

RARELY SEEN



AFRICAN MOON MOTH

These silk moths (*Bombyx mandarina*) live for only about a week, just long enough to find a mate. (Joseph Scheer)



NATIONAL
GEOGRAPHIC

RARELY SEEN

PHOTOGRAPHS OF THE EXTRAORDINARY

SUSAN TYLER HITCHCOCK

Foreword by
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SUPERCELL STORM CLOUD

An ominous storm cloud hovers over a field in eastern Colorado. While these stunning "mother ships" can spawn tornadoes, this one didn't.
(Marko Korosec, near Julesburg, Colorado)

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OPPOSITE: **JELLYFISH LAKE**

Jellyfish pulse in a saltwater lake off the coast of the Pacific island of Palau. Because they lack access to the ocean, millions of golden jellyfish migrate across the lake daily, following the trajectory of the sun. (*Nadia Aly, Palau*)



WHO, ME?

This barn owl gets a close up of its heart-shaped facial disk and spotted plumage. While widespread throughout the world, barn owls took a blow when land came under development in Great Britain. In 2013, there were fewer barn owls in Great Britain than at any time since agriculture became pervasive. *(Tim Flach)*



ULURU

A floating moon hovers above Uluru in central Australia. The sandstone rock, rising 1,132 feet (345 m) above the plain, was formed some 500 million years ago during the Cambrian period. Subsequent folding and uplift, followed by erosion, shaped this stunning monolith. *(Amy Toensing, Australia)*



FOREST ELEPHANT

This Andaman Island elephant is at home both walking through a tropical forest and swimming in the ocean. Elephants were brought over from mainland India to the islands in the 1880s. Elephants were taught to swim in the 1970s, then used to ferry logs between the islands. (Jody MacDonald, *Andaman Islands*)

PHENOMENA

IN THE GLOW

Bioluminescence gives a blue scalloped edge to the water at Jervis Bay, Australia. The watery, electric blue veil is caused by a chemical reaction of millions of dinoflagellates, which make the water shine.
(Joanne Paquette, Australia)



PHENOMENA



If a tree falls in the woods, does it make a sound if no one is there to hear it? Photography has an answer for that age-old question. In fact, extraordinary events happen in the natural world every day, whether or not anyone is watching. But once in a while, a photographer is there to capture it. The results are amazing.

The forces of nature pay no heed to our level of participation. Light, wind, water, rock, quake: These titanic players act upon a stage that is the universe itself, with or without human attention, let alone human intervention.

To some of these phenomena we have assigned names appropriately curious and delightful: haboob, murmuration, axolotl—all rarely seen, yet pictured on the pages that follow. But for others we have found no name at all, and so to denote them we turn to metaphor: fairy circle, deathstalker, chocolate hills, sailing rocks.

The spots on a ladybug, the teeth of a shark, the petals of a daisy, a snowflake's shape: We see, we count, we measure, we collect, we analyze and catalog. We think we understand, but really, our words and numbers only begin to tell the story.

Best just to marvel.

OPPOSITE: **RING AROUND THE SUN**

Sun dogs and an ice halo construct a scene of fleeting beauty above frozen waves of snow in the Grand Tetons, Wyoming. Ice crystals in the upper atmosphere create these stunning optics. The crystals refract and reflect light, creating sun dogs, which flank the central sun, and ice halos, which are circles around the sun. (Chip Phillips, Wyoming)



NATURE'S LAYER CAKE

Striking red sandstone combines with multihued mineral deposits to form a colorful layer cake in Zhangye Danxia Landform Geological Park. Uplift, weathering, and erosion shaped the land, while moving tectonic plates buckled the rock. *(Liu ChengCheng, Gansu Province, China)*



ICE FUMAROLE

An ice tower dwarfs a climber as it belches gas and smoke on the flanks of Antarctica's Mount Erebus. As heat carves out a cave on the volcano's slope, escaping steam immediately freezes in the air, building these knobby towers. *(George Steinmetz, Antarctica)*



TORNADO TOUCHDOWN

An EF4, the second strongest form of tornado, touches down in central Kansas. Traveling 7 miles (11.2 km) with three-second wind gusts topping 166 miles an hour (267 km/h) once it hit the ground, this twister luckily brought only menacing beauty to the wide-open plains. *(Lorraine Mahoney, Kansas)*



CROOKED FOREST

Pine trees bend at 90-degree angles in the Crooked Forest of Poland. Possibly manipulated by humans when they were saplings, approximately 400 trees bend—seemingly to the wind—in this small grove near the western town of Gryfino. (Adam Plucinski, Poland)



“In a remote part of Death Valley National Park, the Racetrack is the only place I know of where you can see the trails of boulders that have moved across the playa. It takes a special blend of wet, cold, and a gale for this to occur. Sadly, though, this pair is no more. I returned two years later and discovered that someone had stolen these stones and others. Take only photos. Leave only footprints.”



