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## Opinion

### I Am Haunted By What I've Seen At Great Salt Lake

By **TERRY TEMPEST WILLIAMS**

*Ms. Williams is the author of "Refuge: An Unnatural History of Family and Place" and a writer in residence at the Harvard Divinity School. Mr. Sheikh is an artist working in the Southwest. His forthcoming book is "Thirst — Great Salt Lake."*

**F**ROM a distance, it is hard to tell whether the three figures walking the salt playa are human, bird or some other animal. Through binoculars, I see they are pelicans, juveniles, gaunt and emaciated without water or food. In feathered robes, they walk with the focus of fasting monks toward enlightenment or death.

This was not a dream or a nightmare, but the first time I realized Great Salt Lake was in danger of disappearing. It was the fall of 2016.

The lake's Gunnison Island has been a sanctuary to one of the largest white pelican rookeries in North America, with as many as 20,000 nesting individuals. The watery distance from the island to the mainland has protected the pelicans from predators. Now, young pelicans are easy prey for coyotes crossing the land bridge created as the waters receded.

Most likely spooked by coyotes, the adolescent pelicans fled the island, but their wings were not strong enough to fly the miles to fresh water for fish. Forced down by fatigue, they were dying from hunger and thirst. Walking behind them at a respectful distance felt like a funeral procession. I passed 60 salt-encrusted bodies stiff on the salt flats, hollow bones protruding from crystallized clumps of feathers, wings splayed like fans waving in the heat.

**I**HAVE known Great Salt Lake in flood and now in drought; between her highest level at 4211.8 feet in 1987 and her lowest at 4188.5 feet in 2022. Maps and newspapers call her the Great Salt Lake, but to me, she's Great Salt Lake.

For 13,000 years, the lake has existed with no outlet to the sea, her large deposits of salt left behind through evaporation. Lately, evaporation from heat and drought accelerated by climate change, combined with overuse of the rivers that feed it, have shrunk the lake's area by two-thirds. A report out of Brigham Young University and other institutions earlier this year warned that the contraction has been quickening since 2020 and that if we do not take emergency measures immediately, Great Salt Lake will disappear in five years.

Already, the lake presents us with a



SOURCE: SATELLITE IMAGES BY NASA EARTH OBSERVATORY. TAYLOR MAGGIACOMO/THE NEW YORK TIMES



chronicle of death foretold: the collapse of an entire salt desert ecosystem of reefs that foster the life cycle of brine flies and shrimp, that in turn support more than 10 million migrating birds along the Pacific Flyway; of a sacred landscape for the Northwestern Band of the Shoshone Nation and the Paiute and Ute Nations; of a \$1.5 billion per year mineral extraction industry; of a \$80 million brine shrimp industry; of a \$1.4 billion ski industry dependent on powder snow from the “lake effect.”

Great Salt Lake’s death and the death of the lives she sustains could become our death, too. The dry lake bed now exposed to the wind is laden with toxic elements, accumulated in the lake over decades. On any given day, dust devils are whipping up a storm in these “hot spots,” blowing mercury and arsenic-laced winds through the Wasatch Front where 2.6 million people dwell, with Salt Lake City at its center. Arsenic levels in the lake bed are already far higher than the Environmental Protection Agency’s recommendation for safety. And with the state’s population projected to grow to 5.5 million people by 2060, the urgency to reverse the lake’s retreat will only grow.

Yet I do not believe Utahns have fully grasped the magnitude of what we are facing. We could be forced to leave.

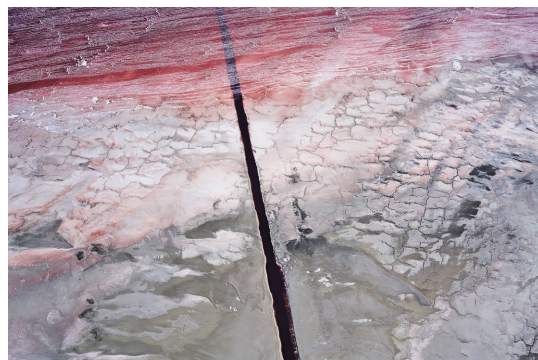
The retreat of Great Salt Lake is not a singular story. Death is what happened to vast stretches of the Aral Sea in Kazakhstan and Uzbekistan by the late 2010s, now seen as one of the planet’s largest environmental disasters. Pick your place anywhere in the world and Great Salt Lake is a mirror reflecting a flashing light on what is coming and what is already here. Our natural touchstones of joy will deliver us to heartbreak. Each of us will face the losses of the places that brought us to life.

