



EXTRACTION ART

SELECTED IMAGES, ESSAYS AND POETRY

“The greatest emergency is the absence of emergency, that is, the status quo, the normalization of disaster.”

—Santiago Zabala

Left: Ilka Hartmann
Grebe Victim of the San Francisco Oil Spill, January 18, 1971
photograph, © Ilka Hartmann 2019



Chuck Forsman, Saskatchewan, Bakken Area, 2019, photograph



Chuck Forsman, Bonneville Salt Flats, UT, 2017, photograph



Chuck Forsman, Logging Debris, South Africa, 2019, photograph



Chuck Forsman, Gilsonite Trench, Northeast UT, 2019, photograph



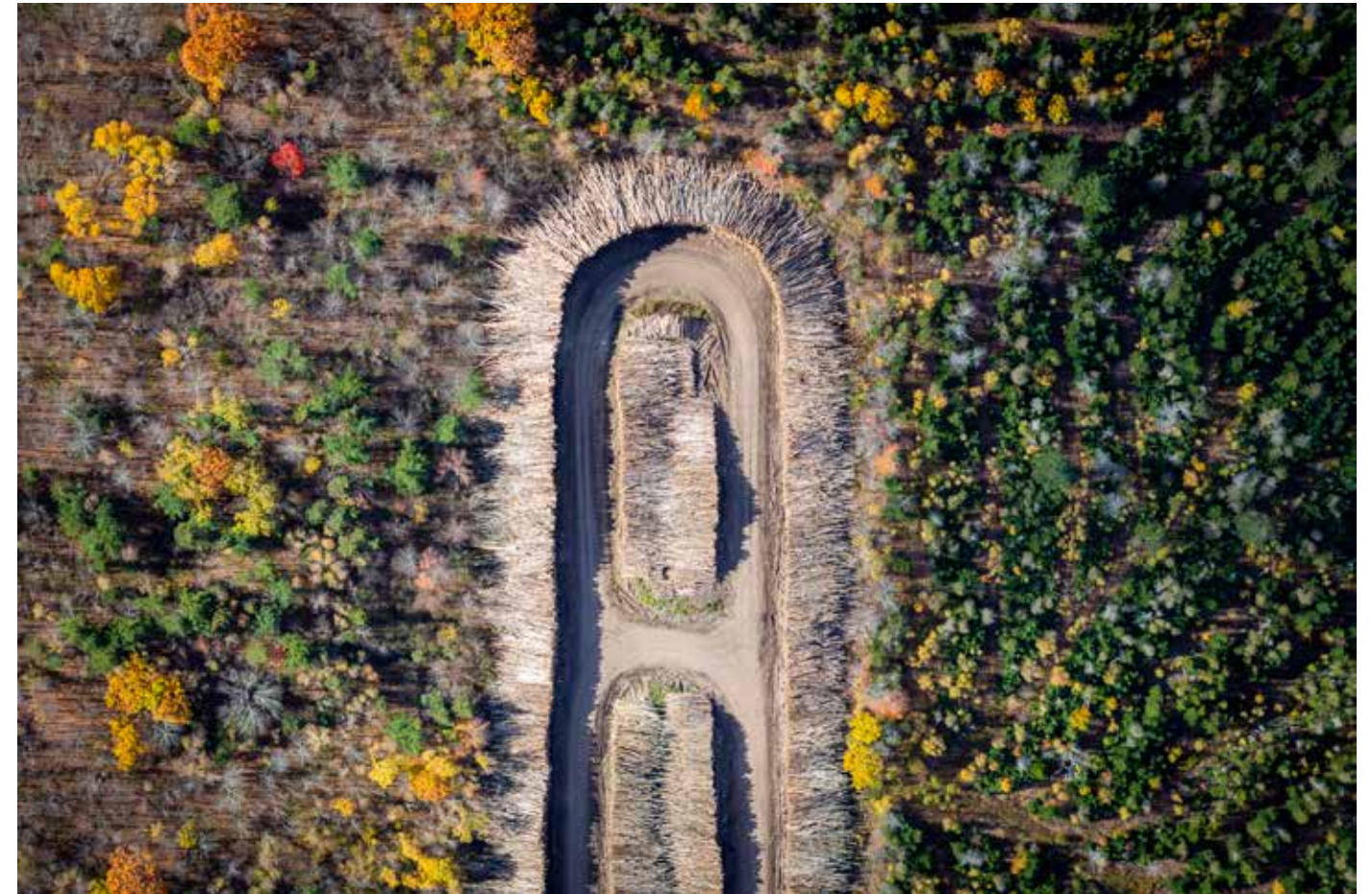
Chuck Forsman, North Dakota Fracking Pond, 2019, photograph



Chuck Forsman, Moroccan Pit Mine, 2019, photograph



Chris Boyer, Prairie Pothole Junkyard, Eden, South Dakota (45.580135°, -97.420159°)



Chris Boyer, Pulpwood, Baileyville, Maine (45.162863°, -67.424985°)



Chris Boyer, Atlantic Salmon Pens, Welshpool, New Brunswick, Canada (44.885980°, -66.959243°)



Chris Boyer, Gold Mine Tailings, Whitehall, Montana (45.886368°, -111.991425°)



Left: Chuck Forsman, *Love in a Pit Mine*, 1999, oil on canvas, 54 by 42 inches

A GENERAL VIEW OF EXTRACTION

William Fox

The rubric of “extraction” for a series of long-running exhortations and examinations about human use of land and associated resources—a public effort culminating periodically along the way with publications, exhibitions, and conversations—opens up an opportunity to discuss what the word performs. For example, the bumpersticker adage “If it’s not grown, it’s mined” is not exactly a Zen koan, but it points out that everything we consume—from food, to clothes, to cellphones—is made from materials derived from only two mechanisms. I’d add to that proposition research geologist Bill Langer’s observation, that “if it’s growing, it’s mining.” Langer points out that agriculture is constantly mining soil for nutrients, and is also often dependent on loess, the wind-blown dust from deserts that provide key resources, such as phosphates, to agricultural lands in much of the rest of the world.

My point is that human extraction of resources is part of nature as well as culture, part of the universal chain of action that transforms the hydrogen burning in stars into all of the elements up to iron, and then via supernovas up through all the heavier elements, such as uranium. Nature works by building the blocks that build life, and our species, as with all others, is built from extraction at every level. But every time one material changes into another, through natural or artificial means, a quantity of energy is dispersed as waste heat. That’s called entropy. Eventually, that energy is so attenuated that all matter grows cold and inert. All energy stops, no information flows from one place to another, and nothing moves. That heat death of the universe, an inexorable consequence of entropy and the Second Law of Thermodynamics, which Einstein termed the only law of physics that would never be overturned.

But that’s a long time in the future, a process our universe is currently presumed to be only about halfway through, and our species will have been but a momentary and almost invisible flare in the career of the cosmos. Entropy as a process on our planet, however, is speeding up dramatically via human technology, the development and use of which increases rapidly as our population explodes.

How we determine our efflorescence on Earth, and the effect of it on ourselves and other species—which is to say our moral obligation to the planet—is where we have a say in how we live within the universal dynamic of extraction. It’s a question of scale, among other things: how much do we consume, how fast, how much do we waste, and simply how many of us there are performing extraction. Physicist Geoffrey West in his book about scale parses out many of the relevant numbers, some of which are as follows.

Extraction and entropy have been established facts of human life since we discovered fire, but they became a problem once the Industrial Revolution started around the late 1800s. That’s when coal-fueled steam engines began laying down a strata of carbon around the world that marked at least one definition of what some scientists call a new era, the Anthropocene. Carbon was, however, only a symptom. The real issue was the exponential growth of the size and number of cities that began then and continues today. Two hundred years ago, for example only 4 percent of Americans lived in cities; today it’s more than 80 percent. That trend is worldwide. Every two months the number of people equivalent to the entire New York metropolitan area moves into cities. Every eight weeks fifteen million people make that migration. Consider that China is building 300 cities to hold more than a million people each during the next twenty or so years, and that both Africa and India are following similar trajectories. West points out that this is “by far the largest migration of human beings to have taken place on the planet.”



Garth Lenz, *The True Cost of Oil*, Triptych, 2011

The amount of biological energy it takes to keep a human alive averages 2,000 calories per day, or about ninety watts, the equivalent of what powers an incandescent lightbulb. During pre-agricultural times the human population is estimated to have been as large as ten million people, and our energy consumption was still on an even keel with the rest of the natural world; our rate of entropy was manageable within the planetary ecosystem. Now there are twenty thousand times as many of us. Furthermore, to keep alive a person in a city, which requires powering everything from infrastructure and vehicles to home computers, takes 11,000 watts per day in the United States, a standard of living that is the goal of most people on the planet (which, in turn is why so many people are moving towards cities, and toward that goal). An estimated third of our energy use in America goes to waste, which is to say entropy. Pre-technological “natural” processes—including the growth of plants, forest fires, radiation generated by minerals—produce heat, but in manageable, ultimately useful levels. How do we return to that level, where entropy increases only very slowly over time? How do we lower the entropy gradient?

It’s worth quoting the numbers, even though we are basically an innumerate species that can’t reliably count past a hundred. But put it this way: at the height of the Roman Empire the worldwide human population is estimated to have been 300 million people—a little less than the current population of the United States. That was enough people to move more dirt on the surface of Earth than rain, which had been the primary force rearranging terrestrial geography for billions of years. Or, consider that in the first forty-five years following World War II humans impounded so much water behind the largest dams in the world—all in the northern hemisphere—that we altered both the axis of the Earth and the rotational periodicity of the planet. The changes were small but measurable using GPS.

We can solve much of our energy problems with solar panels. The sun delivers more power in a single hour to the Earth’s surface than is used by the whole planet in a year. Relative to our current carbon-based energy practices, converting more sunlight into electricity would reduce entropy toward a level of waste heat comparable to photosynthesis in plants, whereas an expanded role for nuclear power would result in an increase of total entropy. Before

humans swamped the planet, energy consumption took place in an open system, where sunlight from a source external to the planet powered the world. Once we opened the Industrial Age and the sun was no longer the primary source of energy, our burning of fossil fuels essentially converted the planet into a closed system—one that relied primarily upon internal resources such as coal and oil. Ultimately, such resources are finite, whereas the sun’s energy is, relative to the timespan of human civilization, virtually eternal. Burning up finite resources in a closed system is not a successful strategy for life on Earth. Add today’s sunlight to the accelerated burning of fossil fuels—essentially mineralized organic material that stores ancient sunlight—and the result is a rapidly warming planet whose ecosystems are unable to cope. Species start dying.

Scientists and engineers aren’t the only people dealing with the entropic fallout of resource extraction—the “global thermodynamic dysfunction” as Paul Mankiewicz and Dorion Sagan put it—a mechanism that is putting into peril the entire terrestrial ecosystem. In their 2016 essay, Mankiewicz and Sagan discuss the work of artists Helen and Newton Harrison. As progenitors of the eco-art

movement around the world, the Harrisons began intervening into the systemic failures of ecosystems at the local level in the early 1970s with a small lagoon north of San Diego, where they were teaching. By the time the 2000s rolled around, they were taking on the entire peninsula of Europe, the Tibetan Plateau, and the 400-mile-long chain of the Sierra Nevada. Their proposals included: farming techniques for Europe that would make the topsoil act like a sponge to re-normalize the water cycle; a reforestation project in Tibet to keep the Himalayan rivers flowing; and planting the Sierras with ensembles of plants that would slow forest fires and regulate clean runoff of snowmelt from the mountains. Through poems, performances, annotated maps, and photo-collages, they convinced entire governments to at least acknowledge these problems.

By the end of their careers, the Harrisons came to understand that their role as artists was to moderate the gradients of entropy in ecosystems, to lessen the loss of energy transferred, and to see that it would dissipate in ways slow enough that life could cope. They believed that you couldn’t stop extraction or entropy, either natural or human caused, what the Harrisons acknowledged as a force majeure. But



Richard Misrach, *Roadside Vegetation and Orion Refining Corporation, Good Hope, Louisiana, 1998*

you could design ways to build resilience to our excesses in rural and urban ecosystems.

The idea that artists could act directly on and with the surface of the planet came of age in the 1960 and 1970s with the advent of Land Art, when artists such as Robert Smithson, Michael Heizer, Nancy Holt, and Patricia Johanson were moving around dirt and building materials at architectural scale. Many artists around the world soon began to integrate Land Art techniques to rearrange geomorphology with the needs of eco-art to address real world problems.

One example is Daniel McCormick, an artist who studied briefly with James Turrell, who along with his partner Mary O'Brien developed a sculptural vocabulary derived in part from Land Art, which they deployed in service to rebuilding oyster beds in the Bay Area. They also created sculptures to help restore tidal wetlands that slow storm surges along the Gulf Coast, and to manage flood erosion along the eastern front of the Sierra Nevada, a project downstream from and closely linked to the work that the Harrisons were doing higher in the same mountains.

The Harrisons understood that the Sierra Nevada was warming so rapidly that species were being forced to move up into increasingly higher elevations, and then simply disappearing, in essence “boiling off.” This had happened before several times in the life of the range, but at much slower rates, which allowed other species time to adapt and move in to occupy niches the previous species had left open. It was a succession guided by multiple evolutionary mechanisms moving in concert over time, a process that preserved the flow of clean meltwater for downstream use. Now the changes were happening magnitudes more quickly, forced by massive human energy consumption from fossil fuels dumping waste heat into the atmosphere. The species moving into the empty niches this time included highly flammable grasses that outcompeted other plant species, and that served to exacerbate the problems via the fires, and in the process degrading the quality of the meltwater. The Harrison’s proposal was to establish test plots at different elevations to see what mix of species would be resilient in the face of the rapid change, and that would slow the spread of increasingly common catastrophic forest fires and consequent erosion.

Working with the Center for Art + Environment at the Nevada Museum of Art, located downstream in Reno, they began a multi-year engagement with the University of California Berkeley Sagehen Creek Field Station located in the mountains north of Truckee. They established plots there that would be monitored over decades to test the success of the plant ensembles.

Soon thereafter the Center began work with The Nature Conservancy to create art projects along the rivers in Western Nevada that the Conservancy were restoring to more natural flow regimes. McCormick and O'Brien, working with teams of local volunteers, designed, built, and installed structures from local materials, such as woven willow, that would redirect and slow flood waters, thus preventing rapid erosion of river banks while providing new hab-

itat for indigenous and often endangered species. While the Harrison project has not yet produced results, which will take years to measure, the McCormick and O'Brien eco-sculptures produced immediate benefits.

Art can also make it possible to prevent extraction before it happens. Photography has been the recording medium of choice when it comes to resource extraction and its consequences, such as climate change. And photography from at least the time of Ansel Adams during the 1960s has been a primary tool for eco-advocacy. John Reid was a professor of photography at the Australia National University in Canberra who would take his students on field trips into the forests of nearby New South Wales. One of the locations he favored was the Monga forest, which contains at least one relict species from the great woodlands of Gondwanaland that two hundred million years ago encompassed the Antarctic and parts of southern Africa and South America, as well as Australia. The forest, which also contained multiple sacred sites, was being logged and under threat of eventual extinction. Reid, a fierce conservationist, brought his artistic practice to bear in service to the environment. In addition to providing photographs of the forest, however, he did something very unexpected.

Noticing a photographic artifact in one of his shots taken of a stream, a flash of light that looked very much like a plan hominid swimming underwater, Reid undertook a multi-year project to document the presence of what he named the “Fishman,” the last unknown living hominid on the planet. He convened a national press conference to present the photographic results of his “artistic discovery,” stating that it would be entirely improper to demolish the habitat of such a rare creature. The resulting press became an important part of the effort to publicize the threat to the forest, which resulted in Monga being declared a national park. Whereas photographers from Richard Misrach to Edward Burtynsky have created definitive bodies of work

documenting extraction, Reid took the tradition a step farther by creating a photographic fiction that was proactive. The point was that it was possible for artists and scientists to work together through non-profit institutions to prevent deleterious entropic effects caused by the extraction of resources.

As a final example of how to slow the gradient of entropy, the artist Elizabeth Monoian and architect Robert Ferry founded an international biannual art and design competition in 2009 as a way of encouraging their peers to propose sustainable sculptures and built structures as engines of renewable energy. Working in locations as diverse as Dubai, Santa Monica, Copenhagen, and Melbourne, the Land Art Generator Initiative (LAGI) competitions drew enthusiastic responses from hundreds of artists and design firms, and the subsequent exhibitions and publications have reached huge audiences. In some places, such as Melbourne, public funds are being used to prototype and construct the actual projects. The competitions have become so popular that they are now being run annually with the most recent competition addressing a remote area of the Great Basin Desert near the site for the annual Burning Man event.

In 2016 the Burning Man organization bought Fly Ranch, the 3,800 acres of which include a notable geothermal resource, the Fly Geyser. The LAGI competition is inviting proposals that will address power (solar, wind, biomass, and geothermal generation and storage), the use of water, construction of shelter, growing food, and land regeneration. After the application process is finished in May 2020, and entries processed and juried, the winners will receive funds to build working prototypes with the goal of building the final project.

These four examples of art engaging with entropic gradients to slow them down are sensible interventions, yet rich in metaphoric and visual beauty. The idea that humans can deploy a temporary technological end run around entropy is aspirational at best. But a societal response that involves both cul-

ture and science has a chance of lowering the steepness of the gradient we've created. We can choose to simply waste less and recover more, but that doesn't solve the fact that we have already created so much thermal momentum in the system that we're now in an era of feedbacks that will last for millennia. For example, heat reflecting Arctic sea ice melts, exposing the dark heat absorbing surface of open water, which soaks up more heat causing more ice to melt—and, to boot, ocean bed methane starts its rise to the surface.

There's no going back, and time will tell if human civilization can handle the consequences. One of the reasons that science fiction literature is so full of dystopian future scenarios is that we've already made the easy extractions. We've mined everything essential that's easy to get to. If we had to restart technological civilization, it would thus be physically beyond our abilities to do so. The Second Law of Thermodynamics obtains: the arrow of time moves in one direction only, and you can't put the ore back into the ground once it has been used in a cellphone. And extracting it from the innards of a computer takes a technology that...well, you get the idea.

The Extraction Project is part of the societal response we must create in order to meet any number of challenges. It's a public collaboration, a chorus of voices raised not simply in protest, but as an active agent of change. May it ring loud and far. To be clear: it's not as if we have a choice.

The examples of eco-art projects mentioned in this essay are often cited by the author in lectures around the world. The archives of the projects all reside at the Center for Art + Environment at the Nevada Museum of Art in Reno where they are studied by researchers from around the world.



Chuck Forsman, *Bakken Flare with Sun*, 2019

SOURCES

Harrison, Helen and Newton. *The Time of the Force Majeure: After 45 Years Counterforce is on the Horizon*. Munich: Prestel, 2016.

