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High Country News

For people who care about the West

Secrets of the Deep

An ancient bone bed in the Nevada desert holds clues to the West's past — and the Earth's evolutionary puzzle | By Hillary Rosner

December 21, 2015 | $5 | Vol. 47 No. 22 | www.hcn.org

Neil Kelley pieces together the flipper of an ichthyosaur at the Smithsonian's National Museum of Natural History.
OLIVIER DOULIERY

On the cover

Shonisaurus popularis **(the larger ichthyosaur) and** ***Californosaurus perrini*** **(the smaller ichthyosaurs), which once lived in the huge ocean that covered what's now Nevada, depicted by Boise illustrator Todd Marshall.**

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FEATURE

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Editor's note

Curious scientists

"Vikings' mysterious abandonment of Greenland was not due to climate change" read the headline of a recent *Washington Post* story, detailing new evidence that the Norsemen's departure from the ice-capped island in the 1300s was not spurred by rapidly cooling conditions, as many scientists had thought. New high-tech rock-dating technology has convinced researchers that glaciers were already advanced in Greenland when the Vikings flourished there. Now, it's believed that socioeconomic factors — perhaps disputes with the Native Inuit over the waning walrus and polar bear trade — caused them to pack up and leave.

There goes another tidy theory about the past. But future scientists, probing with new tools, will likely come up with yet more compelling explanations. For, as Hillary Rosner writes in this issue's cover story, "Humans are a storytelling species. In science, those stories must be based on evidence. But even when they are, we often get it wrong."

Rosner's profile of the adventurous paleontologists seeking to unravel the mystery of a 200-million-year-old marine boneyard in Nevada resurrects more than one wild-sounding theory. A husband-and-wife team, pondering the neat rows of ichthyosaur skeletons, postulated several years ago that an enormous squid killed the "superdolphins" and then carefully arranged their carcasses on the sea floor. Armed with 3-D laser technology, the new team hopes to come up with a more plausible theory, including the possibility that ocean currents brought the bones into an orderly assemblage. But no one is suggesting that this is the last word.

This same humble spirit of inquiry into the past might help leaven the political fever over the science surrounding the great, ongoing mystery of our time — climate change. The models projecting the conditions we will encounter in coming years are increasingly sophisticated and data-rich, but they are still human constructs that inevitably will change as new tools, information, and yes, creative storytelling, are thrown into the equation.

What will be the tipping point beyond which the Greenland ice cap melts and rapidly rising seas overwhelm coastal areas? Will it be an average global temperature increase of 2 degrees Celsius, or will 1 degree do the trick? Will some as-yet-unknown factor offset the effects of concentrated greenhouse gases, or will something else make it much worse?

I don't know, but one thing is for sure: Unlike the mysteries of the past, we all have front-row seats at this drama.

—Paul Larmer, executive director/publisher

Windmills at the San Gorgonio Pass Wind Farm near Whitewater, California, where the BLM has authorized 3,300 acres of wind projects on public lands. SAM MIRCOVICH/REUTERS

Renewables falter on public lands

President Barack Obama's first Interior secretary, Ken Salazar, aspired to turn Western federal lands into hotbeds of wind and solar projects. But seven years later, the administration's record on renewable projects on public lands is mixed. The Bureau of Land Management now counts 57 projects that it has approved since then, including canceled projects and projects where the agency played a bit part, but far fewer projects on federal land actually deliver power to the grid: four solar arrays, five geothermal projects and three wind farms. Still, the BLM has made progress in readying the public lands for renewable energy projects, especially solar. It designated 19 solar energy zones in six Southwestern states, where the BLM will prioritize projects and transmission lines to bring their electricity to the grid. Some in the solar industry fear this approach could complicate the permitting process, while wind developers are more likely to take their business elsewhere. **ELIZABETH SHOGREN**
MORE: hcne.ws/mixed-record

$6 billion

spent each year on energy for indoor cannabis cultivation

15 million

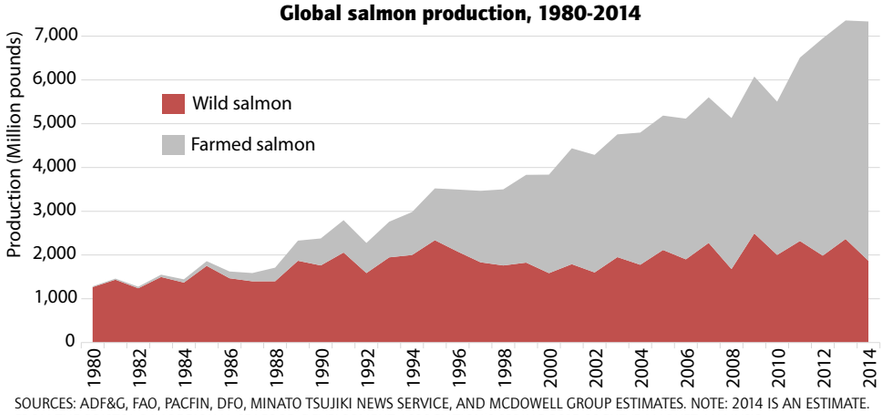
tons of greenhouse gas emissions produced by the U.S. pot industry per year

With medicinal or recreational marijuana legal in most of the West, utilities and grid operators are a bit worried about the impacts of these energy-hogs, even as they're excited about the profits they'll bring. Meanwhile, expanded legalization could reduce pot's energy and carbon footprint. Farmers could grow crops outside, where it takes no more energy to grow a cannabis plant than it does a carrot or tomato. It also means utilities and farmers can work together to maximize efficiency. **JONATHAN THOMPSON**
MORE: hcne.ws/pot-energy

GM salmon changing the market?

The Food and Drug Administration has approved the AquAdvantage salmon, the first genetically modified animal authorized for human consumption. Critics fear the fish's potential to inflict harm on the environment, as well as on the Alaskan salmon industry. History indicates the effects could be complex: Though aquaculture caused wild salmon prices to tank in the 1980s, it also opened new markets for the fish, and wild prices eventually recovered. And while Alaskan fishermen worry the modified fish could further cut their market share, European countries, at least, have largely rejected genetically modified foods. In the end, reconnecting American consumers with their wild seafood resources will likely accomplish more than any FDA action. **BEN GOLDFARB**
MORE: hcne.ws/gmo-salmon

Global salmon production, 1980-2014



SOURCES: ADF&G, FAO, PACFIN, DFO, MINATO TSUJIKI NEWS SERVICE, AND MCDOWELL GROUP ESTIMATES. NOTE: 2014 IS AN ESTIMATE. FROM THE BRISTOL BAY REGIONAL SEAFOOD DEVELOPMENT ASSOCIATION'S SPRING 2015 SOCKEYE MARKET ANALYSIS.

5

Number of Syrian refugees that were resettled in Colorado in 2015. The state typically receives 2 percent of the nation's refugee intake each year, and most resettle in metropolitan areas. **MATT WHITTAKER**
MORE: hcne.ws/COsyrian-refugee

Video

Range riders

In recent years, a rebounding wolf population in eastern Washington has stirred controversy. The resulting wolf-livestock clashes have spurred the creation of a new system: range riders who track both wolves and livestock with GPS collars, hoping to prevent further conflict. **LENA JACKSON**
MORE: hcne.ws/wolf-tracking

Range rider Bill Johnson rides his horse, Walter, while on patrol. LENA JACKSON

"Technology and research is going to be a huge part of how farmers and ranchers move into the future. The ones that get it and move with it will survive."

—Jay Kehne, Okanogan County organizer, Conservation Northwest

Trending

No dogs allowed

Marjorie "Slim" Woodruff, an educator at the Grand Canyon Association Field Institute, argues in an opinion piece that dogs should not be — and usually aren't — allowed in the backcountry of national parks. But she says some human visitors have begun to use the loosely monitored service dog system to get their pets in. "In 2011, the National Service Animal Registry signed up 2,400 emotional support animals. Last year, it registered 11,000. No paperwork required; this is on the honor system," Woodruff writes. "For me, it's the lack of respect for a park's rules that gets my goat, the notion that rules apply to other people but not to me." **KATE SCHIMEL**

You say

NICOLE VON GAZA-REAVIS: "The role of dogs in people's lives, as well as in society, has changed rapidly just in this last decade. The rules are outdated. ... Banishment is not the answer."

IRIS REDCLIFF: "Keep your dog on a leash when walking trails. How hard is that?"

JEFF HALL: "National parks are overcrowded nature museums. ... So does it really make a difference with all the roads and tourists making a ton of noise and emitting a ton of pollution?"

MORE: hcne.ws/natl-parks-no-dogs and Facebook.com/highcountrynews

Send letters to editor@hcn.org or
Editor, HCN, P.O. Box 1090, Paonia, CO 81428.

TOOLS FOR TRAILS

Thank you for your Nov. 9 article on guerrilla trail work. As a former U.S. Forest Service trail crew foreman, trail contractor and now fire lookout, I've done my share of clearing "official" trails and trying to keep others open that have been neglected. Richard Coots' spirit is laudable.

I've also seen the results of enthusiasm's misguided efforts on trails, especially in designated wilderness areas, where chainsaws are not allowed. Trails, while a wonderful way to get to places in wilderness, are not part of the "untrammeled" nature of these places. Wilderness isn't just for humans. And when Forest Service or Park Service managers make a conscious decision to not maintain a particular trail, they may have a serious reason.

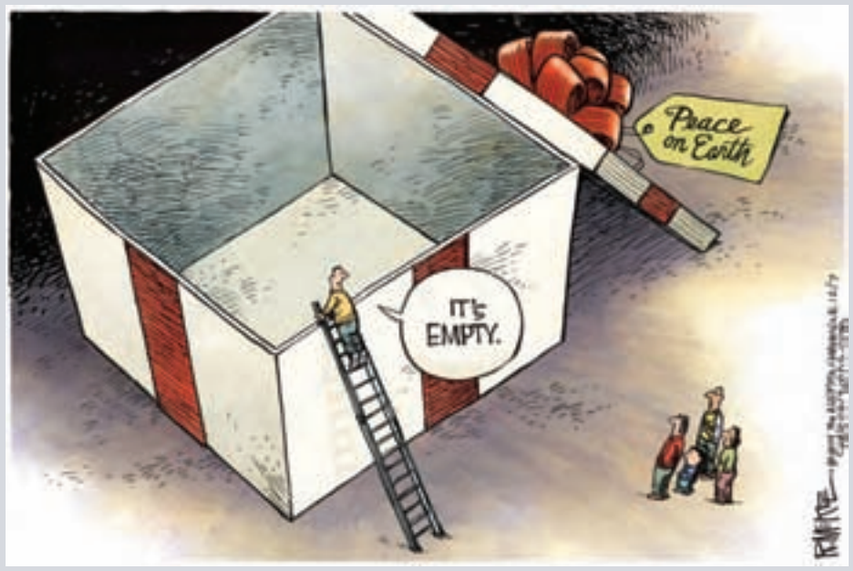
This doesn't make it any easier to see trails "disappear." All of us who love trails outside the wilderness will try our best to keep them open, much as Richard Coots is doing. And inside the wilderness, pack your ax and cross-cut saw and encourage our public-lands managers to value the incredible resource of our nation's trails — and the primitive skills that go along with maintaining them.

Tom Van de Water
Kooskia, Idaho, and Colton, New York

DON'T BLAME THE GREATEST GENERATION

Richard Reeves' book *Infamy: The Shocking Story of the Japanese American Internment in World War II* is a tragic story of an immoral episode in American culture, and it's simply not necessary to compound the tale through sensationalism and historical error. The title of Eric Sandstrom's review in the Nov. 9 issue, "The Greatest Generation at its worst," is off base. The "Greatest Generation" grew up in the Depression and served in WWII, where their average age was 26 years old. These young men and women were hardly responsible for the Japanese American internment. As Reeves points out, the leaders who were responsible included FDR (b. 1882) and Earl Warren (b. 1890). Also, the fact that "more than 1,800 died in the (internment) camps" is not particularly notable. This works out to a death rate of about 500 per 100,000 per year. According to the Centers for Disease Control and Prevention, the U.S. death rate in 2013 was about 822 per 100,000. There is no evidence that the interned population was denied necessary medical care or that they suffered a higher death rate than the general population. That said, the internment was driven by racism, was totally unnecessary, denied 120,000 Americans their freedom, and resulted in the illegal seizure of many internees' property.

Pat Munday
Walkerville, Montana



RICK MCKEE/CAGLECARTOONS.COM

A MODEST PROPOSAL – FOR MUSTANGS

If words were bales of hay, feeding captive feral horses would be no problem ("Wild horses sent to slaughter," *HCN*, 11/23/15). Presently, the government is the largest livestock caregiver in the U.S. Over 90,000 horses are either in lockups or on the Western ranges. In the meantime, one child dies every five seconds from malnutrition and/or diseases, which go hand in hand. The feral horse adoption fad is dead. This year, there were only 2,800 horses adopted — out of thousands that were available. I have the answer to the excess and a way to do some good also. Each 1,000-pound horse will yield about 800 pounds of safe, pure and highly nutritious horsemeat. When a quarter-pound of this meat is mixed with a good variety of vegetables, vitamins and minerals in a pure preservative-free juice, it will yield 3,200 cans of Mustang Stew. Multiply this by 90,000 horses and it will yield millions of cans of safe, nutritious food for all of those babies and lactating mothers.