Utah is my home. The Church of Jesus Christ of Latter-day Saints raised me to care about community in the fullness of Creation. We were taught through sacred texts, *The Pearl of Great Price*, among them: “For I, the Lord God, created all things, of which I have spoken, spiritually, before they were naturally upon the face of the earth.” Great Salt Lake had a spirit before she had a body. Brine shrimp have a spirit. White pelicans and eared grebes have a spirit. They are loved by God as we are loved.

**A**FTER Joseph Smith, the founder of Latter-day Saints, was killed in 1844, the newly recognized prophet and colonizer Brigham Young sought a terri-



PHOTOGRAPHS BY FAZAL SHEIKH



tory of arid lands for his persecuted people, lands that no one else would want. A Great Salt Lake Desert rimmed with rugged mountains seemed an appropriate destination to anchor a religion for Latter-day Saints. He made a hard sell: Leave everything behind but what you can pull in handcarts; then walk 1,300 miles to a land of little water. This was the Mormon trail to religious freedom.

As Mormon pioneers approached the mouth of Emigration Canyon, Brigham Young is said to have raised his head from his sick bed in the back of a covered wagon and caught a sweeping glimpse of the Great Salt Lake Valley with the lake a line of quicksilver stretching across the horizon.

“This is the place,” he said.

Young’s pragmatic gospel of making the desert blossom like a rose was both a strategy for survival and a call to action. My Mormon ancestors dammed, diverted and diked the Bear River responsible for about 50 percent of the inflow of freshwater to Great Salt Lake. By 1920, only 3,000 acres remained of the 45,000 acres of wetlands found at the Bear River delta.

So great was the settlers’ thirst that had it not been for the National Wildlife Refuge system that created the Bear River Migratory Bird Refuge in 1928, these wetlands may not have survived at all. The local edict that “unused water is wasted water” remains Utah’s water policy today. For many Utahns, Great Salt Lake remains a basin of wasted water — salt water in the desert that no one can drink filled with tiny shrimp that humans don’t eat. It is a lake that smells and stings and pickles the skin with brine flies you can’t escape.

Not everyone feels this way.

The landscape around the lake is the ancestral home to many tribal nations, including the Northwestern Shoshone, Paiute, Goshute, Ute Mountain Ute and Uncompahgre Ute Nations. I watched on the vernal equinox in 2022, as the Ute leaders Malcolm Lehi and Christopher Tabbee led a prayer circle on the edge of the lake. Clouds gathered and blackened. Temperatures dropped.

As the first song was sung into the storm, a flock of pintail ducks dropped down to the waters as if they knew that song, had missed that song and needed to hear that familiar rhythm again. The singing of prayers was woven into the wind. Seven bison appeared.

As Mr. Lehi and Mr. Tabbee lit sweetgrass to seal their prayers, the wind swallowed the flame. They lit it



again; the match went out. They sheltered the offering in their hands, but each time, sparks failed. Finally, Mr. Lehi spoke: "This is a sign hard times are ahead — our ancestors have heard our prayers. Great works will be required from all directions." Then he added: "Great Salt Lake is a holy being. She will need our prayers again and again. Blessings will come. But it will take time."

**L**AST November, when Great Salt Lake reached her lowest point on record, the artist Fazal Sheikh and I set out to circumnavigate the lake to see what might be revealed. Both our mothers died in 1987 when the lake was rising in floods after heavy snowfall and rains. Both of us made pilgrimages to the lake at that time and met over a shared love of Utah several decades later.

This time, we were called to the lake in drought. We focused on four compass points: Antelope Island, Promontory Point, the alkaline desert to the west and Stansbury Island to the south.

The years my mother was facing ovarian cancer, 1983 to 1987, Antelope Island was largely inaccessible. The island became my mother's body, unreachable, floating in uncertainty. Now, 36 years later, it is the body of my Mother Lake who is hurting. Great Salt Lake has mentored me almost twice as long as my birth mother. She calls me home with the birds, keeping me buoyant in a broken world.

Housing developments near Antelope Island and other shores of the Great Salt Lake have grown beyond what is sustainable. Each new subdivision needs its own water lines; each home waters a green lawn. Gone are miles of wetlands and fields bursting with meadowlarks; gone are vast tangles of cattails where flocks of red-winged blackbirds rose as a vibrant dark cloud as they banked west to Antelope Island.