Schneider, Eric D. & Dorion Sagan. *Into the Cool: Energy Flow, Thermodynamics, and Life*. Chicago: University of Chicago, 2005. *The flow of energy and information is subject to the Second Law of Thermodynamics. This book lays out a full scope of thinking on the topic.*

Steller, Robyn. *Monga intacta: A Celebration of the Monga Forest and its Protection*. Braidwood, Australia: Robyn Steller, 2005. *This overview of Monga and the struggle of environmentalists to save it includes photographs by John Reid.*

West, Geoffrey. *Scale: The Universal Laws of Life, Growth, and Death in Organisms, Cities, and Companies*. NY: Penguin Books, 2017.

The Land Art Generator Initiative produces a book for each of their major competitions. The first was *The Time is Now* (Singapore, 2012) and the most recent (as of writing) *Energy Overlays* (Munich, 2018).



Joan Perlman, *Untitled*, 2007, acrylic and ink on canvas (private collection), 57 by 67 inches



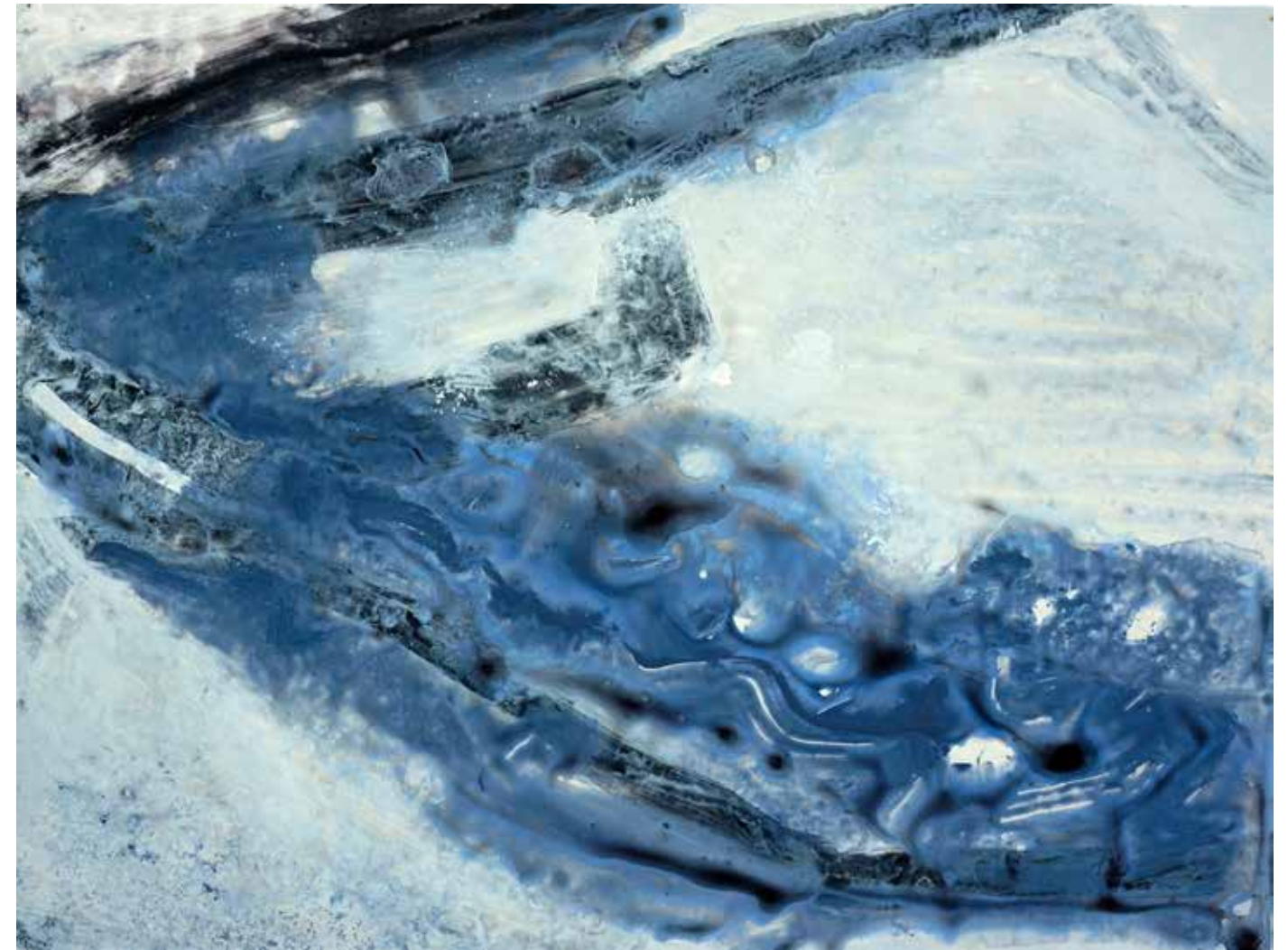
Joan Perlman, *Untitled*, 2014, mixed media on Yupo, 34 by 52 inches



Joan Perlman, *Kreppa I*, 2016, acrylic on canvas, 96 by 73 inches



Joan Perlman, *Níjíos*, 2016, acrylic on canvas (private collection), 96 by 84 inches



Joan Perlman, *Untitled*, 2015, gouache on Yupo, 9 by 12 inches



Laura McPhee, *Early Spring (Peeling Bark in Rain)*, 2008, archival inkjet print





Laura McPhee, Former Copper and Turquoise Mine, Lavender Pit, Bisbee, Arizona, 2012, archival pigment print



Laura McPhee, Open Pit Coal Mine, Kemmerer, Wyoming, archival pigment print



Laura McPhee, Jungo Flats, Humboldt County, Nevada, archival pigment print



Laura McPhee, L & L Classic Auto Salvage, Gooding County, Idaho, archival pigment print



AT ANY GIVEN MOMENT

John Grey

A row of purple lilacs,
a stone fountain centered by a bird –
nothing begins like a beginning.
Vireo, thrush,
magnolias spread pink gauze –
but an interval will do just as well.

We spend our lives learning to speak
to one another,
from the dark, moist tightness of
our mother's woman
to the day death crushes the last beer can against our forehead.

In the meantime, freak storm,
sky turns blue-black,
lightning strikes somewhere behind the Texaco sign,
thunder rattles the neighborhood,
inventories every house with a good shake
and a rattle of specimens in glass.

It's all life—
the clearing, the washed sky,
the hushed-blue of a swamp sparrow's egg—
anytime can have memories
we would never sell off in a rainstorm,
an heirloom like a small wooden child's chair
or tessellated stones, or rain warm as blood.

Life gives such wonderfully rich examples,
gastronomic spells
people in photographs
at their nearest moment
of coming back to life

Even a smile
as raw and wide as a dog's,
two quarter-moons of lipstick
painting the rim—
nothing adds to the album of being
like the expression on a passing stranger

Left: Laura McPhee, *Cliff Swallows'
Nests and Texaco Sign*, Challis, Idaho,
archival inkjet print



Richard Misrach, *Release Flare*, Mississippi River Corridor, 2010

BEARING WITNESS

A CONVERSATION WITH RICHARD MISRACH

Sam Pelts and Eric Zhang

SAM PELTS: We are interviewing you near the beginning of a global pandemic. Conditions will obviously be very different by the time people read this, but at the time of this interview (March 2020), the state of California has just been placed under orders to “shelter-in-place,” meaning non-essential businesses have closed and people have been asked to social distance from one another. We are not to venture out except for essential needs. This is the first order of its kind in the United States, though similar measures are under consideration in other U.S. cities. Since all three of us are Bay Area residents, we are of course interviewing you remotely. So I’ll just ask you first: how are you holding up?

RICHARD MISRACH: It’s only been ten days since you sent me your questions, and within that period of time the United States has already surpassed China in total cases of COVID-19, and we haven’t come close to peaking. It’s a brutal historical moment that no one could have anticipated (well, except for sci-fi!). I have been able to distract myself with projects at home, but so many people around the world are suffering from the health or economic fallout of this virus. It is heartbreaking. That said, my wife and I are able to comfort each other, and my work redirects my thoughts.

SP: What are your thoughts on the Coronavirus situation as it stands? Do you think that the government has responded appropriately, either on the local, state or federal level? This level of social disruption is unprecedented in our lifetimes. How should artists respond?

RM: To be fair, these circumstances are so unprecedented that no administration probably could have handled the outbreak without making any mistakes, although some of the errors appear to be unforced. I do think that governors like Cuomo, Newsom, and Pritzker, as well as health experts and epidemiologists like Dr. [Anthony] Fauci have been doing a great job. The politics are ugly and will likely get uglier.

But I should also say this pandemic should be a huge wake-up call. There are those out there, even folks like Bill Gates, who have been warning that we were vulnerable to a viral pandemic. And we did nothing to prepare. If we had, so many of the tragedies we are about to face could have been avoided. Should this not also apply to global warming? If we could be proactive now, essentially begin taking the threat of global warming seriously the second we get through this pandemic, could we significantly mitigate, if not prevent, the impacts to come? Could there be any bigger lesson from this moment?!

SP: The economic outlook is pretty bleak. I’m hoping that once the public health crisis is over we’ll look back on the New Deal era as a template for restructuring our economy to be fairer, strengthen social programs and place less emphasis on endless economic growth. It is a myth that the economy needs to grow and grow exponentially—that’s the pathology of a virus. When all this is over, we are going to need a *new* New Deal. And if you’re going to have to rebuild large sectors of the economy anyway, why not factor climate change into the equation and make sure that the New Deal is Green? I also hope that people will begin to recognize the value of expertise again, to believe what scientists are saying.

RM: For the arts, generally there is little chance of artists directly impacting policy per se. That said, I think the best art feeds the soul of civilization. Think about all of the art, from day one, that has transcended wars, famines, the fall of empires. I



Richard Misrach, *Sugar Cane and Refinery, Mississippi River Corridor, Louisiana, 1998*

think that artists can directly and indirectly address this existential moment. They certainly will be influenced by it. I know for myself, my wife and I just did an “auto-interview” for Pace—we interviewed each other about “coupling” and “social distancing” at home, and I selected a number of images in my archive that unexpectedly reflect on social distancing. This moment has given me new eyes to see some of my own work in fresh ways.

SP: Many of the environmental and social problems that your work has been addressing for decades seem to have accelerated in recent years, as the world’s industrialized population increases and as the forces of nationalism and far right populism have re-emerged with renewed force all around the

world. What do you think should be the role of photography—or art in general—in an era increasingly defined by environmental degradation, industrialized exploitation of naturalized resources, and de-humanizing political attitudes toward immigrants, all taking place in a hyper-polarized, fractured media context that disseminates disinformation and deploys propaganda on a scale previously thought unimaginable?

RM: Wow. That’s quite a question! In short, artists will follow their own muse, whatever direction inspires them. And that is always going to be determined by personal circumstances. But for those artists compelled to address more political issues, all power to them. As I mentioned earlier, art rarely im-

pacts direct political action, but it can raise awareness, and indirectly shape the way people think, which eventually can have a real world impact.

For me, photography is a profound means of bearing witness. I think my exposure to images of the Auschwitz concentration camps when I was a teenager changed me forever. Those images gave me an understanding of how powerful photography can be. Of course, the photographs were only seen after the war concluded, so they didn’t directly alter the trajectory of the Nazis’ crimes against humanity at the time they were being committed. But I would argue that even after the fact, the horrors in those photographs have shaped our behavior for the better ever since. Bottom line, I think it’s important for artists/photographers to bear witness, to give us pause, to help us contemplate what we are doing to the planet. None of us can singularly fix it, but each of us can contribute to the larger effort. At protests at the Nuclear Test Site in the 1980s, there was a concept thrown around: “The hundredth monkey.” The argument is that you show a monkey how to use a tool. And you show another how to use a tool. And by the time a hundred monkeys know how to use the tool it will become part of the species’ innate set of traits. I am oversimplifying, but activists felt that when you spread an idea enough, it will take hold and be naturalized. If enough artists address these issues, their positions will be adopted by society at large. So goes my parable...

ERIC ZHANG: As a photographer, what drives you to start a new project? And how do you make the decision on where and when to take the photograph? While some of your projects are event driven, like the book *Destroy This Memory* and the *Oakland Fire* series, others feel more like sites that you have stumbled upon. What is your typical research process?

RM: In the early days, I would get a brilliant idea, and then head out in my VW camper to work on it. Inevitably, those projects just didn’t pan out so I

had to change my method. I would simply get in my van and drive and chase the light. I would throw my 8 by 10” camera and tripod in the back of the van; put some coolers with film and film holders on the floor; grab a bunch of dry food like trail mix; and then just head out for three weeks. Inevitably some project would emerge from the images I made and I’d be off and running. I called this strategy being “aggressively receptive.” But I rarely do any advanced research.

SP: You seem to occasionally revisit projects, sometimes decades later. I’m thinking of your *Cancer Alley* series documenting environmental issues in Louisiana along the Mississippi river. What were your initial thoughts when you first explored those locations, and what made you want to return years later?

RM: I photographed the Mississippi River corridor between Baton Rouge and New Orleans, which is home to a hundred industrial complexes, and is known as “Cancer Alley.” I discovered it on an exploratory trip I made in 1998 (I’d been given a tip by my friend Lew Thomas). I did the first major shooting then. The work was shown and published soon thereafter (the High Museum of Art and Aperture, for example). But I had always wanted to do a book with a reclamation project proposal, and in 2010 someone introduced me to Kate Orff, a brilliant landscape architect, and we began collaborating. I went back to do a follow-up round of shooting and we published the book *Petrochemical America* in 2012. Generally, when I feel like I’ve exhausted what I can do in a place, I tend to move onto other projects.

EZ: Would you mind sharing your process when you arrive at a site? Do you start shooting right away or do you like to “take a lap” first? Most of your projects tend to cover a pretty large area.

RM: Oh, I start shooting immediately. The pictures give me feedback. And if I can’t make the idea work



Richard Misrach, *Bomb Crater and Destroyed Convoy, Bravo 20 Bombing Range, Nevada, 1986*

as a picture, I move on. However, once I make a picture that shows promise, I return to the site over and over until I feel I've exhausted its potential.

EZ: How often are you surprised by what you find at a site? And to what extent, if any, is your research informed by interviews with local residents in the communities where you are shooting?

RM: I would say that the whole process is a thrilling act of discovery. I often don't know if anything I have is strong enough until I get home and begin editing. And then often I have to wait months to get some distance on the shoot, to make a final edit. But the process is non-stop exploring with the camera. And on a few projects, like the *Bravo 20 Bombing Range* and the *Salton Sea Flood* series, I did interview

locals to become better informed, though I'm not sure it had an impact on the pictures per se.

SP: The *Desert Canto* series is an enduring project that you have kept returning to in your career. Is it a love for the land itself that keeps drawing you back? Or is it more of a naturally recurring response to the continuation of destructive forces acting upon the land and your need to expose such behavior?

RM: Both! I so love being in the desert. The vast expanses, the light, the heat. It gives a scale to who we are on the planet like no place else. Hopefully, that beauty comes through AND creates a foil for considering our impact on the land. I think it's that dynamic between the two that is at the heart of my work.



Richard Misrach, *Desert Fire #249, 1985*



Richard Misrach, *Desert Fire #81, 1984*



Richard Misrach, *Flooded Marina (gas pumps)*, Northshore, Salton Sea, 1983



Richard Misrach, *Submerged Lamppost*, Salton Sea, 1985



Richard Misrach, "This boat belongs here. Please remove your car from the boat without crushing it! Boat Owner," 2005



Richard Misrach, "Katrina is a bitch," 2005



Richard Misrach, Oakland Fire #12-91 [Hiller Highlands Overview], 1991



Richard Misrach, Oakland Fire #107-91 [Melted Tricycle], 1991

INTO THE ANTHROPOCENE

David Gardner

WWW.LIGHTTIGHT.COM

In 2016, those who determine such things officially agreed the Earth had entered a new Epoch in its evolutionary age. Termed the Anthropocene, it is defined as human-influenced, where our activity has caused irreversible changes to land, oceans, and air. Our new earth age is the starting point for this body of work that explores vast human-altered landscapes. I am both concerned and curious how repercussions from our rapidly expanding global need for agriculture, energy, and water impact our planet.

I investigate locations where the natural ecosystem has been altered or destroyed to provide for our burgeoning world population. In the Palouse grasslands—now wheat fields—of Eastern Washington, a mono-crop landscape terraformed through agricultural commerce creates a sense of bucolic perfection while disguising the underlying impact of single crop planting. Old and new energy extraction techniques in California are compared with images from the largest thermal solar plant on earth at Ivanpah, the fracking-revived oilfields at Oildale near Bakersfield, and massive windmill farms in the Palm Desert. Owens Lake in California and Lake Mead in Arizona illustrate how the demand for water has changed the landscape: a patchwork quilt of dust suppression measures in one and a high water “bathtub ring” in the other.

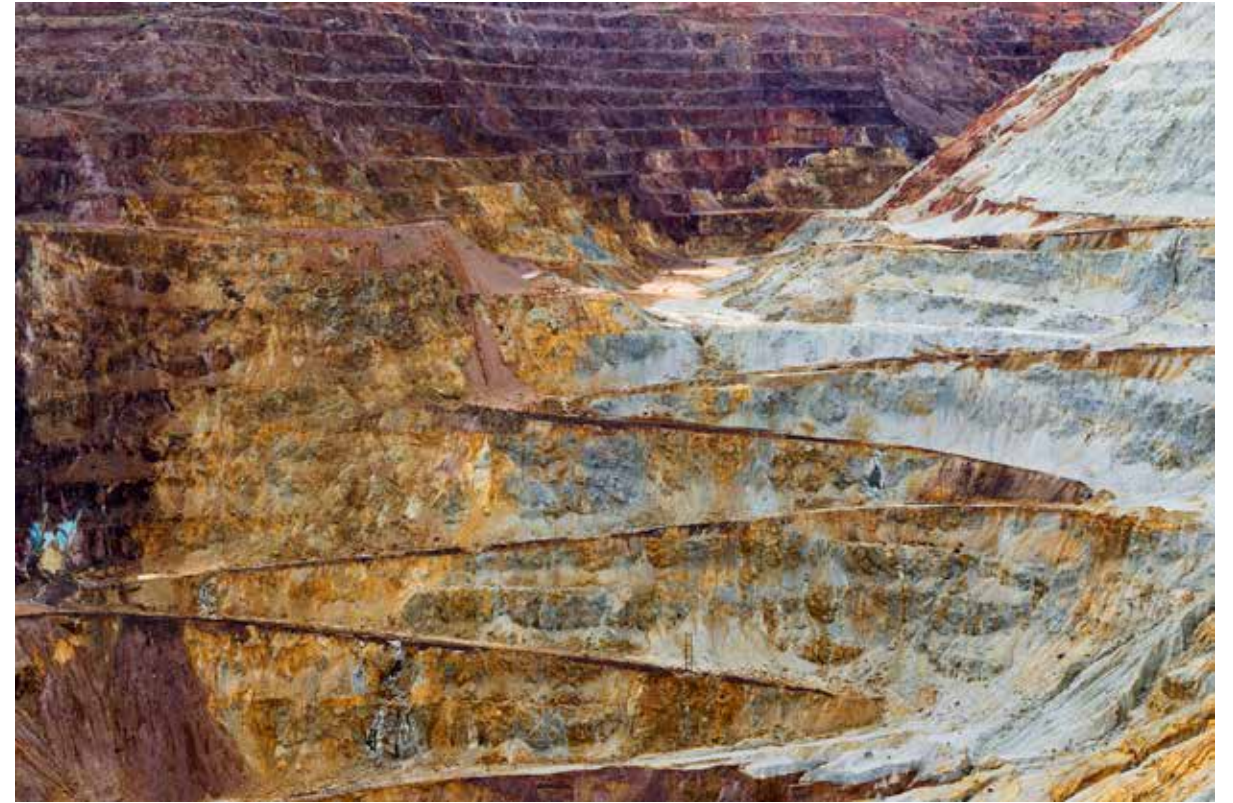
In each location, I was simultaneously dazzled and disturbed by the scope of these transformations—many occurring in my lifetime. What was revealed I found compelling—strangely alien but completely human. By allowing human intervention to speak over the landscape itself in my images, I imagine a new landscape, more of its Age, that highlights the dilemmas faced when considering a balance between exploitation and preservation.