ERIK HARRISON

OPPOSITE: **SAILING STONES**

Sailing stones leave trails in the cracked mud of Racetrack Playa in Death Valley National Park. Moved by small pools of water formed by ice melted in the morning sun, these “sailing” stones have confounded viewers for years. (*Erik Harrison, Death Valley, California*)



PERITO MORENO GLACIER

A rare occurrence, a double rainbow, frames another: the Perito Moreno Glacier, one of a few in the world that is still growing. Its 200-foot-tall (60-m) face blocks a narrow channel in Lago Argentino and routinely calves blocks of ice into the frigid water. (*Hougaard Malan, Patagonia, Argentina*)



CAVE OF CRYSTALS

Glittering shafts of selenite stretch as long as 30 feet (9 m) inside the Cave of Crystals. Two brothers found this subterranean labyrinth in 2000 while drilling 1,000 feet (300 m) below ground. High humidity and scorching temperatures remained constant inside the cavern for millennia, creating the perfect conditions for these massive crystals to form. (Carsten Peter, Mexico)

“That winter’s [2011] weather was particularly favorable to creating these dramatic ice cracks.

Extreme temperature variations caused the lake to repeatedly thaw and refreeze, creating a spiderweb of cracks in various sizes and depths. The temperature was well below zero degrees Fahrenheit while I was shooting this sunrise.”



CHIP PHILLIPS

OPPOSITE: **ICE FORMATIONS**

Winter’s dance with the cold can be seen in cracks stretching toward the horizon on a lake in Canada’s Rocky Mountains. Repeated freezing and thawing create striking geometric patterns on the surface ice. *(Chip Phillips, Canadian Rockies)*





TWO HEADS ARE BETTER THAN ONE

Four eyes peer out from a yellow-striped shell, but it's no optical illusion—this turtle has two heads. Native to the central and eastern United States, the yellow-bellied slider turtle is threatened by habitat loss, pesticides, and heavy metal pollution. This one-in-a-million birth makes this turtle unusual. *(Joel Sartore)*



FOREVER YOUNG

Sporting feathery, frilled gills that emanate from its expansive head, the Mexican axolotl salamander retains its larval features throughout its adulthood. Axolotls live in the lakes of Xochimilco near Mexico City, Mexico. Popularity as both a pet and a delicacy has led to its critically endangered status. *(Stephen Dalton)*