The island and the red-winged blackbirds have resided in my heart since childhood. My grandmother, a passionate birdwatcher, passed her love on to me. Encountering avocets and stilts for the first time was a wondrous secret. Watching birds replaced religion. Long-billed curlews and white-faced ibises, my high priests and priestesses.

Fazal and I stopped at the lake's edge to watch Wilson's phalaropes spinning in circles, creating columns of water rich in brine flies to eat. Half a million phalaropes come each fall. They are vulnerable, completely dependent on Great Salt Lake. Behind them was a sentence of avocets. Flocks of teals, green and blue-winged, flew over us.

Although Fazal and I were seeing many species, the numbers were few. We traveled northeast to the Bear River Migratory Bird Refuge, where 75,000 tundra swans normally gather in the fall, and we saw 11. A predictable world is another casualty in drought and climate chaos. We are navigating in constant disorientation.

**N**EAR Promontory Point, Great Salt Lake is in conversation with the Spiral Jetty. In 1970, the artist Robert Smithson set this piece of land art on the salt flats near the Golden Spike National Historical Park, where a century earlier the Transcontinental Railroad was completed. During the flood years in the 1980s and the years that followed, the spiral made of black basalt stones was submerged, resurfacing in salt crystals in 2002. It is a place of pilgrimage, a path to walk in a landscape of mirages.

In the center of the spiral, Fazal and I lay on our backs and closed our eyes, feeling a shared pulse as we held hands. Our minds slowed down to the pace of the vast spaces that encircled us and we became part of the Great Salt Lake Desert breathing. The world shifts when the heart is met with quiet.

From the Spiral Jetty, Fazal walked west with his camera; I walked south with my journal. The lake was now a mile away. Salt crystals brocaded the flats, reflecting prisms of light. Kettles of water created detours. I saw no pelicans, only stone cairns left by fellow pilgrims. At the edge of the lake, red water pooled like a blood letting: red water, bleeding into magenta becoming pink, color changes caused by halophiles, a Greek word meaning "salt-loving." Halophiles are one of the few microorganisms that can survive the extreme salinity, now at 27 percent in the North Arm of Great Salt Lake.

The malignant colors, shapes and smells eerily mirrored the imaging of my mother's late-stage cancer. I knelt to caress the water body of Great Salt Lake, my henna-painted hands now tattooed in intricate designs by the feathered bodies of dead brine shrimp.

On the surface of the lake, small waves broke toward shore, creating salt lines, but beneath the water's surface there appeared to be an undertow, an inner tide pulling water back toward the center.

If Great Salt Lake is in retreat, perhaps she is holding her breath, as do we who worry about her prognosis. To retreat, to withdraw momentarily to garner strength and perspective, can be a strategy. Retreat can be a conscious action: a period of time called for to pray and study quietly, to think carefully and regain one's composure. I have not thought about the retreat of Great Salt Lake as a position one could take: to commit to a different way of being, to change one's beliefs.

**R**ATTLESNAKES the size of a large man's arm inhabit the western shore of the lake. I find a shed skin of one wrapped around the gnarled branches of a greasewood and wear it as a necklace.

It's easy to get lost out here in the alkaline desert of big sage. It's squint-worthy country, covered with shattered glass and empty shotgun shells. We have seen no one.

In 1959, a 12-mile railroad trestle that crossed the lake was replaced by an earth-

en causeway that cut Great Salt Lake in two. Suddenly, there was the South Arm and the North Arm, but it was a fluid boundary, not fixed.

Mining companies extract nearly two million tons of minerals from the lake a year and the brine shrimp industry supplies 40 to 50 percent of the global demand for brine shrimp eggs. The brine shrimp industry has a history of behaving like cattle rustlers, with companies competing in the open water for "slicks" to corral the eggs.

In 2022, the South Arm was approaching the upper levels of salinity of what brine shrimp can tolerate. And so to stop saltier water from the lake's North Arm from flowing into the South Arm, Gov. Spencer Cox recently issued an executive order to raise a breach in the causeway by five feet, shutting off any flow between them.

Bonnie Baxter, a professor of biology and director of the Great Salt Lake Institute at Westminster College, said she saw raising the causeway as a "temporary measure to protect the life cycles of the shrimp and flies that will ultimately protect the birds in the South Arm, but it's a big experiment."