David Gardner, Ivanpah Thermal Solar Plant, CA. Study #32, (35,34.4769N 115,29.6591W)



David Gardner, Cholla Power Plant, Winslow, AZ, Study #1 (35,9.6525N 110,27.8265W)



David Gardner, Lavender Pit Mine, Bisbee AZ, Study #8 (31,25.8500N 109,53.7061W)



David Gardner, High Water Mark, Lake Mead, NV, Study #3 (36,0.9196N 114,44.0505W)



David Gardner, Oildale Oilfield, Bakersfield, CA, Study #9 (35,24.6353N 118,58.6151W)

GLOBAL WARMING

Jane Hirshfield

When his ship first came to Australia,
Cook wrote, the natives
continued fishing, without looking up.
Unable, it seemed, to fear what was too large to be comprehended.

from After (Harper Collins, 2008)

AS IF HEARING HEAVY FURNITURE MOVED ON THE FLOOR ABOVE US

Jane Hirshfield

As things grow rarer, they enter the ranges of counting.
Remain this many Siberian tigers,
that many African elephants. Three hundred red-legged egrets.
We scrape from the world its tilt and meander of wonder
as if eating the last burned onions and carrots from a cast iron pan.
Closing eyes to taste better the char of ordinary sweetness.

from Ledger, (Knopf 2020)

LET THEM NOT SAY

Jane Hirshfield

Let them not say: we did not see it.
We saw.

Let them not say: we did not hear it.
We heard.

Let them not say: they did not taste it.
We ate, we trembled.

Let them not say: it was not spoken, not written.
We spoke,
we witnessed with voices and hands.

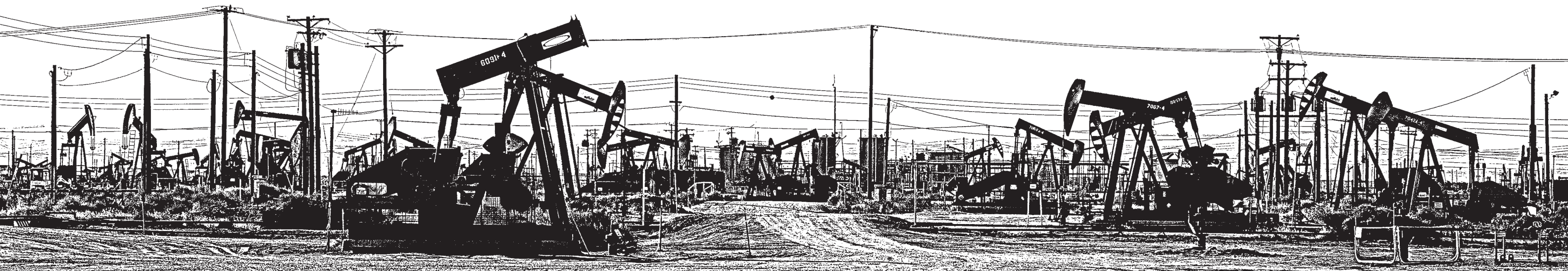
Let them not say: they did nothing.
We did not-enough.

Let them say, as they must say something:

A kerosene beauty.
It burned.

Let them say we warmed ourselves by it,
read by its light, praised,
and it burned.

from Ledger, (Knopf 2020)



GHAZAL FOR THE END OF TIME

(after Messiaen)

Jane Hirshfield

Break anything – a window, a piecrust, a glacier – it will break open.
A voice cannot speak, cannot sing, without lips, teeth, lamina propria coming open.

Some breakage can barely be named, hardly be spoken.
Rains stopped, roof said. Fires, forests, cities, cellars peeled open.

Tears stopped, eyes said. An unhearable music fell instead from them.
A clarinet stripped of its breathing, the cello abandoned.

The violin grieving, a hand too long empty held open.
The imperial piano, its 89th, 90th, 91st strings unsummoned, unspoken.

Watching, listening, was like that: the low, wordless humming of being unwoven.
Fish vanished. Bees vanished. Bats whitened. Arctic ice opened.

Hands wanted more time, hands thought we had time. Spending time's rivers,
its meadows, its mountains, its instruments tuning their silence, its deep mantle broken.

Earth stumbled within and outside us.
Orca, thistle, kestrel withheld their instruction.

Rock said, Burning Ones, pry your own blindness open.
Death said, Now I too am orphan.

from Ledger, (Knopf 2020)

IN A FORMER COAL MINE IN SILESIA

Jane Hirshfield

In a former coal mine in Silesia, a thousand feet inside the earth,
a tongue kept speaking.

In the Arctic, by the triangular door to the Svalbard seed vault,
a tongue, almost fearless, almost not clumsy, spoke.
Spoke verbs, conjunctions, adjectives, adverbs, nouns.

In a small town in the Australian Outback,
in the city of Nanjing, near a gate still recalling unthinkable closures,
by a pit-mine lake in Montana, a tongue, almost steady,
almost not stumbling, spoke facts, hypotheses, memories, riddles, stories.

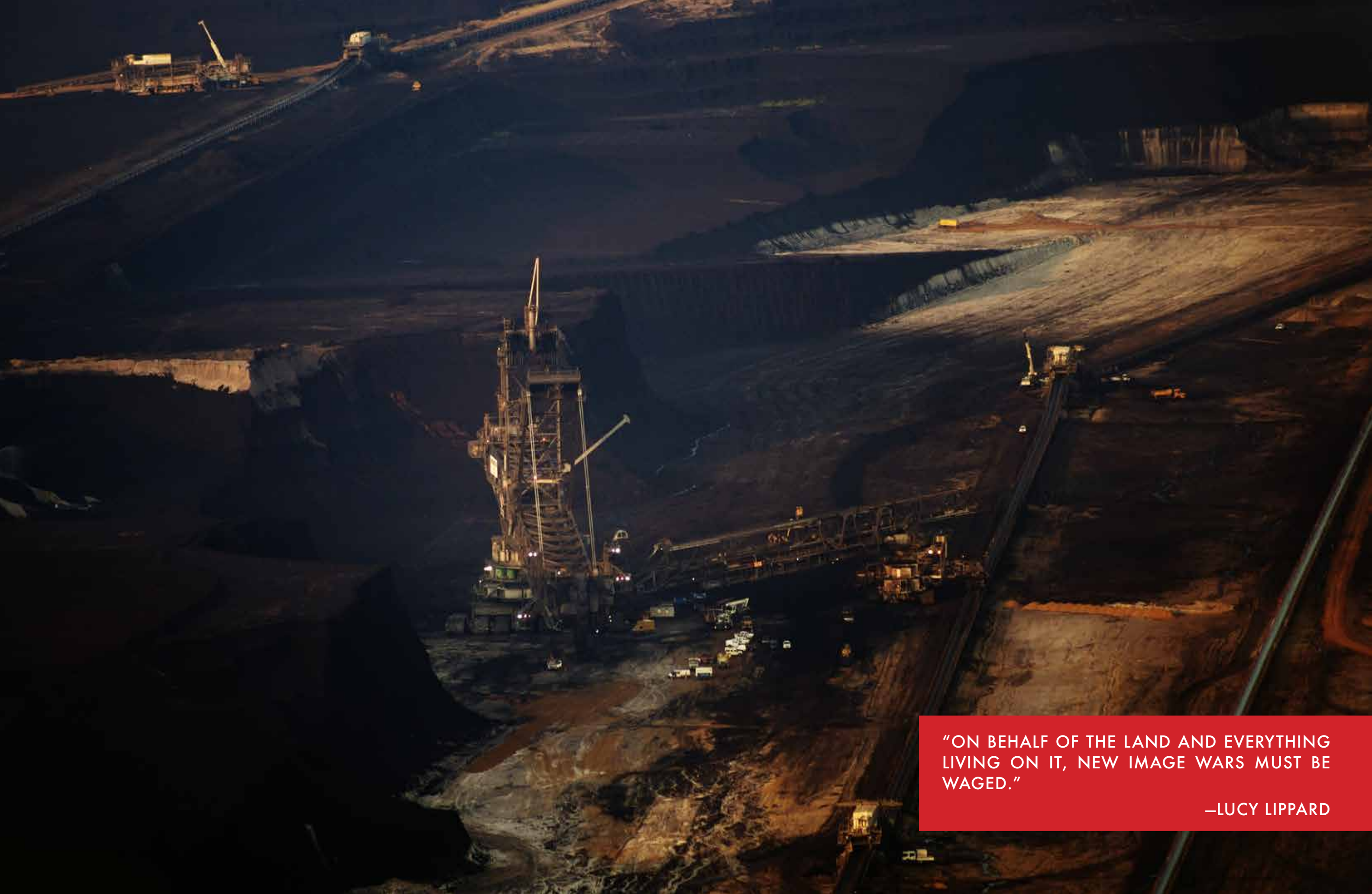
Lungs accept their oxygen without trembling.
Feet stand inside their foot shapes, inside shoes someone has sewn.

We close the eyes of the dead so they will not see their not-seeing.
Light falls on the retinas' stubbornness, on pupils refusing to turn toward or away.

Fireflies, furnaces, quicksilvers fill them, cities & forests glinting though already finished.

And the tongues, the faithless tongues, continue speaking,
as lovers will, because they still love, long past the hour there is nothing left to say.

from Ledger, (Knopf 2020)



“ON BEHALF OF THE LAND AND EVERYTHING LIVING ON IT, NEW IMAGE WARS MUST BE WAGED.”

—LUCY LIPPARD



Léonie Pondevie, *Fossilis*, sunrise over the Hambach coal mine, 2019, digital photograph. Previous page: Léonie Pondevie, *Fossilis*, Hambach Coal Mine, detail, 2019, digital photograph



Léonie Pondevie, *Carrière de Clisson*, 2019, digital photograph



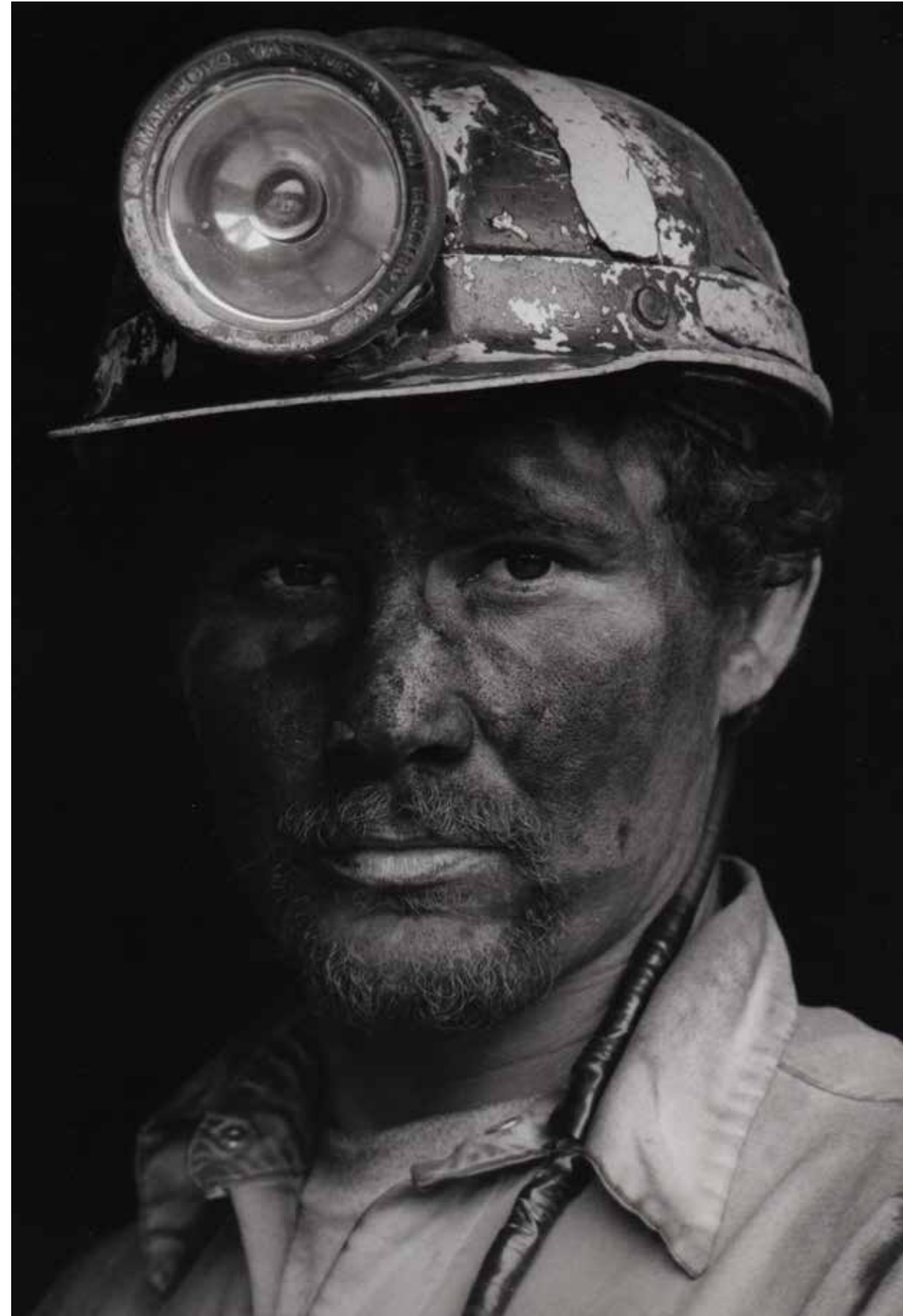
Ken Light, Coal Miner, Harlan County, Kentucky, photograph, ©Ken Light



Ken Light, Mining accident, 1965, Devils Fork Hollow, West Virginia, photograph, ©Ken Light



Ken Light, Environmental Protection Agency, "Please reclaim." Turkey Creek Road, Wyoming County, West Virginia, photograph, ©Ken Light



Ken Light, Coal Miner, Harlan County, Kentucky, photograph, ©Ken Light

GOUGED EARTH / GOUGED PEOPLE

Craig Czury

January 22, 1959 the Susquehanna River burst through the roof of the Knox Mine, up from Wilkes-Barre, flooding the entire honey-comb of mines throughout the lower northern anthracite coalfield: 12 miners dead, thousands of miners out of work forever. I was 7 years old. Within 5 years our textile industry had moved south for cheaper labor... thousands of mill workers out of work or moved out of the region forever.

*I inherited the black-star hole
through each one of these window panes*

I inherited the voices and attitudes of the men and women who were shut down and abandoned. A tremendous anger...a tremendous silence.

One high school student, after listening to me read my poems about the gouged earth, gouged people, sulfur creeks and mountains of slag, asked me if I was an environmentalist. I flipped off the lights, opened the window, rearranged my chair...hacking and smoking.”

*from GOD'S SHINY GLASS EYE
FootHills Publishing
1985
craigczury.com*



Michael Light, *Black Thunder Coal Mine*, Wright, WY, 2007



Jason Sheridan Brown, *Circuit*, 2019, coal, steel, wood, LED lighting elements and plastic, 60 by 64 by 30 inches



Kyle Gallup, *Bethlehem Steel*, 1998, paper lithograph transfer print from original photograph

BETHLEHEM STEEL AND UNION ELECTRIC POWER PLANTS

Kyle Gallup

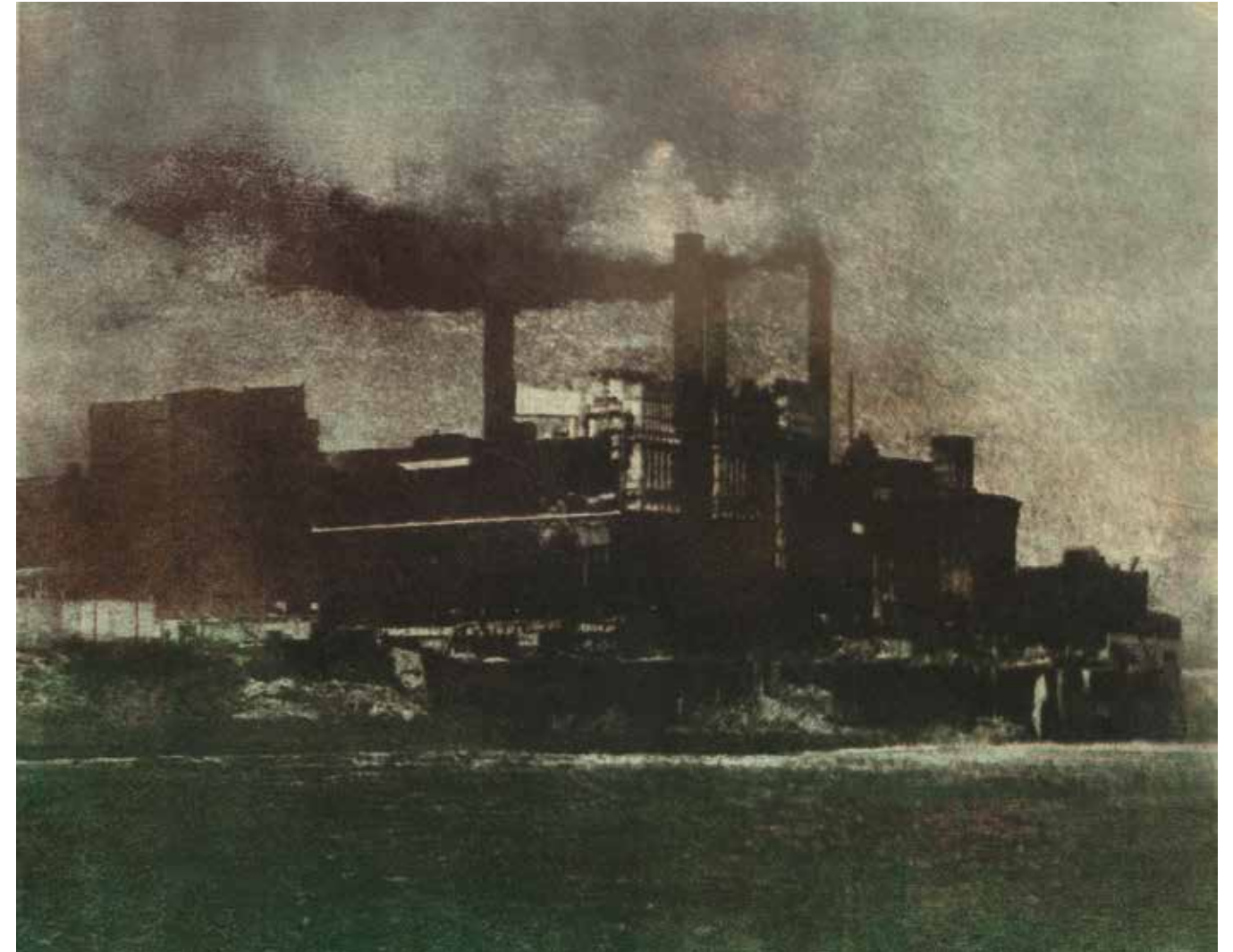
WWW.KYLEGALLUP.COM

In the 1990s through the early 2000s I worked on a series of paper lithographic transfer prints that were one part documentary and one part painterly expression of disappearing industrial sites I was seeing on trips through the Northeast and in the Midwest. The series began as a way to capture the big, built forms in the environment.