John Radosevich
Wheatland, Wyoming

A FORGOTTEN LAKE

I read with interest the article titled "Tenuous revival of Mono Lake" in the Nov. 23 issue. I was involved in the politics of that rescue, being friends with Rick Lehman, our congressman, and with other politicos who drove the legislation. Now that the lake is stabilized, I have tried to interest them in Walker Lake, Nevada, just a short jaunt east from Lee Vining. One of the few terminal desert lakes in the world, it supported prehistoric trout, and multitudes of migrating birds for several thousand years. The inlet end, Walker River, was essentially freshwater, and the terminal end was closer to Mono Lake in its chemistry. Irrigation rights in the Yerington area have deprived this larger and more remote version of Mono Lake of its inlet water, and the level has dropped several hundred feet since the 1900s. The total dissolved solids and alkalinity have grown to the point where it will soon support only brine shrimp.

Walker Lake is surrounded by Bureau of Land Management territory, with a small patch of private lands on the west shore. I find it repulsive and hypocritical that no environmental group has taken on the lake's rescue, or seems to have any interest at all in its imminent death.

Richard Raucina
Midpines, California

High Country News

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Death by cop

Rural Idaho rancher the latest to die at hands of police

BY KATE SCHIMEL

A screenshot of police lapel-cam video from 2014 that recorded Albuquerque Police Department officers closing in on and shooting homeless camper James Boyd in the Sandia foothills. Two officers were later charged with murder.
ALBUQUERQUE POLICE DEPARTMENT

Rancher Jack Yantis was eating dinner on a Sunday in early November when the Adams County sheriff's office called to tell him to come deal with his bull. The bull, Keiford, had wandered onto Highway 95 near the town of Council, Idaho, and been hit by a car. Badly injured and maddened by pain, the animal was charging at bystanders and the first responders who were attempting to help the injured passengers. Yantis rushed to the scene, toting a rifle.

Once there, Yantis prepared to do what the sheriff's deputies had failed to do, to dispatch the wounded bull. What happened next is murky. Some observers say words were exchanged, and perhaps gunfire. But before Yantis could shoot the bull, the deputies shot him multiple times, killing the 62-year-old rancher. The FBI is now investigating the incident.

At a time when the deaths of young black men at the hands of police in places like Ferguson, Missouri, Staten Island, New York, and Chicago have caught national attention, the case seems like an anomaly, with its rural Western setting and middle-aged white victim. But it highlights a surprising fact: Western states lead the nation in officer-involved killings, and rural areas aren't immune.

According to data spanning 2004 to 2010 from the Centers for Disease Control and Prevention, New Mexico, Oregon and Nevada have the highest rates in the nation for fatal injury due to "legal intervention" — the rate of deaths per 100,000 people is more than twice the national average. Utah, California, Colorado and Idaho also rank in the top 10.

Official data on killings and excessive use of force by law enforcement are notoriously spotty, imprecise and often out of date. Much of the most comprehensive tracking now happens on crowdsourcing sites such as Fatal Encounters, run by the editor of the *Reno News & Review*, the U.S. Police Shooting database and KilledbyPolice.net. But all tell a similar story.

As of Dec. 7, the *Guardian*'s series "The Counted" shows Western states filling six of the top 10 places for officer-involved deaths per capita in 2015, with Wyoming fourth in the country. New Mexico, a state of just 2 million people, has seen 18 people killed by the police so far this year. And, according to the *Guardian*, police in Kern County in California have killed more people relative to the county's population than anywhere else in the country. In 2015, mirroring other recent years, blacks were killed by cops in the U.S. at a rate of 6.3 per million people, while Native Americans died at a rate of 3.4. That's compared to a 3.05 rate for Hispanics and 2.66 for whites. Over 100 of the 169 Hispanic or Latino deaths this year were in Western states.

Many happened in urban areas, such as Albuquerque, where a court-appointed monitor is overseeing attempts to reform the notoriously brutal police department. Seattle's police department has also been investigated by the Department of Justice for its violent tactics. Most Western cities, including Portland, Las Vegas and Los Angeles, have grappled with how to minimize the use of force and prevent killings.

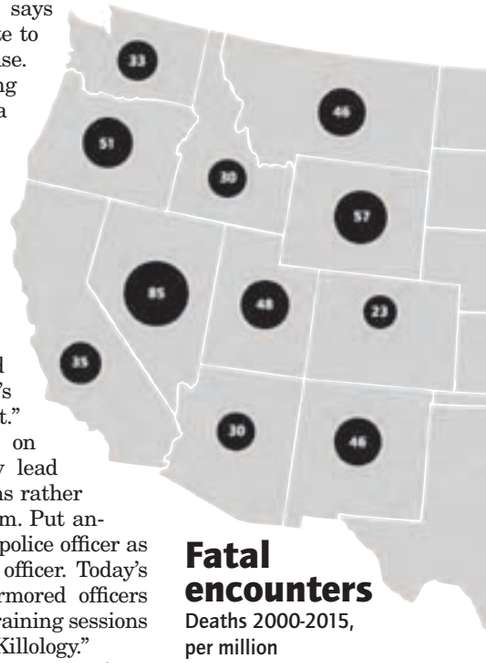
Yet rural areas have been equally bloody. Indeed, only two of Washington's 21 fatalities this year were at the hands of Seattle police, and many took place far from any major towns. And sparsely populated areas like Eagar, Arizona, Dillon, Montana, and Parowan, Utah, have seen killings in recent months. In some cases, like that of Idaho's Jack Yantis, the circumstances remain muddy. In others, the cops may have had little choice, as in remote Lukachukai, Arizona, where a young Navajo man was shot dead this March after killing one police officer and wounding two others.

The lack of comprehensive long-term data makes it difficult to know how the rate of rural fatalities compares to urban zones, but their frequency is notable. Some experts believe rural law enforcement officers in the West are more likely to be facing armed citizens, given the high rates of gun ownership. Or perhaps they're more likely to have to make arrests without adequate backup.

Ralph Weisheit, a professor of criminal justice at Illinois State University who has studied rural policing, says those factors may contribute to a more aggressive response. But he also says training and preparation can play a large role. Rural police "are increasingly getting the same training as urban officers," which now involves the military-grade equipment and training that some have blamed for excessive use of force in cities, Weisheit says. The motto used to be "To Serve and Protect," he says. Now, it's "Get home safe every night." That places the emphasis on defensive tactics that may lead officers to escalate situations rather than attempt to defuse them. Put another way, it's the image of police officer as soldier, rather than peace officer. Today's recruiting videos depict armored officers breaking down doors, and training sessions sometimes bear titles like "Killology."

Holding police who use excessive force accountable in rural areas offers challenges as well; there's less likelihood that there will be bystanders on hand with cameras to document incidents. And obtaining official video is at least as difficult as it is in urban centers. The Idaho State Police has refused to release any video of Yantis' death despite a request from the Idaho Freedom Foundation, citing Idaho state law and the pending investigation.

But the rancher's death may help increase scrutiny of rural law enforcement. Leo Morales, the executive director of ACLU Idaho, says his group has received more complaints of police using excessive force in Idaho since Yantis' death, particularly from rural areas in the northern part of the state. "That fundamental trust the community had with the police and their government is broken, and that needs to be repaired," he says. That's true in communities of every size, wherever they happen to be. □



Fatal encounters
Deaths 2000-2015, per million population, following encounters with police
SOURCE: FATALENCOUNTERS.ORG

Assistant editor Kate Schimel lives in Seattle, Washington. @kateschimel

Gun control

In the wake of mass killings, a state-by-state look at Western gun control laws

BY KRISTA LANGLOIS

On Friday, Nov. 27, a man identified as Robert L. Dear Jr. opened fire at a Planned Parenthood clinic in Colorado Springs, killing three people and wounding nine. Five days later, on Dec. 2, two shooters killed 14 people and wounded 21 in San Bernardino, California.

Most guns used in mass shootings, including the ones in San Bernardino, are acquired legally, often by people with criminal histories or documented mental health problems. Overall, Americans are buying more guns than ever before. Federal background checks soared from just over 9 million in 1999 to 19.8 million so far in 2015. On Nov. 27, the day of the Colorado shooting, the FBI conducted more background checks than on any day previously.

These checks (which do not equate directly to gun sales) are meant to prevent people with criminal records, domestic abuse convictions, drug addictions or dangerous mental illnesses from buying firearms. But in many Western states, private sales, like those at gun shows or over the Internet, are exempt from background checks.

Gun laws also vary from state to state. Montana, Wyoming, Alaska and New Mexico — four Western states whose laws received a failing grade from the Law Center to Prevent Gun Violence — are also among the 10 states with the highest per capita rates of gun deaths. See below for a breakdown of how Western states' gun laws compare.

Correspondent Krista Langlois lives in Durango, Colorado. @cestmoiLanglois

Eric Baker, co-owner of the Mo Money Pawn Shop in Phoenix in September, after he had turned over to authorities surveillance video that showed Phoenix freeway shooting suspect Leslie Allen Merritt Jr. pawning a gun believed to have been used in the shooting.
AP PHOTO/ROSS D. FRANKLIN

Gun laws by state

	Requires universal background checks*	Requires firearm dealers to be licensed by the states	Requires a permit to carry a concealed handgun	Regulates or bans most assault weapons and large-capacity magazines	Imposes additional restrictions on perpetrators of domestic violence**	Requires mental health reporting to the National Instant Criminal Background Check System***	Number of gun deaths per 100,000 people (including suicides), 2013
Alaska	**No**	**No**	**No**	**No**	**No**	Yes	19.8
Arizona	**No**	**No**	**No**	**No**	Some [5]	Yes	14.1
California	Yes	Yes	Yes	Yes	Yes	Yes	7.7
Colorado	Mostly [1]	**No**	Yes	Some [4]	Yes	Yes	11.5
Idaho	**No**	**No**	Yes [3]	**No**	**No**	Yes	14.1
Montana	**No**	**No**	Yes	**No**	Some [6]	**No**	16.7
Nevada	**No** [2]	**No**	Yes	**No**	Yes	Yes	13.8
New Mexico	**No**	**No**	Yes	**No**	**No**	**No**	15.5
Oregon	Yes	**No**	Yes	**No**	Yes	Yes	11.0
Utah	**No**	**No**	Yes	**No**	**No**	**No**	12.6
Washington	Yes	**No**	Yes	**No**	Yes	Yes	8.7
Wyoming	**No**	**No**	**No**	**No**	**No**	**No**	16.7

*Universal background checks include private purchases made at gun shows or over the Internet. **Federal law prohibits people convicted of domestic violence misdemeanors or with a domestic violence restraining order from possessing a gun, but excludes partners who are not married, convicted stalkers and others. States are not required to report domestic violence convictions to the federal database. ***Federal law prohibits possession of a firearm by any person who has been "adjudicated as a mental defective" or involuntarily "committed to any mental institution." But states are not required to report the identities of these individuals to the FBI.

(1) With several exceptions. (2) Nevada has a provision that lets private sellers request a background check from the state Department of Public Safety, but this is voluntary. (3) Only in cities and towns. (4) Colorado prohibits large-capacity ammunition magazines but does not regulate assault weapons or .50 caliber rifles. (5) Only while the person is serving probation for that conviction. (6) Only if a firearm is used in perpetrating domestic violence.

SOURCES: THE NEW YORK TIMES, THE LAW CENTER TO PREVENT GUN VIOLENCE, THE NATIONAL RIFLE ASSOCIATION, THE FBI, THE WASHINGTON POST, AND THE KAISER FAMILY FOUNDATION.

Eastbound and down

An interstate expansion threatens Denver's low-income neighborhoods

BY JOSHUA ZAFFOS

A rendition of the highway cover alternative for I-70 that would add a new park space near Swansea Elementary School. COURTESY COLORADO DEPARTMENT OF TRANSPORTATION

Armando Payán's family moved from California to northeast Denver in 1963, when his dad took a job in a meatpacking plant. Their arrival preceded a new wave of Hispanic immigrants, who now constitute the majority in the Globeville, Swansea and Elysia neighborhoods along the city's rail yards. Local incomes and education levels trail the rest of Denver, and there's no supermarket, bank branch or health clinic. "This is an area of the city that has been neglected for 100 years," says Payán, 59, a state government employee.

One September evening, Payán and other members of the community group Unite North Metro Denver met at an elementary school to discuss a looming concern: freeways. The elevated junction of Interstates 25 and 70, known as the Mousetrap, is just down the street. This stretch of I-70 East, one of the most congested highways in Colorado, badly needs repairs or replacement. But the six-lane highway also cuts off through-traffic on many local roads, blocking access to other parts of the city, and its air pollution contributes to some of Denver's highest rates of asthma and cardiovascular disease.

Now, residents fear that plans to replace it with a larger, partially belowground highway could just exacerbate their problems. What's more, they claim planners are ignoring a cheaper, community-friendly alternative.

Urban freeways are "a simple, but significant, design flaw" in American transportation planning, according to Peter Park, Denver's former planning director and a University of Colorado-Denver urban planning professor. When President Dwight Eisenhower created the interstate system in 1956, he envisioned freeways ringing cities, since even then, planners recognized that urban highways would isolate city neighborhoods and increase congestion, as cars must slow down to enter and exit during rush hours. But they also realized that access to downtowns would help justify new roads and construction taxes.

