

THESIS TITLE

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Fiction:

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by

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Vanishing Worlds

A Collection of Essays

By

Sam Keck Scott

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Author's Note:

The essays compiled in this collection are each meant to stand on their own. For this reason, due to occasional thematic overlap between the pieces, some minor instances of redundancy may be observed if read in succession. Thank you for your understanding.

maggie and milly and molly and may

maggie and milly and molly and may
went down to the beach(to play one day)

and maggie discovered a shell that sang
so sweetly she couldn't remember her troubles,and

milly befriended a stranded star
whose rays five languid fingers were;

and molly was chased by a horrible thing
which raced sideways while blowing bubbles:and

may came home with a smooth round stone
as small as a world and as large as alone.

For whatever we lose(like a you or a me)
it's always ourselves we find in the sea

-E.E. Cummings

The Fire Flowers of Malta

Part I

It was nighttime when my flight descended towards Malta, the small island-nation I'd be calling home for the next nine months. Pressing my face against the scratched, egg-shaped window, I saw a glittering jewel below, surrounded by a sea as dark as deep space. Somewhere beyond that black water were other lands, equally foreign to me— Tunisia to the west, Sicily due north, Libya south, and far to the east, the long bony finger of Crete. All part of the Mediterranean Basin where Malta sits in the center like a small limestone navel in a great big belly of saltwater.

As we taxied across the runway, green and purple fireworks popped silently in the distance. I winced. I hate fireworks. They remind me of the worst day of my life. But I didn't want to think about that right now.

I stepped out into the hot night air and was met with more bursts of light splashing across the sky like radioactive moon jellies. A salvo bellowing in the distance.

What the fuck, I whispered to myself. For the past six years I had purposely and successfully avoided seeing any fireworks after watching the Fourth of July celebrations from the sixth story of a hospital while holding the hand of my dying father. Now they were bombarding me from above, taunting me, and there was nowhere to hide.

"What's the occasion?" I asked my taxi man, sliding into the backseat of his car as colorful ripples blobbed across the airport parking lot.

"No occasion!" he shouted. "We just love the fireworks here in my country!"

How perfect, I thought, as red and gold flares crackled and spit off the hood of the cab. Winding across the island through the narrow, dimly-lit streets, past roundabouts pointing towards villages with names like Marsaxlokk, Xghajra, and Hal Ghaxaq, the barrage of fireworks never stopped.

I moved to Malta to fulfill an old promise to myself. My father was a marine biologist, and for as long as I can remember I'd dreamed of going to sea, just like he had done long before I was born, when he spent months aboard an old research vessel in the Galapagos Islands. Ever since I was kid, my imagination bloomed whenever I pictured him there.

Craggy islands piercing through turquoise water. Blue-footed boobies perched on the ship's railing. Giant tortoises ambling across lava shelves like nomadic boulders. And there he is, bearded and tan, drinking coffee from a metal cup while leafing through research books as big as ballast blocks. There he is, poring over a map of the archipelago; each of its four corners held down by glass jars filled with the specimens they'd collected along the way—leggy decapods, segmented marine worms, sea cucumbers mottling white in formaldehyde. There he is, leaning out over the metal railing at the end of a perfect day, watching the sun sink like a molten bead, smiling as he listens to his shipmates carrying on behind him. All of them too young and alive to ever die.

But he did die, and once he was gone my desire to go to sea felt more urgent. Something almost holy, like a pilgrimage of sorts. Whenever I imagined my future I always saw myself standing on the deck of a boat, surrounded by nothing but blue in every direction.

When I was 25 I was given the chance to make that dream come true. I met two people at a dinner party who head an environmental nonprofit called the Biosphere Foundation, a group dedicated to marine protection around Southeast Asia. Their names were Mark and Abigail, and when I met them they had just finalized the purchase of an old sailboat at a shipyard in Malta only three days earlier, which they planned to fix up and turn into a research and expedition vessel. The boat was 100 years old, encrusted in rust, and soggy with rot, and they were looking for a crew as crazy and starry-eyed as they were to help them make it seaworthy again, and eventually sail it to Singapore. I liked them both immediately, and could tell I was in the presence of two true adventurers, each with eyes the color of the ocean—Abigail’s a light sea green, and Mark’s an even lighter iceberg blue.

They figured the entire project should take about a year—eight or nine months fixing up the boat, and another three or four to sail first from Malta to Egypt, then through the Suez Canal, down the Red Sea, across the Indian Ocean, and finally into the Malacca Strait, a narrow shipping lane between Sumatra and the Malay Peninsula where Singapore sits at its southern end. The moment they told me of their plans, I knew it was what I’d been waiting for—my ticket to finally go to sea. Despite having no sailing or building experience, I convinced them right there and then to let me onto the crew, promising I was a quick learn.

Malta is a dry place, chalky and parched, and a repentant one. The ornate domes and spires of the many Catholic cathedrals loom gothic and watchful over the crowded

streets below. From the bird's view, Malta is monochromatic—both the architecture and the land, with its scant vegetation, are the same weather-beaten, sandy yellow. You have to zoom in a bit to find the other colors on Malta's gamut; the many red and white flags flapping in the breeze; the bright luzzus—Malta's traditional fishing boats—which make a postcard wherever they go with their sharp, curving bows, and their long, sweeping lines of turquoise, blue, red, and green paint. Same goes for the city busses, which are canary yellow with tiger orange detailing.

The rest of Malta's colors only come out at night. I didn't know before moving there that Malta is famed for its firework displays. Whether to commemorate a feast, or during one of the many firework festivals, or for no reason at all, on nearly every night of the year, the black coat of sky above Malta wears a boutonnière of exploding light, illuminating everything below in flashes of amethyst, ruby, sapphire, and emerald.

I didn't always hate fireworks. As a kid, I couldn't wait for the Fourth of July. Couldn't wait to fill my saucer eyes with supernovae almost close enough to touch, with incandescent Koosh balls, and golden crackling torches twisting away from each other like squirming flagella. Couldn't wait for the grand finale—even though I knew it meant it would all be over soon. I wanted that full curtain of exploding light, to clap my hands over my ears from the thunder of it in a stupor of awe, and when it was over, to fall on the ground with the other kids, drunk on light.

But that all changed the night of July 4th, 2003 when I watched the fireworks from San Francisco's California Pacific Medical Center. A 19-year-old kid holding the hand of his dying father, already lost in coma, who only that morning was still supposed to live. To live forever as far as I was concerned—I had never imagined a world where he

wasn't there. But then he was gone, not even a bruise of smoke in the night sky. And it all happened during the course of a single firework display.

After that night, I began avoiding fireworks like a dog. On the Fourth of July, I'd strap on a pack and hike as far away from the deliberate shellings as possible, returning only after being sure the coast was clear.

Those first few weeks in Malta, I spent my days crouched in the stripped-down hull, chipping old concrete to get to the corroded ballast blocks below. Balancing on the steel ribs of the whale-bellied boat, I could have been anywhere in the world. At least anywhere hot.

Finally, Captain Mark decided it was time for a day off. None of us had seen any of the island outside of the rusty Bezzina Shipyard. We took a daytrip to a village on the south side of the island to visit one of the many firework factories we'd been hearing about. Malta boasts 35 of them, which is a lot for a nation of only half a million people. For reference, at that ratio, New York City would have over 570 firework factories.

I didn't tell anyone in the crew about my aversion to fireworks. About how they reminded me of the last time I ever heard my dad's voice. About how simultaneously beautiful and cruel they looked that night as they exploded like wildflowers over Crissy Field. I didn't tell anyone because I hardly knew these people. I didn't tell anyone because they were a bunch of guys I worked with at a shipyard. I didn't tell anyone because I was trying to forget it myself.

The firework factory was perched high on a limestone bluff overlooking the flat sea below. Finally, the Mediterranean of my imagination—the ground white and glaring

with old olive trees surrounding the small stone factory, their trunks dripping like melted candlewax. The cloudless sky met the sea in a perfect line to the south, like a pair of pursed blue lips guarding the top of the African continent. If that blue mouth opened, the first thing to appear would be the green and white spires of the mosques of Tripoli—or so I imagined.

Sitting outside at a wooden table was an old Maltese man hunched over his work. Deep in concentration, he didn't look up as we approached. His hands were broad, the backs matted with thick black hair. His fingers—or what was left of them—worked deftly. He had no pinky on his left hand, only a pointy nub at the knuckle. On his right, he was missing the top two digits of his middle finger, and the top one of his ring. And yet, using the fingers he did have, he was still able to expertly roll the fireworks into tight little cylinders which he piled in a neat pyramid on the table where he worked. They looked like short, fat cigars packed with coal black tobacco, fine as flour.

“Don't smoke near there,” a young Maltese man told us, pointing with his lit cigarette to an old shipping container thirty feet away, its closed metal doors covered with overlapping red and white hazard stickers.

“There would be a crater to the seafloor if it caught fire!” he shouted, clearly proud of this fact.

As we toured the factory, I couldn't help but wonder: had I known I was moving to a tiny island where the people worship fireworks as much as they worship the pope, would I still have come? I wasn't sure.

But one thing was certain—there would be no escaping the fire flowers of Malta.

It wasn't supposed to be the last time I ever heard his voice. The doctors caught the cancer early and told us the surgery was a success and they expected a full recovery. They told us he'd be one of the lucky ones. When he returned to the hospital three weeks later with a swollen leg, none of us were worried. We never could have guessed on that Sunday he'd be gone by the next.

In the days leading up to the Fourth of July, my dad Henry had invited every nurse and doctor who had come within shouting distance to watch the fireworks from his room. "I have the best view in the whole city!" he boasted, twinkling them all with his kind eyes. Everyone agreed that he had the room of all rooms, and assured him they'd be there if they could.

On the morning of July 4th, 2003, I was a 19-year-old kid with no idea what death actually meant. No idea how quickly this world could take something away. On that ordinary morning, I never could have imagined that only a few months later I'd sit alone on the rim of a canyon in Arizona holding a glass jar filled with ashes—a wild animal wounded with grief—turning them over and over in my hands, as I watched what was left of his body sift and settle like crushed bits of seafloor fossils. I could never have imagined that I would dump him into my palm. Rub him into my beard. Eat him. Crunch him between my teeth and swallow his dry, chalky remains into my still wet, living body. That I would slap white hand prints of him across my bare chest while I screamed and cried and drooled until together we became a paste that I mixed into the red soil with clawed fingers ripping at the earth.

On the morning of July 4th, 2003, I took the elevator to the sixth floor of the hospital with my mom, who had been divorced from my dad for over sixteen years, but

remained a lifelong friend. We were coming to visit, to say hi, to check up on him like we had the day before. He had been in the hospital for five days, and despite a puzzlingly high white blood cell count, we were still ignorant to the truth of his metastasis—in his bones, in his lungs, in every major organ.

We got off the elevator and there was my uncle, my dad’s younger brother Tom, wearing a look on his face like none I had ever seen before—grim and reaping.

“Everything okay, T?” my mom asked him, instinctively putting an arm out in front of my body the way she does whenever she brakes the car while I’m in the passenger seat.

“The doctors told us this morning that Henry is going to die,” he blurted. “It’ll be days not hours, but *days*, not weeks.”

Two sentences. My uncle’s words and the truth they carried slammed across my body like a rogue wave, pulling me under. Saltwater filled my nose and eyes and mouth until I could barely breathe. My mom gathered me up in her arms, shuffling me into some empty waiting area away away away from the harshness of the words that tore my world in half. My world, which I had just learned was as thin as tracing paper. And always had been.

When we finally entered his room, my dad lay in his hospital bed, surrounded by our family. He took one look at my blood-choked eyes, my quaking lip, and winced and looked away. Then just as quickly he turned back to me and shot me with a smile. “Fix that face, Sammy.”

I wanted to ask everyone to leave. I wanted to suggest we all have a moment of privacy with him. But I didn’t ask. And in the face of that kind of impossible truth, we all

just sat around with him and made small talk, told harmless jokes, fulfilled that human inclination to stick chewing gum into the cracks of a fracturing dam.

He was still telling everyone who came into his room that day to come back at 9:30pm for the fireworks. Still charming all the nurses. Still asking us if we'd gotten enough to eat. If we had enough money for the parking meters. At one point, he wrote my stepmom Carol a check to help her with her moving costs now that she'd be heading back to New York. She was only living in California to be with him. He was doing what he had always done—taking care of us. But he was no longer one of us. He was already in a place beyond, knowing that these moments of lucidity were his last—a tiny window of time to put a few final earthly things into motion. And all the plans he was making were for others. It was Friday morning. He would be gone before first light on Sunday.

That afternoon he asked for morphine on drip to help with the pain of a cancer that was spiderwebbing and wildfiring throughout his insides. Can't blame him for that. But I wonder if he would have asked for it had he known it would settle him immediately into a sleep he'd never wake from. I wonder if he would have asked for it if he had known he'd miss the fireworks, only a few hours out.

That evening, the sun fell and twilight settled over the San Francisco Bay, leaving the faint outlines of Mount Tamalpais and the Golden Gate Bridge etched black against a Berber blue sky—a vestige of apricot lingering at the horizon. My dad's mouth was wide open, his breathing loud, but not a snore—it sounded like a great emptying, like the exhales were coming from a very finite place.

There were over a dozen of us gathered around his bed, including the three women he had married in his life, and all six of his children. A few nurses arrived,

fulfilling their invitation. They smiled at us politely, solemnly, and stood out of the way against the back wall. As promised, the show began—a few big splotches of color clumsied out across the sky before the display found its tempo, lighting up the water beneath it, turning Alcatraz into an oversized barnacle in the flashing coruscations. I held my dad’s big, warm hand; my eyes reflecting a parade of light; a garden of fleeting anemones; a prismatic bonfire tearing apart the darkness, ushering us all from one lifetime into another.

If my life were a book, these fireworks would be the last words before turning the page to: “Part II.” If my father’s life were a book, these fireworks would have been the final stanza leading to the words: “The End.” And how fitting really. How fitting for a man who led a life governed by love. Who raised six kind children. Who was a marine biologist and a dean of students and the first deputy director of the Peace Corps in Ethiopia. Who treated children like they might teach him something, which meant they always did. Who once found an orphaned river otter pup and let him live in the bathtub for two years. How fitting that such a resplendent life would be sent off with such a resplendent salute.