While working on this series, human back-stories emerged. The day my husband and I photo-

graphed the Bethlehem Steel plant—the images used in my printmaking process—we hadn't realized that the plant had closed a short time before, perhaps only weeks. We were with our son who was a toddler at the time. The employees and their families were out on their porches in the town holding garage sales to generate cash. We spoke with them about their difficult situations—being out of jobs that they had held for years. There was much uncertainty and anxiety. Our son was given a stuffed animal that he happened to see in a box with a lot of other toys. The seller insisted on giving it to him and would not take any money from us.

I grew up in St. Louis, Missouri, where my father was an engineer. I made prints of the Union Electric Power Plant on the Mississippi River using his job site photos from a floodwall project along the river



Kyle Gallup, *Union Electric Power Plant*, 1997 paper lithograph transfer print from original photograph

in the 1970s. It powered the “Palace of Electricity” during the 1904 World’s Fair, which brought my mother’s family to St. Louis in the 1880s. I remember going downtown where the site was located, with my family on the weekends so that my father could see how the floodwall was progressing. This floodwall was intended to protect the power plant along with other nearby buildings. The nature of the printmaking process creates a disintegration of the plate and because of this, the Union Electric Power Plant looks more like a large steamboat on the river. The plant was originally coal-fired, changing over to oil in 1972 and then to natural gas in 1996.

Kyle Gallup is an American artist living in New York. Growing up in St. Louis, Missouri, instilled in her a love of the prairie and wide-open spaces. As a painter she traverses the line between known and invented landscapes. She has developed an intuitive approach to her work that combines observation, experience, and memory. She received a BFA from Tufts University and the Boston Museum School. In 2019 she was invited to be the first international resident at Colart and Winsor & Newton Paints in London, UK, where she experimented with the historic paint company’s new line of environmentally friendly Cadmium-free line of watercolors. She has shown her work in the US, Canada and Britain and is in private and corporate collections, including Robert Blackburn’s print collection in the Library of Congress.



Paulette Myers-Rich, High Bridge Power Plant, 2007

VIEWS FROM THE HIGH BRIDGE COAL-FIRED POWER PLANT

Paulette Myers-Rich
St. Paul, Minnesota, 2007

WWW.PAULETTEMYERSRICH.COM

I'm standing in the boiler room on the top floor of the coal-fired High Bridge Power Plant. I'm alone, even though I arrived with a community activist group, invited on a tour of the facility before it's demolished once the new gas-powered plant upstream is operational. We're considering what the site may eventually be used for and we want to see the view from the roof for context.

The context is the Mississippi River gorge. The High Bridge and the power plant it's named for sit on the banks and are the dominant features of my neighborhood called Uppertown, the oldest in the City of St. Paul. Houses from territorial times to the 1870s line the north bluff 150 feet above the river between its edge and the city's first road, the route from the Red River Valley to the riverboat landing below in the early 1800s, when the Métis came into St. Paul with their wagons full of buffalo hides and furs to send downriver to New Orleans.

This area was such a wild part of the Minnesota Territory, it was called Pig's Eye Landing, named for the whiskey trader that served soldiers from nearby Fort Snelling and the fur traders who came down from Pembina in the North. After statehood, it was renamed St. Paul by a local priest. It was a boom-time when the population rapidly swelled and speculators thrived. Buildings went up overnight. One simple limestone structure, quarried on site, was used as combination bar, whorehouse and post of office before the Civil War.

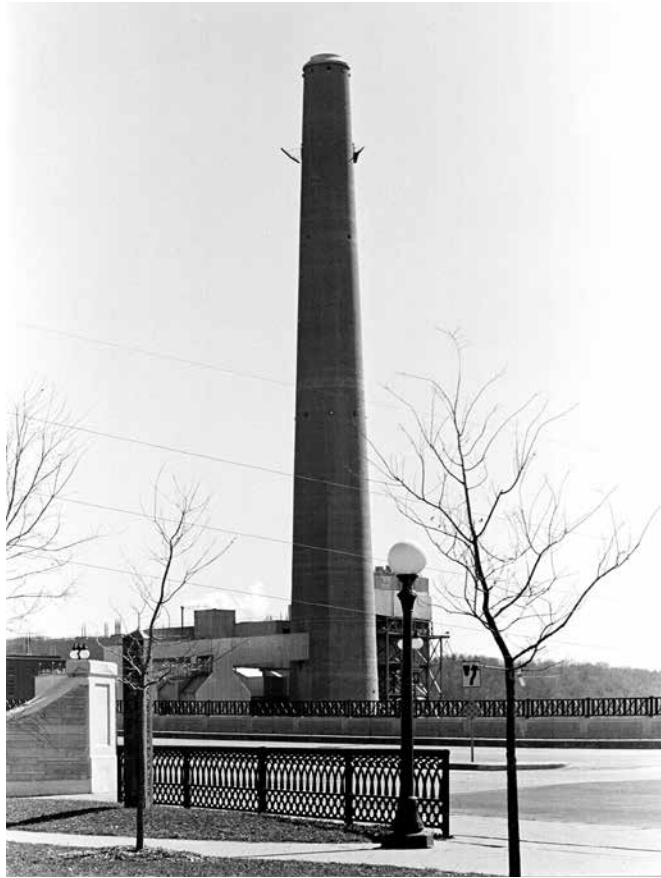
By the 1920s Uppertown was considered a derelict and undesirable part of the city and it made sense to build this sorely needed power plant directly below on the riverbank. The Mississippi River-

front was completely industrial by then, a working river covered over in rail yards and factories, which by 2007 have been removed and are slowly being replaced with housing and parks with bike paths.

Uppertown in 2007 is a combination of lovingly restored houses and tired, neglected, and vacant properties on small lots with no setback from the sidewalk or adjoining buildings. It has character and characters, as we like to say. We're being polite. It remains a tough, avoided, and forgotten post-industrial neighborhood and our group is trying to rebrand it as vibrant and historic in a struggle to attract new residents and businesses. The demolition of this power plant is going to prompt change and we want to be ready.

So, because of this, I'm standing alone, atop what is technically a massive boiler powering turbines that generate electricity for my city. The reason I'm alone during the tour of this hot, noisy, vibrating building is that I couldn't bring myself to climb the exterior metal staircases to the roof, despite the spectacular view of the Mississippi River Valley. I have vertigo and make a plea to stay behind. The tour guide is kind about it and lets me stay while everyone else goes up. I watch them disappear through a door, relieved that I was spared and anxiously await their return, so we can ride back down the open-cage elevator that brought us here. On the way up, I stared at the floor to avoid feeling dizzy. When the door opened, I stepped out and nearly swooned. The floor was made of steel grating you could see through most of the way down before the grids formed a dizzying moiré pattern. I wasn't prepared for any of this.

The height of the room and the depth below makes me feel small and overwhelmed. I keep my eyes fixed on points near the ceiling while I think about how the plant is going to be demolished soon. I wonder how much maintenance they've put into this place since that decision was made. I don't move about. I'm worried I'll find a weak spot, some rusted steel that will give way and send me plum-



Paulette Myers-Rich, High Bridge Power Plant, 2007

meting. I worry that the stairs they're climbing, exposed to extreme elements for decades, will buckle under the weight of the largest man in the group and I'll be stranded here. I then realize I forgot my cell phone in the car. Frozen in place, I decide to take some deep breaths and look around for a solid area of steel-plated floor I can walk to and wait.

The room has eight tall coal burning boilers in two rows that are heating river water into the steam that powers the turbines. I can choose between moving closer to these boilers, or towards a large, wide-open space in the wall. I walk towards the opening and look out. I find myself facing the spectacular view we were promised. I'm transfixed and forget where I am.

I can see the confluence of the Minnesota and Mississippi Rivers, just upstream. Above on the bluff is Fort Snelling, the limestone military stronghold built in 1819, where officers and soldiers from Eastern states were stationed to guard the new-

ly acquired territory of the Louisiana Purchase of 1803. By 1805 traditional lands were ceded by the Dakota due to federal government pressure. The treaties favored the state and resulted in maltreatment, poverty, and the horrific conditions that led the Dakota into an uprising against the government and settlers in 1862. When the U.S. Army finally put down the months-long revolt, they rounded up all the remaining Dakota, primarily peaceful people innocent of wrongdoing, and put them in an internment camp made up of tipis below the fort at the confluence they called Bdote Mni Sota, where they remained until being forced out of Minnesota forever by vengeful settlers and politicians. Bdote is the sacred site of creation for the Dakota but is no longer controlled by them. It was where they originated and where they lost everything before being forced out. Now within state-owned park property, there is nothing there but trees and a powerline pylon at the point where the waters merge. Bdote Mni Sota is a sacrifice zone.

I shift my gaze from B'dote to the vast coalfield below and think about the community meeting held at our high school a few years earlier. We sat on bleachers in the gym while local politicians and officials from the Public Utilities Commission asked for our input on replacing the coal-fired plant with a newly built natural gas facility. There were jobs at stake, but most who had them didn't live here and we'd been worried about our health and quality of life for years. We were woefully uninformed about fracking at the time and just wanted the coal to go away. My neighbor brought a jar of dirty water to the meeting, held it up for all to see and said, "this is melted snow I scooped up from my front yard and this black soot is what we have to live with every day." She passed it around for the benefit of the officials who lived outside the area. Her neighbors knew all about the coal dust and how impossible it was to dry laundry on an outdoor clothesline. I thought about how it clogged my window screens and lined the sills, how we came into daily contact with this



Paulette Myers-Rich, High Bridge Power Plant, 2007

poisonous grit. I thought about the 570-foot-tall smoke stack I could see from my kitchen window, the steam visible in the cold winter air, its roiling, mercury-laced plumes spreading far across the sky. Uppertown is a sacrifice zone.

When we first moved to our home on the bluff, we were startled by an eerie sound that echoed through the neighborhood. It was as if a giant beast was breathing heavily right outside our door. I soon learned it was just the steam being released through vents from the plant that you barely noticed when you were next to them walking on the bridge, but the river valley resonated and amplified the sound

so that we could hear it indoors. The power plant was alive with the energy it produced and this was life on the bluff.

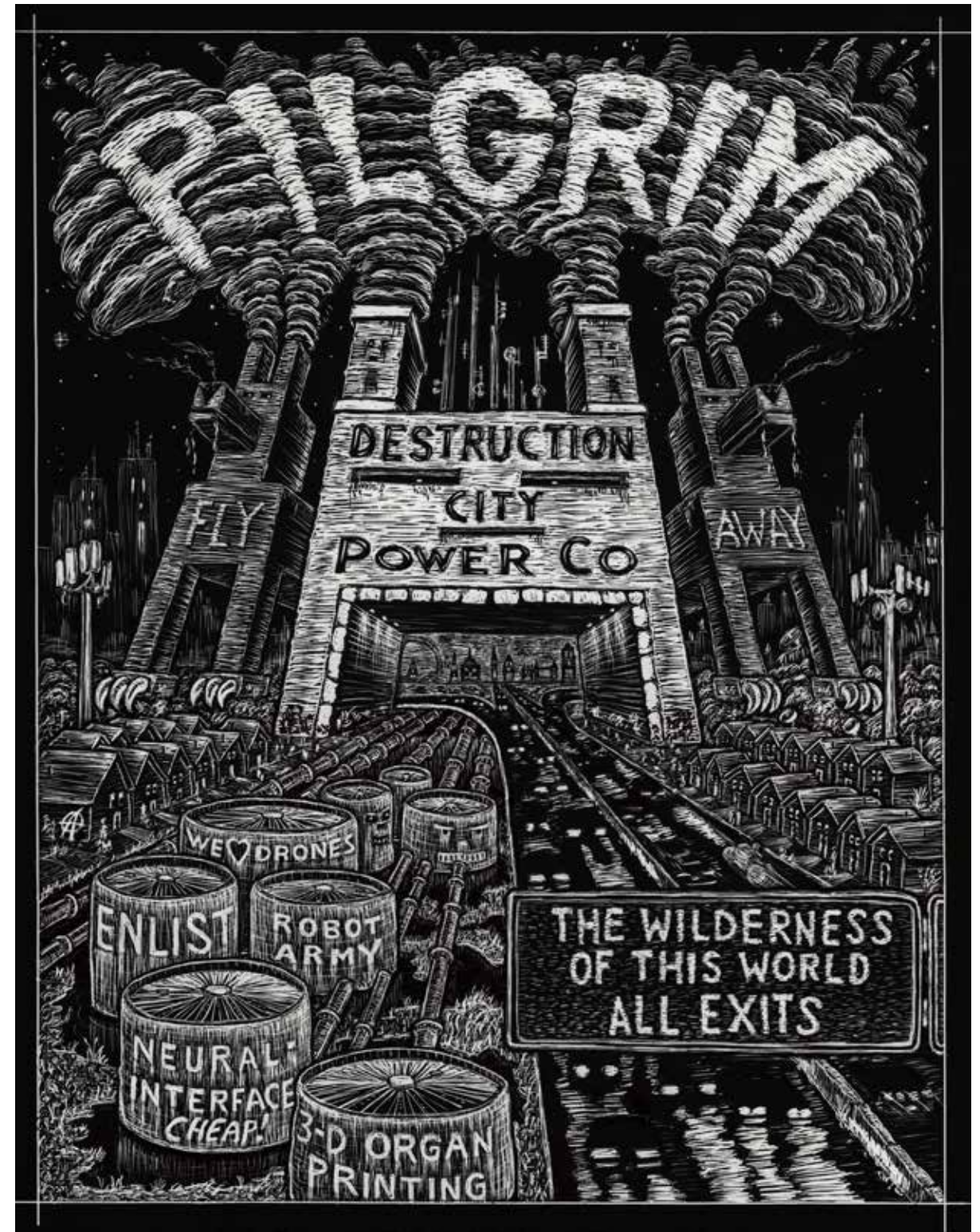
Meanwhile, it's still here, generating electricity and I'm standing on the top floor. The mountain of coal that feeds it is shrinking in size and what's left after the shutdown will be taken away on the trains that brought it. In time, the entire site will vanish and we'll be left with sky and silence. I wonder what it will be like when our windowsills are no longer coated with a layer of grime and we can stay outdoors. But I feel a bit of apprehension about the changes to come. When the sky is free of the smoke stack that signals home from a mile away, will we feel lost? Will things change so much we'll no longer know where we are? There's a bit of grudging love for this industrial structure that holds such prominence in our midst. Some think it's beautiful.

I try to picture the absence of the power plant. I try to imagine

the riverbanks as green and this view of bluffs no longer hidden by the towering structure that gave us heat and light during our long winter days. We know we need the electricity, but our neighborhood had long paid the price those at a distance were spared. We knew no one wanted to buy our homes. We felt stuck and left behind. We're too close to the dirty residue of industry and on the hot, dry days when the wind carried clouds of coal dust up into our yards, we'd go indoors, close our windows, and turn on the fans. It's time to take this place down.



Sara L. Press / Deeply Game Publications, *Spectre of Accountability*, from the forthcoming artist's book *Ghosts in the Machine*. 2013–2019, gouache on matboard



Ralph Sanders, *PILGRIM*, 2018, scratchboard



From the Library Company of Philadelphia, T. Woodworth trade card ca. 1880

COAL AND ICE

Andrea Krupp

WWW.ANDREAKRUPP.COM

Certain terrestrial materials resonate in the environment, in history and in our imaginations in an especially profound way.

Mountains, standing stones, water, trees, gold—they stun us with their beauty, or strike awe or terror in our hearts. Their arc of existence through millennia, eras and epochs, is humbling. They spark wonder and curiosity. Ice and coal are two such materials, and both are super-charged with meaning at the beginning of the twenty-first century.

Charismatic, mysterious, ancient, fearsome, a glacier sparkles and looms on the horizon. A powerful object in its sheer materiality, glacier's presence in the landscape commands attention and respect. She carries stories and stones from the past, gives place to memory and ritual, carves valleys and spews catastrophic floods. The glacier's form chronicles geological cycles of creation and disintegration, and embodies the passage of time. Until very recently, the word glacier signified slow imperceptible movement and eternal cold. Now we witness glaciers on a rampage, responding to Earth's warming atmosphere.



Andrea Krupp, *Jokulhlaup*, 2016, Graphite, 25 by 38 inches. By creating melt-water and icebergs, the glacier announces its dissolution, and an iceless future.

Trapped inside the hexagonal matrix of the ice crystal, materials like ash and wind-blown dust from the geologic past travel forward in time. Greenland's glaciers catalogue 123,000 years of Earth's history—a frozen glimpse of the mid-Cenozoic era. To breathe in a glacier's vapor is to absorb the off-gassing of geologic time, as minute bubbles of ancient atmosphere fizz and pop into the twenty-first century.