Highways were often routed through poor neighborhoods. Recently, community activists have responded by opposing expansions. For instance, plans that were made in the late 1990s to widen Interstate 5 between Portland, Oregon, and Vancouver, Washington, would have increased pollution and razed houses in low-income black Portland communities. Jeri Jimenez, then head of Portland's Environmental Justice Action Group, says opponents forced planners to acknowledge concerns about local asthma rates, which were twice the national average. In 2013, following lawsuits, cost overruns and delays, Washington lawmakers halted the project. Traffic has since steadied.

Still, many interstates clearly need work, including the Mousetrap. Between 47,000 and 205,000 vehicles drive I-70 eastbound from it daily, but 285,000 are expected by 2035. Bridges and drainage structures are showing critical signs of wear.

After 12 years of studies, state and federal officials announced this August that their preferred option is to lower the freeway and add four toll lanes to reduce rush-hour congestion. The $1.17 billion project would include a four-acre, grassy "highway cover" that would double as an urban park.

Fifty-five homes and 17 businesses will have to be removed, but Colorado Department of Transportation spokeswoman Rebecca White says the project would compensate displaced residents, pay for renovations at Swansea Elementary School, next to the covered section, and could include affordable housing and money to attract a local grocery. An air-quality analysis, she adds, concluded that the project would decrease pollution by alleviating traffic. A final environmental impact statement is due in January.

Opponents aren't convinced. Measurements of harmful nitrogen oxides and smaller particulates, such as soot from diesel trucks, were not "specifically modeled or reported," notes Bob Yuhnke, a former Environmental Defense Fund lawyer and air-pollution control expert. Based on his own review, Yuhnke expects those pollutants to exceed national air-quality standards if the renovation occurs.

Residents would rather see the highway realigned with other nearby interstates, and a city street converted into a wider pedestrian- and bike-friendly boulevard to handle local traffic. That would likely cost half as much and get I-70 out of the neighborhoods. Denver would then join the highways-to-boulevards movement, which has successfully removed San Francisco's Embarcadero and Central elevated freeways, rejuvenating the city's waterfront without worsening congestion.

But White says that I-70, which connects the airport to ski resorts, isn't a good candidate for removal. Planners considered rerouting it, but concluded that would clog local streets. "A lot of cities — St. Louis, Dallas, San Diego — are doing exactly what we're doing — adding covers," White says. "The ones we've seen have really become park and community spaces."

If partially covered highways have become popular fixes, that's because funding mechanisms don't support removals, says Park. A 2013 report he authored for the Congress for the New Urbanism highlighted a serious problem: Federal highway funding cannot be readily used for local greenbelts or boulevards. "I don't know of any neighborhood that became more valuable or desirable because of a bigger highway," Park says. "But every single neighborhood that I know of that's adjacent to a former freeway that was taken out got better."

At the September meeting in the school cafeteria, where there was no air conditioning, residents sweated as they considered a lawsuit. "This is a neighborhood being exploited," Payán said. "We're just asking to be treated fair." □

By the numbers

45 million
People in the U.S. who live within 300 feet of a four-plus-lane highway and face elevated adverse health effects from vehicle pollution

30 years
Intended lifespan of bridges and other structures along I-70 East in Denver, built in 1964

1
Roads in Globeville that connect the northern and southern parts of the neighborhood, due to the interstate and rail yards

3.5
Average "years of potential life lost" due to health effects among residents of Globeville, Elysia and Swansea, compared with other Denver residents

Correspondent Joshua Zaffos writes from Fort Collins, Colorado. @jzaffos

Two futures for Utah's Wasatch Range

As ski resorts push for a mega-connection, backcountry skiers try to save some wild

BY PAIGE BLANKENBUEHLER

On a winter day in Utah's Wasatch Range in the early 1970s, University of Utah professor Gale Dick and a small group of skiers stood near the top of Little Cottonwood Canyon, contemplating a pristine slope of powder. A man appeared at the bottom of the run and urgently waved them away. Thinking they were being warned of avalanche danger, they took an alternate, much bumpier way down. At the bottom, they again encountered the man — a famous French skier named Jean-Claude Killy. There was, in fact, no avalanche danger at all. Much to the group's annoyance, Killy had been cast in a promotional ad for Snowbird Ski Resort and needed a pristine slope for the day's photo shoot.

Dick went on to found Save Our Canyons, an organization that's fought for more than four decades to keep development out of the Wasatch Range. The wild land of the Wasatch, which abuts Salt Lake City and its exurbs, has become a ski mecca, with six resorts scattered amid thousands of backcountry-skiing acres. Most of the resorts are separated by just a single ridge, a proximity that has fueled the ski executives' dream: Connect them all, so that skiers can hop chairlifts from one to the next, thereby stimulating an already lucrative industry that brought more than 4 million visitors and 18,000 jobs to the state last year.

A growing community of backcountry skiers, though, object to that plan. They see themselves as more akin to Gale Dick than to Jean-Claude Killy, and, increasingly, they feel squeezed out of public land by the big resorts. Earlier this year, Vail Resorts Inc., a Colorado-based industry giant, purchased and consolidated two Wasatch Range ski areas. In mid-November, Park City opened for its first season as the country's largest ski area, charging more than $100 for a daily pass. Vail's move has created fresh impetus for further consolidation and connection of resorts, and set the stage for a new battle.

The conflict between backcountry users and resort operators highlights two very different visions for the mountains: One that eagerly welcomes the rapidly growing population in the nearby urban areas, and another that wants to hold the growing mass of humanity at bay. The population of Salt Lake and Summit counties will more than double by 2050, according to the nonprofit Utah Foundation, and the tussle over competing uses of a finite resource is only growing as demand increases. "Everyone wants more — more terrain and more solitude within those spaces for backcountry skiing and more acreage for resort skiing," says Chase Lamborn, a research associate with the Institute for Outdoor Recreation and Tourism at Utah State University. "But the reality is, you're talking about

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@PaigeBlank

Construction on the new Quicksilver gondola, a connection between Park City and Canyons resorts in the ONE Wasatch plan, which makes Park City the biggest resort in the United States, below. John Lemnotis drops into the Benson and Hedges Couloir in Big Cottonwood Canyon, a popular place to backcountry ski, right.
COURTESY VAIL RESORTS; JAMES ROH

this confined space, and all of the areas are already being heavily utilized."

Central Wasatch skiing has a lengthy history, beginning with the Brighton Ski Resort (1936), followed by Alta Ski Area (1938), Solitude Mountain Resort (1957), Park City Mountain Resort (1963), Canyons Resort (1968), Snowbird Ski Resort (1971), and Deer Valley Resort Company (1981). All are crowded into 64,000 acres within the Uinta-Wasatch-Cache National Forest.

In 2012, a Canadian developer first proposed a project called SkiLink, which would have required the sale of 30 acres of national forest to connect two Wasatch resorts with a high-speed gondola. Ski Utah, the marketing arm of the state's ski industry, has long sought to boost tourism through a Wasatch connectivity project, but backcountry users feared the influx of infrastructure and lift riders into formerly remote terrain. The newly formed Wasatch Backcountry Alliance rallied hundreds of backcountry skiers and snowboarders and, with the help of the older group Save Our Canyons, defeated SkiLink. Because the proposal relied on resort connections via public lands, it was easy to rally support against it, says Jamie Kent, Wasatch Backcountry Alliance's president. "Everyone loves the canyons."

In 2014, on the heels of the SkiLink failure, Ski Utah proposed "ONE Wasatch," which would connect all of the area resorts, providing access to 18,000 acres of in-bounds terrain. The linkages would be made over private lands owned or controlled by the resorts, instead of through public lands, and both costs and profits would be shared by those resorts. "The ski industry has learned from their past mistakes and have come back with another, more powerful proposal," Kent says. "They have packaged ONE Wasatch very well." Vail has just completed the first of the three required connections by adding a gondola between Park City and Canyons resort, so only two more remain.

The backcountry community supports small-scale infrastructure, such as trail signage, restrooms in popular areas and a transportation system that would limit traffic. But most members vehemently oppose a resort-connectivity project like ONE Wasatch. Earlier this year, Lamborn helped survey more than 4,000 recreationists in the Wasatch. While about half of resort skiers supported a mega-ski resort connection, a mere 1 percent of backcountry users did so.

Backcountry aficionados fear that the ONE Wasatch proposal would clog up both vistas and slopes, taking away some beloved backcountry access points. They see it as an assault on their lifestyle, one that will also degrade a natural resource, further commercializing the mountains with each new development, expansion and marketing ploy. "How can you enjoy skiing when everything has been developed?" Kent says. "That takes away the whole point." Critics also contend that the new lifts and their service and access roads would fragment wildlife habitat and impact popular mountain-biking trails.

Proponents, however, say ONE Wasatch would make Utah an international destination, modeled after the sprawling resorts of the Alps. The European-style gondola and lift connections would also help free narrow mountain roads from car and bus traffic. David DuBois, an airline pilot who lives in Park City and frequently skis at Alta, Solitude and Snowbird, says, "It's a no-brainer for me. I'd much rather ski than be in a car." Nathan Rafferty, president of Ski Utah, believes ONE Wasatch would provide an "unrivaled" product to skiers. "There's nowhere in North America that could tie so much acreage together."

For the moment, ONE Wasatch is stalled amid a tangle of interlocking interests. And it's further complicated by an even broader initiative called the Mountain Accord, which has pulled together dozens of stakeholders to prepare for a growing number of recreationists in the Wasatch while also protecting the area's environment and watershed, which supplies drinking water to half a million Salt Lake City residents. The accord began with meetings between Salt Lake City and county leaders, area ski resorts and Save Our Canyons, who hired a neutral leader, Laynee Jones, as the project director.

The Mountain Accord, like ONE Wasatch, yearns to improve traffic flow through the canyons — but it wants to do a lot more than link up ski areas. During ski season, more than 8,000 cars per day travel Little Cottonwood Canyon alone, according to a 2012 Salt Lake County transportation study. Mountain Accord's proponents want to dramatically decrease that by using a train, light-rail system or buses to connect the Salt Lake Valley and the town of Park City with popular recreation sites in Big and Little Cottonwood canyons.

In July, after two years of negotiations and public comment, local, state and federal governments, Utah's ski industry, recreational advocacy groups and environmental groups signed on to the first phase of the Mountain Accord. That step signifies a "good faith agreement" on broad goals for the mountains, but is not legally binding, Jones says. In phase two, environmental impact statements and studies will be completed for the initial agreements — transportation solutions, a federal land designation to provide stronger conservation protections, an environmental monitoring program, and land swaps to put key parcels in public hands. The accord does not derail ONE Wasatch, but it's not yet clear how the ski connection proposal might be affected by it.

Backcountry advocates like Kent see the accord as a way to leverage more protection for the Central Wasatch, to hold back development and preserve backcountry access. Perhaps the crux of the conflict with the resort ski industry lies in Grizzly Gulch, a small slice of land owned by Alta that backcountry skiers have fought the hardest to protect. The resort has traditionally allowed backcountry skiers to use this gentle, popular terrain. But it's also the best place to site a new ski lift for a key connection under the ONE Wasatch plan that would merge Alta's terrain with Snowbird's. Onno Wieringa, manager of Alta Ski Resort, says that if the Mountain Accord can't come up with a solution to move skiers from one canyon to the next more easily, he will install a lift through Grizzly Gulch.

Kent and off-piste enthusiasts know this time is pivotal for the future of backcountry skiing in the Wasatch. The outcome will hinge on community comment during the next phase, which, Jones says, will be announced to the public in the coming months. "Participation at this point is crucial," she says. "It could go either way." □

BRETT WALTON/CIRCLE OF BLUE

THE LATEST

Backstory

For over a decade, **the New Mexico Interstate Stream Commission has pushed a plan to build a large water diversion and storage project on the upper reaches of the Gila River.** Under the 2004 Arizona Water Settlement Act, New Mexico has the right to develop 14,000 acre-feet of the river's water. Proponents say the project would save a drought-prone region, while critics call it a billion-dollar boondoggle that would destroy one of the Southwest's last remaining wild rivers ("On New Mexico's Gila River, a contentious diversion gets the go-ahead," *HCN*, 5/25/15).

Followup

On Nov. 23, the diversion proposal took another step forward, when **Interior Secretary Sally Jewell signed an agreement with New Mexico water managers.** The decision triggers a federal environmental review, but the project is by no means a done deal. Instead, **it guarantees another round of extensive studies before the 2019 deadline**, when the government must approve or reject the project — no doubt fueling an intense water-management battle for years to come.

SARAH TORY

A.T. Cole sips water straight from the wetland he restored on Pitchfork Ranch in New Mexico.
AVERY MCGAHA

A desert oasis, lost and found

A retired lawyer rebuilds a rare wetland in New Mexico

BY AVERY MCGAHA

Uncommon Westerner

Name A.T. Cole

Age 68

Favorite book *Beyond the Hundredth Meridian*, by Wallace Stegner

Education Pasadena College, on a basketball scholarship.

Criminal record
Cole and his wife, Cinda, were arrested outside the White House during a 2011 protest against the Keystone XL pipeline. As usual, Cole was dressed head-to-toe in denim.

When a monsoon rain blesses southwestern New Mexico, as it does just a handful of times each year, creeks and rivers can rise quickly, causing dangerous flash floods. Those are the moments A.T. Cole, a ranch owner near Silver City, anticipates all year — hoping his dams will hold.