The fire flowers burst with the rhythm of a concerto, each streamer a rising note—some gently curling into crimson flutes, others erupting into gongs of lilac, and in the foreground the constant, diminutive tinkling of golden piano keys. His deep exhales labored through the room, louder than the far-off bombs. I tightened my grip on his hand as the rhythm left the show and chaos broke loose over the bay. The grand finale—meaning it would all be over soon. An operatic fracas of auroras bursting one on top of another in a kaleidoscopic free-for-all. Now other noises besides his breathing and the

distant cannonade—now a room full of sobs, all of us watching the light through lenses distorted by salt water; all of us mesmerized by the show and terrified for it to end. And then it did end. And we were forced to inhabit that hospital room again. The nurses slipped out as my family stood around his bed quietly shaking, blowing our noses, holding each other. With my face buried into my mom’s shoulder I remember thinking that a roomful of crying people sounds oddly similar to a roomful of laughter.

Before leaving, I leaned over my dad and kissed him on his forehead. To my great surprise, he forced out two words from some deep beyond in a hoarse whisper without ever opening his eyes. Well, one word actually, spoken twice. It’s how he had always said goodnight to me, and they were the last words I would ever hear him speak.

“Night. Night.”

Part II

During World War II, there was no country more heavily bombed than Malta. The Germans and Italians dropped over 14,000 bombs above a country ten times smaller than the state of Rhode Island, killing 1,500 Maltese citizens. Still a British colony at the time, Malta’s strategic location made the perfect base to stage attacks on Axis ships carrying supplies between Europe and the new front in North Africa. The thinking had long been that whomever controlled Malta controlled the Mediterranean, so for nearly two and a half years, from June 1940 until November 1942, the Axis forces ran a ceaseless bombing campaign over Malta, day and night. But Malta never fell. The entire populace was later awarded the George Cross for their heroism—the highest honor given to citizens by the British Empire. In December 1943, FDR arrived in Malta to present its citizens with a

scroll, thanking them for their heroism. Part of that scroll reads: "Under repeated fire from the skies, Malta stood alone and unafraid in the centre of the sea, one tiny bright flame in the darkness – a beacon of hope for the clearer days which have come."

Learning this, I couldn't understand why a country that once endured an historic number of bombings would willfully fill their skies with explosions nearly every night of the year. It seemed cruel, masochistic even. As I was settling into my new life in Malta I was often caught off guard by the fireworks, wincing at my association to them, and would think: *For fuck's sake, Malta, for both my trauma and yours, can we cool it on the goddamned fireworks?*

Fireworks have been part of Malta's traditions and history for hundreds of years, dating back to the Order of the Knights of St. John, who ruled Malta from the 16th to 18th centuries, celebrating their feasts with rudimentary pyrotechnic displays. Fireworks are part of Malta's identity, and reflect its people well—celebratory and devoted to beauty, just like my dad, who would have loved it here. The many firework factories that dot the island are all volunteer-run, and the expensive displays each village puts on during the festa season each year are paid for exclusively by local fundraising. The fire flowers of Malta are a labor of love.

I wonder if the people ever considered quitting their firework habit after the horrific bombings of World War II? The sounds of the explosions must have terrified them at first, sent them running for cover with nowhere to hide, remembering loved ones who had died while fire rained down from the skies above. It wasn't until years after I had lived in Malta that I first learned about the concept of exposure therapy—where a traumatized patient agrees to be continuously re-exposed to innocuous stimuli which

triggers memories of their trauma in a safe and controlled environment. Often something as simple as a smell or sound is enough to trigger a response, but when done in a safe setting, new associations can be made, diluting the reaction that once would have sent the patient into a PTSD response, instead transforming it into something more manageable. Something they can live with.

As the months wore on I got used to them. I went for a lot of walks in the evenings after our long days working on the boat. I'd wander along the waterfront, past the brightly painted luzzus, and stop to drink a beer at an outdoor café while everything went pastel at dusk. As night roosted down over the Mediterranean, I'd begin my walk back to the boat. Nearly every evening as I strolled along the dimly lit promenade, a luminous pompon would surprise the air above me. And then another. Umbels of phosphorescent Queen Anne's lace would crackle out across the heavens and I'd stop and let them fill my eyes.

After a few months of constant exposure, they began to look beautiful to me again. Like hand-rolled poems sent skywards for no other reason than to make people stop, smile, shout, gasp. To make them forget whatever it is that troubles them, if only for a moment—or in my case, to make me remember, and realize I was actually ready to.

I've thought often of the old Maltese man hand-rolling those fireworks at the factory that day. One of Malta's devoted sky poets, writing in potassium nitrate, charcoal, and sulfur, rolling poem after poem, his broken hands making a neat pile of future enjoyment for his people.

The bombs above our cities belong to us now

They're lovely and harm no one

*They bring joy to children
and make businessmen look up to the sky
They help those who remember to move on—
to learn to no longer jump at every sound
It's only the fireworks
Only the fireworks
The beautiful, beautiful fireworks,
hand-rolled by our people*

Life itself seems a bit of a poet for leading me to Malta with its triggering, flowering skies. For reminding me that pain and beauty can come from the same place. That they can, in fact, be the same thing. Thanks to my time in Malta, I no longer hate fireworks. Now, whenever I see them, I still remember holding his hand on that awful night, but I also remember the greatest adventure of my life. One that began on a small limestone island in the Mediterranean Sea before taking me thousands of miles across the ocean.

My dad had a saying he liked to sprinkle into the conversation whenever anyone was taking themselves too seriously, or were overly fixated on something inconsequential. “You’re alive a second, dead a million years.” He’d often shout it, and always with a smile. It’s the only thing I ever heard him say about what he thinks may await us after we die, and it always made me imagine my lifetime as a brief explosion in an otherwise inky void. Perhaps that’s the final purpose of fireworks—to stand up to that big bully Death. To shake a fist at the void by throwing light into infinite darkness. We’re still here! If only for a second. We’re still here, made of this fleeting light, even while the

unknowable emptiness unspools all around us. Eventually taking each of us with it, one by one, back to wherever it is all this light gets made.

Red Sea Blue

As I inhale, the small pink balloons of my lungs swell up, causing me to lift a few inches from the sand—not into air, but water. As I exhale, a string of bubbles tickle up my face, growing into bulbous, cellophane jellyfish by the time they reach the surface. Lungs empty now, I settle back down, my weight sending pearls of white sand dancing away across the textured seafloor. I'm 60' below the surface of the Red Sea, sitting cross-legged in a world of blue.

The bottom of the sea is the only place to cool down here. The temperature at the surface is bathwater—a thicker, wetter version of the scorching air above. Not only do I have to go at least 60' down to cool off, but I have to wait nearly an hour before it happens. And I do, at least once a day, ever since we anchored off Yemen's Zubayr Archipelago to rest and make some repairs before entering the most dangerous stretch of the voyage through "Pirate Alley." This summer of 2010, the Gulf of Aden, between Yemen and Somalia, is making international news due to a spike in boat hijackings by Somali pirates. The pirates aren't looking for cargo, they want hostages, and we make the perfect target—ten people from wealthy countries, the U.S., France, and Belgium, in a slow, easy-to-board ship, with no weapons.

Holding the rubber regulator loosely between my teeth, I inhale as slowly as I can, sounding like Darth Vader in a mindful breathing class. I exhale even more slowly, but there's no stopping the rush these bubbles are in to get to the surface as they tumble upwards over each other, racing to the sky. Breathing like this, I can make my tank last an hour and 20 minutes, sometimes longer. It usually happens after about 30—a vague feeling of coolness sweeping across my body. 45 minutes, and my heat rash stops itching.

An hour in, and I'm almost chilly. By the end of the sit, goosebumps run up and down my arms and legs, and for a few short-lived moments, I'm eager to return to the inferno above.

Cooling off isn't the only reason I've been sitting on the bottom of the sea—it's also the only place to be alone here. It wasn't until my first sea-bottom-sit that I recognized how badly starved for solitude I'd become. It's been almost a year since I joined this crew of ten people, and I've scarcely had a moment to myself since. As soon as I could think about anything other than our freshwater tank levels, or cleaning the head, or pumping the bilge water from the bosun's locker, my mind seemed to empty, and I spent that first dive floating in some liminal place between worlds, away from the hot, crowded ship; the yelling captain; the over-masculine crew; the suppressed grief for my dead father that brought me here in the first place.

Sitting on the bottom of the sea was the most relaxed I'd been in months. Time seemed to stop down there. My nervous system loosened, coming unclenched. Empty thought bubbles opening like glass parachutes above my head.

But my thoughts wouldn't remain empty for long. Quieting my mind finally gave me the space I needed to revisit the confusing revelation my mother had shared with me right before I left California—about the real reason my parents had gotten a divorce when I was only two. It was a conversation I'd pushed deep down that was waiting for a quiet opportunity like this to find its way back to the surface.

The six countries that border the Red Sea are some of the hottest in the world—Sudan, Eritrea, Yemen, Saudi Arabia, Egypt, Djibouti—the names alone carry with them

images of yellow sand quavering beneath the glare of a white sun. But I can assure you, the sun is not white, and the sand is not yellow. A haboob is blowing east off the Sahara this summer—a dust storm of atmospheric proportions. For over three weeks, we've been covered in a red dust as fine as flour. The entire ship is coated in it, turning our off-white sails a firebrick red. It fills our galley drawers, hides the compass on the helm stand, and leaves a thin red film on the bilge water.

All of us have turned red as well. Our hair is red, our sweat runs red, the red dust is between our teeth, and in the corners of our eyes. The sky is an apocalypse, the dust turning the sun into a bloody orb, so dimmed by the particulates you can stare straight at it, even at high noon. The haboob acts like a great sooty quilt, trapping the heat of the day. I've taken to sleeping on the roof of the navigation deck, out in the open air with no blankets, but even so, every morning I wring a puddle of sweat from my bedsheet.

The seas have been a colossus ever since we entered the Red Sea three weeks ago. Any time a wave strikes just right against the stern of the ship, the entire steel hull vibrates like a tuning fork.

“That's the type of force that can break a weld,” our chief engineer remarked in the darkness one night where he lay nearby, also unable to sleep from the heat and endless motion. I lay wide-eyed, staring into the blank, black sky, where no starlight could filter through the haboob, listening for bilge alarms and the sound of flooding water.

Belowdecks is unbearable—a sauna where mold creeps up the walls in black archipelagos. We can't open the portholes lest they gulp water each time the boat pitches sideways, but it doesn't matter, there's no keeping the sea out—the teak deck of our old

ship is covered in soft spots, and the subfloor below it is rotten through, making it rain inside our cabins each time a wave crashes over the bow. Or, more accurately, each time the front of the boat cleaves straight down into a wall of blue, scooping hundreds of gallons of seawater onto the deck, which swooshes up and down the length of the ship for the next few minutes, before finally draining through the too-small scuppers below our too-small railing.

Captain Mark yells at whomever is steering each time it happens, as if it's avoidable, his huge frame stomping up and down the soaked deck in nothing but a Balinese sarong, pale gut round and glowing like a cheese wheel. When he takes his turn at the wheel he immediately floods the deck himself, and then is quieter than a tunicate when he does. The rest of us exchange smiles, but don't dare call him out. As the exhaustion of the past year has caught up with him, Captain Mark has grown more and more belligerent, something I had hoped wasn't possible. When not actively yelling at us, he's taken to muttering to himself, his glacier blue eyes filled with a mean, red anger. Thankfully, soon enough, he'll go nearly catatonic and spend the last month of the voyage locked in his cabin, leaving us blessedly captainless.

When I first joined this crew, Captain Mark was warm and effusive and all smiles. I saw him as a potential father figure—something I'm always keeping an eye out for since my dad died when I was 19. But it only took a few weeks of living with him before he showed his true colors and I learned he was the farthest thing imaginable from my dad, who was gentle, compassionate, patient—who cried if I disappointed him, and never yelled. Captain Mark is a verbal and emotional tyrant to everyone in his orbit, no matter how hard we work, or how much we do for him. He rules with his temper and makes

everyone around him live in constant fear of the 6'4", black-haired grenade rolling up and down the boat all day long.

After my first visit to the seafloor I couldn't wait to do it again the next day. Other members of the crew were using their time off to take the small boat out to explore the volcanic cluster of the uninhabited archipelago, but I opted to stay behind. Instead, putting on my scuba gear over nothing but swim trunks, I stepped off the stern with a splash, and slowly sank into the silent blue before landing gently on the sand, 60' below the bottom of the ship.

When I look straight up from my seat on the seafloor, inside this clean blue marble, I can still see the dirty, reddish tint to the air above, like a never-ending dusk. Even here, I'm breathing the haboob. The dive compressor on our ship has no option but to pull in that stained air, and I imagine the inside of my steel tank caked in a thin skin of compacted dust. As I slowly breathe the pressure from it, I picture the skin peeling off the walls like sunburn, falling to the round bottom where it gathers in the dark—a small pile of Saharan rose petals no one will ever see.

I take my flippers off and place them on the ground beside me, like you would your shoes at the beach. I only have them in case some unexpected current sluices up. Inhale, lift. Exhale, settle. I've never had the patience for meditation, but sitting down here feels like the closest I've come. I let my vision go soft. The water is crystalline, aquamarine; but there's nothing to focus on save for the scalloped sand stretching white and dreamlike in every direction. If I crane my head upwards I can see the silhouette of

the bottom of our boat swaying like a ghostly torpedo. Barely visible from where I sit rests the anchor, half-buried in the sand as if waiting in ambush, shark-like.

I think of my dad; how proud he'd be of me for coming on this trip. He was a marine biologist, and has always been synonymous with the ocean for me. So much so, that when I was a little kid I think I actually thought he was the sea. That the warm man who tucked me in at night became marine by day, dissolving into gleaming flickering endless blue as he carried me across the sand in the glossy morning light. He was big hands, silver hair, bushy eyebrows, voice of sweet syrup, but also, somehow, gasping prehistoric barnacles; bubble-mouthed crabs; and green anemones that grabbed at my small creaturely fingers like sticky flowers while I squealed with toddler rapture in his arms.

Not only was my father also the sea, but I think I thought that I was too, which meant I was also him. *We* were the string of pelicans festooned above the serpentine waves. *We* were the sharp cold of the briny surf. *We* tucked us in at night and slept so safe and so sound, dreaming ourselves a baby whale flying through a world of smooth blue glass and golden featherine light. Following our mother's song.

At some point, as I grew older, my reality was no longer a place where a father could also be an ocean, nor a son a father. There were boundaries now, differentiation, things to build an ego with. But when I was 19 years old something that felt impossible happened—he died, suddenly, my father who used to be the ocean who used to be me.

