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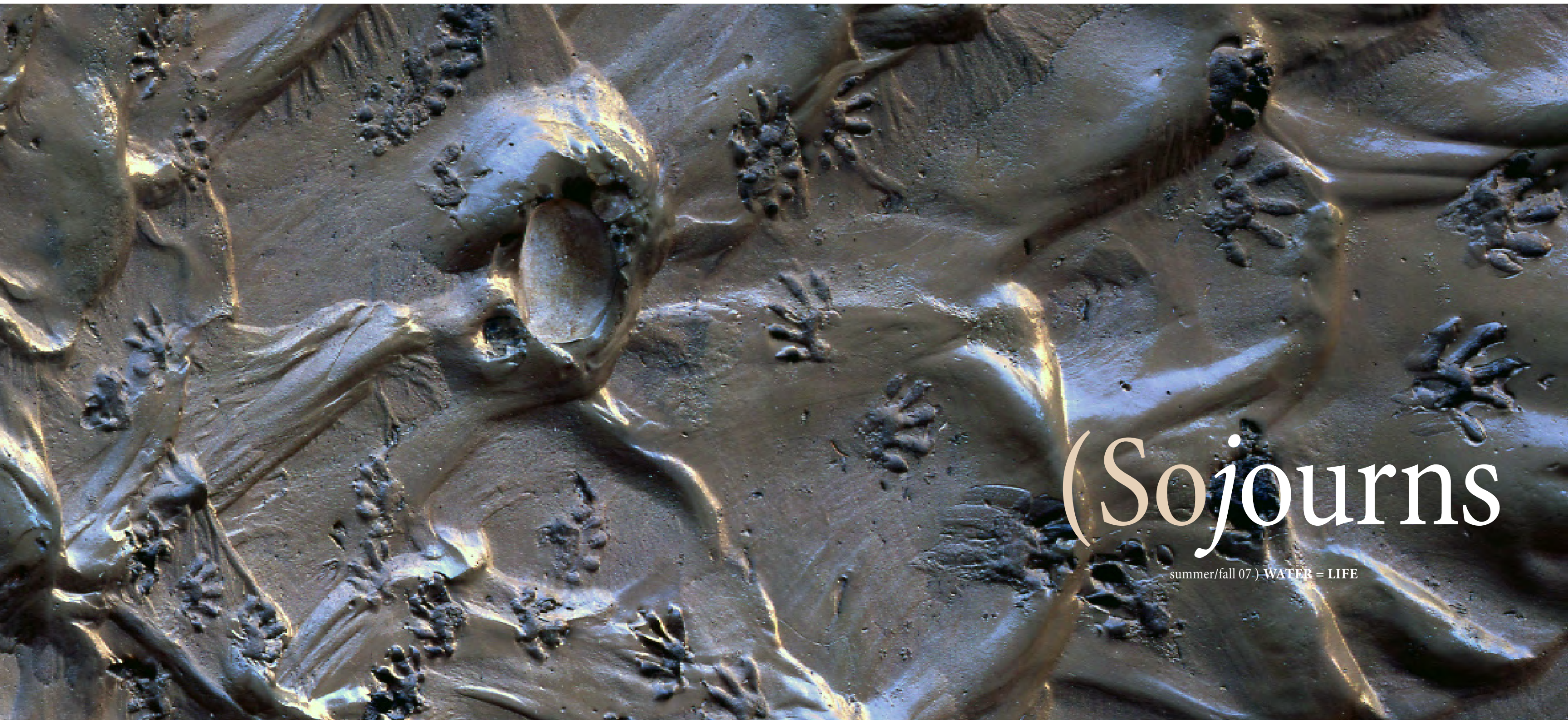
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(Sojourns

summer/fall 07) WATER = LIFE



"Oh, Male God! . . . With the far darkness made of the she-rain over your head, come to us soaring. With the zigzag lightning flung out on high over your head, come to us soaring. With the rainbow hanging high over your head, come to us soaring. With the far darkness made of the dark cloud on the ends of your wings, come to us soaring With the darkness on the earth, come to us."