After Cole, a former Phoenix-area lawyer, retired in 2003, he and his wife, Cinda, searched for a patch of land to restore. They were tired of city life, and in a world threatened by climate change, they yearned for hope. They found what they were looking for in the 12,000-acre Pitchfork Ranch, which harbored remnants of a rare habitat: a sprawling, spring-fed desert wetland known as a *cienega*.

Cienegas used to be fairly common in Arizona and New Mexico; early Spanish explorers complained about the wide marshes, which festered with malaria and impeded travel. They didn't realize that *cienegas* also mitigate flooding and encourage biodiversity, supporting all kinds of fish, birds and plants.

But since the 1880s, many Southwestern *cienegas* have disappeared. Dean Hendrickson, a fish biologist at the University of Texas-Austin and an expert on *cienegas*, believes that the most likely culprits are livestock grazing, groundwater depletion and erosion.

The Coles knew nothing about *cienega* restoration when they purchased their ranch. And the Burro Cienega had been transformed over the years by previous ranchers, who trenched and drained the land and evicted the resident beaver. The *cienega* now sliced deep into the landscape, more creek than meandering marsh, and much of the life it once supported was gone.

So Cole set to work. First, he tracked down every bit of information on *cienegas* he could find, adding volumes on local ecology, indigenous peoples and restoration to the books on politics, Eastern thought and the American Revolution that already filled his ramshackle, century-old ranch house.

One day at a yard sale, a friend stumbled upon one of the first scientific papers devoted to *cienegas* and bought it for $1. According to the paper — which Hendrickson wrote — in order to restore the wetland, Cole needed to recreate the natural process that formed it, by trapping the thousands of tons of dirt that washed downstream with each heavy rain. If he could capture that dirt, the water would be forced to slow down and spread out, and aquatic species might move back in.

Employing his legal talent for argument and persuasion, he eventually obtained more than $600,000 in public conservation grants. "If I had a client in all of this, it would be the *cienega*," he says. Now, instead of advocating to a judge or jury, "I advocate to members of the bureaucracy."

The restoration struggled at first. *Cienegas* form naturally when a persistent source of water, like a spring, bubbles over a solid foundation of rock or clay. That attracts plants and animals, and over time, nutrient-rich sediment builds up and creates wide and biologically rich swamps.

But when the rains came, they blasted away the posts Cole had jammed into the stream to trap sediment. Rock structures crumbled. The creek and downstream flood channels kept deepening under the fast-moving water. But after a decade of work — organized by Cole, but carried out by graduate students, government employees, contractors and the Youth Conservation Corps — the wetland is coming back.

On a cool April morning, Cole zipped up the dirt road leading to it. Dressed in washed-out denim, Cole kept one calloused hand on his cowboy hat and the other on the ATV's wheel. Over the rumbling engine, he yelled himself hoarse explaining his project.

At the ranch's northernmost boundary, a line of bright green willows marked the *cienega*'s mouth. Cole pointed out his first series of dams, made from juniper posts or trees pushed across the banks, meant to slow the water and build up the wetland with sediment. So far, those partial dams have captured almost enough black, spongy dirt to bury the 6-foot-6-inch Cole past his waist.

But the most dramatic change lies in the diversity of life — cattails, threatened leopard frogs and water striders are all thriving in the shady swamp. Even the endangered Gila topminnow finds refuge in Cole's wetland.

"When you see the same location in photographs, it's really sobering," Cole said, recalling his first visits. "It's almost like a different planet."

His own past also seems far away. His days are no longer filled with the deadlines and stress of federal court. He has coffee before dawn and writes papers on *cienega* restoration until 3 p.m., when he enjoys a quiet dinner with wine.

By 7 p.m., he's in bed reading. And every few weeks, Cole races up to the *cienega*. He doesn't bring any water, he says. Once he arrives, he will just bend down and take a drink. □

Avery McGaha is an environmental journalist based in Boulder, Colorado. @climatesolitair

Fighting fungus with fungus

A mushroom called slippery jack could help protect whitebark pine from blister rust

BY BEN GOLDFARB

In a cluttered Bozeman laboratory, Cathy Cripps lays a whitebark pine seedling across the plate of a microscope, adjusts a few knobs, and peers into the eyepiece.

The young tree is just a three-inch-tall spray of green needles, bursting from a carrot-shaped sleeve of black dirt. A constellation of white freckles, each speck no larger than a period on this page, dots the soil like dandruff. Under the microscope, however, the spots blossom into bizarre and spectacular structures, with elegant coralline branches and cotton candy-like threads that coat the tree's labyrinthine roots. These otherworldly bodies are mycorrhizal fungi, symbiotic organisms that trade favors with plants.

"It always amazes me how tiny they are, how delicate," says Cripps, a Montana State University mycologist, who wears wire-frame glasses and a gray ponytail. "And yet they do all this absolutely essential stuff." Indeed, this particular fungus, *Suillus sibiricus*, may help save the whitebark pine — with a little help from Cripps.

Fungal partnerships made the West: Gaze upon a stand of lodgepole pine, a sagebrush steppe, or windblown tallgrass, and you're seeing the fruits of microscopic mutualism. Mycorrhizal fungi draw sugars from plant roots and, in turn, pipe essential nutrients, like nitrogen, back to their hosts through underground filaments. Though most fungi feed on decomposing material, many familiar species, including chanterelles and boletes, lead mycorrhizal lives.

Cripps especially adores the alpine fungi of Montana's Beartooth Plateau, which colonize stunted shrubs in inhospitable climes. A decade ago, however, she noticed a disturbing phenomenon while traversing her field sites: vast red swaths of dying whitebark pine. The trees, whose seeds nourish grizzly bears and Clark's nutcrackers, were falling victim to beetles and a disease called blister rust, twin scourges of the Northern Rockies. To combat the crisis, foresters have tried raising rust-resistant whitebark seedlings in nurseries. But cultivating whitebarks is arduous and complicated — the seeds require elaborate temperature cycles, for example — and rival trees, like spruce and fir, often outcompete introduced seedlings. One study found that just 42 percent of planted whitebarks survive.

As she wandered through surviving whitebark groves, Cripps, like any good mycologist, scanned the forest floor. The soil, she saw, teemed with *S. sibiricus*, whose yolk-colored mushrooms are called slippery jack. Whitebark and slippery jack grew in close companionship. Maybe the failed nursery seedlings just needed their fungal partner.

Cripps wasn't the first to consider the value of mycorrhizae; Austrian scientists have been inoculating European stone pine seedlings with fungal spores for 50 years. Today, you can't walk into a gardening store without knocking over bottles of fungal additive. But while most store-bought products use generic recipes, researchers are coming to realize that local fungi help native plants more than commercial mixes. In a 2015 study, Mia Maltz, a Ph.D. candidate at the University of California, Irvine, who's used fungal inoculation to grow sage in soil contaminated by borax mines, analyzed 28 fungus-based restoration projects. She found that adding mycorrhizae nearly always improved plant growth; that native fungi outperformed store-bought products; and that the benefits endured years after planting. Native mycorrhizae may help blue grama grass withstand drought, sagebrush ward off invading cheatgrass, and ponderosa pine recolonize disturbed forests.

In 2010, Cripps and a graduate student named Erin Lonergan foraged for slippery jack in the mountains of Montana and Alberta. Back at Montana State, they used a coffee grinder to mill the mushrooms' spore-laden undersides into slurry, then employed a cattle vaccination gun to inject the concoction — dubbed "Cathy's magic powder" by some foresters — into the soil around whitebark seedlings in Glacier National Park's nursery. Finally, that September, volunteers planted a thousand inoculated seedlings around Canada's Waterton Lakes National Park.

Four years later, Cripps and Lonergan reported that the fungal injection had improved pine survival in the wild by 11 percent compared to control plots — a substantial gain, considering the challenges of keeping planted whitebarks alive. They believe it will generate even greater benefits in places that have lost their mycorrhizae altogether. "We'd expect this to work best where there might not be any *Suillus* left, like intensely burned areas," Lonergan says. "We want to keep these fungi in the system."

But that won't be easy: As whitebarks perish in the Northern Rockies, Cripps fears their mycorrhizal partners will also vanish, making restoration even more difficult. One morning, Cripps drives up rutted dirt roads into the Gravelly Mountains, three hours southwest of Bozeman, to check on some rust-resistant seedlings she'd planted in a patch of fire-scorched earth. On the way, she passes through endless groves of rust-killed pines, their gray, skeletal limbs twisted against the sky.

"Where goes the pine, so goes the *Suillus*," she murmurs as we flash past a ghostly copse. Cripps sighs heavily, mourning a die-off only she can see. □

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Cathy Cripps checks whitebark pine seedlings in the Plant Growth Center at Montana State University, which she grows with the assistance of slippery jack fungal spores.
MONTANA STATE UNIVERSITY/KELLY GORHAM

A prescribed fire in the Kaibab National Forest, one type of forest restoration in the 4FRI plan.
BRANDON OBERHARDT/USFS

THE LATEST

Backstory

In 2009, the U.S. Forest Service undertook the biggest forest-health project ever attempted, on 2.4 million acres of overgrown ponderosa pine in northern Arizona. **The Four Forest Restoration Initiative (4FRI) aimed to reduce wildfire danger in part by having contractors thin small-diameter trees** and produce wood products and biofuel. But **continual delays and serious accusations of agency bias and incompetence** have plagued the controversial project and its main contractor, Good Earth Power-AZ ("Lost in the woods", *HCN*, 9/1/14).

Followup

To date, **Good Earth has treated just 5,400 acres of forest, after promising in 2013 to thin 30,000 acres per year for 10 years. Now, its subcontractors say the company is skipping payments.** In September and October, several trucking companies and former Good Earth employees complained to the Forest Service about delayed or missing payments. The company is also enmeshed in lawsuits with one subcontractor, a timber management company, which claims it's owed about $3 million.

JODI PETERSON

THE DESERT THAT

An ancient bone bed in the Nevada desert holds clues to the West's past — and the

Route 50 across Nevada has long been dubbed "the Loneliest Road in America." But turn off it onto Nevada 361 at Middlegate — population 17 and the only gas for dozens of miles — and 50's near-empty asphalt seems congested by comparison. Here in the back of the back of beyond, cruising past salt flats and lava tubes and mountains cut like sand castles, you might even imagine you're the last human on Earth. Or perhaps the first. Against this otherworldly scenery, it isn't hard to conjure a landscape long before humans arrived.

About an hour southeast of Middlegate lies the entrance to Berlin-Ichthyosaur State Park. Rising from the desert's unpeopled quiet is the ghost town of Berlin, where a blacksmith's shop, an assay office and some tumbledown miners' cabins stand as shaky monuments to a gold-and-silver strike in the early 1900s, and to the lives of those who worked it. A bit farther down the dusty road is a monument to another kind of vanished life, a boneyard from a time not just before humans, but before dinosaurs — 150 million years before *T. Rex*.

Poking out from a hilltop protected by a barn-like structure and scattered among rocks and scree on miles of nearby slopes are the fossilized remains of ichthyosaurs — giant marine reptiles that terrorized Earth's bygone seas.

These bones belong to the species *Shonisaurus popularis*, a sort of super-sized dolphin with paddle-like front limbs and a long tail ending in a fin. Among the largest of the ichthyosaurs, *S. popularis* could reach 40 feet in length, with a 10-foot-long skull, and may have weighed

A ball cap featuring a prehistoric ichthyosaur rests on the dash of a truck on Route 50 in Nevada, near Berlin-Ichthyosaur State Park.
COURTESY NICHOLAS PYENSON/ SMITHSONIAN

WAS AN OCEAN

Earth's evolutionary puzzle FEATURE BY HILLARY ROSNER

as much as 40 tons. (Mass is notoriously difficult to estimate for extinct creatures, particularly those with no living analog.) Though reptilian, it gave birth to live young in the water.

Discovered in 1928 and partially excavated beginning in the 1950s, these fossils keep an ancient secret — one that Neil Kelley and Nicholas Pyenson are determined to uncover. The two Smithsonian National Museum paleontologists have assembled traditional and high-tech tools, along with a team hailing from three separate institutions. "Something happened here," says Pyenson, 35, Smithsonian's curator of fossil marine mammals. "Is this a graveyard? Is this a murder site? We're trying to figure that out."

The mineralized bones of these animals may also help shed light on a deeper mystery: one that involves their species' origins and the evolutionary forces exerted by our planet's oceans. Throughout Earth's history, all manner of land-dwelling creatures have essentially walked into the sea and transformed, over eons, into something entirely new. *Shonisaurus* — descended from a reptile that walked on land — is among them. What might its skeletons add to the story of life on Earth?

To reconstruct a plausible plot with no witnesses and only spotty evidence, the team must get creative in its investigative tactics. Vertebrate fossils, after all, aren't straightforward research subjects "like pressed plants or microscope slides," says Pyenson. Chasing truth in a pile of timeworn bones demands patience, persistence, and a constant balancing dance between imagination and doubt.

Please see **Fossils**, *page 16*

"Something happened here. Is this a graveyard? Is this a murder site? We're trying to figure that out."

—Nicholas Pyenson, Smithsonian's curator of fossil marine mammals

In the Year 2020...

A vision for *High Country News*' future

Thank you, one and all, for keeping **independent journalism** for the West alive for the past 45 years. Please launch us into **the next 45** by making a donation today, and explore our history at **hcn.org/45**.