In the months afterwards, I found myself standing at the seashore every day, a teenage boy strangled by grief. Pulled to the sea as if by a moon. Staring out at the green galloping waves; at the pelicans skimming the curling surf with their beaks of ancient

stone. Watching the foam roll like sudsy tumbleweeds across the sand. Day after day, as I breathed in the heavy iodine stink of the nearby tide pools, my mind began to rearrange itself, and I stepped from one world back into another. A world where, in his physical absence, I think I thought he became the sea again. So I went looking for him. This is how I ended up on this boat. This is why I'm sitting on the bottom of the ocean.

What did I think I'd find down here? I'm not sure my magical thinking ever got that far, like a dog chasing a car who doesn't know what to do when it actually stops. Did I imagine he'd come walking out of the blue ripples across the white, water-crushed sand, still himself, in his body? If so, would he be wearing a normal outfit on the seafloor—slacks and a sweater? Would he be in swim trunks, perhaps? Scuba gear? I really don't know what I thought I'd find. I just knew the grief was too heavy to hold, and maybe if I went to sea he wouldn't feel so completely gone anymore.

I'm volunteering for an environmental NGO called the Planetary Coral Reef Foundation who fell on hard times after the ship they leased for their marine conservation work was suddenly taken back by its owner with no warning, leaving them without a seagoing vessel—the backbone of their organization. The reason we're in the Red Sea is because we're taking the Foundation's "new" boat Marilou back to headquarters in Singapore.

Captain Mark and his partner Abigail bought Marilou from a shipyard in Malta because it was the only boat they could afford—a 100-year-old Dutch ketch who looked every bit of those hundred years when we arrived to Malta last year to do a full retrofit.

The retrofit ended up being more like an exorcism. Marilou was about to be sold for scrap before we came along and worked six and sometimes seven days a week from sunup to sundown for nine months—cutting out nearly ten square meters of the corroded steel hull, rebuilding the two wooden masts that were rotten through, replacing the engine and propeller and hydraulic steering system which were all defunct, gutting the entire inside of the 114' ship down to its ribs before building it back from scratch. By the time we finally left Malta, broke and exhausted, we had no radar, no weatherfax, and couldn't fly the mainsail for fear it would rip the 113' mast from the rotten deck, which we hadn't had the time nor money to replace.

Mark and Abigail had spent every dime to their names, and called on every favor they'd stockpiled throughout their lives to afford it, and even so, we barely got that boat out of the shipyard where it hadn't taken long to learn that the people who sold it to them had never intended to let us leave Malta. The reason they had been able to afford Marilou is because the shipyard runs a racket where they sell defunct boats for a song, and then make the buyer pay exorbitant rates for every bit of work and storage the shipyard provides after the initial purchase. What they hadn't anticipated was a crew willing to do everything ourselves, but even so, the shipyard hit us with fee after fee until we nearly walked away on multiple occasions. The payment Mark and Abigail were offering us, their volunteers, for our hard work was the adventure of getting to sail Marilou from Malta to Singapore, over 6,000 nautical miles away. According to Captain Mark though, the real payment was all the scuba diving we'd get to do in the Red Sea.

Back on the seafloor, and again, I have the feeling of being in a liminal place—neither here nor there. An unborn place, perhaps—the water I’m gently rising and falling through with every breath feels more amniotic than ocean. Now my thoughts float to my mother, my original red sea. My inhalations are no longer my own, but someone else’s breathing entirely—huge pink lungs expanding all around me. The slow bubbles I exhale are the gurgle of intestines and the murmurs of other red-brown organs, swishing and swaying like soft corals and sea fans in her water body, where I too live, tethered to her alone and not yet the rest of this world. To be born, to make the jump from aquatic to terrestrial life, is to crawl out of the oceans of our mothers, mimicking our evolutionary ancestors of long ago as they crawled onto the shores of this world, rising to the surface, gasping for breath in a brand-new way.

Down here at the bottom of the sea, everything seemed to drift towards origins—towards my parents. The builders of my body. The people who got me here. The news I had forced down about their divorce suddenly rose like balsa to the surface of my mind, no longer able to be ignored. The abortion she hadn’t wanted that he had insisted she get. The younger brother or sister I would have had if only she had won the argument. The way he had used us kids to gang up on her and take his side. I hadn’t had time to process any of this new information before arriving to Malta, and kept it locked away once I was there, living in cramped quarters with a bunch of strangers in a Maltese shipyard. At sea, it’s even worse—a tiny, crowded island made of teak and turnbuckle where there’s always more to do, and never anywhere to hide, and a giant grenade bouncing up and down the rotten deck threatening to explode at the smallest provocation.

But now that I was alone, all I'd been suppressing revealed itself. There he was, the man I'd made into a myth after he died seven years ago. The man I had turned into a saint; who I refused to see as anything but perfect. Now, for the first time, there were cracks in my story of him, and I didn't know how to make sense of my biggest hero in this new flawed light. He was suddenly fallible, disappointing, at odds with everything else I thought I'd known about my dad.

The story had always gone that the reason my parents split up shortly after I was born was because their 23-year age difference had finally caught with them. That while my young mom was beginning her career as a midwife, my dad had decided to retire early at 58 after getting fired from his last job. He had been the executive director of an educational nonprofit and was terminated after siding with the students instead of the administration during a dispute. It wasn't the first time he had been fired for that very same offense in his career as an educator, being someone who valued progress and the fresh ideals of younger generations over decaying, harmful institutional norms. After retiring, he was depressed and aimless, while my mom had just found her calling working in childbirth, and was inspired and full of purpose and energy. The disparate places they each found themselves made their lives no longer congruous, and they decided to separate.

It wasn't until over 20 years after their divorce that I got the rest of the story when my older sister Chloe was getting divorced herself. My sister, brother, and I were all at our mom's house one night, supporting Chloe as she threw her world into turmoil, knowing it was what she needed to do to live the life she truly wanted. It was late, and we were in the dimly lit living room of my mom's drafty, wooden house. Chloe was crying,

knowing she was being painted as the villain by all their mutual friends, and her in-laws. How they all saw her ruining a perfectly good thing. And poor John; hadn't he always been so good to her? None of them cared that she'd been living a lie to stay in that relationship. That she had clipped her wings to fit into all of their pretty pictures of what her life should look like. We were all a little drunk, having moved from wine onto whisky, when my mom spoke.

"I was the villain too, when I divorced your dad," she told us. "Everyone thought I was crazy for leaving such a good man, and cruel for putting you kids through all that. Grammy still thinks so, and reminds me every chance she gets."

We were all silent, just watching her.

"No one knew why I actually did it."

She told us that everything we already knew was true enough, about their age difference and his depression, but there was another piece she had left out. Around the time I turned two, my mom had gotten pregnant again. She wanted to have the baby, but my dad had insisted they get an abortion. He was almost 60 at the time, with three young children, and three other grown ones from a previous marriage. He was done, finished, kaput. But she wanted that baby. She felt it growing inside of her like a small pearl of light, and she wanted to hold it there in the red sea of her body until that light coalesced into a child with a beating heart. But he won the argument, and she never forgave him for it.

"It was my second abortion," she told us. "The first was after the very first time your father and I ever had sex, when he took my virginity, and the second was after the very last time your father and I ever had sex."

My family is staunchly pro-choice, so there was no anti-abortion sentiment present in the room. But there was a feeling of being anti-*this* abortion. We all felt it, because our mother, the carrier of this embryo, did not choose it. And though our father had a strong case for why he was finished having kids, he still ended a life that was wanted by its mother, where it lived, tethered to her alone and not yet the rest of this world.

Was I the only one who suddenly felt the abyssal emptiness of another presence in that room? The presence of someone who might have been. A whole other lifetime flashed before my eyes where there was one more of us—another member of our family. My brother and sister are the two closest people in my life; they have defined my life since the moment I was born, and to think I might have had another sibling, that I might have been a middle child instead of the youngest, always trying to keep up with the twins, four years older—it would have changed everything. It would have been an entirely different life. There would have literally been an entirely different life.

She told us how our dad hadn't wanted the divorce; how he had begged her not to leave him. And when she wouldn't budge, how he had resorted to using the three of us to gang up on her. She told me how when I was a toddler I would avoid her, and she'd ask me what was wrong.

"You're bad for making dad sad," I would say in my deep, serious voice. I was three.

She was crying now, telling us all this, and it was clear the pain of that time was still alive in her. That *it* got to be born. I went to sleep that night roiling with unsettled thoughts, but when I woke in the morning they had drifted down someplace deep inside

me, where I was glad to let them rest. It was too confusing. I wasn't willing to accommodate the fact that my father hadn't been perfect into the carefully-built shrine I had erected for him inside of myself, dedicated to his saintly memory. That is, until I went to the bottom of the actual sea, where it was all waiting for me.

My dad was my mom's college professor, and when they first got together he was 42 and she was 19. He was also married at the time, and had been for longer than she'd been alive. I had always let their significant age difference just be a fact, and never examined it too closely, but now I couldn't help but see it in a whole new light when I thought about her getting pregnant the first time they ever slept together. She had never had sex before and he'd been having it for decades at that point. How could he have been so careless as to let that happen? He was the experienced one; he should have been sure this young woman, this *teenager*, who was having sex for her very first time did not need to be the one to remind him how babies are made. After all, he was literally her biology professor.

For fuck's sake, dad. What were you thinking? And the way you turned me against mom during the divorce? How could you use a little child like that? It's unforgivable.

None of this felt like the man I had known, who was so loving and sensitive and careful with the feelings of those around him. The man who followed us to Connecticut after the divorce when mom went to Yale Midwifery School so he could stay close to us, and help her juggle school and parenting. The man who moved back to California when we did, after she graduated and got remarried, because all he cared about was being our

dad. The man who drove on every school fieldtrip I ever went on, and took my entire class tidepooling every year. Who woke me up whenever I slept at his house with a glass of fresh-squeezed orange juice and a shoulder rub, and then made me scrambled eggs and sweet, creamy coffee.

I'm cold, almost shivering. Oxygen gauge in the red. I slip on my flippers, use some of the last air in the tank to pump up my buoyancy control vest, and begin my slow ascent towards the surface, taking a safety stop along the way to be sure I don't get decompression sickness.

Back on the boat, it's all talk of fixing the roller furling, and how someone heard a U.S. warship patrolling for pirates on the radio. Recent reports had told of pirates expanding their range north into the southern Red Sea, and we started getting nervous as we approached the Gulf of Aden, knowing we had officially entered the fringes of the danger zone. The day before we'd decided to anchor and rest here—the thing that *made us* decide to anchor and rest here—we were about 175 miles north of the Gulf of Aden when we heard a distress signal on our VHF radio.

“Help us, help us!” a man's voice crackled through the thick static in what sounded like a Greek accent. “We're being boarded...Pirates...We're being boarded...surrounded...”

Another voice responded, asking their location. The Greek man shouted out coordinates, and then fell silent. We never heard his voice again, and never learned what happened. The range on our radio is only 40 miles.

Considering I often get nervous before arriving to a dinner party, I was surprised I wasn't feeling more worried about the pirates. I couldn't blame these Somali men for what they were doing. Why did I get to grow up middle-class in California, never hungry a day in my life, while others were starving and desperate enough to spend their lives risking death for human hostages? Nobody would choose that life. Desperation chooses that life for you. As much as I couldn't blame the pirates, and felt wholly undeserving of my privileged lot in life, I still did not want to be kidnapped and held for ransom. But somehow, I knew I wouldn't be. Before making it this far into the Red Sea, Captain Mark and Abigail had told us they would not begrudge any of us if we decided this was too risky and needed to get off the boat. I thought long and hard about it, and listened to my mother's pleas over Skype to not risk my life for these people, but finally, I realized I was full of calm, and knew all would be well. That I had to see this voyage through. Only one of our crew decided it wasn't worth it, and we left him at port in Egypt.

Once we got the roller furling flying again, our plan was to use the high winds and heavy seas to get through Pirate Alley as fast as possible, hugging the Yemeni side of the Gulf, away from Somalia. But for now, the rope that releases the roller furling sail is catastrophically bound up in the drum, and while Captain Mark and our chief engineer Clarence work to fix it, they have the rest of us doing smaller projects that keep us busy all day, sanding, varnishing, cleaning, organizing.

At the end of each workday, I'm quietly happy to learn they still haven't succeeded at fixing the sail, because it means I can keep leaving behind the dusty, angry heat for my cool, blue desert on the seafloor. Where I have a monument to topple.

It was strange and awful to watch my father fall from grace. He was like a huge marble statue at the bottom of the sea, ghostly-white and rippling, and the more I thought about these indiscretions against my young mother, the more the statue began to falter, shift on its base, slowly tilt, until finally it fell in slow motion near where I sat. I could feel the thump of him as he hit the ground, sending a wave of sand crystals floating like a shimmering curtain towards me, until I was engulfed, and could no longer see him at all.

This lasted almost a week. He was obscured, lost, unknowable to me. He had disappeared. I felt betrayed, as if I had never known him at all. Who was this man?

I tried to understand him. I recalled a time when once, after a messy breakup, I had tried to convince each of our mutual friends that my ex was tricking them all if they actually believed she was the decent person she pretended to be. In the heat of those emotions, I felt truly justified in this, when in reality, I was just in pain, and she was a perfectly lovely person who simply didn't want what I wanted. I can see now how childish I was acting, but in the moment, it felt as real as anything—it felt paramount that I warn them of the manipulator who had infiltrated the friend group. Perhaps that was the kind of blinding pain he was in when he used his three little children to make his wife feel guilty for leaving him. Perhaps. Perhaps if I were in a similar situation, I could be capable of doing the same thing. Perhaps.

My daily rhythm of floating between the surface and the seafloor began to feel like breathing. Inhale—a world of blue, bubbles, disgraced invisible father. Exhale—a red world, heat, yelling captain. Inhale—blue, silence, settling sand. Exhale—red, dust, another coat of varnish. Inhale—blue, goosebumps, small frightened child. Exhale—red,

stomping feet, white belly, huge belligerent child. Inhale—blue, good visibility, compassion. Exhale—anger. Inhale—compassion. Exhale—anger.

Inhale. Lift.

Exhale. Settle.

Then there he is. As the last of the sand falls around what once was an oversized monument, a regular-sized man stands on the flat seafloor wearing the red raincoat he always wore when he took me to the tidepools all my life—where he introduced me to the sea. He holds up a hand in greeting and smiles, as if to say:

“Nice to have you finally meet me.”