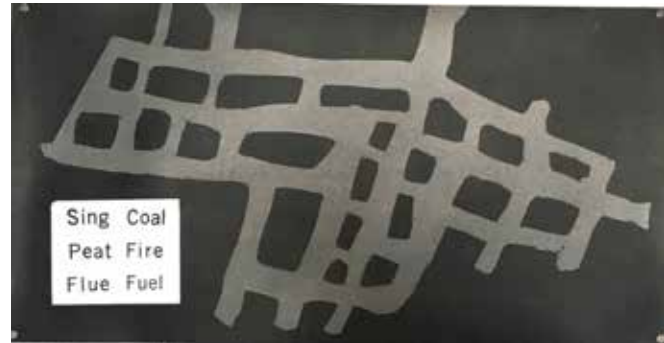


Andrea Krupp, *Graphene with room and pillar mines*, 2019, carbon black, graphite, stencil, rubber stamp, 19 by 25 inches. Coal is as dark as the glacier is light. From peaty origins, coal slowly refines itself into lignite, then sub-bituminous coal, to bituminous and finally anthracite and graphite.

94% carbon, anthracite is a rare and beautiful material—a dark mirror, dense, glassy, hexagonal and ordered. When nothing else is left but pure carbon, the once waterlogged remains of organic life is called graphite. At the molecular level, graphite is composed of slippery stacks of a two-dimensional nano-material called graphene. Only one atom thick, the hexagonal mesh is invisible to the human eye, but through an electron microscope its materiality, brilliance, symmetry, and scale strike awe. Equally astounding are fullerenes and buckminsterfullerenes, two related expressions of carbon that also exist in the micro scale.

Compared to glaciers, coal carries materials from a past twice as deep. In the making for

300,000,000 years, a lump of coal physically connects us with the remains of organic matter from the Paleozoic era. Like the glacier that effervesces ancient atmosphere when exposed to air, the coal bed off-gasses the byproducts of its transformation. These gasses, aka damps, can suffocate lungful bodies, or kill by violent blast.



Andrea Krupp, Page from "Coal and other four letter words", 2019, artist book, graphite and carbon black, hand stenciled, 6.5 by 13 inches. To stand inside a tunneled-out out coal vein in the anthracite fields of Pennsylvania is to witness coal-human entanglement first-hand.

Tunnels blasted through solid rock to reach the veins of softer coal, and silica dust and powdered carbon settled deep inside miners' lungs. The mine is an anti-human realm of silence, darkness, water and time. Over centuries, coal mining families sacrificed health and well-being. Hundreds of thousands of coal miners were exploited and maimed or killed. Yet the concept of workers' rights and workers' unions sprang up from their struggles. We dig. Soot on ice darkens the planet and carbon dioxide accumulates in the atmosphere, heating us, the Earth, and melting glaciers.

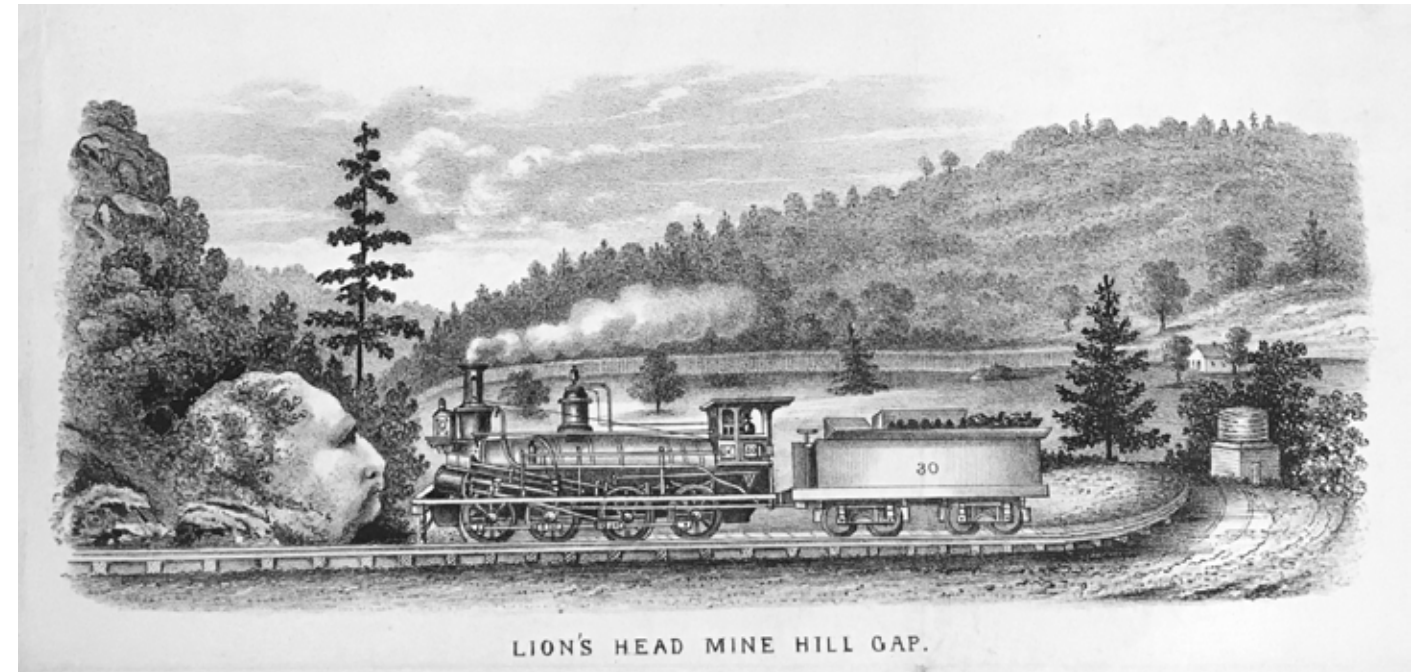
Certain materials possess a kind of charisma that sparkles in the gap between self and other, human and non-human, animate and inanimate. Our curiosity lights up and causes us to stop, to observe, to learn, and the boundary between self and other thing grows porous. When we investigate with wonder, patience and humility, we connect with materials, things and beings of the world. Coal, glaciers, and humans all move through time on vastly differ-



Andrea Krupp, "I AM ALL BOG", 2018, hand stenciled carbon black acrylic, 25 by 19 inches. Coal is in us and of us. We are peat, we are coal.

ent cycles of generation and disintegration, and intersect, miraculously, in the here-and-now.

Thinking through coal and ice, and all of Earth's materials, helps us re-calibrate our own sense of belonging within the vast planetary system of which we are a part, and on which everything depends.



From the Library Company of Philadelphia, detail from "Map of the Mine Hill and Schuylkill Haven Rail Road and Branches", Philadelphia, 1861



"THE MORE CLEARLY WE CAN FOCUS OUR ATTENTION ON THE WONDERS AND REALITIES OF THE UNIVERSE ABOUT US, THE LESS TASTE WE SHALL HAVE FOR DESTRUCTION."

—RACHEL CARSON



Above: *Shore and oil field in Huntington Beach, ca. 1937* by Herman Schultheis, Herman J. Schultheis Collection, Los Angeles Public Library; Previous page: Garth Lenz, *Tar Mine and Roads, Northern Alberta, Canada, 2010*, photograph

EXTRACTION AS THE GREATEST EMERGENCY

A PHILOSOPHICAL CONTRIBUTION TO EXTRACTION: ART ON THE EDGE OF THE ABYSS

Santiago Zabala

Among the many contributions of postmodern thought—devoted to disclosing the interpretative nature of existence—is that art, like science and politics, is inevitably a response to its own epoch. Its discoveries and intuitions are conditioned by the historical events that artists have experienced throughout their lives. Their work can also be understood as a consequence of the various challenges and opportunities these events present. But art, unlike science and politics, always involves a critical element meant to stir our existence. This element might be identified after the fact in scientific breakthroughs or political revolts, but it seems to be constitutive of works of art independent of the frames, hierarchies, and rules of the art world. The point is not that scientists and politicians aren't free but rather that their works are more framed by economic and political systems of rule than those of artists, the success of whose work depends on finding such freedom despite the systems that seek to frame and tame expression.

This freedom is particularly evident in the *Extraction* project, which discloses the emergency of natural-resource extraction through installations, performances, and exhibits throughout the world. The different works of art in this multimedia and cross-border intervention are not meant only to disclose an environmental emergency but also to thrust us into the greatest emergency we face today.

The greatest emergency today—as I explain in *Why Only Art Can Save Us: Aesthetics and the Absence of Emergency* among other publications¹—are those emergencies we ignore, overlook, or reject from the

arena of action. This does not imply that the world is not full of emergencies—we hear of them and watch government responses every day. Rather, the greatest emergency today is the ignored causes and origins of these emergencies. *The greatest emergency is the absence of emergency*, that is, the status quo, the normalization of disaster.

Extraction is a paradigmatic example of how an emergency becomes an absence. Natural resources are now being extracted from the planet three times faster than in 1970 even though the global population has only doubled in that time. Extractive industries are responsible for half of the world's carbon emissions and more than 80 percent of biodiversity loss, but while individual occurrences are mourned or even fought, the whole is rarely addressed as an emergency at all. This is currently evident in Australia, the sixth-biggest producer of fuels that release carbon, whose emissions are expected to double by 2030, independent of the ferocious wildfires that struck the country at the beginning of 2020.² The greatest emergency is not carbon emissions, biodiversity loss, or the fires in Australia—although these are dramatic consequences—but rather how natural-resource extraction (the cause of these emergencies) is predicted to increase.

If, as the German poet Friedrich Hölderlin said, “where the danger is, also grows the saving power,” then we must find ways to experience the danger hidden in the greatest emergency. Art practices can thrust us into absent emergencies. This is evident in the ongoing turn from “relational” to “emergency” works of art or aesthetic theories and in artists' inevitable participation in global matters. Although the art world, like scientific and political institutions, is a system with hierarchies and frames, it has been affected by globalization in a different way, one that through actual exchange lets works emerge for different purposes and in unusual settings.

This is clear in the different experiences of art in art fairs and in biennales: in the rigid art fairs, the viewer contemplates valuable objects, but in



Vicky Sambunaris, *Untitled (Power plant)*, Huntington, Utah 2017, C-print

the biennales the members of the audience all take responsibility for a collective experience. As Caroline Jones recently explained, it “is the emphasis on events and experiences, rather than objects, that constitute[s] the surprising legacy of biennial culture.”³ The fact that the latest trend in biennales, which have increased markedly in these past decades, is to offer these experiences in such remote places as Antarctica and the Californian desert is an indication that globalized art demands global interventions from artists and audiences as the Extraction Project proposes. The “globalization of the art world,” as Arthur Danto once said, “means that art addresses us in our humanity, as men and women who seek in art for meanings that neither of art’s peers—philosophy and religion—in what Hegel spoke of as the realm of Absolute Spirit, are able to provide.”⁴

The artists who seek to expose these meanings today are the ones whose works demand our intervention in masked and hidden global emergencies, emergencies that are concealed in the idea of their absence. This is evident in Mary Mattingly’s installations, Victoria Sambunaris’s photographs, Ann Lewis’s interventions, and the work of others artists featured in this catalogue together and in the various events that will take place during the summer of 2021. The goal of these works is not to rescue us from emergencies but rather to rescue us into absent emergencies, an absence into which the planet’s natural resources are disappearing. Only art can still produce works, as the organizers of this project said, that “disturb the collective oblivion that makes possible our suicidal cultural contract regarding extractive industry.” With science and politics part of



Ann Lewis & BAMN, *TIXE*, abandoned hotel, 2014, intervention/installation

the problem and art sounding the call, it’s up to us to interpret and intervene accordingly.

SANTIAGO ZABALA is a philosopher and cultural critic and ICREA Research Professor of Philosophy at the Pompeu Fabra University in Barcelona. He is author of many books, including *Why Only Art Can Save Us: Aesthetics and the Absence of Emergency* (Columbia University Press, 2017) and *Being at Large: Freedom in the Age of Alternative Facts* (McGill-Queen’s University Press, 2020). His opinion articles have appeared in the *Guardian*, the *New York Times*, and *Al-Jazeera* among other international media outlets.

NOTES

1. Santiago Zabala, *Why Only Art Can Save Us: Aesthetics and the Absence of Emergency* (New York: Columbia University Press, 2017); and *Being at Large: Freedom in the Age of Alternative Facts* (Montreal: McGill-Queen’s University Press, 2020).
2. Jonathan Watts, “Resource Extraction Responsible for Half World’s Carbon Emissions.” *The Guardian*, March, 12, 2019, <https://www.theguardian.com/environment/2019/mar/12/resource-extraction-carbon-emissions-biodiversity-loss>; and Isabella Kwai, “Australian Coal Company Says Bush-Fire Smoke Is Slowing Production,” *New York Times*, January 21, 2020.
3. Caroline A. Jones, *The Global Work of Art: World’s Fairs, Biennials, and the Aesthetics of Experience* (Chicago: University of Chicago Press, 2017), xiv–xv.
4. Arthur Danto, *Unnatural Wonders: Essays from the Gap Between Art and Life* (New York: Columbia University Press, 2006), xvi.

THE TRUE COST OF OIL

Garth Lenz

WWW.GARTHLENZ.COM

The images in this portfolio are drawn from my larger traveling exhibit, *The True Cost of Oil*. The following artist statement is from that exhibit:

The True Cost of Oil exhibition is a comparative study of the Alberta Oil Sands and the surrounding boreal forest. These contrasting subjects serve as a visual metaphor of the cost of our ongoing consumption of fossil fuels.

The boreal forest ecosystem is the world's greatest terrestrial storehouse of carbon and Canada's boreal forest is considered the largest and most intact forest remaining on Earth. In the middle of this ecosystem lie northern Alberta's Oil Sands, the world's third largest oil reserves and its largest energy project. They are also possibly the most visually compelling example of all that is wrong with our consumption of fossil fuels while at the same time offering stunning opportunities to make images of great scope, power, and variety.

Making extensive use of aerial photography, *The True Cost of Oil* includes images of vast tar mines, tailings ponds, and refineries, as well as some of the world's largest wetlands and remaining tracts of forest. My approach includes images of pure abstraction as well as those of a more documentary approach. The inherent beauty in many of the images of industrial devastation is often at odds with our preconceptions of this subject matter while reflecting our complicated relationship with fossil fuels; while we lament the negative impacts of fossil fuel extraction, we continue to enjoy their benefits.

The True Cost of Oil explores the power of nature, our power to transform the landscape on a previously unimaginable scale, and most importantly, the risks we are willing to take and the sacrifices we are willing to make to meet our demands for carbon-based energy. It is my hope that this exhibit will invite viewers to consider the true cost of our dependence on fossil fuels.



Garth Lenz, *Tar Mine and Roads*, Northern Alberta, Canada, 2010

The Alberta Tar Sands (or Oil Sands) represent the world's third largest proven oil reserves. They produce more carbon than traditional oil reserves. This is compounded by the fact that the production of this resource requires the removal of the boreal forest ecosystem, one of the world's most effective terrestrial carbon sinks. The Tar Sands also border on the Peace Athabasca Delta, a Ramsar designated wetland and Unesco Cultural Heritage Site considered the world's largest freshwater delta. Lying at the junction of all four of North America's migratory bird flyways and the last refuge of the largest remaining wild herd of bison, it is being critically impacted by pollution and water withdrawals from the tar sands. Toxic pollutants are also found in the wildlife and neighbouring indigenous communities are showing elevated rates of cancer. The proposed full exploitation of the tar sands would industrialize an area the size of Florida. NASA climatologist Dr. James Hansen has noted that the GHG emissions caused by extensive extraction of the Tar Sands oil would essentially mean "game over for stabilizing the global climate."

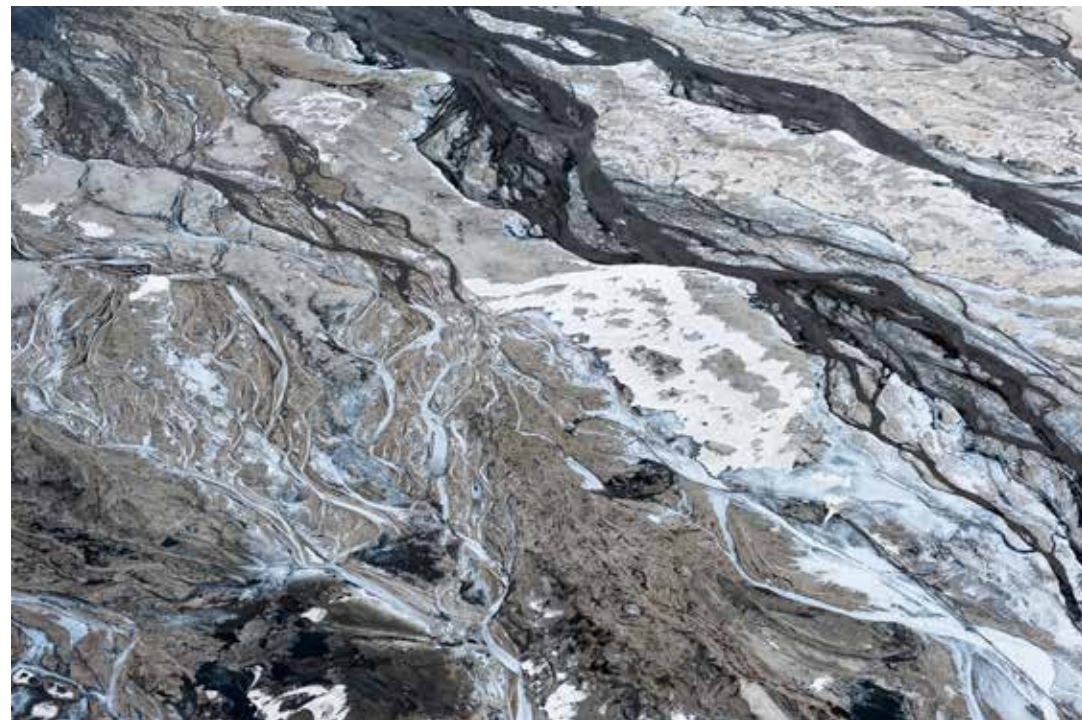
Garth Lenz, MacKay River, Boreal Forest, and Tar Mine, Northern Alberta, Canada, 2010

The boreal forests and wetlands that surround the Tar Sands are the most carbon rich terrestrial ecosystem on the planet, holding almost twice as much carbon as tropical rainforests. Referred to by the tar sands industry as “overburden,” these forests are scraped off and the wetlands dredged, to be replaced by tar mines like this.



Garth Lenz, Tar Sands Upgrader in Winter Northern Alberta, Canada, 2010

The Alberta Tar Sands are Canada’s single largest, and fastest growing, source of carbon. They produce about as much carbon annually as the nation of Denmark. The refining of the tar-like bitumen requires far more water and energy than the production of conventional oil and produces significantly more greenhouse gas. Nikon D3, Nikkor 24-70 f2.8. Shot at ISO 800, 24mm, 1/8000 at f4.5.