Imagine this: In late 2015, during a float on the Gunnison River celebrating *High Country News*' 45th anniversary, Executive Director Paul Larmer thumps his head with an oar and slips into a coma, just as the organization finishes its 2016-2020 Strategic Plan. Five years later, with the help of a team of Burning Man brain surgeons, he awakens to a new world and happily discovers that *High Country News* not only still exists, but is thriving beyond expectations, even as the West weathers tumultuous conditions driven by climate change, globalization and dramatic demographic shifts.

In some ways, the organization looks similar to the one he left behind — it still produces a unique print magazine and website out of tiny Paonia, Colorado, and it still serves a region resplendent with public lands despite repeated attempts to privatize them. But in other ways it has changed.

For one, it now serves a whopping 50,000 subscribers, and its website readership has tripled to 6 million a year. *HCN*'s hard-won reputation for fairness and authenticity has made it essential reading for lawmakers, agencies, educators, students, journalists and astute citizens of all stripes — and helped inspire meaningful conversations and action.

"How did we grow so much, so fast?" Paul asks. It turns out that, during his blackout, readers raised an astounding million dollars, which was wisely invested in staff and technology to help the organization better adapt to — and serve — a changing world.

On the editorial front, in 2020, *HCN* now has:

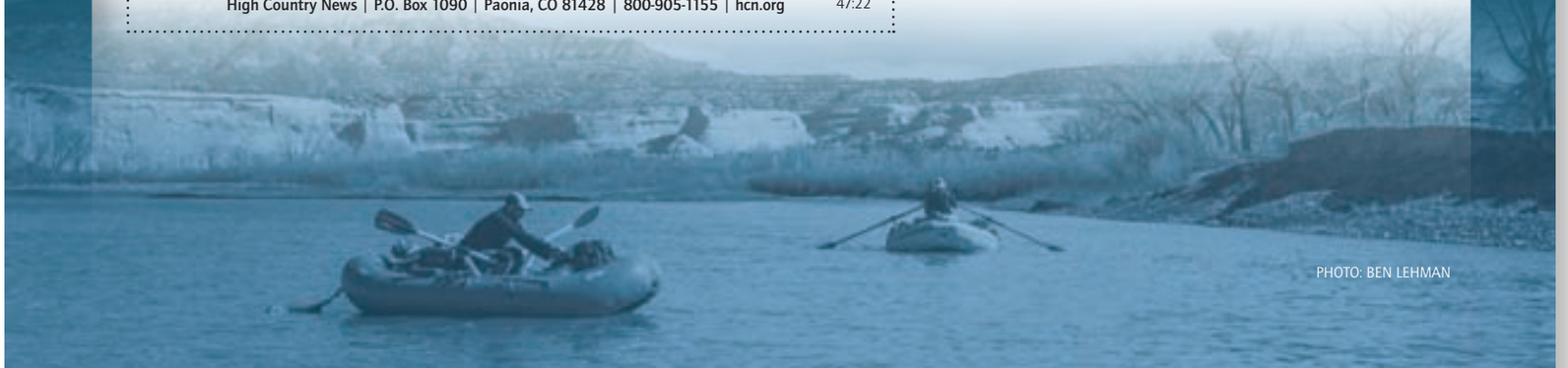
- a robust editorial staff, including a dozen field correspondents, that not only digs up stories for the print magazine, but also rapidly turns around pieces for its digital platforms to provide critical context for breaking news. It's not unusual to encounter two or three new *HCN* stories a day, in print, video and audio formats; every few weeks one goes "viral," much as our post on the famed Animas River mine spill did in August 2015.
- strategic partnerships with several regional and national media nonprofits. Together, they produce eye-popping investigations into the workings (and dysfunctions) of the agencies, corporations, and people trying to conserve and exploit the West's limited resources. Several garner national attention and spur policy changes.

On the business front, *HCN* has:

- a marketing team that, with the help of a state-of-the-art database, promotes *HCN* to a citizenry desperately seeking journalism it can trust. Digital campaigns and partnerships with nonprofits, progressive corporations and academic institutions have overtaken expensive mail campaigns as the primary channels for bringing people into the community.
- an HCNU Classroom Program serves 300 professors and their 10,000 students with mind-blowing journalism, live-streamed webinars and in-person events.

Other than the fact that he is jobless, Paul is thrilled by the new *High Country News* and humbled by the fact that its existential base — the readers who care about the West — is more solid than ever. As a massive December rainstorm plows into the Rockies, he asks the board if he can help write the next strategic plan, and suggests two audacious goals: 100,000 subscribers by 2025, and the creation of the Tom Bell National Monument — protecting the *HCN* founder's beloved Red Desert in Wyoming.

PAUL LARMER



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Holiday publishing break

The holidays are approaching, and we're taking a break from our 22-issues-per-year schedule. Look for *High Country News* again around Jan. 25. But new stories will be published online at hcn.org nearly every day. And don't forget to follow us on Facebook and Twitter for even more news.

With the cold weather and short days, our Paonia office hasn't seen many visitors lately, but **Henry Kroll** and **Carmen Vigil** dropped by on their way from Boulder, Colorado, to a nearby hot springs. Henry is currently at work on a documentary about the late **Richard Moore**, founder of the country's first listener-supported radio station back in 1945, in Berkeley, California.

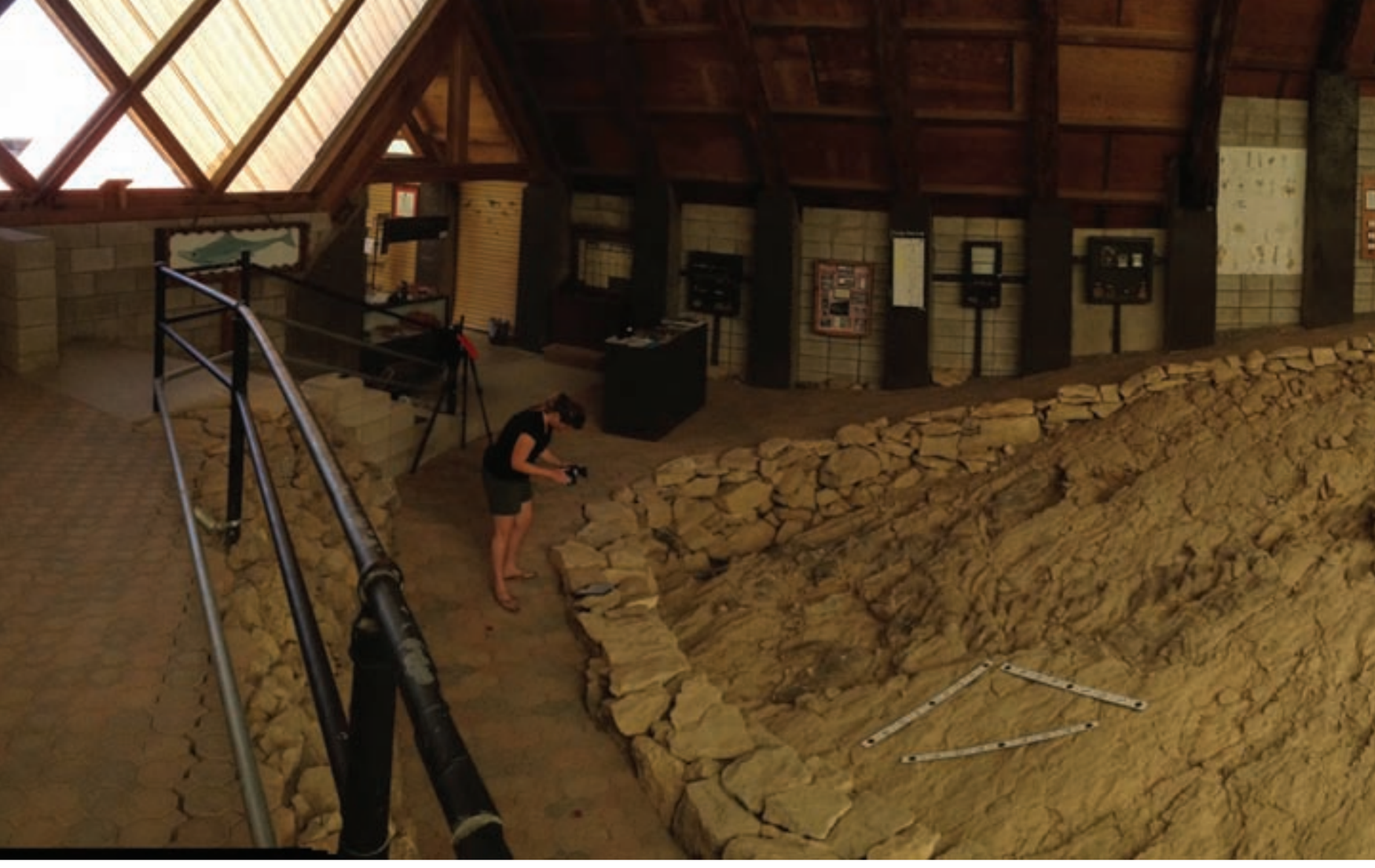
Some news came in recently from good friends far afield. Former intern **Pete McBride**, who now photographs for *National Geographic*, recently walked all 600 miles of the Grand Canyon and has helped make a film about the late, renowned river guide **Martin Litton**. Look for *Litton's Boat* at the Wild and Scenic Film Festival. And Reno-based board member **Bob Fulkerson** alerted us to a significant event in Nevada state government: **Marta Adams**, chief deputy attorney general, retired last summer after fighting successfully for more than two decades to keep Yucca Mountain from becoming the nation's primary nuclear waste dump. Marta credits *HCN* founder **Tom Bell** with getting her started, by hiring her in 1973 as a proofreader. "That was really the beginning of my environmental/natural resource career," Adams says.

We were saddened to hear of the passing of **Don Mabey**, a longtime reader and *HCN* supporter from Salt Lake City. Don served in the Navy during World War II before launching a career as a geophysicist in the West. He worked for the United States Geological Survey and the state of Utah and, in 1979, earned the Interior Department's Distinguished Service Award. He also authored two books — *The Bend of Bear River*, on southeastern Idaho's geology and history, and *The Canyon*, a personal tribute to his family. He will be missed.

—Sarah Tory for the staff

SARAH TORY

Henry Kroll and Carmen Vigil visit *HCN*.



About 250 million years ago, Earth was rocked by the Permian-Triassic extinction. Roughly 90 percent of marine species disappeared. Ichthyosaurs appear 7 million years later.

Fossils, *continued from page 13*

ON A WARM, CLOUDLESS MORNING, Kelley and Pyenson scout the main excavated quarry. An 80-foot-wide slice of rock, now set up as a sort of museum, cradles a smorgasbord of fossils, including some near-complete ichthyosaurs. Dozens of vertebrae, each several inches thick and nearly a foot in diameter, lie alongside scores of rib bones stacked in the rock like fence slats. Jaw fragments show indentations from the reptiles' inch-wide teeth.

It's Pyenson's first time here, and he consults a preliminary digital map the team made last summer. He's dressed in a striped Oxford shirt, orange pants, Chacos, and a baseball cap advertising Great Basin Brewing Company's Ichthyosaur IPA — a nod to Nevada's state fossil. Kelley, a 34-year-old postdoctoral researcher at the Smithsonian and an expert in extinct marine reptiles, wears a T-shirt promoting Built to Spill — an indy rock band — Chacos to match Pyenson's, and a "Yo! MTV Raps" trucker hat. With their identical shoes and scruffy facial hair, the boyish-looking scientists could be paleontology's answer to the Hardy Boys.

And indeed, they've taken on an ambitious case. Earlier this year, Kelley and Pyenson published a paper in the journal *Science*, laying out an expansive research agenda: to explore how top predators in the ocean have changed through the ages, reshaping entire ecosystems. About 250 million years ago, Earth was rocked by the Permian-Triassic extinction — the largest in planetary history. Roughly 90 percent of marine species disappeared. "After that event, ecosystems are built from the ground up," Kelley says. "Everything changes. Things that build reefs change, shellfish change, fish change." It's the first time there's evidence of land reptiles returning to the oceans and thriving; ichthyosaurs appear 7 million years later.

Shonisaurus was the biggest vertebrate yet to take to the water. And ever since, "big predators are continually diving in from land," Pyenson says. "All these big, iconic, beloved critters — whales, dolphins, sea otters, polar bears. Every time it happens, the whole structure of food webs accommodates these great predators, and they have an influence that's disproportionate to their abundance."

Even *Shonisaurus*' form is one that reappears throughout time, says Pyenson: those paddle-shaped forelimbs, for example, and a streamlined body ideal for efficient movement underwater. "When we see that happen in reptiles, and then much later in marine mammals," he says, "it tells us something really important about how evolution works." The demands of the marine environment yield the same structures in completely different creatures. Today's apex ocean predators are simply the most recent rendition of a song that Earth has been singing for a quarter-billion years.

Berlin-Ichthyosaur offers a snippet — a brief crescendo, like a passage from the planet's unfolding ecological score — that will help Pyenson and Kelley illuminate how evolution progresses on a grand scale. Scientists call it "macroevolution," the natural world's version of macroeconomics: a scaled-up picture that explains broad patterns at play over eons.

But first Kelly and Pyenson need to figure out some more basic things, such as just how deep the ocean here was. Charles Camp, the University of California-Berkeley paleontologist who studied and excavated the site for more than a decade beginning in 1954, believed the ichthyosaurs died after stranding on the shores of a giant inland sea. In a slim, trippy volume called *Child of the Rocks*, published in 1981 by the Nevada Bureau of Mines and Geology, Camp imagined what "pioneer astronauts" from a distant planet might have seen had they touched down here roughly 220 million years ago. Standing at the "edge of the muddy tideflats," he wrote, the visitors would have come upon the stinking carcasses of dead

ichthyosaurs "lined up like logs along the shore, and rotting in the sun.