The risk is that changing the shape of the lake, and letting the wildest parts die, will compromise the pelicans at Gunnison Island and the health of the almost 350 species of birds that depend on Great Salt Lake.

A dying North Arm may also offer us a glimpse of the future: the collapse of an entire Great Salt Lake Desert ecosystem. Ben Abbott, an ecosystem ecologist and lead author of the B.Y.U. report, is opposed to creating a tourniquet across the North Arm. "This single act of raising the causeway and closing any flow between the two arms is sacrificing the North Arm to save the South Arm," he said.

Who will benefit long-term? The miners and brine shrimpers will continue to extract their profits from Great Salt Lake. But the elevated causeway is the first step to a smaller lake, and a vastly diminished world for the birds. As of now, there are no plans in place to lower the causeway and restore flow between the two arms in the future. This, in itself, could be a terminal decision for a terminal lake.

**F**AZAL and I scrambled up a rocky slope on Stansbury Island just in time to witness the sunset over Great Salt Lake. It is a local ritual. My mother would stop everything to step outside and applaud the sun slowly sinking into the lake. As Fazal and I watched in silence, I saw it as a burning metaphor for the state of the lake. The poet Rainer Maria Rilke's words returned to me: "For beauty is nothing but the beginning of terror." Darkness fell as we sat facing the lights of U.S. Magnesium LLC, where salts are mined for magnesium metal. The remoteness of the 80,000-acre operation has kept it largely out of the public eye — but the birds see it.

In 2009, the E.P.A. identified U.S. Magnesium as a Superfund site. The 4,525 acres on the edge of the lake, 40 miles west of Salt Lake City, was deemed a hazard to human health and the environment. Contaminants, including heavy metals, dioxins and PCBs, were found in sediments, waste pools, water and air. In 2021, the company was still cleaning up these environmental abuses under the oversight of the E.P.A.

Nearby, on the southwestern edge of the lake, Morton Salt has produced industrial and table salt for decades.

As a result of industrial waste, agricultural runoff and other processes, the lake's sediment now contains a host of pollutants, including arsenic, cadmium, mercury, nickel, chromium, lead and organic contaminants, the B.Y.U. report found.

How can we be surprised at the lake's critical condition? With its retreat, these poisons are transformed into deadly dust sitting on exposed lake bed.

In January, Hanna Saltzman, a pediatric physician and mother in Salt Lake City, wrote in *The Salt Lake Tribune* that as the lake retreats and the toxins on the lake bed are uncovered, "toxic dust storms could be catastrophic for children's health. Take lead, for example, one of the heavy metals found in the lake bed: Even the tiniest amount of lead poisoning can harm a child's brain."

Robert Paine is a pulmonologist and professor of medicine at the University of Utah who studies the impact of air quality on human health. He's most concerned about the effect of breathing in the tiny particulate matter in the lake bed dust known as PM 2.5. "We know that even a couple of days of higher exposure to PM 2.5 particles can have immediate health effects," he told me. "We also know that increased amounts of lake bed dust will add to accumulated exposure with long-term health effects." What we breathe in during these dust storms can trigger cardiovascular events from strokes to heart attacks to respiratory diseases such as asthma, pneumonia and lung cancer.

The laws of nature do not negotiate

with generations of abusive behavior. Our needs are overtaking the needs of Great Salt Lake at our own peril.

We have known this was coming.

In 1947, Dr. Walter P. Cottam, an esteemed professor of botany from the University of Utah, delivered the Reynolds Lecture to reflect on the 100th anniversary of the Mormon pioneers arriving in the Salt Lake Valley. "Is Utah Sahara Bound?" he asked. "To a public accustomed to the self-glorification expressed by the repeated boast that 'we have made the desert blossom as the rose'" he said, let's admit that "serious range and watershed problems do exist . . . and that we can do something about them."

This rebuke of Utah's poor agricultural practices and mismanagement of soil

## The Latter-day Saints church can change the lake's fate.

and water resources hastening desertification can now be read as prophetic. The desertification of the lake is happening, a fate that may echo the death of Owens Lake in California when it desiccated in 1926.

Fazal and I walked for miles along the shoreline of Bridger Bay, stepping between microbialites — reef-like formations that are usually covered by salt water. What remains are dry, calcified honeycombs void of life. In spite of what Fazal and I have seen on our circumambulation, we have been embraced by a great and peculiar beauty. Grace can inhabit the paradox of being present with the living and dying.

I made a bouquet of bones and left them for coyotes.