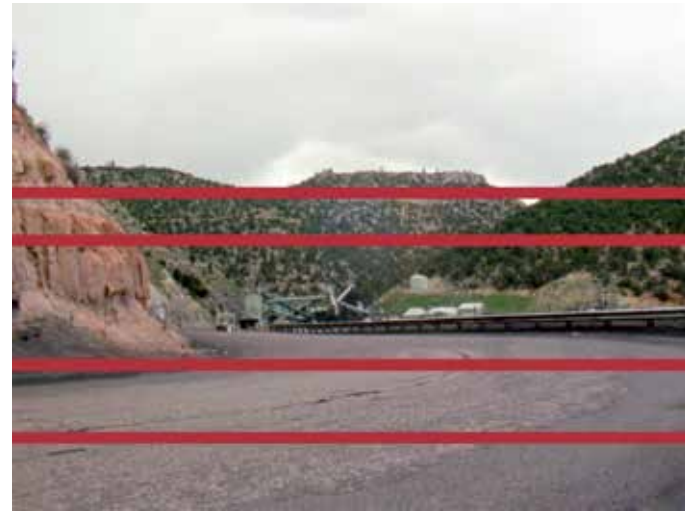
Garth Lenz, Tailings Pond in Winter, Abstract #2, 2010

Even in the extreme cold of the winter, the toxic tailings ponds do not freeze. On one particularly cold morning, the partially frozen tailings, sand, liquid tailings and oil residue, combined to produce abstractions that reminded me of a Jackson Pollock canvas.

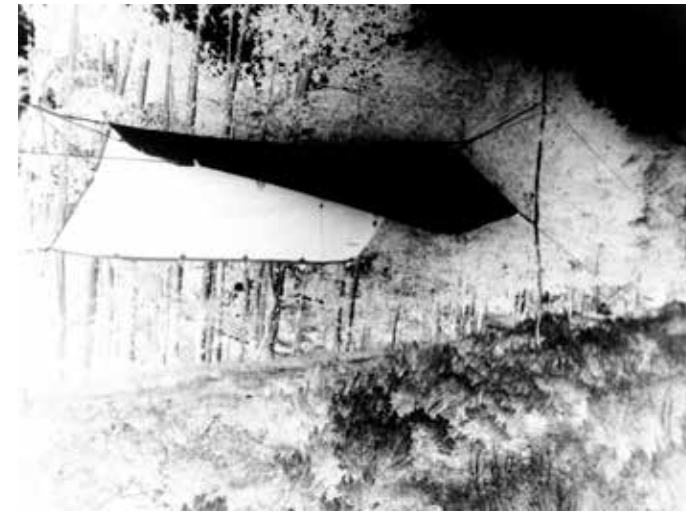


Garth Lenz, Tailings Pond Abstract #2, Alberta Tar Sands, 2010

So large are the Alberta Tar Sands tailings ponds that they can be seen from space. It has been estimated by Natural Resources Canada that the industry to date has produced enough toxic waste to fill a canal 32 feet deep by 65 feet wide from Fort McMurray to Edmonton, and on to Ottawa, a distance of over 2,000 miles. In this image, the sky is reflected in the toxic and oily waste water of a tailings pond.



Jason Livingston, film stills from *Ancient Sunshine*



ANCIENT SUNSHINE

Jason Livingston

Ancient Sunshine is an experimental documentary in the essayistic tradition that explores extraction and climate defense in the American West.

“We discovered coal, the genie in the Earth. Now we live off ancient sunshine (coal, oil, gas), which has made possible the extraordinary expansion of our population. We have to return to a life based on contemporary sunshine.”

—Joel Achenbach

When I first learned of the tar sands mine operation in remote Utah, I was alarmed. How could there possibly be tar sands in Utah? How could anyone, given the horror show of the Athabasca oil sands in Alberta, Canada, consider replicating extraction like that here at home? And then my horror turned to inspiration. I learned of a small group of environmental activists who for half a dozen years have protested the exploratory mining operations. Every year, following the snowmelt, and continuing to the turning of the leaves, they build a resistance camp within sight of the mine.

Ancient Sunshine consists of interviews with the Utah Tar Sands Resistance primary organizers and other Utah land protectors, and sets their voices in and against an extractive landscape. The film draws on other voices and sources, too, to complicate ideas of resistance and kinship during times of extinction. *Ancient Sunshine* proposes, through its formal operations and poetry, a solidarity of inter-dependency, across history, across geography, across species.



Jason Livingston, film stills from *Ancient Sunshine*



Eric Zhang, *Source*, 2019, digital photograph



Eric Zhang, *Storage Tanks*, 2018, digital photograph

THE MARTINEZ REFINERY

Eric Zhang

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The Martinez Refinery, which traces its roots to 1913, was the first modern refinery to be built in the United States, and today it remains the largest refinery in the San Francisco Bay Area. Its 177 mile-long pipeline extends from California's Central Valley up to the refinery, weaving through numerous neighborhoods, reservoirs, and agriculture fields. Shell owned the refinery until 2019, when they sold it and its related facilities to an independent refining company. I live near the Martinez Refinery, and only became aware of the pipeline after noticing the pipeline markers, which I followed to their source. This series investigates and informs the public about the pipeline and the Martinez refinery through photography, video recordings, and interviews with residents of nearby neighborhoods. My work seeks to expose the destructive influences the pipeline poses to the land, as well as the harmful living conditions communities endure at that hands of a threat that remains invisible to most.



Eric Zhang, *Martinez Refinery*, 2019, digital photograph



Kim Steele, Oil Platform, Jacket Cerveza, New Orleans, photograph, Kim Steele Photography, Getty Images, San Francisco



Kim Steele, North Sea Rig 87088, #3, photograph, Kim Steele Photography, Getty Images, San Francisco



Kim Steele, Oil Shipping Pipelines, Arthur Kill, Staten Island, photograph, Kim Steele Photography, Getty Images, San Francisco

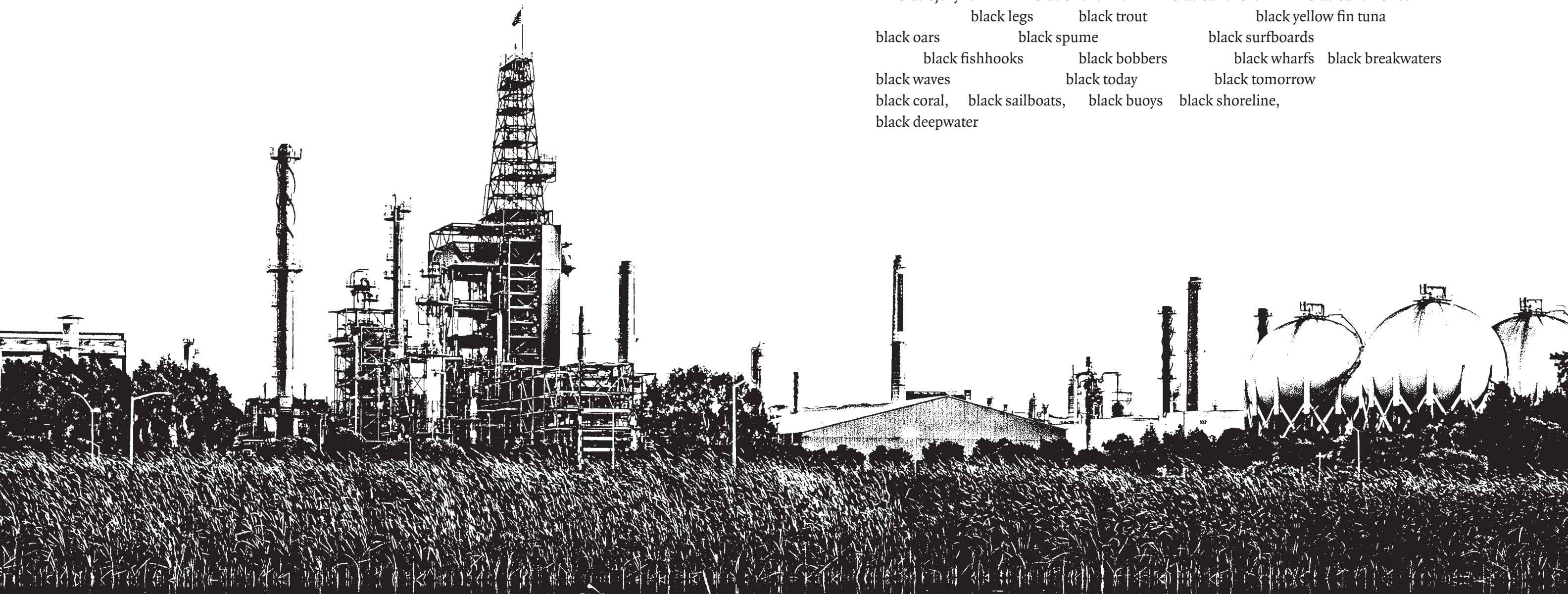


Kim Steele, Roughnecks, Oil well drilling, Texas, photograph, Kim Steele Photography, Getty Images, San Francisco

BLACK GOLD

CB Follett

Black horizon black water black beaches, black crabs,
black oysters black flounders black nets
black surf black scud black sand crabs
black sandpipers black sand dollars black seaweed
black shoreline black pelican black feet
black rocks black tides black globs
black dunes black egrets black sanderlings
black keels black beaks black wings
black clams black seagulls black coots
black boots and gloves black gold pouring out black shrimp empty nets
black finned tuna black herons black bellies
black jellyfish black fishermen black anchors black anemones
black legs black trout black yellow fin tuna
black oars black spume black surfboards
black fishhooks black bobbers black wharfs black breakwaters
black waves black today black tomorrow
black coral, black sailboats, black buoys black shoreline,
black deepwater



CAN WE HOLD ONTO THE EARTH

CB Follett

Each day the sun throws down
fiery fingers and grabs
the corn from the ground, but we
dance on. Giant slabs

slide like dead men off the ice shelves
and melt into the great
shrugged shoulders of the sea
but we are far away
and don't blink

Polar bears can no longer swim
enough to get home
as their frozen islands shrink
but we have zoos and bears enough

Huge whirlpools of wind
rise up and smash the land
but those are poor people
and we turn away

Men sleep on sidewalks
women too in doorways
children huddle long and low
In street life lie others

their cars, now towed or sold
for a few more meals
We have doors and hearths
yet feel helpless

It's all too much. We are too many
The Earth we can only hope
is resilient We must all hang tough
Reach out. We must all hold on

MIGRATION

CB Follett

Across our sun soaked sands,
our oceans, a billion people
are moving, always moving –
towards, away, with little
in their pockets, nothing
on their backs.

The trails are old, scuffed
by the feet of ancestors.
Where they lived
is parched, war torn, cyclonic.

They travel by callused foot,
by broken down camel,
donkey, wagon, over-
crowded boat. They must

shed and leave behind,
they must abandon the sick,
the falling, the dead. They
have paid everything they had,

money, clothes, pails, baskets.
With nothing left, they keep
walking, keep their eyes on
on hope, on an horizon unknown.



KB Jones, *Well*, 2018, watercolor and ink on paper, 45 by 64 inches

THE PERMIAN BASIN

KB Jones

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The Permian Basin lies in Southwest Texas and the bottom right corner of New Mexico. Sitting a bit north of it is a small ranch that my great grandfather pieced together for grazing his cattle. Today, my father and his sister lease this property out to a rancher, a hunter, and an oil company. While our ranch produces a relatively small amount of crude, great pride in the oil industry runs through the area. There is a thriving economy surrounding it and everyone is happier when there are more jobs and more money.

I became particularly interested in the oil industry after reading a *New Yorker* article claiming that the Permian Basin was arguably, “the hottest oil and

gas play in the world.” The oil boom that this part of the country is experiencing is due to the “fracking revolution,” which is coinciding with the Trump administration’s loosening of regulations.

My paintings began with a trip to this part of Texas and New Mexico. I did not look at the oil and gas industry exclusively. From there, I visited sacred places for my family, like my grandfather’s ranch and the small town of Spur, Texas where my Grandmother Betty grew up. I went to Marfa and visited the Chinati Foundation. I went to two National Parks and saw friends in Las Cruces and Carrizozo. In my diary I wrote, “Some of the nicest and friendliest people that I have met. Charming small towns and hardworking people.”

The paintings that resulted from this trip are not a scientific investigation in any sense. They reflect my subjective experience of looking at a landscape



KB Jones, *Halliburton*, 2018, watercolor and ink on paper, 30.5 by 45 inches

and a region that I love. I made paintings that attempt to tell a complicated story, one that both honors the place and the people, while revealing my own concerns and anxieties. The U.S.’s border with Mexico lies just to the south and it looms heavy, behind everything. These paintings are not only about a place, they are about complicated emotions and fractured perception.

Rather than oil on canvas, I am painting in watercolor on paper. Traditionally, watercolor has been taken less seriously, sometimes considered a “hobbyist’s” medium best left to women at home rather than the men in their studios. The workers in the oil patch are predominantly male, and as a female and a tourist, I did not feel welcome to explore any of the heavy industrial sites. The machinery is immense. The scale is non-human. I wanted to depict powerful industry by using a light and delicate me-

dium, as well as a very human scale. Water itself is a huge and contentious issue in hydraulic fracturing. The process uses tons of it, in a desert that has very little. Conservationists worry that the process risks damaging the water table. Skies and clouds, which reflect the moisture content in the air, were particularly fun to paint in watercolor, which, compared to oil, has little body or weight to it. I spread paper out on the floor of my studio and worked from above where I could control the pooling of the paint. I often started by taping out the horizon line because in the wide open spaces of the Southwest, everything rests on the horizon. Beginning from there, I might go on to depict a car window, a frack waste pond, a leaky pipe.

When I wanted to paint something that seemed more complicated or dense, I used gouache, which unlike watercolor is opaque. I painted one of the



KB Jones, *Jacy in The Last Picture Show II*, 2018, watercolor on paper, 9.25 by 12.5 inches

many towers of cases of plastic water bottles that were for sale in a gas station in Pecos. At the center of the oil patch, Pecos is surrounded by fields of RVs that house the oil field workers. The men working in the field need to stay hydrated, as summer temperatures are typically well above 100 degrees. As one oil field worker told me on my flight back to Houston, he often goes through a case of bottled water a day. I used gouache to paint one of the many billboards in the Midland airport that advertised something related to the oil and gas industry. Passengers wait in front of a billboard that advertises “SmartSand” from Wisconsin, for all your hydraulic fracturing needs.

In this series of paintings, there is a focus on trucks and the experience of driving. Trucks, windows, and windshields became a major part of my paintings because they were the vehicles (or lens) through which I saw everything on this trip. 285, which is one of the main roads used to carry supplies to the oil fields is called Death Highway by the locals. In 2017, ninety-three people died from accidents involving trucks on the highway—on the Texas side alone. In order to travel in that area and see what I wanted to see, I had to drive, relying on gas whose production I was investigating. I used washes of sumi ink to depict the interior of the vehicles. The inked windows often become the frames

through which one views the landscape. I also used ink to paint glazes and washes in areas that seemed dirty or smoggy from heavy production. I connected these landscapes to my own interests in art history and display, which is why I attempted making paintings using a long vertical format. I layered and stacked images of the area, using ink washes like strata. The stripes started to look like rocks, mines, geological maps or diagrams. Rather than depict the horizontality of the place, I wanted to show a sense of time and history going down deep like roots.

Halliburton’s logo was a common site in the Permian. However, I believe that there are other connections between the oil industry and America’s military efforts. Like our recent efforts in the Middle East, groups of predominately male workers travel to remote sites, living and working together amidst heavy and dangerous machinery. The process of hydraulic fracturing itself is violent, as literally tons of water, sand, and chemicals are shot down deep into the earth, and the landscape itself is similar to the Middle East. Traditionally, Texas has symbolized a lot of what we imagine America to be: the independent spirit of the frontier. But so much of the old west is a myth that has been passed down from Hollywood. The great Texan author Larry McMurtry explores the connection between mind and landscape, and he often writes of depression with intermittent highs, mimicking the boom and bust cycles of Texas’ oil industry. In the movie based on his book, *The Last Picture Show*, Cybill Shepard plays Jacy. She is young and beautiful. But, not unlike oil, beauty will not last forever, and America’s obsession with both is perhaps shortsighted.



KB Jones, *Pecos Gas Station*, 2018, watercolor and ink on paper, 27 by 25 inches

ART AS ACTION:

CONCERNING ART AS A TOOL OF POLITICS AND PROTEST

Christopher W. Benson

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The reader should know at the outset that I am a painter. And because painting is the kind of art I know best, what follows mainly concerns that medium. That said, the general principles outlined here could equally be applied to poetry, prose, theater, photography, film, video, or any other creative path a person might choose to take up. Indeed, I tend to experience all those different kinds of art in much the same spirit in which I experience a painting.

Although I wholeheartedly support, and indeed am pleased to be a participant in the Extraction Project, I have always been dubious about art's effectiveness as a tool of political change. The simplest way to put it is that, for me, politics is a way to speak to others about how we think the world *should be*, whereas art is more a matter of allowing the world to speak through us about how it is. One approach is outward and instructive, and the other is inward and receptive, notwithstanding that both are forms of communication.

This is not to say that powerful statements of protest cannot be made through art; they often are. I think immediately of Turner's *The Slave Ship*, Käthe Kollwitz's etchings on *The Peasant War*, or Picasso's epic painting *Guernica*. But what all those works also have in common is that their makers were probably more interested in recording the emotional power of their own responses to the events depicted, than in attempting to tell us viewers precisely what or how we should think about them.

This is not, however, how much of today's art is made. Thanks to the overlapping ideas of the post-modern and deconstructive theories, two generations of artists have now lived their whole working lives in an often highly politicized art world. These

ideas coalesced around artistic thinking and practice in the late twentieth century with the aim of dismantling a variety of, mainly western, cultural assumptions, tropes and biases—from matters of personal, group, or gendered identity, to the impacts of colonialism and more general cultural, economic, or political critiques. This approach took hold in the 1980s and 90s and was then taught at colleges and universities throughout the subsequent decades. The more aesthetic ideals of Modernism (the correlation of the physical qualities of a work to its meaning and value) have made a return in recent years. Even so, the deconstructive mindset persists as an underlying set of norms for much contemporary art. Given the wide proliferation of these ideas, many artists now (not to mention critics, historians, curators, and educators) seem unaware that “serious” art can be anything else but politically or culturally critical—so much so that if a work does not contain some critical or otherwise politicized message, it is considered by many engaged in the world of art, not to be art at all.

It can be discouraging to “fight city hall” as they say. This is how the art of our time is made. It is no less a normative ideology of the contemporary western art world—and now, by globalized extension, of the rest of the world as well—than existed in past ages when other ideologies (whether ecclesiastical or academic) determined what kinds of art society would most encourage and support. And yet, there are always some who do not quite embrace the zeitgeist of their historical moment. Many painters working today have either hung onto, or else re-embraced, the ideas that their art's defining qualities are aesthetic and physical rather than purely ideological, and that its meaning can be revealed intuitively, through the physical act of painting, rather than conceptualized beforehand as a narrative requiring explicit illustration.