> *One of the carcasses may have seemed fresh as if it had come in on the last tide. Its skin, smooth, only slightly lined and crinkled, would have glistened in the sun. The great head, with its long tapering snout partly embedded in the mud, lay twisted around alongside the body. Rows of pointed and fluted teeth ranged down the sides of its long upper and lower jaws. The monstrous eye, glazed in death, was a foot across, while the body, eight feet thick, lay like a half inflated balloon.*

Camp used his vivid imagination to reconstruct the tragic and compelling scene of one reptile's demise. The poor creature, he wrote, was "churning the water into a froth with his lashing tail and puffing out air from his lungs in great agonized gasps." But there's one crucial problem: Back then, the site was almost certainly much deeper underwater; it wasn't a tideflat.

"There's no beach sand in these rocks," explains Kelley. "These are fine-grained mud rocks that you typically get in deep-water sediments." Jennifer Hogler, a paleontologist who studied the site in the 1980s and 1990s for her doctoral research at UC-Berkeley, concluded there was no evidence for the idea that *Shonisaurus popularis* "frequented intertidal waters or was prone to stranding."

Carefully stepping among the *Shonisaurus* bones, Kelley deals another blow to Camp's theory. The skeletons, he says, look to be belly-up.

Pyenson is intrigued. "Cool!" he responds.

Beached creatures, such as modern whales, usually end up on their bellies. The ichthyosaurs' orientation suggests that they were already dead when they hit the sea floor.

"Unless they were rolled," says Kelley.

"They could be rolled," admits Pyenson.

Asking whether the animals floated or sank or stranded is useful, says Pyenson, "because what we are really asking, whether it be fossil whales or ichthyosaurs, is the process of what happens between death and discovery." That process has spawned a science all its own, called taphonomy — the study of the dead. As biological evidence becomes locked in stone, key information vanishes. Reconstructing that data from other sources is how we ultimately tell the story of lost worlds.

Here, the skeletons' orientation may point to something profound, or it may ultimately prove nothing more than "the physics of centers of gravity," Pyenson says. Where clues are scarce, you gather all you can.

GATHERING THE *LARGEST* CLUES, however — the skeletons of 40-ton animals — is an unwieldy process at best. You can't pick up a giant skull with calipers. "Anything bigger than what you can hold in your hand means that you can't see everything in one glimpse," explains Pyenson, "which has the effect of really limiting your understanding." But Kelley and Pyenson have found a hack: 3-D imaging, or photogrammetry, a relatively new technique for paleontology, which, Pyenson says, lets them "search for patterns that cut through the random vagaries of what taphonomy leaves for us to find." A few years ago, for example, when workers building a new section of the Pan-American Highway in Chile's Atacama Desert exposed a bed of fossilized marine animal bones from roughly 6 to 10 million years ago, Pyenson and his colleagues raced to the scene armed with equipment that would preserve a virtual copy of the excavated site. Time was short: In just two weeks, construction would destroy more than 40 complete or partial skeletons — extinct varieties of whales and other marine animals, includ-

A team from the Smithsonian Institution's National Museum of Natural History works at Berlin-Ichthyosaur State Park in Nevada, where they're using 3-D imaging to help study fossils found in the prehistoric sea bed.
COURTESY NEIL KELLEY/ SMITHSONIAN

At the Smithsonian's National Museum of Natural History, Nick Pyenson, Randall Irmis and Neil Kelley compare fossils with 3-D prints and images of extinct marine predators to understand the fossil reptiles found at Berlin-Ichthyosaur State Park in Nevada.
OLIVIER DOULIERY

ing an aquatic sloth.

The scientists combed the area for clues — in the boneyard, in the rock, in the surrounding landscape. "We were searching for a single good explanation," Pyenson says, "for why we had the cast of characters and the condition they were in." The skeletons, perfectly preserved, lay just meters from one another, piled in four layers that each represented roughly 10,000 years of history. By building 3-D digital models, the scientists were able to observe the skeletons from angles impossible in the real world. "These views gave us the luxury to see every nook, cranny and overhang, and really understand how different bones, and the tangled skeletons of different individuals, were positioned relative to each other," Pyenson says.

The team ultimately concluded that the killer was a toxic algae bloom: a red tide, like those implicated in the recent deaths of Florida's manatees and bottlenose dolphins. Iron eroding from the rocks of the Andes could have caused it. The whales and other animals would have eaten prey contaminated with the poisonous algae, died within hours, and washed up onto the flat sands of an estuary. Over millennia, the scenario was repeated, and the bones became buried in the mud.

Along with the imaging technology, an understanding of macroevolution helped solve the mystery. Throughout history, four-legged animals that return to the water dive in at the top of the food chain. That makes them susceptible to things like toxic algae, whose effects can be magnified the higher up the chain you go.

Pyenson hopes Berlin-Ichthyosaur will ultimately prove as scrutable as the whale bone bed. Inside the Ichthyosaur shelter one morning, Holly Little, Smithsonian's "paleoinformatics specialist," prepares the eons-old fossils for their 21st-century moment, carefully sweeping away dust with brooms and brushes. Meanwhile, Jon Blundell readies a series of cameras and laser scanners, mounted on tripods that he'll carry around the site. The lasers capture millions of data points that essentially describe the surface of the objects with sub-millimeter accuracy; photogrammetry uses algorithms to combine exhaustive, overlapping digital images into a high-resolution 3-D model. The result can be easily manipulated and examined on a computer, aiding the hunt for clues. Blundell, who describes his background as "nerd," has also helped make other 3-D scanned models, including an image of President Obama, and — as part of an ongoing project — a replica of the space shuttle *Discovery*.

In addition to making massive objects easier to examine, digital 3-D models can bring fossilized bones and other rare objects to a wider audience, allowing researchers around the world swifter and longer access. Bones from fossil digs too often end up virtually reburied in museum basements. Many of the *Shonisaurus* bones that Camp excavated from Berlin-Ichthyosaur still lurk in cartons at the Nevada State Museum. "A few paddles are on display, but then there are boxes full of wrapped-up bones sitting undisturbed," Pyenson laments. Who knows what mysteries might be solved if more eyes could scrutinize those bones?

POWERFUL AS NEW TECHNOLOGY can be, paleontology still relies on tools that would have been familiar to Berlin's miners. Outside the fossil shelter, under a sun growing fiercer by the hour, Randall Irmis supervises a sort of geological scavenger hunt. He's building yet another bridge to the past, this one using information gleaned from the rock record. With picks and shovels, Irmis and his team dig a trench up a hillside — surveying the rock at different levels, above and below the quarry, measuring its layers and taking home samples to test for concentrations of isotopes, or different forms of chemical elements. That will help determine how the bone beds formed. "It's pretty low-tech," says Irmis, a 33-year-old paleontologist at the University of Utah and the Natural History Museum of Utah who has been involved in the discovery of a half-dozen extinct reptile species. He and Pyenson were housemates during grad school at UC-Berkeley.

In addition to containing clues about ichthyosaurs, the dirt and stone at this site can help tell the broader story of Nevada's prehistoric past — the movements of its land and water as well as their inhabitants. The region's famous "basin and range" topography consists of mountain ranges of very old rocks separated by valleys of very young rocks. It's caused by plate tectonics. "Forty million years ago, Nevada was half the width it is today," Irmis says. "It's been pulled apart to almost twice its original width just in the last 30 million years." The Pacific plate used to move underneath the North American plate. But now it moves side to side — a switch that put extreme tension on the western side of North America, pulling it apart "like a Snickers bar," as Kelley says, and leaving chunks of rock separated by thinner layers. Nevada's mountain ranges reveal the layers of many eras of the deep past — timelines of geologic history scrawled across the region's stark scenery.

The geological slices found at Berlin might help explain how these particular ichthyosaurs died, or how they ended up preserved as fossils rather than decomposing like most corpses, their mineral components recycled to the sea. Or they might offer answers to questions we haven't yet asked.

But visualizing long stretches of change over time, across a physical landscape, is a tricky endeavor. Pyenson calls it "the mind-fuck of geology." To imagine what the area around Berlin looked like during the age of the ichthyosaurs, you need to time travel back to a very different planet. The Mesozoic era lasted from 248 million to 65 million years ago. Trying to fathom that timespan is daunting, and the familiar trick of picturing Earth's 4.6-billion-year history as if it's 24 hours on a clock seems unhelpful: It minimizes the scale, and therefore the scope, of our awe. "To grasp the face of evolution, we don't need to speed up the film, we need to slow it down," marine biologist Richard Ellis writes in his book *Sea Dragons*. "We must not be misled by the idea that a million years is a mere blink of the eye." One million years is a long, long time. Ichthyosaurs roamed the planet's oceans for roughly *150 million* years. The fossil record of whales, by comparison, is only about 50 million years old.

Sitting around the campfire one evening, I mentally strip this spot of its contemporary features: first the SUVs, picnic tables and composting toilets, and then the piñon pines, sagebrush and Mormon tea plants. I erase the biting red ants underfoot and the scorpions scurrying in the shadows. I try to ignore the constellation of REI tents on the desert floor and instead focus on the dazzlingly starry sky above — though even this would have looked different to the ichthyosaurs.

In a camp chair beside the rising smoke, Irmis — another boyish-looking scientist with scruffy facial hair and a baseball cap — tells me that the trench revealed layers of limestone interspersed with the layers of mud that Kelley described earlier. "You think about an

At the Natural History Museum of Utah, Fred Lacy cleans part of a fossilized humerus bone of a *Shonisaurus*, top, that was found during a dig at Berlin-Ichthyosaur State Park. Above, the museum's paleontology curator, Randy Irmis, holds a fossilized *Shonisaurus* tooth. KIM RAFF

Paleontologists from the Smithsonian, University of Utah and University of Nevada in one of the quarries in Berlin-Ichthyosaur State Park in Nevada, where scientists believe hundreds of the prehistoric reptiles may be buried.
COURTESY NEIL KELLEY/ SMITHSONIAN

ocean environment; it's got to be fairly quiet to get mud deposited, but it's got to be warm enough and fairly close to the surface to get calcium carbonate." Back in the Triassic, when *Shonisaurus popularis* crammed the seas of the American West, eastern Nevada would have formed its coastline. Despite a distance of 200 miles to land, Irmis says, the ocean here was relatively shallow, maybe a few hundred feet deep.

"You want to look out for the *Shonisaurs*. You're a little snack for them."

—Paleontologist Randall Irmis, imagining what life would have been like in a Triassic era sea

The sea Irmis is describing was part of Panthalassa, also called the Proto-Pacific, the "super-ocean" that once surrounded the mono-continent Pangaea. Much of that land mass floated in the Southern Hemisphere — meaning that our fire pit, at roughly 38 degrees latitude, sat in a very different part of the globe. Back in the Triassic, this same spot was at 5 or 6 degrees latitude, in the tropics.

"So we could be floating peacefully in a calm, warm sea," I venture.

"Except for the giant reptiles swimming around you," Kelley says.

"Yeah, you want to look out for the *Shonisaurs*," says Irmis. "You're a little snack for them."

DURING THE YEARS that Charles Camp worked at Berlin-Ichthyosaur, he excavated about a half-dozen quarries. One is the sheltered bone bed; another lies partway up an adjacent slope. But Camp worked before the days of GPS. Though he made meticulous drawings, his directions left much to interpretation. Part of the team's goal is to relocate some of Camp's quarries. They're certain that the fossil trove has barely been touched.

On a search for Quarry 4 one afternoon before I arrived, Cornelia Rasmussen, a doctoral student in Irmis' lab, found a tantalizing piece of jawbone embedded in the rock. A few days later, we set off to take a better look. We scramble several hundred yards up a steep hillside covered in scree, to where the ichthyosaur jaw lies in the shadow of a juniper. It's about 10 inches long, with perfectly preserved indentations from its teeth. The creature's whole jaw might have been three to five feet long. More of its skeleton is likely buried not far beneath the surface, somewhere on this same hill.

Partly to keep from slipping down the slope and partly to dodge the blazing sun for a moment, I crouch in the shade of a piñon. At my feet, a mess of reddish rock shards stretches up and down the hill. "How can you possibly pick out something like a jawbone — or any fossil — when it all looks so similar?" I wonder aloud. No sooner have I uttered the words than I begin to distinguish fossils all around me. I start picking up some of the smaller ones, and soon I have handfuls of bones — bits and pieces of ribs encased in limestone. Paleontologists call these fossils "float" — bones that erosion and weathering have left exposed on the surface rather than buried beneath the soil. But these seemingly trivial rock scraps can be crucial pieces of the prehistoric puzzle. They're the glass shards from a backwards-gazing crystal ball.

Nearby, Paige dePolo, an undergraduate from the University of Nevada, is assembling another pile of float. Pyenson and Matt McCurry, a research fellow from Australia, head toward us, each carrying an armful of fossilized bones. They could belong to the same individual as the skull, or represent additional ichthyosaurs. "The story isn't nine individuals dying," says Pyenson, visibly pleased by the glut of fossils here. "It's hundreds."