Of course, I didn't actually see my father standing on the seafloor. But in a way, I did. It takes a lot to unsaint someone—that's a long way for the pendulum to swing—and after the chaos of those big oscillations between flawless and despicable, perfect and irredeemable, blue and red, the pendulum finally slowed, found its center, and began to loop tiny, imperceptible circles above *human*. I sat on the bottom of the Red Sea and turned my father into a human. He was no saint. Just a man. A really good man—kind, loving, and imperfect, who could act from hurt when it hurt enough, and be careless and immature, even when he was supposed to be the grownup. Just like the rest of us. I found the man who had always warned me that if I hold my tears inside, they'll turn to stone. But who forgot to warn me that if I exalted my own father to something larger than life, he too could turn to stone inside me.

Letting go of the story I'd held onto so dearly for so long was a whole new death to grieve. I felt vulnerable, no longer having the protection of my own personal saint. But

I also felt lighter; more free—holding a giant monument inside doesn't leave much room for anything else.

The next day the sail was finally fixed and we weighed anchor. It was time to go. The Red Sea ends at a strait called Bab-El-Mandeb, which narrows like a birth canal before opening up into the Gulf of Aden and the Arabian Sea. The moment we passed through the strait, the temperature dropped 20°F and we all whooped and hollered and ran downstairs to put on long-sleeved shirts for the first time in a month.

We saw no pirates in the Gulf of Aden, and the winds and swell were in our favor the entire time. One day, Captain Mark disappeared into his cabin without a word, and we barely saw him again, shutting himself up to lick at his wounds, which come from a place only he can know.

Our entire passage across the Arabian Sea we sailed through waters so thick with bioluminescence I barely let myself sleep for fear of missing it. Night after night, I sat on the stern of the boat, my feet dangling over the cap rail, watching a wake of living light stretch out like an opaline road in the darkness behind us. No matter how brightly that road shone, it always disappeared again, as if it were never there, while new light erupted from beneath the ship, filling its place. On and on, this continuum of light, of life, a never-ending ribbon, always vanishing, always replenished.

Searching for Lost Worlds

Looking down from the top of the steep bank, the Okavango River was cast sterling by a moon two days shy of full. Hippos splashed and belched below, their silhouettes like oblong boulders in the light-burnished water. A chorus of frogs and insects tinkled and weeped. But nothing could drown out the bellows of the lions, whose roars stayed low—earthbound—as the rest of the din dissipated into the night air.

There were many reasons I had felt compelled to cross the globe to camp in Namibia's remote Caprivi Strip. Some I understood better than others, and some my therapist found more interesting than others, namely those about regret and my dead father. But already, on my first night here, I was finding so much of what I had come for. A world wild enough to eat me. A land where an apex predator freely roars, and isn't forced to spend its life as a ghost in the shadows.

I learned the word *extinct* when I was five, maybe six, the day my father gave me a book about the Pleistocene. He was a biologist, and so much of my upbringing was spent squinting through his binoculars as he pointed over my shoulder at a rail skulking through the marsh grass, or kneeling beside him in a tidepool while he used his small folding knife to gently pry a chiton from a rock, its underside a rough tongue against my fingertips. But when he handed me that book, I encountered a different world of animals—one with woolly mammoths and saber-toothed cats and giant beavers as big as grizzly bears.

“Where do they live?” I asked.

“They used to live here,” he said. “But they're extinct now.”

“What’s that?”

“It means they’re gone, Sammy. And never coming back.”

Since that day, the lumbering, snorting, tusked, and fanged ghosts of the megafauna that once roamed North America have haunted my imagination. It never seemed possible something so grand could disappear.

As an adult, I’m haunted by a world more recently lost. One that existed only 200 years ago, instead of 200,000. Grizzly bears and gray wolves were once numerous in my home state of California, but both were shot into local extinction shortly after the arrival of European settlers. Mountain lions still prowl here, but they don’t dare announce themselves like the African lions I listened to on the banks of the Okavango River. The lions where I come from slink along the edges to keep alive.

Like my father, I too became a biologist: I protect threatened wildlife species at risk from construction projects. Day after day, I witness as more habitat is destroyed and more animals lose their homes—San Francisco garter snakes, snowy plovers, red-legged frogs—inching ever closer to the abyss of extinction. At best, my efforts to help these disappearing animals feels like spreading a thin strip of gauze across a buzzsaw wound.

Namibia was the first nation in Africa to write environmental protections into its constitution, resulting in the designation of over 20 percent of its lands as communal conservancies—a system which empowers local communities to establish and maintain their own wildlife populations. This model has been highly successful in helping animal populations rebound while providing revenue for the people who protect them, incentivizing communities to live alongside crop-crushing elephants, cattle-marauding

lions, and crocodiles who patiently wait for them to do their washing in the river. As a citizen of the United States, where our national policy seems to be to annihilate first and ask questions later, I found this type of creative cohabitation with animals that can eat and destroy both people and their food sources so foreign I had to go see it for myself.

I was traveling in the Caprivi Strip with a bush guide named Nick Buys, whom I'd met five years earlier on my only other trip to Southern Africa. After originally meeting over email, I was surprised to learn that Nick was as white as I am, descended from Dutch ancestors who arrived on the continent longer ago than even he knows. Nick had the classic look of a white safari man—kempt in khaki, clean-shaven, massively built—the type of guy who says “good afternoon” if you sleep past seven in the morning.

After staying up most of the night listening to the lions, Nick woke me at dawn and we drove east, deeper into the Caprivi—a narrow salient jutting off Namibia's northeast corner, some 280 miles long and 20 miles wide. Too small to be a panhandle, the Caprivi is more the penny nail from which the rest of the country hangs on a crowded wall of political boundaries—a nail bordered by Botswana to the south and Angola and Zambia to the north.

The reason this strange appendage exists at all is one of the countless remnants of Europe's bloody colonial rule in Africa. In 1890, when what is now Namibia was known as German South West Africa, the Germans traded Zanzibar to the British in exchange for the Caprivi Strip (as well as the island of Heligoland in the North Sea) to gain access to the Zambezi River, which they planned to use to ship goods up from the Indian Ocean. It wasn't until after the deal was finalized that the Germans learned their plan had one minor flaw: roughly 150 miles downstream from where they now had a post on the

Zambezi was the largest waterfall on the planet—Victoria Falls—making the river about as navigable by boat as Half Dome.

Unlike the rest of Namibia, which is one vast desert, the Caprivi is wet, lush, green—a place where rivers crisscross the land and animals aren't penned in by park boundaries but move freely across territories that often have them stepping over multiple international borders in a single day.

The first time I met Nick he told me the Caprivi Strip was his favorite place to search for wildlife in all of Africa—an area where tourists rarely visit and animals remain wild and skittish, unaccustomed to seeing people. Ever since that conversation, the Caprivi has been stuck in my imagination like a foxtail. If I were ever to find a trace of the Pleistocene in the 21st century, this was the place. And now, five years later, I had finally made it.

The Caprivi's one main highway was lined in roadside signs depicting wart hogs, elephants, impala, and wild dogs. The signs were triangular and outlined in bright red—reminders that you're driving through feral, unfenced bushlands, and it won't matter whether your truck has four wheels or 18 if you hit a 12,000-pound elephant. On the road, Nick explained that the area had seen near continuous military action from 1966 until 1990 during the Namibian War of Independence—a conflict that killed over 20,000 people. Because of the war, the animal populations had been nearly wiped out. On his first visit there in the mid-1990s, the only wildlife Nick saw were four zebra and a handful of impala.

“What happened to the animals?” I asked.

“All sorts of things,” he said. “They were killed for meat, killed for sport, blown up by landmines. Poaching was rampant, so whatever animals remained learned to give the area a wide berth.”

“But things are better now?” I asked.

“Oh yes,” he said, smiling, never taking his eyes off the road.

Later in the drive, Nick told me we’d be spending the night at his friend Dan’s safari camp and going for a bush walk the next day.

“I hope you packed some hiking shoes,” he said, smiling again.

I laughed, thinking he was joking. “Wait, are you serious?” I asked.

“Oh, I’m serious.”

I had not packed any hiking shoes. On my only previous trip to the African bush not only had I never hiked, but I’d rarely left the vehicle at all thanks to guides like Nick telling me it was too dangerous. The only thing I’d packed besides flip-flops was a pair of sneakers called “barefoot shoes” that can be rolled up like t-shirts and stuffed into a duffel bag.

Dan’s campground was located on the banks of one of the many branches of the Kwando River. We arrived in the late afternoon, and before we’d even parked, Dan handed two beers through my passenger window.

“So this is the guy we’re feeding to the lions?” Dan said with a smile, nodding towards me.

“That’s him,” Nick said.

Dan was from Northern England, his accent like wading through molasses, turning *water* to *wuuu-tah*. He was in his early 40s, short, muscular, and ruddy from years spent beneath the African sun. Thinking he was only visiting when he came to the Caprivi 12 years earlier, he had never left.

That evening, the three of us sat around the fire roasting sausages and drinking Namibian lager and South African pinotage. The Kwando River wended through the flat open plains away from us, dipping in and out of view through the yellow-green reeds that crowd its banks. As the light died in the east, the water became a string of bloody pools, reflecting the vermilion clouds above.

Perched on one elbow by the fire, my mind wandered while Nick and Dan argued about the Premier League 5,000 miles away. I thought of the ostrich egg that rests like a cantaloupe-sized moon on my shelf back home—old paper yellow, smooth as ivory. My most cherished possession. My dad lived in Addis Ababa for two years in the 1960s, long before I was born. He was deputy director of the Peace Corps in Ethiopia shortly after the organization was established by President Kennedy. It was a detour from the rest of his career as a marine biologist and professor. He was 35 at the time, the same age that I am now, and at some point, he got his hands on an ostrich egg and kept it for the rest of his life.

My therapist had pressed me about why it felt so important that I go on this trip, despite my guilt about my carbon footprint, my worry over the cost, my confliction at being a tourist—my greater confliction at being a white tourist.

“I want to know what it feels like to be on the food chain,” I had told her.

“Hmm,” she said, her eyes boring into me.

“It’s a place I’ve been trying to get to for years.”

She watched me. “Uh huh.”

“My dad used to live in Africa.”

A flash of light across her eyes.

“He was stationed in Ethiopia, but traveled all over the continent.”

“Did he tell you stories from that time?”

“Some, but I was too young to ask him about it.”

My dad was 55 when I was born. I was 19 when he died. My greatest regret is not pressing him for his stories from the more than half a century he was on the planet before I arrived. Just as I’m haunted by the megafauna who once roamed California, I’m haunted by my father’s life. In the 16 years since he died, I’ve searched for his stories—not retracing his steps, but living new versions of them. Filling in the blank spaces with adventures of my own. I went to sea on an old research vessel in my 20s, just as he had done long before I was born—a time in his life I know nothing about. I became a biologist, just as he had been, though we never talked about his career—he retired when I was five. And though Namibia and Ethiopia are over 2,000 miles apart, it was that ostrich egg that first enticed me to the continent where it was laid by a 200-pound bird before being taken home by a young man whom I look so much like but only ever knew when he was gray-haired, spectacled, mistaken by everyone for my grandfather.

A week after he died, my five older siblings and I laid out his belongings across the dining room table and pulled numbers from a hat to see who would get the first pick. I pulled number one. All eyes were on me as I scanned the relics of a 74-year life.

Paintings, clothes, books, Coptic crosses, mother's china, school rings, his glasses, camera, binoculars, passport, and, floating above it all, that freshly risen moon, still yellow on the horizon. I felt unworthy of it. I pretended to deliberate; ran my fingers along the frame of a Mexican painting. My three oldest siblings had actually lived in Ethiopia. No one had spent less time with that egg than me.

The ostrich egg had always rested in the same hulking abalone shell, making them a package deal. I lifted them from the table and quietly left the house, avoiding eye contact. In the backyard, I picked a handful of magnolia leaves and placed them below the egg like a nest to keep it from clinking against the shell on the drive home. I did it with all the care of a child making a bed for its first pet. When my mom came out to tell me it was my turn to pick again, she found me hyperventilating in the grass.

“So you ready to hear the plan for tomorrow?” Dan asked, snapping me back to the banks of the Kwando. I sat up taller, nodded to him, then took a long pull from my beer.

Dan explained that he'd recently started taking his more intrepid clients on walking safaris through the bush, but had never camped out before.

“We thought you'd be the perfect bloke to test it out on,” he said.

“And that's safe?” I asked.

“Oh definitely.”

“Should be fine,” Nick added quietly, staring into the flames.

“Alfred will keep us safe,” Dan said.

Alfred is a local ranger who'd be joining us on our walk. He's an Indigenous Namibian of the Lozi Tribe, born and raised in the Caprivi. Imagining the four of us setting out the next day, I recalled a grisly story Nick had told me five years earlier about four bush rangers who were deep in the wilds when their truck broke down. They knew no other vehicles were patrolling the area, and they'd have to walk out for help. The men were unarmed, and as they made their way across the plain, a far-off pride of lions spotted them, bursting out in long strides in their direction. The men ran to a lone acacia tree—the only thing taller than them. They climbed as high into the tree's spindly branches as they could, knowing all the while, as any bush ranger would, that lions can climb trees. Over the course of the next three days, the lions pulled the screaming men one by one from where they clutched to the boughs of the acacia, eating them alive in the feathery shadows below. All but one of them were killed before a vehicle finally came along. That last remaining man, crazed with terror and thirst and sun exposure, never recovered; he was mad for the rest of his life.

“Sounds like a plan,” I said.

The next morning, I hopped into the bed of Dan's pickup and we drove to Alfred's village—a small cluster of circular huts with rush mat walls and pointed thatched roofs. Waiting in the shade of a tree in fatigues was Alfred. He walked to the truck slowly, nodding at Nick and Dan in the cab before hopping in back with me. I reached out my hand and introduced myself, and Alfred shook it limply.

“Alfred,” he said in his deep voice.

Alfred was in his late 50s or early 60s with long sinewy arms and a severe face. He had a puckered scar on his right cheek that looked like someone had long ago hammered a nail into it. The scar and his fatigues made me think of the war. Dan had mentioned the night before that Alfred had been a soldier. Had he killed anyone?

“Is this where you’re from?” I shouted as we sped down the road.

Alfred nodded.

“Have you camped in the bush before?” I yelled.

Another nod.

“First time for me,” I said, pointing to myself.

Alfred hid his face in his hat. And perhaps not only from the wind.

