued Executive Order 10952; it tasked the Secretary of Defense with developing a robust civil defense program, the core of which centered around a national system of public and private fallout shelters. The now defunct Office of Civil Defense aimed to secure 240 million shelter spaces by 1968. One year into the civil defense program, nearly 104 million shelter spaces were identified nationwide. This is where shelters come into play.

“Class members brought their families and friends to the shelter,” Kirk opens one titled Highlights of the US Civil Defense Program. A map of the United States depicts where fallout might occur after a range of random attacks on a spring day. Only Oregon is spared. Fallout is the dirt and debris that gets sucked skyward after a nuclear blast. It rises with the expanding mushroom cloud and gets covered with radioactive particles as the gases cool and condense. Eventually, the fallout drifts back to the ground and spreads with the wind, blanketing the earth with radioactive material.

This is where shelters come into play. If the initial explosion and heat didn’t kill you, the fallout might. Persons fortunate to find themselves in one of the few stocked fallout shelters would have a meager ration of food—10,000 calories per shelter space—and access to basic medical supplies including petroleum jelly, penicillin tablets, surgical soap, bandages, thermometer, and sanitary pads.

In 2019, it’s unclear how many fallout shelters existed at Utah State University during the Cold War. No such records exist and remnants of the shelters have either been relegated to storage, razed during new construction projects, or forgotten entirely. However, the documents that remain in USU archives indicate that USU Extension was heavily involved in doomsday planning.

The U.S. Department of Defense awarded USU Extension a $40,000 grant to teach civil defense as parts of its programming. Beginning in 1963, USU Extension taught courses in radiological monitoring and shelter management around the state. USU President Daryl Chase sent personal invitations to city and county officials to boost participation. Each shelter management course was conducted in a mock fallout shelter and lasted, at minimum, 20 hours.

Shelter managers were responsible for reporting information such as the number and condition of shelterees, supply quantities, and radiological monitoring levels to the nearest Emergency Operating Center. Shelterees were provided three meals a day consisting of eight government issued biscuits at breakfast and lunch, 10 more biscuits at dinner, and washed down with six ounces of water.

“Class members brought their family members and friends to the shelter,”
reads the first annual report of USU’s Extension Civil Defense Program. “This increased the value of the exercise considerably.”

Kirk slides an accordion folder across the table containing files of Extension materials donated to the library by community members. In the same folder as circulars on vegetable varieties recommended for growing in Utah, home laundering, and producing hogs for profit, is a green-gray pamphlet called “Fallout Protection When You’re Not Prepared,” which describes ways for citizens to create makeshift shelters out of existing spaces like root cellars and basements.

A second folder of similarly benign subject matter like “Christmas Tree Growing for Profit,” “Making and Judging Needlework,” “Dressing your Windows,” and a babysitter’s guide to childcare, contains a fact sheet designed to be tacked by the telephone in case of nuclear disaster. It reads “Don’t panic. You can survive if you know what to do.” The threat of nuclear war was very much alive in the public sphere.

Christine Lord’s father, Theophil Erni, an employee of USU facilities, took advantage of educational opportunities and participated in some of the university’s workplace preparedness programming—“like Master Gardener, but for civil defense” says Lord ’74.

When building the family’s new home, Erni built a bomb shelter in the basement. He numbered the cinder blocks and installed a lead screen across the window. One evening he took Christine, then about 11, and her younger brother Martin to the Ray L. & Eloise H. Lillywhite building for a fallout drill. She recalls walking down a set of stairs into a shelter and seeing so many people it was difficult walking between the rows and rows of cots. We ate “these horrible crackers, like saltines without the salt,” she says.

In the background, a sound reel of bombs blasting played back-to-back inside.

“I thought for sure we were being bombed,” Lord says. “It was a drill, but for me it was real. I was convinced when they opened the door that Cache Valley was going to be leveled.”

She spent the night just trying to fall asleep. In the morning, when Lord climbed the stairs and peered outside she was surprised to hear birds chirping and see the sun shining overhead. “I was just relieved that the earth was still here.”

“A nation’s internal strength can be measured by the ability of its people to react intelligently to any emergency. How people conduct themselves depends on how they have been conditioned to act.”

IN MEMORIAM
Through July 25, 2019

Blaine R. Tidwell '52 Att, Apr. 21, UT
Reed L. Stone '50, Mar. 16, UT
John K. Shriver '50, May 10, NV
Blaine R. Tidwell '52, Apr. 21, UT
Sharen Ward (Mumford), '55, May 1, NV

1950s
Blanche Viola Anderson (Chamberlain) '46, Apr. 19, UT
Beth Atkin (Workman) '49 Att, Apr. 11, UT
Cleda Ayer '47, Apr. 24, ID
Joan B. Bittner '49, Apr. 14, UT
L. Lee Arnum '49, Jul. 6, UT
D. Frank A. English '49, Jul. 25, UT
Earl Fidell French '43, May 19, UT
Odel A. Frandsen '49, Apr. 24, UT
Lynn H. Gray '44 Att, Apr. 5, WA
Robert O. Hickman '47 Att, Apr. 4, WA
Seymour B. Johnson '49, Mar. 19, UT
Kenneth L. Lindsay '48, May 2, UT

1960s
Leonard Alan '60, Jul. 11, UT
R. Louis Sebenhr '66, May 6, UT
Robert J. Bland '62, May 6, UT
Gary B. Bonestrook '63, May 14, UT
Kenneth C. Boyer '63, May 8, UT
James C. Bush, Jr. '62, Att, Mar. 15, UT
Marjorie Patricia Parchay '61, Jul. 13, UT
M. Ronald Emertson '60, May 27, UT
Reed F. Christensen '61, May 17, UT
Dean J. Coddington '61, May 1, ID
Dennis J. Crofts '65, May 11, ID
Robert E. Davis '64, Apr. 24, OR
Merle J. Dunkley '65, Apr. 20, UT
Carolyn A. Eustrom (Christensen) '61, Jan. 28, UT
Thomas D. Elliott '63, Jun. 24, CA
Elaine Hansen Ewing '64, May 31, UT
Michael F. Ferrin '62, Jul. 20, ID
Paul D. Fonnesbeck '63, Apr. 8, UT
James Fullerton '62, Jul. 4, UT
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Wynn R. Walker '62, Jun. 29, UT
Randy M. Jones '62, Apr. 27, UT
John S. Walters '62, May 10, UT
Barbara Ann Howell '62, Apr. 17, UT
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William P. Nielsen Att, Mar. 17, CO
Gerald L. Mills Att, Mar. 28, UT
Terry Masterson Jul. 5, KS
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David D. Kilcrease May 4, UT
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Football Tickets Only, Promotion Ends 11-23-19