Berlin-Ichthyosaur's jawbones in particular intrigue Pyenson. Some contain teeth, and others don't, making him wonder whether *Shonisaurs* lost teeth as they aged and their diets changed. "This is something we see with a lot of big ocean predators," he says. "They go through different ocean niches as they grow."

He and Kelley are also debating the timing of the ichthyosaurs' deaths. How closely together did they happen — over hours? days? weeks? longer? And how long did the bones linger on the ocean floor before they were buried? Partly from studying the digital model of the boneyard, they already have one theory for how some of the bones came to their final resting place. "A good analogy is how the corner of a hockey rink sometimes accumulates clusters of pucks, over the course of time," says Pyenson. "Ichthyosaur vertebrae start off as a wrapped package of pucks on their side, and then slowly unroll, until they collect together again, given enough time." The process is a clue to the oceans: It suggests passive currents making "very organized structures from basic units."

BECAUSE IT'S EASY TO IMAGINE all sorts of crazy scenarios based on strange fossils, paleontologists must remain vigilant about evidence. What does the geology say? What do the bones say? Which explanations make sense based on the evidence, and which are pure speculation? "Complexity is really challenging to keep in your head," Pyenson says, "and then you're always playing this game of, like, 'Is what I'm seeing connecting to what I think is going on in my head, which may just be a fantasy?' "

One such story is in part what propelled the team to Berlin-Ichthyosaur in the first place. A few years ago, a husband-and-wife paleontology team proposed a new theory for the Nevada boneyard: 100-foot-long, hyper-intelligent, narcissistic cephalopods with a taste for ichthyosaur.

"Giant Kraken Lair Discovered," a press release blared shortly after Mark and Dianna McMenamin of Mount Holyoke floated the idea at an annual geologists' meeting in 2011. An article on Livescience.com explained the McMenamins' theory that the "markings and rearrangement of the *S. popularis* bones suggests an octopus-like creature either drowned the ichthyosaurs or broke their necks" before purposefully depositing their vertebrae into a pattern like the suckers on a squid's tentacle. "The researchers," the article said, "suggest this pattern reveals a self-portrait of the mysterious beast."

The evidence for this idea? There isn't any, save for the way the skeletons' arrangements appeared to the two observers. "It is a case of reading the scattered bones as if they were tea leaves able to tell someone's fortune," paleontology blogger Brian Switek wrote on Wired.com.

But though the kraken theory may be more science fiction than science, it invokes a broader truth about our quest for knowledge. Humans are a storytelling species. In science, those stories must be based on evidence. But even when they are, we often get them wrong. New ideas, new theories, new evidence, new techniques — all of these prod us forward, and we modify our understanding as we go.

Scientific inquiry is a process of constant revision. And as any writer will tell you, revision is where the most interesting things surface. Dinosaurs, we once thought, were lumbering, tail-dragging reptiles. Now we've come to believe that they were warm-blooded, carried their tails off the ground, and often came with feathers. Who knows how future discoveries will change the narrative?

Shonisaurus popularis has a real story, a concrete series of events that happened millions of years ago. But to recreate it, we must cast back across vast spans of time, assembling clues from each new lead we unearth. Luckily, technology improves and dirt shifts: There will always be another bone that pokes up from the ground and entices us a little way farther down the path to the truth. □

Hillary Rosner writes about science and the environment for *Wired*, *National Geographic*, *Scientific American* and other publications. She lives in Boulder, Colorado.

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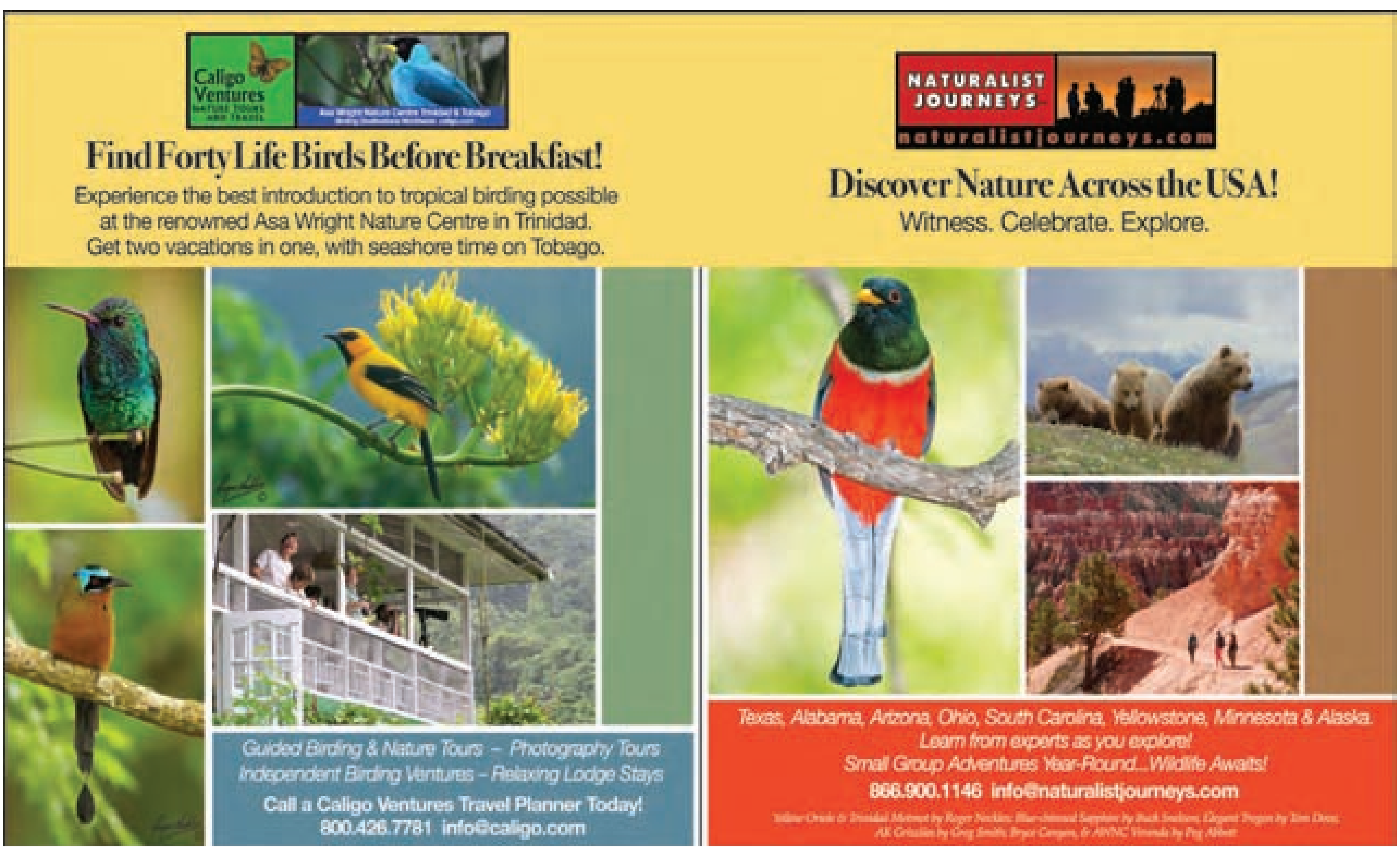
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Ilyas Wadood, right, of the Islamic Community Center of Phoenix talks with a demonstrator during an anti-Muslim rally last May. More than 200 protesters, some armed, denounced Islam and its Prophet Mohammed, while counterprotesters shouted, "Go home, Nazis." NANCY WIECHEC/ REUTERS

Western nativism has a rotten odor

OPINION BY FORREST WHITMAN

Back in my railroad days, we often said that something had "a bad smell."

"I smell a bad order!" — lingo for a car that was rolling wrong and needed to be removed from the train. The alarm was shouted down from the conductor up in the "angel's seat" in the caboose, back when a person actually had a job riding the caboose. The kid brakeman, who, back then, was inevitably me, would trudge up in the snow and dark to find the offending car, called a "hot box." These days, there's a different kind of bad odor here in the West, and I'm ready to shout the alarm.

Each time I read a letter to the editor calling for a stop to immigration, the smell gets stronger. Lately, I've seen letters to the editor calling for Islam to "grow up," or agreeing with politicians like Republican presidential candidate Donald Trump that we need to stop "Muslim immigration" to the United States altogether. Some small-town publishers come close to saying the same thing.

I cringe at this kind of talk. Many of us have friends and relatives who are Muslim. Some of our kids marry those folks. Some of our grandkids grow up in Muslim families — even though the kids may end up as Buddhists or atheists or Evangelical Republicans, for all we know. It smells bad enough that I'm ready to call the reaction what it is: a resurgence of nativism.

Nativism is no stranger to the West. The belief that those of us already here are superior to immigrants is part of our history. The Native Americans felt that way when the whites invaded. The Latino farmers in the San Luis Valley were unhappy when Anglo gold-seekers appeared. The Ku Klux Klan tried to keep out Catholics and "Slavs" in the 1920s. To some degree, it's a feeling that isn't surprising: Old-timers feel threatened, and some of them react fearfully. But when intolerance is touted as public policy, we deny the best in our Western heritage of hospitality.

It's never possible to keep out a targeted group for long. Anyone who thinks there are hardly any Muslims in the Rocky Mountain West needs to talk to my goat-farmer acquaintance. His place in southern Colorado sends off a truckload of meat goats to market every week. Some of those animals are destined to become Mexican cabrito, but most are for Muslim consumption. During Eid, one of the Muslim holy days, he'll send off even more. It's sort of like raising turkeys for Thanksgiving.

To be fair, not all the concerns about Muslim refugees are caused by nativism. Perhaps better vetting of immigrants is needed, though their vetting already takes a couple of years. But when writers in Western newspapers warn of dangerous "Muslims," with no qualifiers such as "radical" or "terrorist," I smell a bad odor.

Western folks at our best have always welcomed immigrants, and I love the vision of Colorado's first territorial governor, William Gilpin. Though one of his books, *The Cosmopolitan Railway*, is full of the usual booster fantasies about the abundance the railroads would bring us, I appreciate his image of railroads "debouching" (his favorite verb) the peoples of the world to help build the West.

He lauded the Chinese for their culinary and laundry skills. He was grateful to Mexicans, who taught us about their system of *acequia* ditches, which diverted water from rivers for farming. He was probably no more racist than most in the mid-19th century, when he welcomed the musically talented "Africans," who, he said, were suited for working in deep mines because they were able to tolerate the heat.

Gilpin went so far as to argue that our wide-open spaces and mountain air would encourage a new kind of humanity to emerge, with a "hy-brid" vigor based on mutual respect. He didn't quite say all the children would be brighter and all the dogs behave, but he came close in some of his speeches. True, he did have land for sale, but sorry, writer Wallace Stegner, he never said "rain follows the plow."

The bad smell of nativism can be overcome if we stay true to our tradition of hospitality. Welcoming all has made us what we are. Old Gov. Gilpin was probably right about how our willingness to welcome whoever had the good fortune to get here has strengthened our Rocky Mountain population. We've never gone it alone in the West; we've needed everybody to create a society. This is no time to get on a high horse and tell some people they don't belong. □

Forrest Whitman writes from Salida, Colorado.

WEB EXTRA
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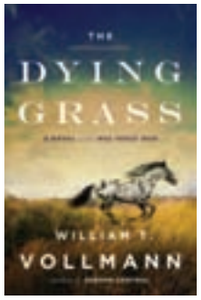
Writers on the Range is a syndicated service of High Country News, providing three opinion columns each week to more than 200 media outlets around the West. For more information, contact Betsy Marston, betsym@hcn.org, 970-527-4898.

Searching for the good fight in the Nez Perce War



The Dying Grass
William T. Vollmann
1,213 pages,
hardcover: $55.
Viking Press, 2015.

William T. Vollmann's striking new novel, *The Dying Grass*, chronicles the shameful events of the Nez Perce War of 1877, when the United States Army tried to prevent several bands of Native Americans from fleeing to Canada after miners and settlers encroached on tribal lands in the Northwest, in blatant violation of an earlier treaty. Much of the tale — and it's a long one, north of 1,200 pages — is told from the perspective of Gen. Oliver Otis Howard, who led the campaign.

Howard personifies a troublesome wrinkle in American history: the near-simultaneous fights to emancipate slaves and obliterate Native Americans. Unlike many of his fellow bluecoats, Howard was fiercely opposed to slavery; in fact, he founded Howard University, a black college, in Washington, D.C., in 1867.

Vollmann uses Howard's memoirs to create internal dialogues that show him wrestling with the injustice of American Indian policy. Howard was acutely aware of the fact that settlers were willfully encroaching on treaty land in the Wallowa Valley. He sees his government as terrorizing the Nez Perce people: "He feels for them, of course. He disapproves not only of our national Indian policy, but also of Wallowa's heedless seizures."

Yet he still leads the campaign against the Nez Perce and several other Indian tribes. Why? Howard himself struggles with the question: He's a soldier; he needs the money; he's proud to serve his country. When all else fails, he reasons that "Washington has given instructions, and there must be an end." Howard is a tragic figure whose self-deception becomes painfully obvious as the long march carries on. In him, Vollmann finds a clear historical allegory for America at large — a nation keenly aware of its principles even as it fails to live up to them.