I suspect I wouldn’t have answered my questions either. Here was Alfred, a man whose ancestors had watched their homeland get carved up and traded around by Europeans like it was a bargaining chip in some deranged board game. Alfred, a man who spent the first half of his life fighting for his independence against South Africa’s apartheid government, one of the most racist regimes in modern human history. At the same time, the Angolan Civil War, dubbed by the United Nations in 1993 as “the worst war in the world,” pushed against and bled into the Caprivi from the north—each of these conflicts a thumb pressing into Alfred’s young eyes. And finally, after winning his independence—and living through God knows what—here was Alfred, still being asked to risk his life to babysit three white men on a bush walk. And for what? Because the man from California had flown halfway across the world searching for an authentic experience? Because the man from California wanted to know what real danger felt like and had spent more money than Alfred would likely ever see to find out? Money which

mostly went into the pockets of airline executives and fossil fuel companies and barefoot shoe manufacturers—and the wallets of Nick and Dan—before Alfred saw his pittance.

A few silent minutes passed before Alfred asked if I had a cigarette. It was his lucky day. I hadn't bought a pack in years until I landed in the capital city of Windhoek a few days earlier. I long ago made a pact with myself that I would only smoke while traveling to ensure that the cigarettes that killed my father wouldn't kill me too. I fished the Marlboros out of my bag and handed them to him, glad to have something to offer our guide. He asked me for another cigarette every 20 or 30 minutes for the next few hours, until he finally asked for one and then put the whole pack in his pocket without either of us saying a word.

We parked at a ranger station at the entrance to Mudumu National Park. The plan was to walk directly on the outside of the unfenced park boundary through communal conservancy land, because it's prohibited to get out of your vehicle within the park. Not only are there the obvious animals that can kill you—lions, buffalo, leopards, elephants, crocs, hippopotamus—but there are also those killers more difficult to see—the black mambas and spitting cobras, the puff adders, vine snakes, and boomslang.

Alfred and Dan walked into the small ranger's post. I thought they must be in there getting a gun. We'd be crazy to do this without one. But when Alfred and Dan stepped out of the station a few minutes later, they carried no gun.

We started walking on a narrow dirt track that runs parallel to the park boundary. Already I could feel every small pebble through the paper-thin soles of my shoes. After a quarter-mile we stopped, and I learned that Alfred is a man of more words than I'd thought. He asked us all to remove our hats and began a prayer in his native tongue of

Silozi, which lasted at least five minutes. The four of us faced each other, heads bowed. I looked at the folded hands of my three companions, all of whom I barely knew. I thought of my mother. I thought of standing at the airport sidewalk in San Francisco only a few days earlier and how I'd promised her I wouldn't do anything stupid.

Alfred concluded his prayer and we started walking again, this time leaving the dirt track and lighting out cross-country. We waded through shoulder-high grass, thick and tall enough to conceal any number of 400-pound cats. My body felt carbonated, like all my nerve endings had come loose in my bloodstream. I had wanted a real adventure, to touch a wilder, less human-centered world, but now that I was getting my wish all I wanted was to flee.

A baboon scurried through the grass and skipped up a small tree. Before I knew what it was, my arms were out in front of me in a karate pose. Nick and Dan laughed. Alfred never stopped walking. Moments later, a lone wildebeest barked at us, kicking up clods of dirt before bolting off.

I thought of the bush rangers again. How the lions must have slept in the shade of the tree after eating each man. I imagined myself as one of them, clutching a branch, staring down at the ribcage of my comrade resting like a wet basket in the dirt between the dozing cats. How when night came I fought back sleep, nodding off a few times, nearly falling from the branches. How my vision swam when the first lion woke again in the morning, fixing me with an amber stare. And as the other cats slowly rose, gently rubbing their faces and long bodies against their sisters and mother, how I cried and pleaded for them to leave us alone. The big one with the head like a pile of tawny thatch was the last to stir. And the youngest daughter, still needing her practice, the first to get

on her hind legs and reach into the branches. The awful shrieks of my friend once she had him by the calf, pulling him into that mayhem of claws and fangs and golden fur.

“So we’re really not bringing a rifle or anything?” I finally asked Nick, unable to hold the question any longer.

“Apparently not,” he responded.

Unlike much of the Caprivi, which is spongy with floodplains from the Okavango, Kwando, Chobe, and Zambezi Rivers, the land we were hiking through was a dry savannah with low rolling hills. The grass was golden, topped with soft, feathery seed, and the only water was in shallow clay pans that dotted the landscape like oversized puddles rimmed in gray mud. Between the muddy pans were occasional thin woodlands of mopane and silver leaf terminalia trees, hunched and thirsty.

Dan carried his phone out in front of him while he walked, following a GPS program, trying to keep us heading in the direction of camp. Alfred stopped often to sniff the air, or toe at some elephant shit with his boot. He’d crouch down to puzzle over faint tracks in the dirt, or consider a snapped tree branch still hanging from its fibrous bark. He was reading the landscape like I might read a newspaper, sensing when elephants had last passed through, or informing us that a herd of kudu had recently been drinking from a waterhole. It was a relief knowing Alfred was keeping tabs on the story unfolding around us. A story we were now part of, if only for a few days. One that we had evolved for millennia to be part of, and yet here I was, an anxious visitor, an alien on my own planet, just as so many wild animals have become aliens in places where humans tend to feel most at home.

In the late afternoon, after hiking ten miles through the heat of the day, we arrived at the largest pan yet—still only the size of a small pond. We stopped and made camp in the thin woods on the far side.

Once settled, Alfred, Nick, and I sat on our bedrolls while Dan made a round of gin and tonics. Alfred lit a cigarette. Dan handed me a drink.

“We don’t have much tonic,” he said, smiling. It was rigor mortis stiff and exactly what I needed.

“Let’s go check the next two pans,” Dan said, downing his drink in a few quick swallows. Neither Alfred, Nick, nor I budged when he spoke.

“Come on,” he urged us, “we got a bit skunked today, didn’t we? It’s a great time of day to see game.”

We all groaned as we stood back up, but off we trudged, to the next watering hole. Not ten minutes later, as we were making our way through some thick brush, Alfred shot a hand up, signaling us to stop. Nick whispered back to me: “Big herd of zebra ahead, and a few giraffe.”

I crept forward to see. In a clearing, just beyond where we crouched, was a mixed herd of some 60 zebra plus four giraffes. They stared keenly in our direction, and before any of us had moved, they were off, stampeding past us in a swirl of dust. The ground quaked beneath our feet, the zebra like squat linebackers pummeling the earth, while the giraffes sashayed high above them.

The dust made an amber filigree of the evening light where it cut through the tree branches. When the animals were gone, and the ground had stopped shaking, my heart

continued to stampede. I thought of the war that had ravaged this land only a few decades earlier—of how the many creatures of this world are just waiting for the opportunity to wander back in, stop, sniff the air cautiously, take a step forward, then another, until they return by the thousands to reclaim their home. It felt hopeful to be reminded that life really does come back when given the chance. Even if not always—the black rhino never returned to the Caprivi after the war.

I thought also of the continent where I was born and the animals that once filled that land with thunder: the American bison—the national animal of the United States. In the 1500s, over 30 million bison roamed North America. By 1893, only 400 remained. “Kill every buffalo you can,” Colonel Dodge famously ordered his troops in 1867. “Every buffalo dead is an Indian gone.”

The atrocities that occurred during Europe’s colonization of both Africa and North America are too numerous to name, yet something more final seemed to take place in North America with the arrival of Europeans—they didn’t just see a wealth of resources and human labor to exploit, they saw an entire continent to claim as their own. The land itself was the prize, which meant the people already living on it were in the way of that prize—their very existence a threat to Manifest Destiny.

Unlike Africa, the strategy in North America was to settle, to stay forever, so when the white man arrived, they never stopped arriving. This explains why African nations have been able to win back their independence from their colonizers over time, while in North America no such movements have been possible for Indigenous people. This permanent settling also explains why Africa has held onto so much of its megafauna while North America has not—my European ancestors had little appetite for coexisting

with animals higher on the food chain than themselves. That, and in the case of the buffalo, they were severing an artery to a way of life they were hell-bent on eradicating.

The two waterholes we visited were empty of animals, but both were surrounded by a mottle of fresh elephant tracks that looked like meteor-pocked moons in the gray soil. Alfred sniffed the air.

“Few hours ago,” he said.

It was getting dark and we started back towards camp on a well-used animal trail, the dirt turning a soft lavender under our feet in the gloaming. I stopped.

“Is that a...”

“Lion track,” Nick said matter-of-factly.

It was the size of a salad plate in the soft sand. Nick stooped down to examine it.

“Probably from this morning,” he said.

A fizz of electricity up my spine. We started walking again.

“Remember the story you told me the first time I met you?” I asked Nick.

He stopped, turning to look at me. “Which story?”

“The one about the rangers who got treed by the lions,” I said quietly.

Nick smiled. “Best not to bring that up right now,” he replied, and kept walking.

Ten minutes passed before Nick spoke again. “In a place as wild as the Caprivi, where the animals rarely see people, the chances that lions would attack are extremely slim,” he reassured me. “It just isn’t worth the risk for them.”

“I see,” I said.

“But,” he went on, then paused.

“But?” I asked.

“Well,” he said, stopping again to look at me. “The only real thing to worry about is an old male who’s been kicked out of the pride and might be missing a claw or a tooth and can’t hunt so well anymore. You definitely don’t want to run into an old crust like that. They can be desperate enough to try anything.”

Back at camp, Alfred started a fire and Dan put chicken and potatoes in the Dutch oven before pouring us stiff, lukewarm gin and tonics, one after another. There was a full moon that night, and as we ate our dinner, the dull yellow orb rose through the branches of the trees. It looked like my ostrich egg.

I thought of my father and the complicated legacies our parents leave for us. That egg has become my most precious heirloom, yet how did I come by it? This inheritance, which is appropriately biological, and not some valuable stone or a thing made by human hands, but an egg, the place where life begins, formed inside the body of a flightless bird who lived within the borders of a land called Ethiopia, found and taken by my father, a white man from the United States. And not just any egg, but one that appears larger than life, mythical even, but in reality, is just another piece of this world.

He was part of the original leadership team of the Peace Corps, which at the time must have felt truly noble and important, yet the subsequent decades have judged—and correctly—as an early iteration of what Nigerian-American novelist Teju Cole has dubbed the “white-savior industrial complex.” Should my father have taken the egg? Probably not. Should he have been in Ethiopia at all? Hard to say. Should I be here now, 55 years later, a white tourist drinking gin in remote Namibia? I’m not sure.

As I sat beneath the moon that glinted through the mopane trees above our camp, something struck me for the first time. Since I was a kid, I had always imagined my father stumbling upon an ostrich nest on the ground and stealing one of its eggs—a highly dangerous thing to do, as a kick from an ostrich can be lethal. Even so, I pictured him as young and brazen and covetous of such a rare thing to own. But as I thought about it further, I realized that my father never would have taken a viable egg from a wild bird's nest. Never. He had been rehabilitating injured and orphaned animals since he was a child, keeping a Cooper's hawk in the garage, a river otter in the bathtub, a rattlesnake in a tank in the guest room. My dad, who taught me as a kid that centipedes deserve to live just as much as I do—not to bring me down to the level of a squirming, stinging insect, but to teach me that there is no hierarchy on the value of life, and if anything, he was exalting centipedes to the station of his own child, where all life belonged.

I realized I had no idea how he had come by that egg. Just that my original imagined story must be wrong. Perhaps it had been a gift? Perhaps it was from a nest he knew had been abandoned? I'll never know, because I never asked him while I had the chance, but I was suddenly certain he didn't steal it.

My father's stories may be irretrievable to me now, but there are other stories I might still hear if I'm perceptive enough to listen. Stories from the world he taught me to love and care so much about, those roared by lions on riverbanks, the dust storm stories kicked up by zebras and giraffes, the moon print stories written by invisible elephants in the clay, the quiet story of Alfred, who doesn't need to speak to tell me he's seen the worst of this world. Stories of survival, of regeneration, of hope. Much needed antidotes to the torrent of bad news that currently fills my head—extinctions, coral bleaching,

climate refugees. The Caprivi had different tales to tell, and I knew I'd never regret having come all this way to hear them.

"I got to take the day off today," Nick said, breaking our collective silence. "With the amount Sam was looking around I knew he wouldn't miss a thing."

"I thought your head was gonna fall off, mate," Dan joked.

We all laughed, even Alfred.

"Alfred, may I have a cigarette, please?" I asked.

"Finished," he said.

A piercing cry rang out nearby, followed by a scuffle, and a few short, disheartened brays. We all listened, silent. A minute later, a booming call that started low before rising to a high-pitched yip repeated just on the other side of the trees from our camp.

"Hyena," Nick whispered. "Must have gotten something."

A few minutes later, a gang of curdling giggles and gleeful screams filled the night as a clan of hyena descended on whatever had just been killed by their kin.

"You don't hear that every night," Dan said.

Alfred lit another cigarette in the dark.

I never did see a lion in the Caprivi—only the roars on the first night, and that lone paw print during our walk. But two weeks after returning from Namibia, I was driving home on a dark backroad in the middle of the night. Coming around a corner, I passed what I thought was a dead mountain lion on the edge of the road and slammed on

my brakes. I put the truck in reverse, praying that I hadn't seen what I thought I had. Once the animal was back in my headlights, my fears were confirmed. It was indeed a mountain lion, but it wasn't dead—the lion lifted its head from where it lay across the white line of the road and stared in my direction, panting.

I left my headlights on, opened the truck door, and slowly approached the cat, worrying my presence would only add to its stress. But as I walked up to the injured lion, it didn't appear to even notice me. I circled it slowly, examining its long, sleek body—tawny fur, the white of the muzzle like two cotton balls beneath its nose. The back half of its torso was crushed. I could see fractured ribs poking perversely against its abdomen, like a bedsheet pulled over a pile of sticks. Its breathing was rapid, ragged.

I bent down beside the lion. Its face and head were unharmed. There was no blood. Its eyes were wide and rimmed in a delicate line of white fur, staring at something I couldn't see. This was a young lion, probably only two or three years old, its paws disproportionately larger than the rest of its body.

I tried to think of a way I could help this wounded animal, but nothing came. If I had a gun, would I put it down? This cat knew how to die without me. After spending its short life sneaking down vineyard rows at night, getting snarled at by domesticated dogs, hiding by day in culverts and small strips of woodland, only to finally get struck by the blinding lights of a speeding car, dying might be the most natural thing it would ever do.