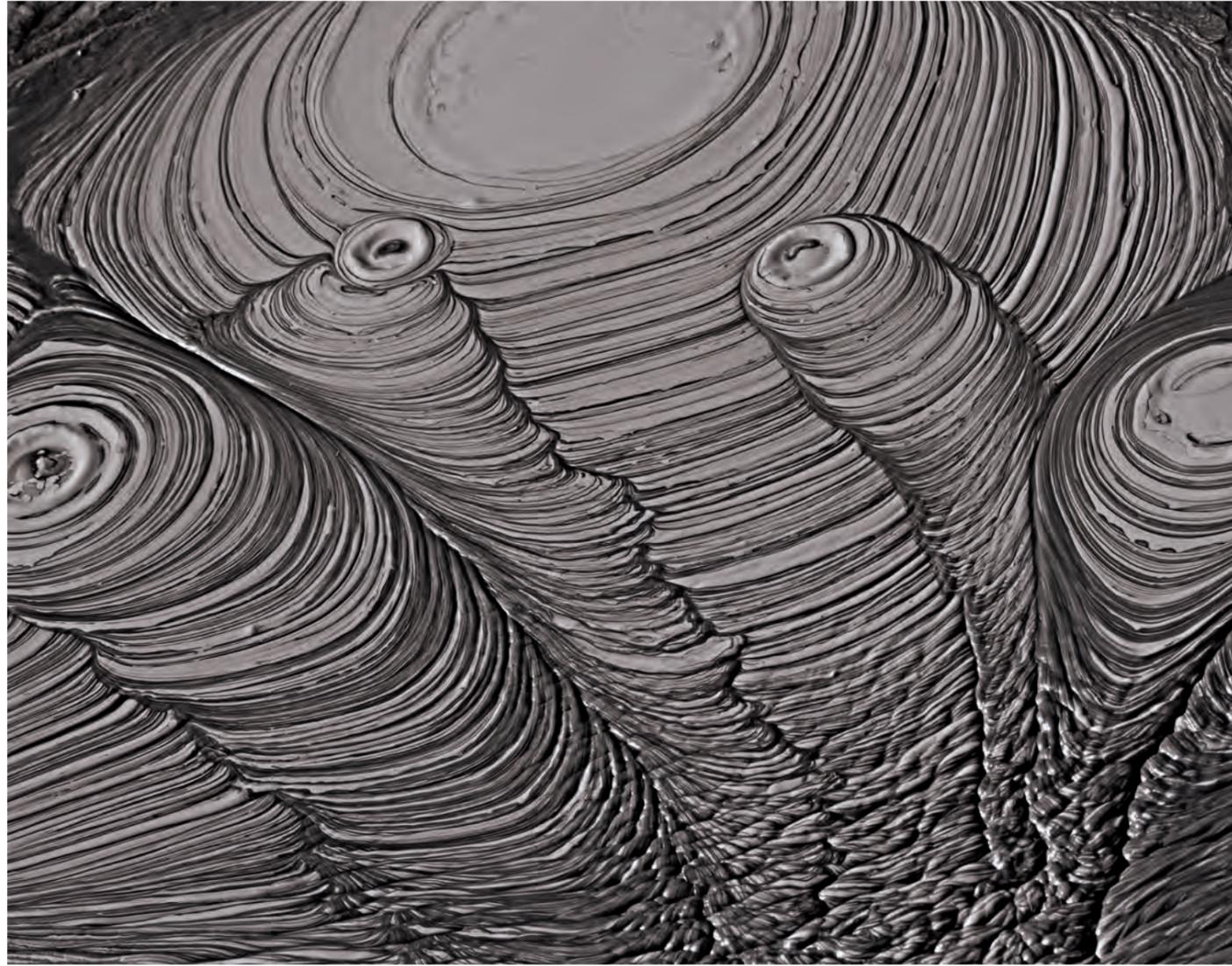
PURPLE HAZE

A rare carpet of purple flowers spreads toward a distant butte. Every few years, when winter snows and spring warmth create the ideal conditions, this stretch of the Mojave Desert bursts into color with bee plant and scorpion weed. The view is best enjoyed from a distance—bee plant has an unpleasant odor and scorpion weed is named for its bite, which can cause a reaction similar to poison ivy. (Guy Tal, Utah)



KING COLONY

A sea of king penguins (*Aptenodytes patagonicus*) stretch out to meet the hills on South Georgia Island in the southern Atlantic Ocean. King penguins, the second largest penguin species, congregate here starting in September. The aquatic birds form breeding colonies that can reach up to tens of thousands in number. (Frans Lanting, Antarctica)



BOILING MUD

A pool of bubbling mud in Russia's Uzon Caldera forms layered patterns in Kronotsky Zapovednik (a nature reserve) on the Kamchatka Peninsula. The volcanic region has at least 500 geothermal features, including the volcanic cone that collapsed some 40,000 years ago, leaving this caldera to bubble on. *(Michael Melford, Kamchatka Peninsula)*



PANCAKE ICE

A road forms a black ribbon, cutting through multisize blocks of floating ice on the Vistula River near the village of Kiezmark, Poland. The circular shapes—known as pancake ice—that fill the nearly frozen river form as smooth pieces of ice bump against each other and round off their sharp edges. *(Kacper Kowalski, Poland)*



CRIES OF NATURE

Lava, lightning, and ash make for a crucible of destruction at southern Japan's Sakurajima volcano. One of the most active on Earth, the volcano erupts in Kyushu with regular frequency. Some scientists think the phenomenon of volcanic lightning bolts serves to quench opposite electric charges. *(Martin Rietze, Japan)*



COLUMNS OF BASALT

Lit from within, basalt pillars line Fingal's Cave on the uninhabited island of Staffa, Scotland. These geometric features began as lava some 60 million years ago. Cracks formed after the lava solidified to create the hexagonal columns that range from 3 to 10 feet (1 to 3 m) wide within the 72-foot-tall (22-m) cave.

(Jim Richardson, Inner Hebrides)



GLOWING MUSHROOMS

Bioluminescent mushrooms stretch their glowing green stems away from the brown matter of a rotting log. A chemical reaction in the fungi produces this cold light. Although they are “on” all day, the show starts when they light up the night. Bioluminescence on land is rarer than at sea because most bioluminescent organisms call the oceans their home.
(Taylor F. Lockwood, Brazil)

“The Fly Geyser is an unlikely encounter in an arid area near Nevada’s Black Rock Desert, resembling some strange feature on an alien planet. I had the opportunity to study it at all times of the day; as the wind shifted the steam concealed and moistened some parts of the formation, while others temporarily dried up, constantly changing the appearance of the incredibly colorful algae-covered travertine. It is also so intriguing that it was people and a well drill that started the creation of this natural wonder.”