Vollmann is notorious for writing at too great a length, but something must be said for the book's word-to-word beauty. He has a tendency to fall into near-verse when describing a scene. Early in the novel, he flashes forward to his own visit to Chief Joseph's grave on the Colville Indian Reservation near Nesplelem, Washington, where the surviving members of Joseph's band were eventually placed, years after their surrender. Standing in the cemetery, Vollman forms something like a High Plains haiku from a simple inscription on another gravestone:

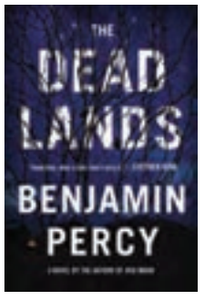
My precious little girl
Haylee Roxanne
June 5 2004
Oct 6 2004

"— my heart is good;
my heart is grass;
graves in the gravel and golden grass."

BY DANIEL PERSON

An 1877 sketch by General Howard's son, Guy, depicts Nez Perce Chief Toohoolhoolzote in talks with General Howard about relocation to an Idaho reservation. When the chief said he wouldn't leave his homeland, he was jailed. OREGON HISTORICAL SOCIETY

The Corps of Discovery, post-apocalypse edition



The Dead Lands
Benjamin Percy
403 pages,
hardcover: $26.
Grand Central
Publishing, 2015.

"Every story might seem unique and particular but is actually recurring, in conversation with others," observes a man in Oregon-born writer Benjamin Percy's third novel. "We're all characters caught in a cycle of ruin and renewal."

What if a global flu pandemic resulted in nuclear war? *The Dead Lands* begins 150 years after such a catastrophe occurred, at a time when the people living inside a walled enclave known as the Sanctuary, formerly the site of St. Louis, have finally begun to wonder whether anyone else exists in the land that used to be America.

When a strange young woman named Gawea appears on horseback at the Sanctuary's gates, speaking of a lush green land across the country in Oregon, where a kind of civilization has managed not just to survive but, apparently, thrive, the Sanctuary's loathsome dictator orders her execution. But others, including a bold woman named Mina Clark, a security agent for the Sanctuary, and an antisocial man named Lewis Meriwether, who runs a museum of the past, decide to save Gawea and set out Westward across the American wasteland.

Percy, who made his name as an award-winning writer of literary fiction, has recently incorporated more elements of science fiction, fantasy and horror into his writing. (His last novel, *Red Moon*, concerned werewolves.) *The Dead Lands* features some of Percy's finest work to date, a tale that doesn't skimp on rich characters, language and setting, complete with a suspenseful, anything-might-happen plot. Percy's prose has grown more subtle and beautiful, full of evocative descriptions. Describing Gawea, for example, he writes: "The girl appears so thin, like a piece of wood somebody whittled and gave up on."

Percy has always set his fiction in the West, and here he plays with the notion of what heading Westward means to the American spirit, even when the landscape is no longer recognizable. "They are the same," Percy writes about two characters seeking to upend the standard order in this post-apocalyptic world, "both refusing to acknowledge that they live in a place where fantasies must be discarded." Even readers who lean toward realism ought to welcome Percy's turn toward fantasy. *The Dead Lands* shows what can happen when a talented, disciplined writer gives his imagination free rein.

BY JENNY SHANK

What *IS* this?

Bryozoan colony.

At first, we mistake the bronze balloons for bags tangled around low-hanging branches on Coyote Creek. Our 7-year-old daughter leans out of her kayak. "Trash," she concludes.

I lift a branch holding one of the oblong sacs. It snaps, and the thing plops into the water. Maia scoops it into her bug net. It's not trash: We stare at a mysterious translucent thing with star-like patterns embedded in its membrane. In 14 years in Oregon, I've never seen anything like it.

I pull out my smartphone. My caption on Facebook: "What *IS* this?"

MY HUSBAND MOVED HERE from New York 15 years ago; I came from California. We're not unusual: In 2014, according to United Van Lines, more Americans moved to Oregon than to any other state.

Jonathan and I bonded over our shared fascination with the Cooper's hawks that shrieked through the forest between his apartment and my bungalow. We were happiest outside, shivering or sweating, soaked with rain or river water.

At Darlingtonia State Natural Site, we paced wooden walkways between tall yellow-leafed masses of *Darlingtonia californica*. "Cobra lilies," I read. "Insects fly into the plant's hood and slide down the stalks. The plant digests them. Yikes."

We married among Douglas-firs, then added a child to our exploration team. We braved coastal windstorms to study the sea stack called Face Rock. I read the Coquille Tribe's legend aloud.

Maia frowned. "How could a sea god turn the princess and her raccoons to stone?"

"It's a legend," I said. "Not true." Though I wondered, given the rock's resemblance to the upturned, imploring face of a woman.

"What are these?" Among sea stacks, Jonathan examined dozens of finned aquamarine discs. "By-the-wind sailors," I read in my guidebook. "They float on the ocean. Wind blows them onto beaches."

We rejoiced in the knowledge that individuals are either right-finned or left-finned and chanted their Latin name: "*Velella velella*, you're a hell of a fella."

BUT THEN WE GREW BORED. "We've lived here a decade," we told friends.

"So move your couch," one advised. "Take a vacation."

Instead, we sold our couch, packed our belongings, and moved to Costa Rica.

IN COSTA RICA, NATURE ISN'T SUBTLE. Iguanas and monkeys festoon branches; wonders declare themselves outright. We snorkeled with octopus and stingrays. I saw a tapir. Maia found leaf-cutter ants, the parade of tiny bodies brandished leaf fragments aloft like flags. We didn't miss Oregon.

Outside Maia's new kindergarten, students and parents pointed into the trees at a long hairy creature. "What is it?" I asked the teacher.

"*Oso hormiguero*," she replied. "An anteater."

Along with monkeys howling at dawn and the blue undulation of morpho butterflies, we made mundane discoveries: How to make money, where to live. We missed our family and friends.

"I miss oak savannahs," Jonathan said, navigating our rickety jeep down a jungle-bordered dirt road.

"I miss the seasons," I said. "I even miss the rain."

On a beachside boardwalk, we navigated snowcone carts, bicycles, kids selling puppies. We stepped across a bridge and discovered an open-air restaurant covered in Oregon Ducks flags.

"What is this?" I studied the tourists and Ticos.

The expat owner hailed from Eugene. We sat under green-and-yellow flags and looked at each other over fish tacos.

"It's time," we agreed, "to return to Oregon."

Amanita muscaria.

ONCE AGAIN, OUR HONDA is stuffed with camping gear.

In the Wallowa Mountains, we marvel at tiny pink wildflowers.

On a coastal hike, we find *Amanita muscaria*, hallucinogenic red mushrooms with white spots. Our consciousness feels altered enough by the sight of the rough-skinned newts below them.

"Newts," I read, "smell their way back to their birth-river at mating time. Males grow rough patches on their feet to embrace females. They rub their snouts together."

I rub my nose along Jonathan's. Maia giggles and scampers toward the beach.

Another day, at a river confluence, a sliver flash leaps upward. "What is that?" she yelps.

The migrating salmon hurl themselves up boulders, heading for their hatching ground, using the earth's magnetic field like a map.

We visit the carnivorous plants at the Darlingtonia site. Maia wanders the path between thousands of fork-tongued stalks. Suddenly, a man runs over.

"Bear!" he pants. "Ran across the highway … headed this way."

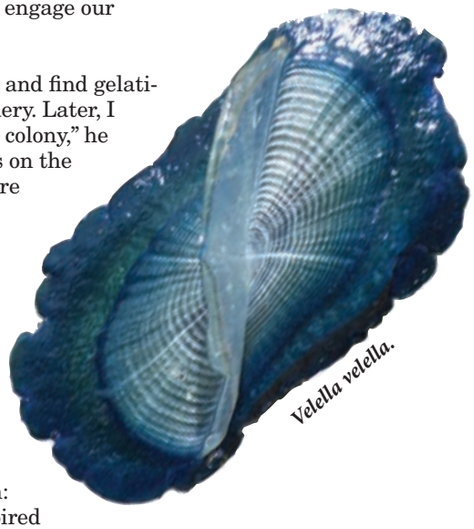
Just when you think you've seen it all, Oregon surprises. Mystery and discovery sharpen our minds, engage our senses, confirm that wonder still exists.

AT COYOTE CREEK, WE CUT open the bronze sac and find gelatinous goo. No one responds to my Facebook query. Later, I meet a biologist from Philadelphia. "Bryozoan colony," he says. "Moss animals. Those star-shaped things on the outside? Zooids — individual creatures. What're they doing on the creek?"

"No idea."

We grin at each other, thrilled by what we don't know about our adopted homeland.

So much to discover, still. □



Velella velella.

Melissa Hart is the author of the memoir Wild Within: How Rescuing Owls Inspired a Family *(Lyons, 2014).*

Darlingtonia californica.

PHOTOS: LISA MILLER, DAWN AND JIM LANGIEWICZ/FLICKR, NOTAFLY/WIKIMEDIA COMMONS, NOAH ELHARDT/WIKIMEDIA COMMONS

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HEARD AROUND THE WEST | BY BETSY MARSTON

THE WEST

Forrest Whitman belongs to one of rural Colorado's most endangered species: He's a Democrat. Nevertheless, this brave man ran for mayor of Salida a few months ago — unsuccessfully, of course, though he got a respectable 44.63 percent of the vote. He shared with us some of the valuable lessons he learned on the campaign trail, and the first rule, he says, is to be sure to harp on your roots — assuming your parents were fortunate enough to be born in the county. But what if you've been a resident for three decades and are still considered a newcomer? It might help to have a third- or fourth-generation local introduce you at your meet-and-greets. At such gatherings, he cautions, do not mention that your son-in-law is a Muslim or point out that, in your urban life, you were a professor. Your actual qualifications for office probably count for little, though it helps if you have a reputation for running the annual community dinner. Most of all, he advises, always carry dog treats and say nice things about people's dogs — even if the vicious little yappers are nibbling on your ankle. It's only a matter of time, Whitman optimistically concludes, before newcomers can help change things by doing something positive about local economic development, alternative energy and bicycle paths. *(An op-ed by Whitman appears on page 25.)*

THE WEST

Mystery solved in Yellowstone and Grand Teton national parks: The dozen broken toilet seats in outhouses were most likely caused by Asian tourists who climbed up on the lids to squat instead of sitting on the "throne," reports the *Jackson Hole News&Guide*. Next year, park latrines will sport signs illustrating the proper use of elevated toilets to visitors more used to porcelain holes in the floor. It might take more than a sign to change the propensity of tourists to crowd and elbow their way through parks, where the melee at information desks makes asking — or answering — questions like "Where is the bathroom?" somewhat difficult.

WASHINGTON **When your Christmas tree just keeps growing ...** ELAINE THOMPSON/AP

ELSEWHERE

New York City's menagerie already includes deer, wild turkeys and hawks. Now, an increasing number of coyotes have invaded parks in Queens and the Bronx — even a high-rise development on Manhattan's East Side, reports *The New York Times*. In a refreshing response, Sarah Grimke Aucoin, director of the city's Urban Park Rangers, says residents ought to relish glimpsing coyotes, though they should never attempt to feed them: "People might be alarmed, maybe even a little fearful. But the message we want to get out is: 'You're lucky. Enjoy how special it is.' "

And in Canada, two 20-something brothers from Ontario became Internet stars after they rescued a bald eagle, one of whose talons had been caught in a trap. The *Guardian* said that Michael and Neil Fletcher gingerly approached the giant bird, but "as soon as he realized we were trying to help, he kind of calmed down." It took four minutes for the men to free the bird's talon, and after posing with the eagle for a widely shared selfie, they released the formidable raptor, which flew off. The brothers said they had never seen an eagle up close and were struck by its grandeur: "We were just really amazed — and still are."

UTAH

When your religion forbids you to drink liquor, smoke cigarettes or swill coffee, what can you do to be a little bit naughty? In Salt Lake City, devout Mormons can patronize a "dirty soda shop," reports *The New York Times*, where "sugar is the vice of choice." And how sweet it is: At Sodalicious, the drink called Extra Dirty Second Wife boasts a concoction of Mountain Dew, fruit syrups and a shot of half-and-half. Meanwhile, down the road, its competitor, Swig, serves up a calorific brew called the Missionary, which combines Sprite, coconut cream and something called tiger's blood syrup. Unfortunately, the two popular chains are now in litigation over who owns the right to call their mixed drinks "dirty." Swig says it nailed the term first; Sodalicious scoffs that the word dirty is nothing new; think "dirty martini." For now, the "soda war" is galvanizing fans on both sides, though on Twitter, Rea Perry commented, "Only in Utah would a soda shop think they own 'dirty.' "

A Salt Lake City judge will soon decide whether children as young as 6 were forced to do farm work under the polygamous sect, the Fundamentalist Church of Jesus Christ of Latter-Day Saints. Federal attorneys say Paragon Contractors violated a 2007 order involving underage labor and should be held in contempt for failing to pay 1,400 workers from the sect, including 175 children, who took part in a 2012 pecan harvest. In its defense, Paragon said that because the children among the pickers were home-schooled and with their parents, they weren't "working during school hours," reports the *Jackson Hole News&Guide*.

WEB EXTRA For more from Heard around the West, see **hcn.org**.

Tips and photos of Western oddities are appreciated and often shared in this column. Write betsym@hcn.org or tag photos #heardaroundthewest on Instagram.

"So I threw a party. Or rather, I held my first Death Café, and **it turned out to be a lively, invigorating affair.**"

Laura Pritchett, in her essay, "He didn't die with dignity (so I threw a party)," from Writers on the Range, hcn.org/wotr