Washington Mathews

"Is it not of great significance that the world of stars permeates all movements of water, that water infuses all earthly life with the events of the cosmos, that all life processes are through water intimately connected with the course of the stars? . . . Thus water becomes an image of the stream of time itself, permeated with the rhythms of the starry world. All the creatures of the earth live in this stream of time, it flows within them, and, as long as it flows, sustains them in the stream of life." Theodore Schwenk

"Spider Woman instructed the Navajo women how to weave on a loom which Spider Man told them how to make. The crosspoles were made of sky and earth cords, the warp sticks of sunrays, the heddles of rock crystal and sheet lightning. The batten was a sun halo, white shell made the comb. There were four spindles: one a stick of zigzag lightning with a whorl of camel coal; one a stick of flash lightning with a whorl of turquoise; a third had a stick of sheet lightning with a whorl of abalone; a rain streamer formed the stick of the fourth, and its whorl was white shell." Navajo legend

CAROL HARALSON

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Water, food, and sex. Of the three, it is water we suffer most quickly for lack of, and perhaps can do least about. But the three pillars of survival are inseparably connected psychologically as well as biologically.

The connection between rain and your dinner plate is obvious. The connection between water and progenerative activities may be less so, but humans apparently have felt it across widely diverse cultures and eras. In an epistle that must have shocked his proper East Coast sponsors, the nineteenth-century anthropologist Frank Hamilton Cushing, who lived for years among the Zuni, remarked that they regarded the shape of their ceramic canteens as similar to that of the female breast, a maternal signifier honoring water as the source of life. Fast forward to a twenty-first-century online dating profile for an updated, if less spiritual, reverberation of this connection: "single white female, likes walking in the rain."

IN MOAB FOR A PPCA MEETING, I happened on a little cafe called Breakfast at Tiffany's across from the visitor's center. The name is a wordplay on the title of a film released by Paramount Pictures in 1961, and a video of the film played silently on a TV screen on a high corner shelf above decorative vintage milk bottles and ceramic chickens. My eggs and toast arrived simultaneously with the climactic scene in which Audrey Hepburn finally falls for the boy next door, in this case a struggling young writer from the apartment one floor down, while both are looking for a stray cat in a back alley in New York City in the pounding rain. Pretense is cleansed away, the past washed clean. In some odd way, the star of that scene is rain, which, either synchronistically or through some form of sympathetic magic, had just begun falling in the silvery Utah light outside the cafe windows. It was about the water. City or country, it's the same. How many hearts have been lifted or broken by something other than the liquid scenery while rafting the Colorado River?

A raindrop falls into a clear pool (facing); raindrop on leaf. Photos by Elena Miras.