INGE JOHANSSON

OPPOSITE: **FLY GEYSER**

When an energy company drilled a well on this site some 40 years ago, the seal didn’t hold and Fly Geyser has been active ever since. Geothermal energy feeds the thermophilic algae to create this desert oasis. (Inge Johansson, Nevada)





FAIRY CIRCLES

Barren land sprouts within these circles dotting the ground of NamibRand Nature Reserve. Found along a 1,200-mile (1,900-km) stretch of land from Angola to Namibia, the structures are an enigma for scientists. One theory holds that as plants compete for water in these desert conditions, they self-organize into circular patterns. Others say condensation is the cause. (*Frans Lanting, Namibia*)



DOOR TO HELL

Burning like a solitary eye from the center of the Earth, it's thought that the 225-foot-wide (69-m) Darvaza Crater has been burning for more than 40 years. The story goes that this crater opened up and then at some point scientists lit the noxious gas. (Or at least, that's what the devil wants you to think.) (*Carolyn Drake, Turkmenistan*)



COTTON CASTLE

Water rich in calcium carbonate from thermal springs cascades over travertine-terraced pools in Pamukkale (which means "cotton castle" in Turkish), southwest Turkey. As the water falls down the cliff face and cools, the calcium precipitates out to form the white terraces of chalky rock. (Izzet Keribar, Turkey)



“I camped out, backpacking the Yukon’s Ogilvie mountain range for more than two weeks to make this capture in early winter as the lakes were freezing. For this image, I waited by the shore of the lake for three days hoping that these delicate ice formations would not crack or melt. Fortunately my luck held just long enough to make a unique capture of one of the area’s high cliffs.”



MARC ADAMUS

OPPOSITE: THE NORTHERN LIGHTS

The green glow of an aurora reflects off a frozen lakeshore in Canada’s Yukon Territory. In this composite image, the aurora shows off one of its most common colors. Electrically charged particles from the sun enter our atmosphere and interact with gases above the magnetic poles to form these rippling curtains of light. *(Marc Adamus, Canada)*



BOG MAN

Death came at the hands of a leather cord for prehistoric Tollund Man, a 2,300-year-old mummy found in 1950 in a Danish bog. The bog's lack of oxygen and antimicrobial soil naturally preserved the body, thought to be a sacrifice to the gods, after the man was hanged and carefully put to rest in the bog. *(Robert Clark, Silkeborg, Denmark)*



DANCING DUNES

The undulating sand dunes of Sossusvlei in the Namib Desert tower hundreds of feet above the ground below. Sossusvlei, which comes from a combination of Afrikaans and native Nama words meaning “dead-end marsh,” derives from its having no natural outlet for rains. The sands here have been sculpted by the wind for thousands of years. *(George Steinmetz, Namibia)*