Suddenly the cat stood up, and I did too, fast, surprised by how quickly it had moved. It managed to rise onto its front paws, but its back legs wouldn't budge. They seemed molded to the road. The lion swayed for a moment before slumping back down with a rasping exhale. Over the course of the next 45 minutes, the cat managed to drag

itself inch by inch off the road, onto a narrow strip of grass between the shoulder and a barbed-wire fence. I was relieved it was off the asphalt now—that it had found some actual earth to lie on, with earth scents and earth dampness. Once there, it stayed still, heaving with shredded breath. A few feet behind the cat's broken body was a large American flag hanging limply from a mailbox post; the red, white, and blue of its banner tawdry in my headlights.

I sat cross-legged a few feet away from the dying animal, my face cupped in my hands. The day after we learned my father's cancer had spread into all his major organs, he fell into a coma from which he would never wake. There was nothing I could do then but witness, no matter how badly I wanted things to be different. When death is near, an elixir seems to fill the body—that which ushers us from here to there. My father no longer seemed to be in pain, just gently emptying, his animal body taking over for its final act, knowing precisely what to do.

The cat seemed filled with this same elixir now, its honey eyes staring into something I don't yet know. This lion and I had shared a mammalian world for a time—both of us hairy-bodied, meat-eating, milk-reared offspring of caring mothers, living on a land one of us calls California. But now the cat was leaving, and I was staying behind.

Winding my way home in the darkness, my eyes darted from side to side, not wanting to miss anything. Not wanting to hurt anything. The dull yellow beams of my headlights lit only the asphalt and painted lines of the empty roads. All else was lost in shadow. All else was crouching, hiding—a land vibrating with ghosts, both dead and alive.

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Living Light

We had sailed Indonesia's shattered archipelago before arriving at the uninhabited island chain of Wayag—a gumbdrop cluster of limestone peaks cloaked in an aura of brilliant, turquoise lagoons. Our crew, a ragbag of scientists and sailors, had come to this remote corner of the globe to study coral reefs. Unlike the bony, barren graveyards that haunt much of the tropical world, the reefs in this part of Indonesia are still vibrant, prismatic wonderlands, and if kept intact, can serve as nurseries to repopulate our oceans. These Technicolored coral wildernesses are unforgettable, yet what I saw at night during that voyage glistens most brightly in my memory.

One evening we had a cookout on a small beach, and in the wee hours of the morning I peeled myself off the sand to head back to the boat and my bunk. I pushed off into the black water, the fins of my paddleboard scraping the ground before gliding out into the bay. I didn't have a flashlight, nor did I need one; the entire Milky Way had touched down to fill the secluded inlet with thick, woven starlight. Sixty feet up the mizzenmast, our ship's anchor light shone, a little beacon moon to aim toward as I crossed the half mile of water. Snaking off each side of the pointed tip of my board were pearl necklaces of light, twisting in tiny jet streams past me. With each paddle stroke, the once-dark water pulsed a lucent bluish-white, first in a stout wall, then breaking into windswept clouds of luminous flagella, frenzying for a moment before going black and silent once again. I was rowing straight through the cosmos: the bright, cold braid of stars above and the starlike streamers below. I imagined how the Polynesians had read the night sky like a map of pinpricked light—a map that was not only above them but all

around. A map that their wooden boats cut straight through, parting the stars as they went.

Bioluminescence is the emission of light by a living organism. Before going to sea for the first time, I had no idea just how positively awash this world is in light-emitting life. Most of the bioluminescence seen from the deck of a ship comes from profusions of *Noctiluca scintillans*, microscopic dinoflagellates aptly known as “sea sparkle,” which burst with light each time the water around them is stirred or agitated. *Noctiluca scintillans* proliferate in warmer waters, so all around the equator our planet is wearing a thick belt of potential light, wakened into nebulae and galaxies by boat hull and paddle stroke, whale and turtle, wave against sand and rock, creeping octopus and patrolling hammerhead shark.

Imagine raven-black ocean all around you—nothing to see—but then you stand at the front of the ship where it slices through water, and there, light is spinning and twisting in opaline helixes and clouds off each side of the bow like liquid fairy dust or a cast spell still careening toward its destination from the tip of a wand.

I’ve seen birds take off from the surface of the sea in the dark, startled out of a bobbing sleep by our approaching vessel, and as they beat, beat, beat their wings, they smacked a trail of light in their wake before disappearing into the invisible air. If birds can set off this thrum of light, imagine a blue whale and how nobly they must shine as they drive their 90’ bodies through the sea at night, glowing from baleen to fluke, their spouts hissing geysers of blue crystals into the night air.

Another night, we were anchored off a different small Indonesian island. I was nearly finished cleaning the galley after dinner when I headed up on deck to pitch the slop bucket overboard. When that dripping pile of onion peels, potato skins, and coffee grounds splashed against the still water below, it looked like I had thrown a bucket of Day-Glo paint instead of compost overboard. By then I had seen bioluminescence, but this was different—this was concentrate. I took off my shirt, put on my snorkel mask, and jumped off the stern.

My body created an upside-down fountain of white light as I slammed through the surface of the water, instantaneously incandescent. I flailed around wildly, sending limbs and sparks in all directions. My slim, creaturely legs resembled two long, bony-tailed fish glowing in a wet splendor. My crewmates shouted that it looked like I was on fire: a watery self-immolation; a scintillated baptism; a sacred, gleaming doggy-paddle. To swim in light. To become light. If this was the only thing I ever got to do before leaving this world forever, it would have been worth it.

When I finally climbed back on deck, I was surprised to look down and see I was no longer glowing. Surprised I wouldn't have to scrape the light from my body.

Dreaming of Water with Tiger Salamanders

The front of the big, yellow machine is taller than I am; its huge diesel engine rumbling above my head. The rotary mixer's blade makes a ripping sound as it pushes through the hard clay soil, casting up a brown blizzard of dust, adding to the already difficult task of seeing any small bodies make a last-ditch effort to run or slither for their lives—bursting from a burrow, or a crack in the dry mud, or a thick clump of grass. I chase the fleeing field mice and pocket gophers, pinching them at the backs of their furry necks so they can't twist their heads around to bite my fingers, stuffing them into the pocket of my orange safety vest, already bulging with the wriggling bodies of alligator lizards and western skinks. Better that pocket than the other one, where a two-foot gopher snake is coiled like a bracelet of pure muscle, its head continuously poking out from this alien world of fluorescent orange I've abducted it to. The machine doesn't slow down, so I have to be fast. I spot a garter snake, too late; it darts straight under the mixer, into the mayhem, and I have to let it go.

From a distance, which is where most of the construction crew watches me from, I must look ridiculous—stooped over, racing this way and that through a cloud of dust, grabbing small creatures and filling my pockets with them while a giant machine nips at my heels. But I've mostly learned not to care. No matter how I appear, the biologist will always be the outcast on these projects.

Again and again, the snake's head pops out of my vest, flicking its black tongue as it slowly unspools its long body, the color of wet hay, from my pocket. Using the heel of my palm, I coax it back in, waiting for the mixer to stop long enough for me to walk

across the busy road to the edge of the dry creek where I unceremoniously dump them all out in a squirming pile at the base of a Himalayan blackberry thicket. Homeless, but alive.

When I walk away from the machine, I can hardly tell where the dust ends and the smoke from the nearby wildfires begins. This August, the sky in California is once again lethal to breathe, bruised gray and purple, burning my eyes and throat as I stand in it day after day. But this year is different, because this year I need two different types of masks as I juggle calamities—when alone, the N95 mask with a one-way valve is superior for filtering smoke. But when close to other people, I must quickly switch to my cloth mask for the virus, since the valve doesn't protect others from my potentially deadly exhalations.

Some animals don't flee when the mixer comes. They hold their ground, squeeze their eyes shut, and wait for the trouble to pass. But nothing in their evolution has prepared them for an eight-foot-wide drum covered in corkscrewing blades coming straight towards their soft bodies where they hunker in their meadow homes. The rotary mixer penetrates the ground 20 inches deep, turning the hard-packed earth into fluffy, aerated, hydrated soil in tidy rows. It's a dream machine if you need to turn a bumpy field into the future site of a housing development, but it's a science-fiction nightmare if you're a vole or a praying mantis or a king snake; a fence lizard, an earthworm, a deer mouse, or a Jerusalem cricket. The ones who don't flee will be ground into sausage and mixed evenly into the soil, and sometimes are so pulverized they become more mist than matter.

On every jobsite, within an hour of the first pass of the mixer, crows appear by the dozens to peck at the many bits of the animals I failed to save. My job is not to save any of these animals, but since I'm here, I try. The only reason the development company was forced to hire a biologist, as they are on every housing development being built on the Santa Rosa Plain, is for one single species of salamander—the federally-endangered Sonoma County population of the California tiger salamander—an animal once prolific in this part of Northern California, now almost entirely wiped out.

Before European settlers colonized this area, one could scarcely come up with a place more perfectly suited to the unique needs of tiger salamanders than the Santa Rosa Plain—a lush mosaic of lakes, creeks, wetlands, vernal pools, riparian forests, grasslands, and oak savannah. A hummocky world of wet depressions and dry rises—almost as if the land itself was as amphibious as the salamanders who thrived there.

Tiger salamanders live a double life—they need both wet and dry places in close proximity. For most of the year, they stay underground in the burrows of other animals, or in large cracks in the adobe soil. But when the rains come, they emerge from their subterranean lairs to migrate in their slow, salamandery way, padding out across the land to a nearby breeding pond, which must be ephemeral to ensure no predatory fish can take up residence in them. After breeding, the adults move upland again, leaving their eggs to hatch into larvae who metamorphose either quickly or slowly depending on the speed at which their pool is drying up. Once the larvae grow legs, maturing into juveniles who breathe air through lungs instead of gills, they too migrate upland to find an underground home, where they remain for the two to five years it will take them to reach breeding age themselves.

I thought a lot about tiger salamanders during the early weeks of the pandemic—drawing inspiration from these masters of sheltering-in-place. I live in a trailer, which normally suits me just fine—not only do I find small spaces comforting, but the forced constraint on my possessions feels like a worthy protest against the material excesses lodged in our collective windpipe. But when shelter-in-place began last March, and everything came to a halt, my trailer quickly shrank around me. I morphed into a subterranean animal living in a narrow, aluminum burrow, aestivating during the dry months, waiting for rain. Waiting for a vaccine. Waiting for anyone to tell me anything that felt true or useful.

Time thickened, then congealed. I hunched over, shuffling around in my sweatpants. One step to the fridge, two to the bathroom, one to the bed, three to the door. This trailer was only meant to be a home base for my life on the move as a field biologist. A way to hack the Bay Area’s obscene rental market—the highest in the nation. Not a place to weather a global pandemic. Alone.

After months of being stuck inside, treating my groceries like hazardous waste until I’d washed them with soap, and growing tired of my own cooking, it was tiger salamanders who finally coaxed me out of my burrow—or at least the possibility of them. A few months into the pandemic, developers had found their way onto the essential workers list, and I got the call about 42 new townhouses being built in a vacant lot in Santa Rosa. “Vacant” being a relative term. Without needing to see it, I knew the site would be home to many living things. And it was—on my first day on the job I saw fence and alligator lizards, a garter snake, western skink, piles of fox shit, many birds. I also found the recent remains of a human encampment, as I almost always do at the beginning

of these projects. Vacant then, according to the company preparing to develop the land, meant the lot is empty of any living thing willing to pay money to be there.

What I didn't find in that lot were any tiger salamanders. And I knew I wouldn't. They're endangered for a reason. The needs of tiger salamanders are far too specific for them to be living in a bone dry, weedy lot like this, penned in by urban sprawl, and nowhere near a breeding pool—long ago amputated from the few remaining life-supporting places of tiger salamanders in Sonoma County. But I spent day after day looking for them anyway, filling the pockets of my safety vest with the struggling bodies of all those whom we aren't legally mandated to care about, while the yellow machines stripped the land bare like a swarm of gargantuan locusts.

“You've been out here every day for two weeks and still haven't found one of them salamanders?” the foreman said to me one morning, appearing beside me and slapping me on the back while I watched an excavator dig up an old waterline.

“Not yet,” I replied, stepping away from him. I could still feel his handprint glowing on my shoulder blade like a coronavirus starburst.

“What's the point of having you out here if there aren't any?” he asked me, maskless.

“Well, there's always a chance there are,” I told him, despite knowing there almost certainly wasn't. “They used to be all over this place before we dried up the Laguna,” I added.

He looked around at this dusty, flat, unremarkable place, surrounded by houses, a nearby high school, storefronts with blinking neon signs, busy roads. I'm guessing that's

all he saw. I'm guessing he wasn't imagining what this place used to look like only a few generations ago, like I was.

He stepped forward, peering into the eight-foot deep trench.

"There's too much fucking clay in this soil," he barked, saying it to no one in particular, before walking away.

I wanted to yell at him that there's too much fucking clay in this soil because it used to be a wetland. There's too much fucking clay in this soil because this place once teemed with profusions of wet, aquatic life. But I kept quiet, staying in my narrow lane—only here for the nonexistent salamanders.

Before Europeans settled the Santa Rosa Plain and turned it into cow pasture and high-intensity agricultural land; smeared it with chemicals and shopping centers; bifurcated it with roadways and irrigation canals; before they dried it up, domesticated it, sucked the green lush life from its spongy soil, turning the land and the grasses the dead-grey of roadside cardboard—the Santa Rosa Plain was dripping, oozing, sprinting, squirming, squiggling, crawling, flapping, splashing, and growling with life.

Grizzly bears waded up to their haunches in cool, clear water that never once knew the iridescence of engine oil; never once swirled with carcinogenic agrochemicals, hormones, or antibiotics. Coho and steelhead pushed upstream in thick, slick torrents; almost like a single, miles-long, grey-pink organism, beating past the swiping claws of the grizzlies, big as catcher's mitts. Waterfowl blackened the sky like living, billowing curtains, honking and calling; shitting an even coat of nutrient-rich fertilizer across every inch of the land, sending a chaos of plants bursting skywards as if attempting flight themselves. Pronghorn grazed on native grasses on the wetland's edges, stalked by

cougar slinking down through the purple manzanita in the foothills to the east. Condors with nine-foot wingspans cast sharp, slicing shadows over the land, searching for carrion. Grey wolves, though never numerous in the Bay Area, were indeed here, howling beneath the silver lantern of the moon, curdling the blood of the smaller canids—the foxes and coyotes, who skulked off to sing and bark some other place. At night, the frog chorus was so deafening the bats swooping through it must have felt they were flying through a thick, sonic stew. And of course, there were people here then too. The Southern Pomo built tule balsa rafts and lived in tule huts all over the Santa Rosa Plain, fishing for salmon with hooks chipped from chert. Hunting black-tailed deer and pronghorn. Gathering fat acorns in baskets woven from willow branches. Coexisting with all this life.