**I**N JANUARY, I walked a quarter-mile of the lake's edge stepping over and around dead eared grebe after dead eared grebe, rotting in the shallows. They are small, sturdy water birds with a sharp pointed beak, largely black with

pearlescent white bellies and a shock of gold feathers that radiate outward from the intensity of their red eyes.

We counted their bodies: 496 eared grebes were dead. There were so many more. We stopped counting. The stench was suffocating.

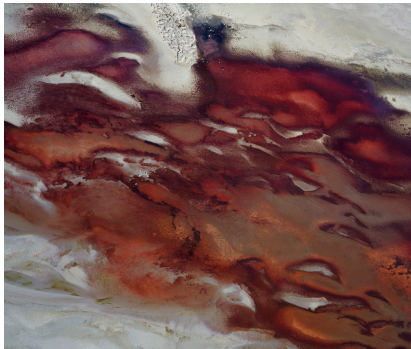
Each year, at least two million eared grebes, half of the North American population, come to the lake in the fall to molt. Each eared grebe eats from 25,000 to 30,000 brine shrimp a day. They, too, are dependent on a healthy lake. The dead we saw may have left Great Salt Lake later in the season than usual, their health weakened by the low lake level, and were slapped down by a winter storm.

Walking back the way we came, everything was blurred. Tears are made of salt water and we drank them. Grief is love, I kept repeating under my breath. Whatever I have come to know of love and grief I have learned from Great Salt Lake.

Protecting the life of Great Salt Lake is a moral imperative. "We can become a lakefacing people," as the poet Nan Seymour said to me. We know what needs to be done in the next five years.

Scientists tell us the lake needs an additional one million acre-feet per year to reverse its decline, increasing average stream flow to about 2.5 million acre-feet per year. A gradual refilling would begin. Two-thirds of the natural flow going into the lake is currently being diverted: 80 percent of that diversion by agriculture, 10 percent by industries and 10 percent by municipalities. Water conservation provides a map for how to live within our means. We can create water banks and budgets where we know how much water we have and how much water we spend. Public and private green turf can be retired. State and federal agencies must turn toward Indigenous leaders for traditional knowledge about watershed restoration and conservation.

But for Great Salt Lake to survive, we need to cut 30 to 50 percent of our water usage. The ecologist Ben Abbott's words return to me: "The Gospel of Overconsumption must end." We can compensate farmers who use water to grow alfalfa to



PHOTOGRAPHS BY FAZAL SHEIKH  
Halophiles, one of the few microorganisms that can survive the extreme salinity, have turned parts of the Great Salt Lake red.



Salt-encrusted mounds in the North Arm of the Great Salt Lake.



Part of the lake's hypersaline North Arm.





PHOTOGRAPHS BY FAZAL SHEIKH

Low water levels have stressed the reef-like mounds known as microbialites and threatened the lake's ecosystem.



Salt production on the shore of the lake.



U.S. Magnesium extracts magnesium from the lake's briny water.

feed cows in other states to fallow their fields during these critical years to support the lake's rise. We can demand a legally binding lake level within a healthy range of 4,200 feet or higher where Great Salt Lake can count on a sustained table of water that will benefit all species and cover 60 percent of the toxic dust. And most importantly, we must secure permanent legally binding water rights to replenish the lake.

"If we believe in the Western water doctrine of 'first in time, first in rights,' then the water law of prior appropriation says these water rights originally belonged to her as a sovereign body," said Mr. Abbott.

The Rights of Nature is now a global movement granting personhood to rivers, mountains and forests. In Ecuador, they have granted constitutional rights to Pachamama, Earth Mother.

In the United States, Lake Erie was granted personhood in 2019, allowing citizens to sue on behalf of the lake. Although this right was invalidated by a federal judge, this is the new frontier of granting legal status to a living world. Why not grant personhood rights to Great Salt Lake, which in 2021 was voted "Utahn of

the Year" in The Salt Lake Tribune? This is not a radical but a rational response to an increasingly wounded Earth.

Senator Mitt Romney may not be ready to advocate personhood, but he has acknowledged the crisis and helped Congress pass the Great Salt Lake Recovery Act, which will bring millions of dollars home to support the lake.

The Utah Legislature recently finished a 45-day session without passing the most meaningful legislation for the lake, including a nonbinding resolution that would have created a target lake level of 4,198 feet. The bill never even made it out of committee. One reason the Legislature was so cowardly this session was that the "water buffaloes" and their lobbyists, who favor water storage projects and pipelines over conservation, pulled the strings of the local lawmakers like puppets, said Zachary Frankel, executive director of Utah Rivers Council.