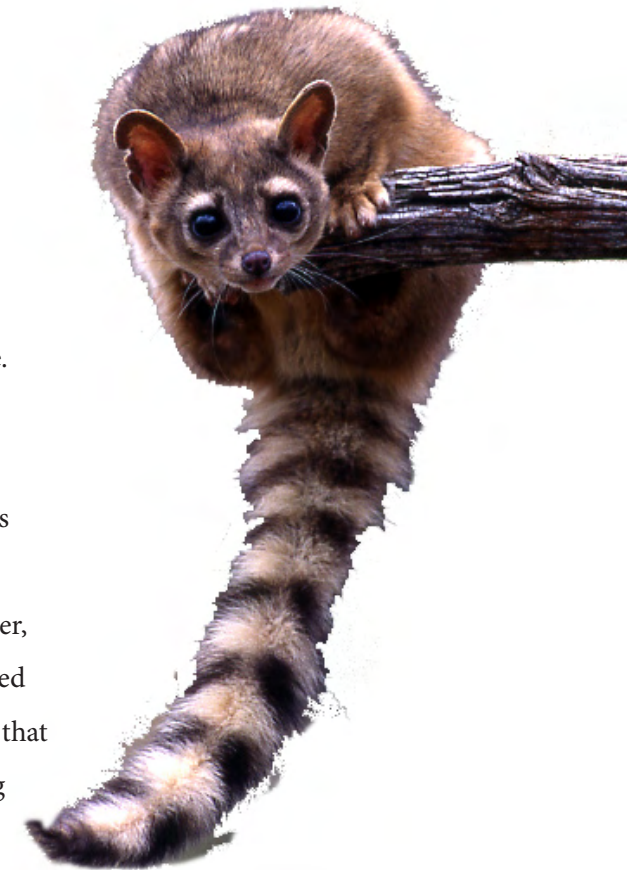


BY SOPHIE A. H. OSBORN

Wildlife and Water in the Wild

I had to be hallucinating. That was the most logical explanation for the bizarre sight that met my eyes while walking in the desert one achingly hot spring day several years ago. Plants and rocks shimmered in the heat waves that danced over the arid landscape. Northern Arizona's glorious Vermilion Cliffs loomed in the background, threatening to crack under the searing sun. In the foreground, a silky sheet of water beckoned. The scene was not unusual—I was accustomed to seeing mirages in the desert. What was unusual, however, was seeing several graceful American avocets strolling through this figment of water, their long bills curved delicately skyward. These were waterbirds. They belonged on a shoreline or marsh. As I approached, they shifted nervously, assuring me that this was no heat-induced vision. The avocets had been drawn to a shimmering patch of asphalt that must have looked like a watery oasis at the edge of a small desert outpost. The human footprint had altered an age-old landscape, confounding a creature that has long been attracted to watery rest stops during its migration over the Colorado Plateau. The avocets soon took flight, continuing their migratory journey and their search for a place to rest and refuel.

Throughout the Colorado Plateau, animals thrive in arid environments either because of their ability to find water or because of adaptations that allow them to do without. Water is scattered on the plateau in forms as varied as the habitats that cloak its basins and mountains, canyons and mesas. Whether in broadly flowing rivers or rain-filled cliff-top potholes, in high-elevation wetlands or trickling desert seeps, dryland water supports a wildly diverse complement of animals. It serves as a guide, provides refuge, gives sustenance, allows life.



SOPHIE OSBORN, an ecologist and biologist by training, was field manager for the Peregrine Fund's California Condor Restoration Project in Arizona for many years. She has pursued her wayward charges all over the Southwest, smiling with jubilation at the condors' successes and hurting for them in times of tragedy. Her first book, *Condors in Canyon Country*, was recently published by the Grand Canyon Association.

Facing: American avocet. Charles W. Melton.
Ringtail and sandhill crane. Photos by Michael H. Francis.



: PORTFOLIO :

NARRATED BY CHRISTA SADLER

Water giveth and water taketh away. This, in a nutshell, is the story of water's relationship to the landscapes of the Colorado Plateau—of the whole planet, really: deposition and erosion, erosion and deposition. While wind and ice are effective eroders, transporters, and depositors, water does the lion's share of the moving, carving, and weathering of the land's modern surface. On the semi-arid Colorado Plateau, this process is simply more blatant than in many other regions, since the surface lacks the usual green skin of plant cover to hide and protect the land. In fact, the plateau has the ideal climate for erosion by water: not enough moisture to encourage protective plant growth, and not so arid that there is too little water to do the work.

The Colorado Plateau is famous for having a greater number and diversity of erosion-al landforms than anywhere else on Earth. Its layer-cake strata were almost all deposited through the action of water, though wind played a significant role in creating several important and widespread layers such as the Navajo, Wingate, and Coconino sandstones. As ancient rivers carried eroded sediment from faraway sources, the boulders, gravel, sand, and mud rolled, bounced, and swirled along until the energy of the water was no longer capable of supporting such a load. On calm floodplains, in back eddies and mid-channel bars, in tidal flats and deltas, on the beaches and offshore in the tranquil ocean, the slowing water dropped its load—the sands, muds, and limestones that would be compacted and cemented into the varied and enduring layers of the plateau. These same dynamics, millions of years later, would ultimately carve and erode the improbable landscapes of today. The process is endless, as these layers are continually shaped by water from the sky, from the rivers, from ice, and from the mountain snows, carving into the past and carrying it into the future.

Water Shapes Land Shapes Water





The Kissing Pool

CRAIG CHILDS

It is water's absence that brings it to attention. In the desert, water is the sole element. . . . In the desert, there is no other wealth but water.

CRAIG CHILDS contributes regularly to National Public Radio's Morning Edition. He camps in the wilds of the American West several months of the year, usually living in the back of his truck, out of a river vessel, or from his backpack. His other books include *Crossing Paths: Uncommon Encounters with Animals in the Wild*, *The Secret Knowledge of Water*, and *House of Rain*.

Water and desert are the same word. The irony is inescapable. Meager springs and rainstorms rise and fall, bringing life and potential to the desert. Lines between oases become highways. Highways lead to cities. Dubai, Phoenix, and Jerusalem each stand at a crucial water juncture.

The flow is now dwindling, and in some places has stopped. Springs are drying up. Some of the largest freshwater lakes in the world are shrinking so fast they will be gone in twenty years or less. Whole fishing fleets lie beached in the sand where water receded faster than boats could be moved.