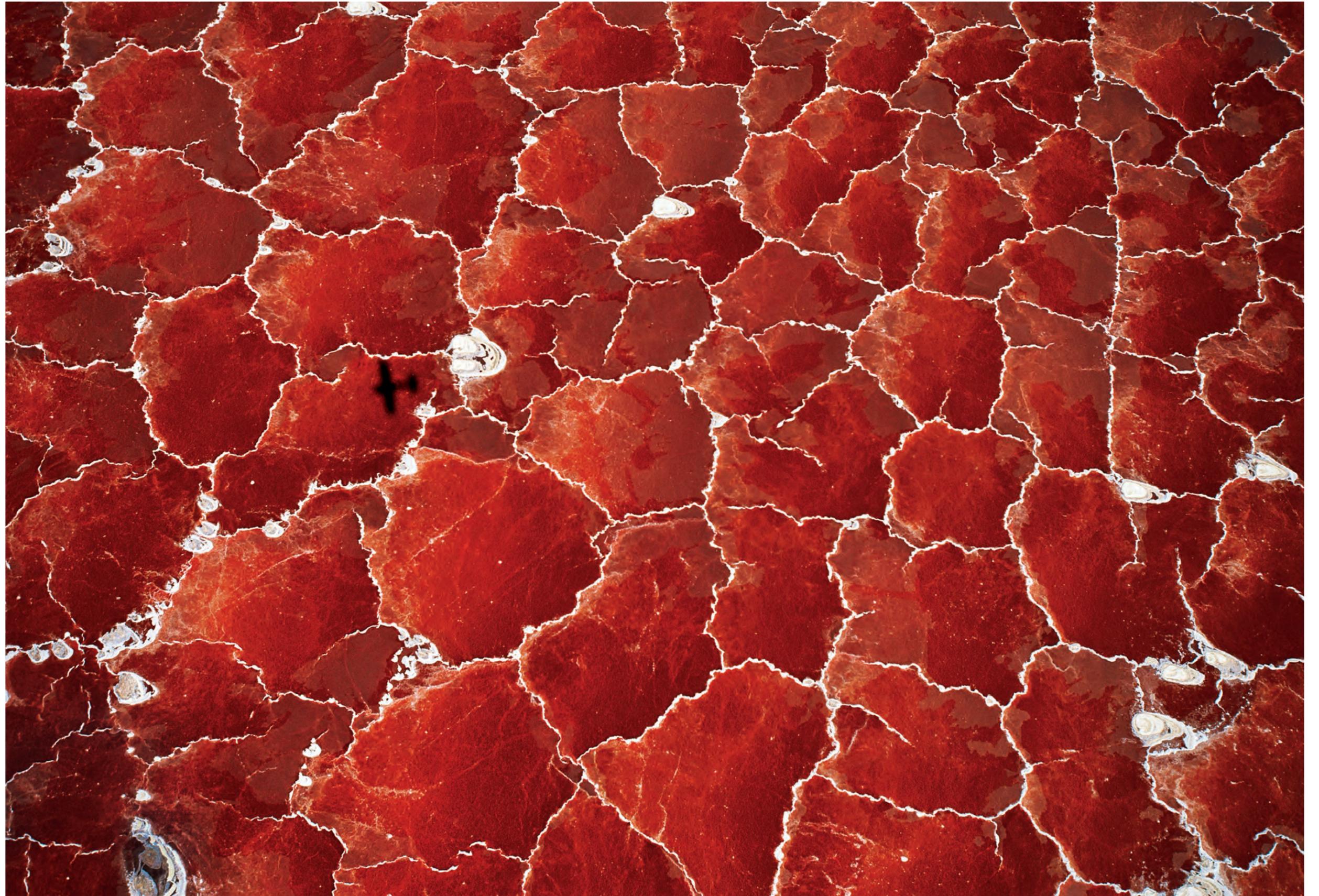
DUST STORM

The lights of Phoenix shine bright against an impending wall of dust and sand. In July 2011, this ominous storm reduced visibility to nil as a mile-high (1.6-km) wall of dust and sand enveloped the metro area. These severe sandstorms are also known as haboobs, from the Arabic word for "wind" or "blow." As cool air from a severe thunderstorm collapses, its momentum kicks up loose sand into sand storms. *(Daniel Bryant, Arizona)*



FROZEN ICE

A full moon stands guard over the St. Joseph North Pier Lighthouse in St. Joseph, Michigan. Crashing waves against the pier during the cold winter of 2013 built up layers of ice and created a frozen dreamscape on the shore of Lake Michigan. (Glenn Nagel, Michigan)



LAKE NATRON

The shadow of a plane shows the monumental scale of Lake Natron in Africa's Great Rift Valley, northern Tanzania. The salt lake—14 miles (22 km) wide—has an unusually high mineral content and extremely high alkalinity. During the dry season when the water begins to evaporate, salt-loving microorganisms thrive and a red-pigmented alkali salt crust forms on the surface. (George Steinmetz, Tanzania)



FRIGHT NIGHT

A yellow scorpion (also known as a deathstalker) glows green under a black light as it eats its dragonfly prey in the Negev desert of Israel. Although the scorpion is just a few inches long, its highly dangerous venom makes humans take notice. Scientists are not sure if the glow is an evolutionary adaptation or just an accidental occurrence with no evolutionary advantage. *(Uriel Sinai, Israel)*



BLUE LAVA

A center eye of red lava shines against blue flames from Ethiopia's Danakil Depression. As superheated sulfur gas escapes from the vent, it goes down one of two paths: hit oxygen and burst into flame or cool in the air and condense into liquid. In liquid form, the sulfur ignites with the other gases and creates an otherworldly blue glow. *(Olivier Grunewald, Ethiopia)*



TEMPORARY ISLAND

Waters surround Mont-Saint-Michel, on France's northern coast, submerging the causeway connecting the islet to the mainland. An infrequent "supertide" in the English Channel turned the famous Benedictine abbey, and the village below its grand walls, into an island. The tide occurs once every 18 years. (Associated Press, France)