On March 1, a reporter asked State Senator Scott Sandall why no bills had passed to replenish the lake. "Mother Nature really helped us out," said Mr. Sandall, a rancher and farmer. "We are going to see a really nice runoff in the lake" with the

above-average snowpack this year.

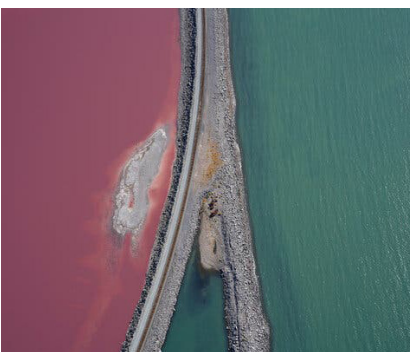
What he didn't say is that very little, if any, of that runoff will find its way into Great Salt Lake. The water has already been earmarked, mostly for agriculture. One high water year does not solve decades of overconsumption.

But moral leadership comes from many directions. Within the state of Utah, Latterday Saints is a nexus of power, some of it hidden. It has moral authority and political sway.

On March 15, the Utah Department of Natural Resources announced that the church, which holds significant water rights within the Salt Lake watershed, was donating 5,700 water shares, or about 20,000 acre feet of water, permanently to Great Salt Lake. This is a significant gesture that hopefully will inspire other private donations of water rights to be managed by the Great Salt Lake Watershed Enhancement Trust, established by the State Legislature in 2022 in partnership with the Nature Conservancy and the National Audubon Society.

But it is not enough.

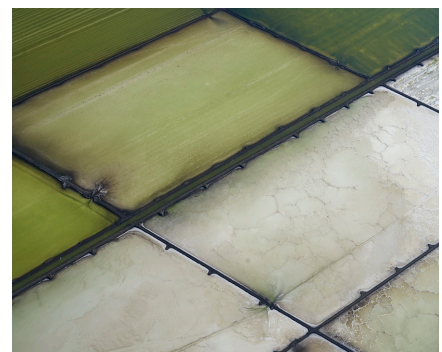
Brigham Young's vision of roses in the desert needs a radical correction. The eco-



An earthen causeway blocks the flow of water between the North and South Arms of the lake. Salt-loving microorganisms called halophiles thrive in the saltier water of the North Arm, giving it its pink hue.



Low lake levels and increasing salinity threaten the brine shrimp and brine flies that feed migrating birds.



Evaporation ponds near the Bear River Migratory Bird Refuge.



logical, economic and human health along the Wasatch Front is at stake. Our toxic legacy is being written on our bodies.

The Latter-day Saints president, Russell M. Nelson, the current prophet, has devoted much of his life to saving lives as a cardiac surgeon. But we do not need a revelation to save the life of Great Salt Lake. We need an immediate churchwide call for conservation to deliver urgent care to the lake and protect the health of those of us living in the heart of Mormon Country.

This is where I place my faith — in our collective capacity to mobilize love. If we can shift our view of Great Salt Lake from a lake to be avoided to a lake we cherish; from a body of wasted water to an ancient body of wisdom; not to exploit, dam, and dike, but to honor and respect as a sovereign body, our relationship and actions toward the lake will be transformative.

The artist Alfred Lambourne was keep-

ing his own vigil at Great Salt Lake from the vantage point of his homestead on Gunnison Island in 1895. In his book “Our Inland Sea: The Story of a Homestead,”



PHOTOGRAPH BY FAZAL SHEIKH

Lee Creek, which feeds into Great Salt Lake on its south shore.

he wrote, “History must be rewritten. With a wider view, we must grasp the deeper law.”

A wider view restores the lake to health. A deeper law is exhorting us to change, so she can flourish as she has done for centuries.

The Mother Lake is an oracle who has brought us to this place of revelations; she is offering us a gift of prophecy if we will humble ourselves, kneel at her receding shores and listen.

A few weeks ago, I returned to Great Salt Lake. The sunrise cast a silver sheen on blue waters still laced with ice. A coyote hunted along frozen edges with a focus forward. Sweet murmurings of pintails and shovelers numbering tens of thousands became an exuberance — an ecstatic reminder of what I still trust, the return of birds with millions more on their way.

It was also a haunting of all we stand to lose.