Nations have begun searching for water elsewhere, looking in cracks and holes around the globe. Audacious schemes have been plotted, towing icebergs to the Middle East, rerouting the Yukon toward California, alchemizing H₂O. Wells are being sunk to the lowest tiers of underground aquifers, draining water that has taken hundreds of thousands of years to collect. The list of our water endeavors rings an alarm. We are desperately clawing at the ground, trying to crack the planet open and drink out its last moisture.

This is what I want to do right now. Pick up a rock and crack it against the next, a sorcerer making water in the desert. But I am no sorcerer. I am a tired man in worn clothing, boot soles skinned smooth. Around me red desert canyons bake in noonday sun. There is no water here, and I know better than to waste time cracking stones open. They are as dry on the inside as they are on the outside, pure Permian sandstone eroded out of the cliffs of southeastern Utah.

I have been on a walkabout for several days, stretching from one water source to the next. My mouth feels as if it is home to a small, dusty animal, a desert pocketmouse curled on my tongue. I stop and drink the last of my water to wash out this taste of thirst. Bottle tilts up in a glaze of sun until it is empty. This is not the way it happens in movies; trembling hands, water dribbling across the lips of a man in a pith helmet, drops running down his dusty chest. No, you would not waste a single diamond of water in the desert. You would break open a stone and touch your tongue to it, hoping for moisture.

I am in no danger, though. I am backpacking for pure pleasure, following routes I've been using in the area for the last twenty years. I know there will be water ahead. A sweet, blue hole sits under a ledge where infrequent rainwater pours off. I've used it many times in the past, and it has never failed me. It is deep enough, shaded by an overhang, that it keeps its rain for at least ten months. A solitary cottonwood tree stands beside it like a proud flag.

Facing: North Creek, Zion National Park, Utah. Photo by David Muench.



Climate Change: A Conversation with Kelly Redmond

Sojourns talks with Kelly Redmond, deputy director and regional climatologist at the Western Regional Climate Center, about how climate change might affect life on the Colorado Plateau.



DR. KELLY REDMOND is interested in all facets of climate and climate behavior and has conducted studies on a broad range of climate-related topics. Although a scientist, Dr. Redmond recognizes the importance of helping non-scientists understand climate issues.

Lake Powell at Fifty Mile Canyon, a tributary of the Escalante River, May 2004. Gregory Natural Bridge, still submerged, penetrates a thin rock fin. Photo by Gary Ladd.

Q How would you describe the core concept referred to as “abrupt climate change”? Simply stated, describe in general terms what the fuss is all about.

A snail was recently going down the sidewalk. A turtle came out of the grass and assaulted the snail. A while later the police asked for a description of the assailant. “How should I know?” the snail cried. “It all happened so fast!”

What is gradual or abrupt has to be expressed in terms of the usual or expected rates of change. There is a dependency on the measuring stick. Almost by definition, we tend to consider the climate to consist of those facets of atmospheric behavior that remain relatively unchanged.

Long-term averages (say, thirty to one hundred years in duration or longer) seldom vary by more than a degree or so over many dozens or hundreds of successive periods. If a difference between two adjoining periods is larger than perhaps 95 or 99 percent of all such differences, we would probably call that change “abrupt.”

There is no universal definition of “abrupt” but the concept usually involves a large change over a short period of time, with “large” and “short” dependent on what has been experienced over many

prior intervals. The term “abrupt change” also implies that the change is not just a temporary fluctuation but lasts for at least several such intervals. (You might notice that all such definitions end up using other ill-defined words, like “temporary” and “fluctuation” and “several” and so on. There almost has to be a self-referential character to the explanation.)

“Abrupt” can also imply that plants and animals cannot change or move fast enough to adapt to the change in climate, and thus suffer losses in number or diversity.

Q How abrupt is “abrupt” when discussing global climate?

A rise or fall of decade-mean temperature of several degrees in a few years would be considered abrupt, though evidence exists in past records that such changes have occurred. But point of view comes into play here. A rise of several degrees in mean annual temperature during our lifetime would seem very slow and almost invisible to us, and even slower to a butterfly with a fifteen- to thirty-day life span, but viewed from a longer-term perspective (as witnessed for example by a thousand-year-old pine tree) this would be a very rapid transition.