There is an old tension between these different ways of working which is, somewhat misleadingly, traced back to the dawn of European Modernism in



Christopher Benson, *Maybe, Maybe Not*, 2018, oil on panel, 24 by 24 inches

the mid-nineteenth century—the point at which the genesis of today’s deconstructionist line is thought by some of its champions to have occurred. Seeing their approach as a foreordained evolutionary consequence of the Avant-Garde rejection of classical aesthetics, they presumed that a wholesale rejection of all aesthetic art was the inevitable, even desirable, outcome of that revolution. This was demonstrated to me when I returned to art school in my mid-forties to complete a previously abandoned degree. We were taught in our art history class then that the early Modernists—Édouard Manet in particular—launched the deconstructive line when they rejected the historically-themed classicism of the French Académie and Salon, in favor of a more direct contemporary critique. In this telling, socially provocative works, such as Manet’s *Olympia*, or *The Execution of Emperor Maximilian*, laid the foundation for the conceptualism of Duchamp and the Dadaists. From there the line lead inexorably to Andy Warhol, to the triumph of critical philosophy over art, and to the inevitable “end of art history.”

That is a very different story from the one I learned as a younger man at the same school in the late 1970s, when early Modernism was presented as an *aesthetic* revolution—yes, away from classical naturalism, but towards the non-objective, and in some cases even spiritually transcendent expressionism of American abstraction. In that telling, first Gustave Courbet, and later all the Impressionists as a group, abandoned the biblical and historical content of academic painting for a grittier realism, coupled to sensory and tactile (later termed “plastic”) experiments with color and surface. The major figure at the head of that charge was not Manet at all, but Paul Cézanne. It was Cézanne’s carefully examined color relationships, his rough edges and broken surfaces, which led into the fragmented Cubist imagery of Picasso and Braque (Picasso once even referred to Cézanne as “the father of us all”), and thence into the acutely distilled pure abstraction of de Kooning, Rothko, Frankenthaler, and Pollock. Henri Ma-

tisse’s and Pierre Bonnard’s formal innovations and saturated colors also influenced that line, as well as the semi-abstracted Bay Area representation of painters like David Park, Richard Diebenkorn, Elmer Bischoff, and later, Wayne Thiebaud. It was only when the Postmodern factions overthrew the high minded aesthetics of mid-century Modernism, that the alternate concept-driven lineage I heard in my later college sojourn was proposed. “This is why we do not talk of Cézanne but of Manet,” my instructor announced in the fall of 2004. Pissarro, Monet, Cassatt, Morisot, and Degas, as well as Seurat, Matisse, and Bonnard, were completely unworthy of mention. And only Pollock among the New York painters rated a nod. The message could not have been more clear: “In the new order, none of that will be considered art!” Sadly, when put in curatorial service, this mindset can impoverish and misrepresent a wide range of both Modern and pre-Modernist art. Desensitized to the subtle, deeply historically layered languages of aesthetically made things, art historians educated in the Postmodern era project the contextualizing language of critique backward onto works made in a completely different tongue, alternately condescending to them as unsophisticated, or simply pretending they never existed.

The problem with both these art historical trajectories—the transcendently aesthetic on the one hand, and the transgressively culturally critical on the other—is that each is only a piece of a whole organism in which there were in fact a great many other moving parts. Like the tail or trunk of the elephant that is respectively grasped by the proverbial blind men, these were, at best, fractional views that justified the narrow ideological prejudices of those who advanced them. The broader reality of the Modernist century that unfolded between the height of Impressionism and the end of the Vietnam War, is that it was, on the whole, a period of profound non-conformity and resistance to institutional thinking—or really to any firmly articulated “correct” way of making art. It

was an individually driven free-for-all: a time when myriad diversely branching tributaries sprang up and flowed in radically different directions from one another. Even within those many branches, individual artists found distinctly different ways to express the inquiries to which each of their more narrow movements were ostensibly dedicated: Henri Matisse is distinctly unlike Pierre Bonnard, as Willem de Kooning is distinctly unlike Jackson Pollock, as Richard Diebenkorn is unlike Nathan Oliveira, Agnes Martin is unlike Al Held, etc., etc.

Given this extraordinary variety in the art forms that came out of the century of Modernism, it is difficult to say exactly what they have in common (or what makes them Modern overall) apart from this characteristic of being freely investigative and innovative. It is possible, however, to say with some certainty that most grew out of relatively personal aesthetic or intellectual quests, rather than flowering from the seed beds of anybody else’s pre-formulated theories or agendas.



As distinct as the artistic identities of the major figures of Modernism are from one another, there is a positional sameness to the works of those painters who immediately followed and overturned their movements. A certain programmatic similarity can be seen in the Pop Artists Robert Rauschenberg, Andy Warhol, Roy Lichtenstein, James Rosenquist, and even a somewhat later figure such as David Salle. These, admittedly, are all people who adopted a kindred appropriative and ironic style with respect to the visual ephemera of popular culture. But that isn’t entirely where the similarity lies. It is rather in their collective adoption of the distanced, authoritative posture of the cultural critic. In claiming that role, they somewhat took their emotional skin out of the game, and put themselves in the comparatively remote and safe position of shooting from the edge of a barrel at whatever sort of fish they cared

to put inside it. What they seemed to be saying was “all is crass, corrupt and commercial, including art itself; I don’t really believe in any of it, and neither should you.”

Another major development of the overlapping periods of late Modernism and early Postmodernism, especially in the top New York galleries, was the first emergence of the phenomenon of commercially marketable artistic superstardom: the now pervasive market role of fine art as an investment vehicle indexed to the celebrity of its maker—a shift that somewhat accounts for the resurgence of aesthetic painting in the early 2000s after a brief reign of (difficult to sell) pure conceptualism. Nevertheless, the spirit of deconstructive critique was carried forward into these more marketable works as a badge of artworld authenticity and seriousness. It wouldn’t do to make appealing artistic commodities without embedding a jaundiced view of both aestheticism itself, and of the culture that was consuming it for such large sums of cash.

Since the postwar period, many varying strains of this more aesthetically-minded investment art followed. And yet, the posture of the ironic, insulated skeptic continued to permeate the age. We see the clearest examples in market phenoms like Jeff Koons and Damien Hirst. But the same ironic approach is also present to some degree in the work of a wide range of less overtly conceptual painters, beginning with the German Gerhard Richter—whose 2002 retrospective in New York marked painting’s prodigal return to art world legitimacy. Soon after that, a crowd of younger up-and-comers followed, including Lisa Yuskavage, Walton Ford, John Currin, Dana Schutz, Peter Doig, Cecily Brown, Neo Rauch, and more recently, the fantastic Kerry James Marshall. To be clear, I consider some of these people to be outstanding artists. In any case, they are the definitive painters of our age. Time will tell which will be most remembered by posterity, but it is likely that many of them will, as well they should be. Still, they are all in some sense of an epochal



Francisco Goya, *Qué alboroto es este?*, ca. 1814–1820

kind, just as the major painters of the Renaissance or the Baroque were of a kind that is likewise fixed to their respective periods.

It is worth considering though, that when an artist fails to cleave so obligingly to the persona of a specific cultural moment, he or she can sometimes rise above and avoid being trapped in the amber of its dominant identity. The overarching character of both the art of our age, and of its critical and curatorial analysis, is that of a cannily self-conscious commentary on both the culture and itself, coupled to a mystic aura of commodifiably innovative genius that is manufactured both by and for its makers. It may be heretical to suggest this, but perhaps this is not the only kind of art there is—or, more to the point, maybe there are other ways to understand the art that we have.

So what alternatives are there to the currently prevalent approaches to both making and valuing artistic things? And, to return to the matter of political effectiveness: can powerful, socially conscious art be created without quite playing the game according to the rules we've been handed over the past half-century? Furthermore, should we even want an

alternative? What's wrong with the way we do things now? Despite an instinctive distrust of the hyper-inflated art market—and of all the ways in which its absurdvaluations are manipulated and justified by the artists themselves and their commentators—I can't answer the last question because I don't believe there is any such thing as a right way to make art. We make what we make and others get to decide what value, if any, it has for them. The art of our age, like that of any other, is a reflection of this relationship. There are excellent works to be found within it, just as there are excellent works to be found in the art of any age.

It just happens that I am not interested in doing things in the currently popular way. There is a different sort of art that is more engaging to me: an art that does not quite put the cart of content out in front of the horse of practice, and which does not harness that practice so insistently to the carrots of fame and fortune. I don't mean to suggest that such artists do not care or think about their content. And, so far as I know, most of us, myself included, want critical recognition and financial stability very much indeed. But I must confess that the minute

I read a gushing profile in the *New Yorker* magazine of some young (or older) art star whose prices have lately broken them into the millionaire club, or whose dazzling innovations have won them the mantle of “genius,” their appeal to me begins immediately to plunge. It's an old and perhaps a puritanical conceit, but I tend to regard artistic celebrity and genuine artistic greatness as being in some fundamental way mutually exclusive conditions. The really amazing stuff seems so often to have been made somewhat outside the limelight, and in a spirit of almost anonymous, or perhaps forgotten, striving—and yes, I'm sorry, also through some sort of struggle. But striving or struggling after what? As I said at the beginning, the artists whose work most moves me seem to be after a sort of truth that the work reveals to them, rather than setting out to manufacture a vessel that will dependably deliver some

already-digested idea to the viewer or to the market. This is a very subtle distinction, because of course we all have ideas we hope to convey. But in this alternative process, a kind of subjective, perceptive alchemy can also occur within our practice which imbues its products with the mystery and power of the unknowable. A handful of oddballs work this way today: the painter Vija Celmins comes to mind, as does the sculptor Lee Bontecou.

Two painters who fit this description, and who had an immense early impact on my understanding of what art is, and what it can and can't do, were the Spaniard Francisco Goya and the Englishman J.M.W. Turner. Both came well before the French Modernists, but managed in an earlier age to evolve to a kind of expressionism that didn't happen again until the early to mid-twentieth century. Turner is classified historically as a Romantic painter; Goya, who was about thirty years older, came out of the Spanish tradition of court portraiture. But each in their different ways arrived, late in life, at an innova-

tive, personal style that wasn't easily pigeonholed as belonging to any particular movement or method. Both painted emotionally charged pictures about the important events of their time—the Napoleonic wars, the Inquisition, the slave trade, early industrialization, etc. But they described those events in ways that rose above any explicitly ideological positions into a more revelatory, and aesthetically communicated vision. Interestingly, both artists arrived at these plateaus after the success and celebrity which each had achieved earlier in life had begun to wane. Both were even considered by some contemporaries and former patrons to have gone a bit mad in their old age.

In Turner's late paintings, one gets the sense of a kind of eidetic vision having driven his practice—in which marks were made on the canvas that were not initially representative of anything in particular,

“[the late works of Goya and Turner] suggest that ungovernable reality is an inevitable counter to all of our most controlled projections of the ideal ... they remind us that we live in a universe in which creation and destruction are inextricably linked and, in the end, unfathomable.”

but which served as a guide for drawing out some internalized memory or imagined scene. Often these scenes of Turner's were purely atmospheric, or else land and seascape derived. But he did also paint deliberately representational scenes, as in his series on the whaling industry, or *Rain, Steam and Speed*, his famous painting of a steam locomotive on the Great Western Railway.

Turner's picture *The Slave Ship* offered an unusually pointed protest of an event that had happened fifty-nine years before it was painted. He made it in a period of awakening opposition to slavery in Britain, in hopes of moving the social consensus—particularly among his aristocratic patrons—in favor of abolition. In that sense it was a completely political work. And yet, it has the feeling of having been ex-



J.M.W. Turner, *Slavers throwing overboard the dead and dying – typhoon coming on*, 1840

tions were maybe less important to the artist than the strength of the feelings he was recording.

There is tremendous aesthetic beauty in the way that both Goya and Turner depicted the respectively horrific and scandalous events of their time. Their pictures are darkly emotive, but also transcendently beautiful objects. Turner portrayed the great crime of slavery in a lurid but transporting, rather than merely scolding way. Goya, even as he created his terrible records of violence, also made them in some sense sublime. These early Mod-

perceived into being rather than *designed*; its narrative feels like more of an expression of personal outrage than any explicitly instructive polemic on a better kind of behavior.

Goya did something similar in his earlier series of etchings about the French occupation of Spain, which described the atrocities perpetrated on the Spanish people by Napoleon's invading armies in the early 1800s. Later referred to as *The Disasters of War*, these prints were about disturbing events, without commanding any particular interpretation of their literal political causes or implications. We know historically who was responsible for the crimes depicted, but the specifics are not too clearly encoded in the pictures themselves. Neither is there any overtly patriotic or nationalist sentiment in them. Rather than singling out Napoleon specifically, or the French people more generally, Goya seems to have been more determined to show us what appalling things human beings can sometimes do to one another. In all likelihood, he hoped for the viewer to be as upset as he was by that realization ("I saw it" is inscribed below one of these tableaux). But the exact content of his response, or the particulars of those events' precise political causes and ramifica-

ern pictures (both are Modern artists despite their predating Modernism) point to a bigger truth existing out beyond any contextually codified ideological position. They suggest that ungovernable reality is an inevitable counter to all of our most controlled projections of the ideal—that stark horror is the natural counterbalance to the comfortingly benign. They remind us that we live in a universe in which creation and destruction are inextricably linked and, in the end, unfathomable. This is a realization which can be quite effectively communicated in purely aesthetic terms, even though we may go on to meditate on its meaning with our intellects. Above all, both Goya and Turner were able to communicate these things by way of the poetry of the seen and felt, rather than through any analytically reductive instruction.

For painters especially, the conflict between these sorts of "traditional" aesthetics and the deconstructive critique that came to dominate the art of our time, is central to the question of what art can actually achieve in the political sphere. The latter approach, being quite illustratively topical, would seem to lend itself best to works of pointed protest. But as I started out to say, this may not be the most



Christopher W. Benson, *Four In-Progress photos of Standing Rock painting*, 2016

powerful or persuasive way to move people's feelings about the issues we care about most.

My guiding instinct from the outset of what has now been a nearly fifty-year career of making paintings, is that a strongly felt experience in the artist can elicit an equally strong, autonomously formulated (and thus fully-owned) experience in the viewer. I am also most profoundly moved by artistic discoveries that I didn't necessarily go looking for—in my own work, as well as in the art that others have made. I have to believe that when the same holds true for the viewer, they might just become roused to action. But telling others exactly how to think or

act, or why they should do so, is perhaps not what artists do best.

An example of my own efforts to work in this way can be seen in a painting I made in 2016 in response to protests by the Native American Standing Rock Sioux Tribe against a proposed oil pipeline that would traverse their traditional lands and watershed. It was a powerful, moving act of civil disobedience by a coalition of native peoples against an intrusive, environmentally destructive act of corporate capitalism. The event upset me so much that I felt compelled to make a picture about it, without knowing ahead of time exactly what form that picture would take. Instead of formulating some



Christopher Benson. *Baked Alaska*, 2018, Oil on panel, 30 by 30 inches

narrative tableau that would tell the viewer exactly how I wished for him or her to think about this issue, I imagined the place and began to make marks on the canvas that were expressive of the emotions I was having. It was immediately a picture of light and darkness at war with one another. It did not begin as any sort of literal representation of the actual protest site, but gradually resolved into a view that echoed aerial footage I had seen of the landscape there. Land and sky dominated the picture so much that I ended up leaving out any representation of either the pipeline builders or the protesters themselves, save for the tiny image of a lone Sioux warrior on horseback confronting the storm. Almost immediately, a huge black stormcloud formed above the land, which only at the end of my work took the shape of a rearing serpent (the protesters called the pipeline “The Black Snake”). This echoed Turner’s painting *Hannibal Crossing the Alps*, in which a similar cloud resolves into a looming bird of prey. In the end, I was able to impose a more literal depiction of the waterways around the site. But the process of painting the picture was as much responsible for

showing me what it meant, as I was the deliberate author of its meaning.

The Standing Rock Painting was a work of protest against an event with definite political implications. It was not, however, an intentionally political picture, but one driven by strong feelings and created as a graphic container for them. I imagine that this is a similar process to what the artists I’ve described above used in the past. My pictures certainly share a kindred feeling with that earlier work. In that sense, they partake of a tradition. But they’re not a pastiche or imitation of those older forms. A craftsman I know who hand-carves letters on gravestones once said: “[...our stones] look the way they should for our time. To some, I’m certain they look primitive, but they don’t look like eighteenth century stones, they just kind-of adhere to the same principles.”

Being an artist is a highly skilled vocation with a rich history of revealing meaningful truths, in its own unique terms, about the human condition. We painters especially have the extraordinary freedom to record what we see and feel without needing to explain it, even to ourselves. Why surrender that freedom, that subjective magic, to the pedantry of philosophy and critique? If what we witness in the world is beautiful or awful, tragic or sublime, and we feel in our hearts that this is so, then looking at it squarely, feeling its effects, and reflecting their impact through some thoughtful, or even impassioned practice—all while allowing the nature of all things good and bad to come through of their own volition—this is, for me, the most effective way to take action through art.



Christopher W. Benson, *Standing Rock, Coming of the Black Snake*, oil on linen, 2016

WHEN THE LANDSCAPE IS QUIET AGAIN

NORTH DAKOTA'S OIL BOOM

Sarah Christianson

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Since 2012, I have been documenting the legacy of oil booms and busts in my home state of North Dakota. My photographs bear witness to the transformation of its quiet agrarian landscape into an industrialized zone dotted with well sites, criss-crossed by pipelines, illuminated by natural gas flares, contaminated by oil and saltwater spills, and fracked beyond recognition.

North Dakota is no stranger to the oil industry. Its previous booms of the 1950s and 1970s peaked with only 3,000 active oil wells. Now, the Bakken Boom currently underway has added over 10,000 new wells that are pumping out more than a million barrels of oil per day, due to horizontal drilling and hydraulic fracking.

Everyone wants a piece of the action, including my family: since the Bakken Boom began, we have been profiting from oil wells drilled on land my great-grandparents homesteaded in 1912. Although many other families are doing the same, I started this project to reconcile our involvement with the hidden costs of this prosperity and to give a much-needed voice to those who feel powerless to effect change.

In 1973, North Dakota's Governor, Art Link, envisioned: "We do not want to halt progress... We simply want to insure the most efficient and environmentally sound method of utilizing our precious resources for the benefit of the broadest number of people possible. And when we are through with that and the landscape is quiet again... let those who follow and repopulate the land be able to say, our grandparents did their job well. The land is as good and in some cases better than before."

Unfortunately, his hope for the future remains a fantasy thus far: our grandparents did not do their job well. I examine the scars from prior boom-and-bust cycles and the new wounds being inflicted upon my home because the status quo must change: something needs to be left for the next generation, not just the next quarter.