And amidst the flurry, tiger salamanders, their dark, stalky bodies splotted in archipelagoes of sunlit buttercup, ambushing spiders in the darkness of gopher burrows. Tiger salamanders, with their yellow lips, giving them the appearance of a dopey grin, twisting their wet, rubbery bodies around each other in breeding ponds. Tiger salamander larvae boiling in every vernal pool dotting the plain. Tiger salamanders dragging their heavy tails as they migrate by the thousands on the first big rain of the year; a clumsy procession of yellow speckles moving in slow-motion over hills; through tall, swaying grasses; past the brown, humped mountains of sleeping grizzlies; a few getting speared and eaten by herons and egrets along the way, but it didn't matter—they were determined to get to their breeding ponds at any cost—determined to make more tiger salamanders. The only ones in the world who can.

This was not a long time ago. This wasn't the Pleistocene, or some other far-flung time in the past. This was less than 200 years ago. Individual koi fish have been known to

live longer than that. Only 100 years ago, and the Santa Rosa Plain would have looked a lot more like that throng of life than what it is today—traffic, bad air, car dealerships glinting in the sunlight, townhouses crammed between townhouses crammed between townhouses.

The reason tiger salamanders are no longer proliferating as they once did is certainly not for lack of effort. Nowadays, on the first big rain of the year, tiger salamanders are run over by the dozens as they slowly cross the busy roads separating their underground homes from their breeding ponds. Pulled as if by the strength of a giant magnet, drawing them towards tens of thousands of years of instinct, despite these brand-new dangers in their paths. Local biologists have learned where some of the busier road crossings tend to be, and will spend all night standing in the rain escorting salamanders safely from one side to the other, headlights whipping past them at 70 miles per hour. But the efforts of these biologists are not enough to counteract what we've done to the land in Sonoma County.

In less than a geologic blink of an eye, 95% of the breeding habitat of tiger salamanders is now gone or under direct threat from development. And it isn't just the salamanders who are suffering. Some of the largest grizzly bears in the world used to live where I live, and recently—the last one shot by white settlers in California less than 100 years ago—yet I rarely hear mention of them, despite their likeness taking up the majority of the California state flag. Grey wolves were also trapped and shot into local extinction in California, though after 90 years of absence, a small pack has recently reentered the Golden State, mounting a quiet comeback—godspeed. Pronghorn, a short-necked relative of the giraffe, left the Santa Rosa Plain long ago, as did the California

condor, who nearly went extinct due to lead poisoning from the bullets filling the bodies of the countless animals we left to rot across the landscape.

According to the historical records of the Laguna Foundation in Santa Rosa, an individual hunter killed 6,200 ducks *by himself* in 1892 to supply markets in San Francisco. When I came to work yesterday morning there were seven Canada geese standing in the center of our project site. When the construction crew arrived, firing up the yellow machines, this anemic flock flew off to look for some other marginal place to scrape out an existence. As I watched them fly away, I didn't see seven geese in the sky above me—I saw the ghosts of the thousands of birds that were no longer there, replaced instead by a sky filled with toxic smoke.

None of this is normal, yet we treat it as if it is. And it isn't just Northern California that's changed—the entire planet has. All the way down to the fish in the sea, as I'll explain in a moment.

As a species, we suffer from a sort of collective amnesia brought on by a phenomenon called “shifting baseline syndrome.” Shifting baselines are what allow each new generation of people to be born into a world that appears “normal” to them, even as their grandparents loudly lament the way things used to be. Those lamentations die with the older generations, and the new generation begins the process over, now lamenting the changes they've witnessed in their short lifetimes, while their children and grandchildren are born into worlds that appear perfectly normal to them. And so on.

A classic example of shifting baseline syndrome was discovered by marine biologist Loren McClenachan when she found a series of historic photographs all taken in the same place on a wharf in Key West, Florida. The photos show people displaying the

day's fishing catches in front of a hanging board throughout the decades, beginning in 1958 up until 2007. As the years slip past, the fish on display get smaller and smaller and smaller. At first, they are mighty behemoths hanging from hooks, taller than the people who caught them, averaging 43.8 pounds in the 1950s. But by 2007, the average weight of the fish is only five pounds, held proudly in the hands of the anglers with no exertion whatsoever. Yet what is most striking about these photographs is the fact that the smiles on the faces of these pleased fisherpeople lose none of their brightness throughout the decades, even as their catches become preposterously diminished. This is shifting baseline syndrome. We keep smiling, ignorant to the fact that the natural world, which we rely on for survival, is disappearing beneath our feet.

Yet recently, we've reached a point where the ecological changes are happening too fast and are too destructive for us to continue to ignore them. Shifting baseline syndrome may have brought the Big Bad Wolf to our door, but climate change, habitat loss, and pollution have blown the house down. Or in the case of my home state of California, burned the house down.

Growing up in Northern California, I never remember the sky filling up with smoke. Not once. Wildfires, if I heard about them at all, were burning "over there" somewhere, out of sight, and nothing for me to fear. Not so anymore. Now, for the fourth straight year, Sonoma County has either been on fire itself, or has become smothered by the toxic smoke of other fires—or both—with 2020 becoming the largest, most destructive fire season in the state's history.

On a recent day off, I found myself stuck in my trailer again. The air quality outside—measured in PM2.5—was in the 370s. Anything above 250 is considered

hazardous. The air temperature was 95°F. I had no choice but to keep every window and door sealed shut because of the smoke, but my trailer sits in direct sunlight, and the indoor temperature quickly outpaced the heat outside. Sweat poured down my body as if I was in a sauna at full furnace. My chest tightened. It felt like I was being squeezed by the hands of some invisible giant. I couldn't tell if it was claustrophobia or if I was actually running out of breathable air. I paced around my narrow home, leaving wet footprints across the wood floors—the air a hot, toxic porridge both inside and out. Panicked, I went to the window, looking out across the farm where my trailer is parked. Normally I see green hills and old red barns out that window, but on this day, I could barely see the outline of my truck, parked only 15' away—a vague shape in a brown-grey hellscape.

I needed fresh air. My chest squeezed tighter. I had to find some good air to breathe. I held my door handle, ready to burst out of this sweltering aluminum pillbox, but there was nowhere to go. I was trapped. If I opened the door, the air inside my tiny trailer would only get worse. The air outside was not only the smoke of charred forests, but also countless human structures filled with paint, asbestos, burned out cars, garages full of half-empty gas cans, lacquers, engine oil, cleaning supplies. I remembered two years earlier when the smoke from the fire that destroyed the entire town of Paradise had settled over Sonoma County, and I'd wondered if I was breathing dead bodies. If the ash on my truck was someone's uncle, or mother. Black bear, or rattlesnake.

I fell face-first onto my small couch, pressing my nose and mouth into a pillow, trying to calm down. I thought of the salamanders—how they breathe air through both their skin and lungs, and how easily polluted their small, squishy bodies are. When the

smoke rolls into their cramped burrows, what will this rancid air do to them? Will any tiger salamanders crawl out this winter when the rains finally come? If they come. Or will they all die in there? Smoked. Jerkied. Little golden-flecked mummies, hard as old bubblegum. Will anyone notice? Will tiger salamanders make the news if we kill off the last one? Will people finally realize just how cute they were, and wonder why no one told them earlier, before it was too late?

According to ancient belief, salamanders have nothing to fear from fire. The Talmud describes salamanders as being born of fire, and that anyone who covered themselves in the blood of salamanders would be immune to burning. In Greek, the name salamander means “fire lizard.” Both Pliny the Elder and Aristotle claimed that salamanders could extinguish fires with their wet, icy skin. Leonardo Da Vinci said that salamanders have “no digestive organs, and gets no food but from the fire, in which it constantly renews its scaly skin.” People also long believed that the fire-proof substance, asbestos, was made from the “fur” of salamanders. It’s thought that these archaic misconceptions arose from the fact that salamanders often burrow beneath, and sometimes inside of rotting wood, and throughout history, as people placed these logs into their fires, salamanders would occasionally crawl out of the flames.

As the August Complex Fire—California’s first-ever “gigafire,” one that is larger than a million acres—burned to the north of me, and the nearby hillsides around Santa Rosa were on fire to the east, and the Santa Cruz Mountains to my south were engulfed in flames until they ran straight into the sea, I found myself wishing that the mythology of the fire lizards was true. That somehow, in the charred wake of all this destruction, millions of salamanders would materialize—slow-motion phoenixes rising from the ashes

with long tails, fat legs, yellow spots, and a knowing look in their wet, protruding eyes that says: “we come from where you’re headed, and you’re not going to like it there.” But of course, tiger salamanders, like most other lifeforms, will not emerge from these fires, but will instead be destroyed by them.

Even before this latest record-setting fire season, my brother and I were planning a trip to Washington State to scout out a few towns we were hearing good things about up there. Not only is our home state on fire and only getting worse every year, but we can’t afford to live here anyway—no matter how many housing developments I watch being built in Sonoma County, the cost of living remains stratospheric. These developments aren’t being built out of compassion for the affordable housing crisis in this part of the country, they’re being built by profit-driven capitalism.

I can’t imagine leaving the place I’ve called home for almost my entire life, and yet, I also don’t see how I can stay. Like tiger salamanders, I feel pushed out. Unlike tiger salamanders, I have the option of leaving and trying my luck elsewhere. But eventually, if we humans don’t stop ransacking our one home planet, we will all be forced to learn that we live in a single biosphere—a materially closed system in outer space—and there will be nowhere for any of us to go.

“Why should I care about some salamander anyway?”

It’s a question I get from the construction crew on nearly every jobsite, and you can replace salamander with whatever species I might be there to protect: dusky-footed woodrats, Alameda whipsnakes, red-legged frogs, desert tortoises.

Don't all of our most revered Western documents, from the Magna Carta to the New Testament to the U.S. Constitution, clearly state that this world is here for us to enjoy, that private property is sacred, and dominion over the earth is sanctioned by God himself? So what does it matter if these other creatures are here or not? This is our garden! We have houses to build for actual human beings; isn't that more important than some swamp gopher?

Well, yes, sure. But also, no. We need tiger salamanders, and all other plants and animals, because what's killing them is also killing us. A California with a healthy tiger salamander population is a place where we are all healthier. The reason the state of California, and much of the West, is experiencing record-breaking heat, drought, and fire, year after year, is the same reason tiger salamanders have all but disappeared. The natural processes of our planet have been thrown catastrophically out of balance by the short-sighted, highly-destructive behavior of a single species on a timescale too fast to allow for the majority of species to adapt to the changes.

Tiger salamanders need both undisturbed habitat and enough clean, unpolluted water to fill their breeding pools every year. They don't have it. It's the same reason you might not have enough water in your well. It's the same reason farmers can't keep their crops from drying out. It's the same reason cities are fighting over, and diverting distant streams to keep the taps flowing. And it's the reason why California had its first gigafire this year, which will surely not be the last, just as the SARS-CoV-2 pandemic will not be the last virus to spill from the bloodstreams of animals into our own, due to our endless, violent encroachment into wild lands.

Tiger salamanders are trying to tell us something by their very disappearance—if the world isn't healthy enough for us, it isn't healthy enough for you either. The shrinking fish in the photographs from Key West have the same message: "Keep smiling, sickos, you will ultimately follow us all into oblivion if you don't make drastic changes to your way of life, and fast."

My job is to protect the disappearing animal species of California. I think of these animals as ambassadors to the apocalypse. Not only are we creating a world where California condors and mission blue butterflies and steelhead trout can no longer live, but we're creating a world where none of us will be able to live either. We would be wise to heed the warnings of those species who are showing us where we're all headed, because there is no more urgent form of communication than going extinct. Without wondering "what's in it for me?" when encouraged to consider the wellbeing of a frog, pupfish, or vole, just know that they are all part of a web of life too intricate and complex for any of us to ever truly comprehend; that they defied every evolutionary odd to be here; and that they deserve to live, just like you. And if they're not allowed to, you might not be either.

I dream of water. Every day, as I wake to more smoke, more news of another fire ripping through nearby hills, I dream of heavy clouds galloping, gathering, rolling in from the sea—white-grey baskets sloshing with clean rainwater that burst open as they sweep across the West, drenching us, rinsing us, reminding us of what this world could, and should be. So much water that each dimple in the landscape fills up, turns green, and writhes with life again. I dream of a world where people don't simply care about the many creatures we share this planet with, but celebrate them. A world where tiger

salamanders migrate by the thousands on the first good rain of the year again—so many they walk over each other’s backs—all of them wet and vigorous, breathing pure air through yellow-speckled skin, while the people come outside to line up and watch. Cheering them on.

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Sea Stars Disappearing, Reappearing

The sea stars were disappearing. They were wasting away by the millions up and down the west coast of North America, and no one knew why—their rough, rubbery bodies literally melting, breaking apart. It began in 2013 and only got worse from there. I heard about it, saw the headlines, but I didn't click on the articles. Instead, I ignored the news; let other people worry about this one.

It's not normal for me to turn my gaze like this. As a biologist, my job is to protect disappearing animal species, and despite how desperate and global the ecological devastation has become, my love for the riot of lifeforms with whom we share this planet has always been big enough to keep me in the fight. But the vanishing sea stars turned out to be too much for me. My breaking point. Causing me to do the very thing I find so troubling when I see it in others: the impulse to look the other direction when met with a frightening truth, instead of facing it.

Reflecting on it seven years later, I'm finally beginning to understand why I averted my eyes when I heard about the sea star wasting syndrome—how their disappearance was about so much more than simply the loss of some marine invertebrates. It's only now that I can see how heavy is the thread that connects sea stars to my own story, and how losing them pulled too directly, too painfully, on the greatest loss of my life—the person who introduced me to them, my dad, whose absence I can only bear because this living world he shared with me remained after he died, half my lifetime ago.

The only way I could fully protect myself from the news of the disappearing sea stars was to be sure I never saw it for myself. Sea stars are one of the defining animals of the intertidal zone along the Pacific coast. To see rock pools devoid of them would be an all-too-terrifying indicator that we've lost control; that ecological collapse is already here, now, and the biodiversity of our planet is vanishing, literally before our eyes. That would be enough on its own, but to see rock pools devoid of sea stars would also be to lose him all over again. My connection to my father going extinct right along with the ochre and bat and sunflower stars. The world he gave me, winking out.

The promise of even a few hours of significant low tide every year has always been enough to make me never want to live anywhere but the very edge of the continent. But once the sea stars began to disappear, I stopped checking the tide charts to see when it was low. If I didn't know it was out, I wouldn't go to the tide pools, and if I didn't go to the tide pools, I wouldn't have to see that so much of their color had gone away.

None of this was done consciously. I wasn't even aware I'd stopped checking the tide charts. Grief is funny like that. It's only now, peering back from this ledge of time, that I can see how deep in the sand I'd buried my head. Instead of looking out towards the ocean. Like I was taught.

I've been tide-pooling for as long as I've been alive—one of the perks of being the child of a marine biologist. Whenever the tide was out, he'd bring us to the rocky coastline where for a few hours the sea would pull away from the shore, urged by the moon towards Japan, exposing an alien world that we could suddenly visit. Wet, turquoise flowers with red, thorny crab legs jutting from their mouths. Sea stars like

bodiless hands prying open iridescent mussel shells in slow motion. A hummocky, slippery mess of bull kelp, sea cabbage, and bladderwrack, concealing hidden cities populated by gumboot chitons, owl limpets, and gooseneck barnacles.

It's still one of my favorite things to do—walking out as far as I can at low tide and letting the sea slowly walk me back in. We'd flip over rocks and part the thick, slick drapes of algae to find kelp crabs as big as teapots, hiding, ready to rumble if I dared pick them up, which as a kid I always would. Grabbing them from behind like my dad did, where their claws couldn't get me.

We were always searching for nudibranchs—sea slugs bright as a neon sign, their backs covered in wavy cerata making them billow and sway beneath the water like opalescent flamenco dancers. Nudibranchs are generally small and hard to find, turning the entire tide pool into a treasure hunt. I can still feel my child pride whenever I spotted one, calling him over from where he crouched in his faded, red raincoat to show him the living gemstone I'd discovered.

“Good find, Sammy!” he'd shout, slapping me on the shoulder. “The reason they don't need a shell is because their backs are covered with stinging cells,” he taught me. “That's why they're so colorful: to warn predators against eating them.”

My excitement at finding nudibranchs hasn't dulled a drop throughout the years—it still feels like stumbling upon some lucky secret every time. I like to let them crawl onto my hands. When out of the water, nudibranchs lose their form, collapsing into a small pile of colorful gelatin. But when placed back into the pool, these resplendent saltwater slugs bloom out, elongate—their bright, mucousy bodies turned to ripple and feather as they slide across the ridgeline of my knuckles.

Octopi were the rarest find of all. A young octopus will sometimes hide out in the intertidal zone for an afternoon to take a break from their usual role as tiny, delectable prey, instead, becoming Godzilla for a few hours—terrorizing and devouring the shore crabs and combtooth blennies, trapped until the tide returns in their own tiny underwater Tokyo. Where I saw nothing but an empty pool, my dad would suddenly pull one from a small crack in the rocks as if by magic, his hand entangled in suckered arms pulsing from scaly crimson to mottled eggplant to prickly bone. He'd always let me hold them, but only for a moment, their dozens of suckers grabbing onto me, probing, sensing, gathering information, before he'd say it was time to put it back where we found it. Gently peeling the octopus from my fingers and returning it to the shadowy water where it would instantly become rock, algae, nothing at all.

Every time I bring someone tide-pooling I give them the same speech about sea star feeding that my dad gave me as a kid: “Imagine you have a hamburger and French fries on your plate, but instead of eating them with your mouth and swallowing them into your stomach, you pull your stomach out of your mouth and put them straight inside.”

Whenever we'd find a sunflower star—a massive, twenty-armed species as big as a dinner plate (though they can grow as large as a truck tire in deeper waters)—he would have me arch my head back towards the sky and gently drape it over my face. As the thousands of slimy tube feet would begin to explore and suction onto the topography of my cheeks and forehead and nose, I'd let out a close-mouthed squeal while he laughed and laughed beside me, slowly detaching it, one clinging arm at a time.

“Your turn!” I'd shout, pointing at the drooping star in his hand.

“No, no,” he’d reply with a smile. “I think we’ve harassed it enough for one day. Plus, I wouldn’t want it to mistake my nose for a sea urchin.”

Going to the coast at low tide was my version of getting to spend a day at the family business—I was learning the ropes, learning the names of the creatures there, learning their strange habits, and how each is as important as the next. I was learning to pay attention, which made me care. And without knowing it at the time, this transference of curiosity and care was precisely what he wanted, ensuring that his love for the more-than-human-world would not be gone when he was. An unbroken line.

It was a different sorrow that finally got me looking at the tide charts again. A break-up. And as always happens when I’m sad, I was pulled to the coast—being a sort of tidal creature myself. I started running every day at Salmon Creek Beach near my home in Northern California. I needed those runs—the sea was the only thing big enough to quiet my self-pity after the woman I loved had so quickly moved on to someone new. The hiss and roar of the green waves beside me, whooshing and retreating, helped to widen the aperture on my lens. The occasional dolphin fin or humpback tail beyond the breakers, a reminder that the center of the story is everywhere, and not only above me and my bruised heart. The vultures and ravens clustered around a seal pup carcass, their heads bowed as if in prayer, forcing death to come alive again.

I finally returned to the tide charts after a few too many times arriving to the beach at highwater, left to tramp through the driftwood in sand soft as sugar. Low tide is when you want to run—when the beach is huge and flat, and the sand wet and compact.

I saw there was a good minus tide coming up and made sure I was at the beach during the peak. It was late afternoon in early winter, and the silvery clouds above the sea were tea-stained and appeared fixed, as if they would never move again—weakening the distant sun and turning the water to cold, roiling metal. I ran at the edge of the surf, letting it sweep over my bare feet, parting the sanderlings by the hundreds as I slowly padded towards them where they fed like little white bells in the wet sand.

Salmon Creek Beach terminates at its southern end at a long finger of sandstone sculpted with shallow caves and smooth bowls that trap water at low tide. This is the halfway point of my runs, and normally I don't stop—I just swing around and keep going, never breaking stride. But on this day, I did stop, ordered to a halt by a cluster of colorful hands. Clinging to the exposed rocks were 20 or more ochre stars—our most common sea star in California. You know the ones, purple or orange, covered in rough white dots, big as your dad's hand. I stared at them, feeling confused, before slowly approaching. Had they been here all along? Or had they come back? I had no idea. This is the problem with willfully ceasing to pay attention.

I greeted them, as I greet all animals when no other people are around; chatting them up a bit, asking how they are, and wishing them nothing but the very best, and many, many babies. But I felt a distance between myself and the ochre stars that was never there before. I felt embarrassed. Ashamed, even. I had let a lifelong relationship lapse, and just when they needed me to be paying attention to them most.

I started running back down the beach, leaving the stars behind, and when I got home, I did a strange thing, perhaps because of the shame I felt for not already knowing what I knew I should, but I still didn't read up to learn what was happening with the

ochre stars. Were they still melting away? Were they making a remarkable, unlikely comeback? I didn't know. And I was too afraid to find out. I just let the experience be a one-off—perhaps that's just a little holdout population there on those remote rocks. Best not to get too attached or you might get your heart broke, Sammy.

A few weeks later, I was checking the chart before a run when I noticed that the following day boasted the lowest tide of the year. I stared at the number: -1.51'. A great low tide which landed squarely during daylight hours. Before all this sea star business, that's the type of negative tide I would have had on my calendar months in advance. I kept staring at it, this negative number that was like a key to a hidden world. A treasure map.

I decided I'd deprived myself of the rock pools long enough. I wanted to find some nudibranchs, damn it. I wasn't even thinking of starfish. But the next day, when I arrived to the tide pools, there they were—constellation after constellation of ochre stars. They were everywhere, like gravity-defying drunks sleeping one off, splayed out over every vertical wall and overhang in the village square. They were piled one on top of another, crook-necked and double-jointed, and some of them were enormous—far bigger than my father's big hands, even in my child's memory where he's still the size of a grizzly bear. The sea stars were back. And all I could do was marvel in silence, as if seeing an old friend who I'd been told had died, but then there they were, not just alive, but positively thriving.

Something loosened in me that day. A tension I didn't know I'd been carrying. When I got home that evening, I finally did some research on sea stars along the western seaboard. Scientists are still murky on the details, but it seems that much like us, the sea

stars were hit by a virus, but theirs was far deadlier, causing a disease called sea star wasting syndrome. The densovirus that is thought to be contributing to sea star wasting syndrome—though many scientists believe it is not the sole cause of the dramatic die-off—was able to proliferate because of rising sea temperatures caused by climate change. But as I saw with my own eyes, some species had recently begun to bounce back.

Though it's true that many sea star species have been making a recovery of late, the news is still grim, especially for one species particularly close to my heart. When my dad would drape the sunflower stars over my face I would imagine I was a space traveler visiting another planet, and this was how I had learned to communicate with the friendly, twenty-armed aliens I'd met there. If they wrapped their wet, sticky bodies around my head, we'd be able to read each other's thoughts. And if anything went wrong, my dad was there to protect me.

For most of us, whenever a species is threatening to permanently disappear, it's usually happening over there somewhere, out of sight, or at best, in photographs. Polar bears, Sumatran rhinos, orangutans—I've never draped any of them over my face before. I've never held any of them in my upturned hands like an offering—a red, squishy, marine sunflower held up to the sky while my dad stood beside me, patiently teaching me their scientific name one syllable at a time.

Pycnopodia helianthoides.

Sunflower stars are the second largest sea star species in the world. And they are now locally extinct in California and Oregon, and all of Washington south of Puget Sound. In the waters between British Columbia and Alaska—the last place on earth where sunflower stars still remain—their population has dropped 96% since 2013. In the

span of only seven years, this common and abundant species is now fluttering on the brink of extinction.

Sunflower stars are one of the main species that keep urchin populations in check, and now that they're gone, the urchins are decimating the kelp forests off the west coast. Most people think of climate change as rising seas, melting ice caps, and hotter weather, which is certainly part of it, but the reality of climate change is that its effects are far more intangible and unpredictable than we could ever forecast. The story of the sunflower star is a perfect encapsulation of the type of destruction a changing climate will bring about—our industries extract and burn fossil fuels, carbon dioxide builds up in the atmosphere where heat is trapped, ocean temperatures rise, a densovirus takes advantage of this and proliferates, sunflower stars melt, urchins lose their predators, sea kelp is wiped out, and suddenly the home of sea otters and sea lions and countless fish and other species is gone, effecting the food supply of humans, and further accelerating climate change due to losing the massive carbon sequestration that kelp forests provide. As it turns out, everything is connected. Imagine the sunflower star as one tiny strand in a web more vast and complex than we could ever comprehend. If you stress any part of that web, it inevitably tugs on the whole.

Not long ago, out of sight from the endless human carnival, some of the last remaining ochre stars who hadn't melted away found favorable breeding conditions. Perhaps these lucky few had developed a resistance to the virus killing off their kin, or maybe they were simply stationed in the only places where it never arrived. Whatever the case, they represented the last of their kind, and like all species on Earth, their survival

depended on them replacing themselves at an equal or greater rate than they were dying off.

A single large ochre star female can release up to 40 million microscopic eggs, which are fertilized by sperm from their male counterparts. These sperm and eggs form a cloudy soup, filled with the building blocks of new stars. Many of these fertilized eggs will become bipinnaria larvae, floating in the great slosh of oceanic plankton. Eventually, these larvae will fall from the ceiling of the sea down to its floor, where they enter their next life stage as brachiolaria larvae, before metamorphosing into adults, which we would recognize as ochre stars.

As politicians were tweeting; as traffic was backing up on the Bay Bridge; as I was going about my terrestrial life, driving from here to there, worrying about this and that; the sea stars were out in the cold, dark waters off the west coast reproducing like mad, quietly and without fuss, proving yet again the stupefying resilience of life on this planet. But as encouraging as this story is, we must not forget that this resilience always has its limit, and for many species we have taken them to that limit and then accelerated right past it; casualties of our human-dominated age. Caribbean monk seals, western black rhinos, Saudi gazelles—none of them could replace themselves faster than the death toll brought on by the world we've created.

Life exists on a continuum. We stand today, alive, in a precarious present, with innumerable lifeforms stretching behind us—our multispecies ancestors who got us here, to this very moment, where an uncountable number of species still coexist today. Together, connected, we look out towards an unknowable future, looming beyond our

comprehension. Many see this future as already written in grey ash; an inevitable apocalypse, and have given themselves permission to look away. But just as the effects of climate change can have a catastrophic domino effect, like in the case of the sunflower stars, so too can we be surprised by the unpredictability of resilience, if only we could slow down our destructive behaviors long enough to allow the diverse web of life on this planet the opportunity to course-correct and adapt.

Instead of looking away, or being naively optimistic, we must do what multispecies feminist theorist Donna Haraway describes as “staying with the trouble.” We will never be able to wish away life-killing corporate greed with our eyes closed and our fingers in our ears. Just as we will never bring about a future where myriad species are thriving together if we pretend everything is fine just the way it is, because clearly, it is not. We must stay with the trouble, and be brave enough to look it in the eye, to speak up, to boycott nefarious corporations, and only elect officials who are committed to justice, both within our own species, as well as for our life-sustaining biosphere. And we must be brave enough to believe that all is not already lost, but instead, visualize a future that is bright and worth fighting for.

Perhaps the most exciting—and frightening—thing about being alive in a complex, living world is that we have no idea what will happen next. But what we do have is the power to each do our small part to conjure a future that not only our children and grandchildren deserve, but that sea stars, and desert tortoises, and marbled murrelets deserve as well. A green and blue planet with ecosystems in equilibrium, not a place we’ve given up on, covered in ash. Whether we want to be or not, we’re all caught in the same web. We’re also all weavers of this web.

Today, I celebrate the return of my old friends the ochre stars—*Pisaster ochraceus*—while simultaneously grieving another old friend, the sunflower star, who has made no quiet comeback. It’s likely I will never see a sunflower star again; will never drape one over the faces of my own squealing children. But knowing this will not make me turn my head, not again, because today I recommit myself to paying attention, even when it hurts. Today I commit to staying with the trouble. Because the world as we know it cannot survive if we look away.

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