Sarah Christianson, *Sections of the Dakota Access pipeline near Standing Rock*, October 2016, archival pigment print

This heavily protested pipeline carries oil from western North Dakota to its terminus in Illinois. It bores underneath the Missouri River, less than a mile from the Standing Rock Sioux Reservation. Its route and construction were controversial, most notably because it was supposed to be installed north of Bismarck, the state's capital. This plan was rejected because of the threat to the water supply, yet this was deemed an acceptable risk for the Standing Rock Reservation to bear instead.



Sarah Christianson, *Flaring near the Blue Buttes*, January 2015, archival pigment print

Natural gas is being flared off in North Dakota due to a lack of infrastructure. Before new policies were adopted in 2014, upwards of 30% was being burned and wasted. Flaring has now dropped to around 18%, and the overall goal is to reach 10% by October 2020.

Right: Sarah Christianson, *Cleaning up the largest inland oil spill in the United States on the Jensens' land near Tioga*: 2014, 2015, 2016 (triptych), archival pigment print

In 2013, the largest inland oil spill in the United States was discovered by Steve Jensen as he harvested wheat: over 865,000 gallons of oil had leaked into his land from a twenty-year-old pipeline. Since then, the cleanup area has grown from fifteen to thirty-five acres and remediation efforts are still ongoing.





Sarah Christianson, *Shale Shaker St*, July 2015, archival pigment print

North Dakota's oil is trapped in small pockets within dense shale rock formations. To unlock the oil, wells are drilled horizontally through these layers and fracked with a high-pressure mix of water, sand, and chemicals.



Sarah Christianson, *Well site carved out of bluffs near the Badlands*, August 2013, archival pigment print

The Lakota called this area “mako sica” or “land bad.” French-Canadian fur trappers did the same, claiming these were “bad lands to travel through” because of the rugged terrain. Although no drilling is taking place within Teddy Roosevelt National Park, the noises and sight of oil development along its borders are clear.

DAKOTA IS EVERYWHERE

The fracking boom in North Dakota is transforming the prairie and disrupting the lives of the people who live there.

Photos by Terry Evans

Text by Elizabeth Farnsworth

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For two years photographer Terry Evans and I have been exploring a modern-day oil boom on the North Dakota prairie. We've traveled seven times to the area of the Bakken boom, named for a shale formation two miles underground. New methods of hydraulic fracturing are making ever-more petroleum available from the shale, and we have tried to document some of the consequences for the prairie and those who depend on it for their livelihood.

Prairie and oil are both stored energy from the sun.

When Terry and I first arrived in Williston, epicenter of the boom, in June 2011, we had trouble finding a place to stay. Roustabouts and truck drivers had filled the motels. Some people were sleeping in their cars in the Walmart parking lot. We finally found rooms just over the Montana border, near the confluence of the Yellowstone and Missouri Rivers; on future trips we made reservations weeks ahead.

As we traveled across territory made famous two centuries ago by the journals of Meriwether Lewis and William Clark, we experienced stories as deep as the shale and as wide as the prairie. Some of these stories appeared earlier this year in an eleven-part blog on the website of the Center for Art + Environment, at the Nevada Museum of Art, where Terry and I are fellows. Recently, some events and scenes we mentioned briefly, or not at all, have taken on new significance for me. Two examples:

East of Williston, we toured a large "man camp"—prefab housing erected quickly for oil workers. Afterwards, I stood alone near one of the barrack-like buildings, taking in the scene. A west wind

was blowing, as it usually does in North Dakota, and construction dust filled the air. (Dust is omnipresent in the oil patch.) Nearby, a young Labrador Retriever attached by a long rope to a front door handle was barking, in frustration or despair. We were on the south side of Highway 2, the four-lane strip running through the oil patch, and beyond us, towards the Missouri River, lay vast, mostly open lands. We saw no one in the camp except the dog and the superintendent who had given us the tour. Everyone else was working the long hours common in the oil industry, or asleep. Suddenly I felt chilled by a sort of shadow, something invisible and ominous. As we drove away, I could see, just beyond the dusty dormitory-camp, that the prairie was green and vibrantly alive—an unsettling juxtaposition.

Another day, at an RV camp near the small town of White Earth, we walked past a "No Trespassing" sign to talk to residents about the attraction of oil jobs. The sign was off to the side, and I can't remember seeing it. We met a woman with pots of red geraniums around the door of her RV. In Missouri, she and her husband had owned two Midas muffler shops that had failed, for reasons still unclear. They learned about the Bakken boom online, she said, and now her husband was making "up to \$80,000 a year" trucking water to oil sites. She was working as a cook in a school cafeteria about fifteen miles away. A younger man, a college graduate, came across the lot to talk as well. He had lost his Minneapolis business in the recession and was now working on a pipeline building crew.

Soon the owner of the camp came running from his office, berating us for trespassing. He more or less forced us back to the main road. "I could call the police," he threatened. "You have no idea how devastated these people are. You didn't see smiles, did you? Banks won't let them in the back door. Husbands are here without wives. There are fights in bars. I won't allow you to photograph the misery of people in this camp." And then: "This isn't a boom. It's an industry. They're putting in \$50 mil-



Oil pads and prairie potholes northeast of McGregor, May 2012. [Photo by Terry Evans]

lion office buildings. This is going to be Anchorage, Alaska, right here."

Today, reading my travel notes, I understand that his angry words were more illuminating than I'd realized then. Outside Williston and in White Earth, at the camps where the oil workers were living, Terry and I felt as if we'd traveled back to scenes from the Great Depression. Today I can see that again and again during our journeys, boosters of the boom urged us to discount damage from the oil industry—to see it as offset by the economic boon of relatively high-paying jobs in a time of high unemployment. Few boasted that Bakken oil might make the United States more energy independent. Mostly they emphasized the multiplier effect of boom-re-

lated payrolls on places and people broken by tough times, not only in the recent recession, but during the droughts and floods that have made North Dakota a hard place to earn a living.

That's why a letter to the editor of the *Williston Herald*, from a woman we met at a meeting organized by the Dakota Resource Council, caught Terry's and my attention this past February. Shelly Ventsch, of New Town, put it more clearly than almost anyone we'd met:

Much of what I cherished is gone or disappearing. ... I am trying to navigate farm equipment through a string of crazy drivers of semis raising clouds of dust, stunt-

ing my crops, lowering my yields. I am picking up oil-soaked ducks.

...

I am searching for the sight of the wildlife which is no longer there. I realize everybody is not to blame for this, but the general feeling is we have been forced to sacrifice our way of life to accommodate the nation's unemployed and to feed the state's insatiable appetite for money.

...

I do not expect understanding, nor am I looking for sympathy. I just want the life I had already made for myself.

When Terry and I began our exploration, about 5,500 oil wells were producing 11.5 million barrels of petroleum monthly. Now about 9,000 wells are pumping more than double that amount, and the numbers are rising rapidly. On the ground and also from the air, we witnessed a proliferation of sites for drilling, fracking, pumping, shipping, piping, refining, and dumping waste from oil.

Terry's photographs reveal a constant tension between the industrial facilities and the mysterious beauty and timelessness of prairie. We were exploring early enough in the boom to experience still-vast stretches of native prairie, but that is changing. The industry is a juggernaut in the original sense: the word derives from Sanskrit and recalls Vishnu's image being carried on a cart with large wheels that could crush devotees along its path. Like the Hindu god, the oil industry is at once creative and destructive. If all proceeds as planned, 45,000 more wells will be drilled into the Bakken and Three Forks Formation in the coming years, with implications that reach far beyond the prairie.

The International Energy Agency released a study last year predicting the United States will overtake Saudi Arabia as the world's leading oil producer before 2020, largely because of the oil and gas now available through fracking from shale, in North Dakota and elsewhere. That same report reminded us that two-thirds of the earth's remaining fossil fuels would need to remain in the ground until 2050 to

avoid the earth's temperature rising more than two degrees Celsius; as documented in the Copenhagen Accord, scientists believe this is the limit beyond which further climate change will become dangerous. (Our world is still profoundly dependent on petroleum. Terry and I were acutely aware of this each time we boarded an airplane to North Dakota and traveled to remote drilling sites in a rented SUV.)

North Dakota has already experienced economic swings with national implications. Before petroleum, there were booms in fur, gold, railroad, land, and banking; there was a smaller oil boom in the 1950s, too. Cycles of greed and grief are familiar in American history, which is one reason why the refrain, "Dakota is everywhere," occurs repeatedly in *Letter to an Imaginary Friend*, Thomas McGrath's epic poem about land and life in his home state.

*Southbound the coulee
Carries its freight of moonlight toward the fox-brightened river breaks.*

All time condenses here. Dakota is everywhere.

BULLISH ON THE BAKKEN

Brigham Exploration, a company based in Austin, Texas, was one of several operators in North Dakota and elsewhere that figured out how to drill two-mile-long, lateral wells and frack them in multiple stages to free oil from shale. That new technology, along with high oil prices, made drilling in the deep Bakken shale economically feasible. As production increased in late 2011, Statoil, which is 67 percent owned by the Norwegian government, became so bullish on the Bakken that it bought Brigham for \$4.7 billion, gaining Brigham's expertise and 375,000 net acres in North Dakota. Brigham's CEO and others moved on, but engineer Russell Rankin stayed in the Bakken as Statoil's regional manager, and he met with us in Williston late last year.

I wrote about Rankin in our Art + Environment blog and bring him up again here because he's im-



Oil pad below the Jorgensons' home, April 2012. [Photo by Terry Evans]

portant, since I am being partly elegiac for all that's being lost in the Bakken boom. Rankin represents an especially forward-looking aspect of the oil industry in North Dakota. Before meeting him, I read Walt Whitman's *Song of the Exposition* because I wanted to feel what it was like when a poet could "sing" an industrial boom.

*Mark the spirit of invention everywhere, thy rapid patents,
Thy continual workshops, foundries, risen or rising,
See, from their chimneys how the tall flame-fires stream.*

Rankin is thirty-nine years old, deferential, and polite. He told us Brigham/Statoil had quadrupled production—far more than he'd anticipated—since Terry and I first visited the state two summers ago. We drove together to a new Statoil site, a 176-foot-high Sidewinder drilling rig that stood on a rise a few miles north of the Missouri River. The bright

red rig—a sharp contrast against the light snow—had robotic feet and in the next few weeks would "walk" in order to drill two boreholes.

From the rise, I could see that we were in the middle of what would eventually be a multitude of wells along a section line road. Barely visible—almost ghostly in the fog—were several pumpjacks and a wide gash through the prairie—a trench for a pipeline under construction. Behind us, just over the hill, was a barn, and I figured a farmhouse wasn't far away. Rankin didn't know who owned the mineral rights Statoil had leased to drill the well. (In North Dakota, in tough times, people have sold their mineral rights to save farms and ranches, meaning land owners sometimes don't benefit much from wells drilled on their property.)

As I observed the industrial structures, I was struck by the radical transformation of formerly rural land. North Dakota was, until recently, about



Teepee stones on Davis prairie above White Earth, ND, 2011. [Photo by Terry Evans]

18 percent prairie—a source of pride to many in the state. Terry’s photographs of the changing landscape document continuing loss and fragmentation of that prairie. Fragmentation is an enemy of the wide variety of plants and grasses that make a healthy prairie. It can also be the death knell for wildlife that depends on those plants and grasses.

Before climbing onto the Sidewinder rig, we went into a trailer serving as headquarters for the drilling operation known as “geosteering” and met the workers. They would soon guide a drill bit two miles down into the earth, gradually executing a 90-degree bend, and then go two miles more laterally through dolomitic sandstone lying between two layers of shale. Sensors on the drill bit would provide the information needed to guide it by remote control. “It’s like steering a car backwards,” Rankin said. After drilling, the well would be hydraulically fractured. Oil companies have fracked in North Da-

kota and elsewhere for a long time, but only in recent years have they reached current levels of precision, reach and explosive force. Compressors pump tens of thousands of tons of chemicals (some toxic), several million gallons of water, and 1,000 to 2,000 tons of sand into a well at about 8,000 pounds of pressure per square inch. The liquid shoots down the pipe and when it reaches the two-mile long horizontal portion, it explodes out of holes every couple of hundred feet, fracturing the shale to release petroleum.

Later that afternoon, Rankin led us over large vats of churning “mud”—the drilling fluid (diesel fuel, water and chemicals) that would clean and cool the drill bit and carry cuttings out of the hole. “Statoil is working towards a mineral-based, environmentally friendly mud,” he told us. He also said Statoil will use 50 percent recycled water for fracking sometime in the near future (other oil companies are talking about using recycled water too).

He was eager to explain that his company is environmentally conscious, perhaps because he sensed critics of the oil industry nipping at his heels.

I thought of rancher Brenda Jorgenson, a critic of industry recklessness, on the Statoil rig that day. She and her husband Richard run 100 Black Angus cattle on 2,240 mostly prairie acres in the White Earth Valley northeast of Tioga. They also farm flax, alfalfa, and spring wheat. “I feel the bond to this place in my soul,” Brenda told us on the first of several visits. “Providing food is our mission and calling.” She described a discussion last year with a state oil and gas regulator about the waste pit near the oil well on their land. He claimed that a plastic liner—the barrier between toxic liquids in the pit and the soil—would last for at least forty years. “You won’t be around after that anyway,” he told Brenda. “What do you care what happens after you’re gone?”

“A chasm separates that way of thinking and ours,” Brenda said. “We’ve had the privilege of living here and calling it home because generations before us cared for the land. We owe it to future generations to do the same.”

An oil well was drilled on one of their flax fields in late 2010. Construction killed more than fifty olive trees planted on that land as a soil conservation measure thirty years earlier. Brenda showed us a photograph of a road grader moving earth at the far edge of the oil pad, damaging trees. She believes other trees died from toxic fumes or hydrological changes caused by compaction that cut off sources of water.

This early damage to a symbol of good stewardship played a key role in making Brenda something she says she never was before: angry, assertive, and outspoken. She wrote letters of complaint to the oil company and regulatory agencies, with no response. Then the waste pit near the well, which is filled in now, overflowed during the 2011 spring thaw, sending unknown toxic fluids across the road between Brenda’s and her daughter’s houses and down towards the White Earth River. (fifty-sev-

en pits in northwestern North Dakota overflowed that spring.) In the days that followed, members of Brenda’s extended family were exposed to fumes from those fluids. Brenda, her son-in-law, and her granddaughter suffered symptoms like cough, laryngitis, and burning eyes. Brenda tried, but failed, to get the contents of the pit tested; no company or regulatory agency would do the testing, and it would have cost \$2,700 to get it done on her own. Again she wrote letters to the oil company, which now claimed it had followed “standard procedures” in disposing of the waste; again she wrote to county, state, and federal regulatory agencies, with no result. Most people she called on the telephone said, “This isn’t our responsibility.”

At that point she began addressing her letters: “To whoever will take responsibility.”

Across from the oil well and just down the road is a larger pad with the usual tanks and a well. Though it’s not on Jorgenson land, it’s at the bottom of their driveway and dominates the area southwest of their house (as Terry’s photograph shows). The company will eventually have multiple wells on that pad.

A gas flare just 800 feet from their living room burns above the pad. The flare has blown out six times, and the resulting fumes have driven the Jorgensons from their home. Brenda has written many letters about this to the oil company and state regulators. (These too got no response.) She also helped circulate a petition organized by the Dakota Resource Council that hundreds signed. It endorsed a bill calling for the placement of oil operations at least 1,000 feet from dwellings (not 500 feet as permitted now.) The bill got amended several times and never made it out of a North Dakota Senate Committee.

I called Brenda and Richard recently to pose a question I hadn’t asked before. “If you had it to do over again, would you lease any mineral acres to an oil company?” They own only 137 of the mineral acres under their large ranch (earlier owners, including Richard’s father and grandfather, had sold off the rest). Thirty-eight have been drilled so far.

They've received only a small sum of money from the sites ruining their daily lives. Richard said they'd refuse to lease any of their mineral acres if they had it to do over again.

The refusal would have been symbolic, a decision not to accept income born of destruction, and it wouldn't have prevented the drilling of the well on their former flax field or more wells on the ranch in the future. In North Dakota, as elsewhere in the nation, state law ensures that mineral holders can exploit what they own, even if a landowner objects.

"IT BROKE MY HEART WHEN THEY TORE UP OUR PRAIRIE"

The problems faced by the Jorgensons and other ranchers we met are legion. According to state records cited by Nicholas Kusnetz in a June 2012 article in ProPublica, oil companies in North Dakota reported more than 1,000 accidental releases of oil, drilling wastewater, or other fluids in 2011. Kusnetz wrote that state regulators also acknowledge many more illicit releases that went unreported. We met a trucker over dinner one night in Williston who had just witnessed another driver dump drilling waste in a stream south of town. Over lunch in Tioga, a farmer described seeing waste discharged in a newly planted field.

Cattle have reportedly been sickened by contaminated water and died from dust pneumonia caused by traffic on dirt roads. Trucks hit animals on highways when fences aren't replaced properly after construction of oil facilities.

"I think people would value prairie more if they understood they're eating grass when they eat the cows," rancher Scott Davis told us as we walked down a road gouged across his land by an oil company for its new well. Davis owns 1,100 acres of land, 80 percent of it prairie, in the White Earth Valley, and 240 mineral acres underneath. "It broke my heart when they tore up our virgin prairie," he said as we stood on a rise above the huge scoria-covered

oil pad and well on what had been his favorite land. But we couldn't stop them." Like Brenda Jorgenson, Davis is working with the Dakota Resource Council and other groups to get more and better regulation of an industry they consider often out of control.

Scott and his brother Steve are candid about benefiting from the boom. They receive checks every couple of months from the mineral rights they still own, and they got a one-time payment of \$22,500 from the company for use of the land for the well, road and pipeline. Three of Scott's children, who also revere the prairie, have recently built modular homes on the ranch, which they paid for with money from oil-related jobs. Scott says his children most likely would have left North Dakota if not for the boom. "I'm not opposed to all drilling," he says. "I just want them to do it safely for people, animals and land."

Meanwhile, life for the Davis family—and for so many others—continues to change. Today Scott and Steve lock the doors to their houses and cars, which they never did before. They try to travel on the back roads with less traffic and to buy groceries in small towns, like Powers Lake, instead of busy Tioga. They no longer herd cattle even on remote dirt roads because of speeding trucks. Crime, almost nonexistent in the past, is much more common, and the Davises, like many other long-time residents, are wary of strangers in ways they never were before.

As Scott Davis said to us, more than once: "Our way of life as we know it is over."

This article was originally published in Places Journal in June 2013.



Scott's Appaloosa foal in his pasture near White Earth, ND, 2011. [Photo by Terry Evans]

MEMORY AND THE DIAL FACE

for Ken Sara Wiwa

Elizabeth Herron

Before dawn – she stirs the embers,
singing softly for her daughter.

Shush-whiz of morning commute
wheels turning numbers changing.

The parts of a gasoline pump
include the dial face

where numbers roll
tracking gallons, dollars—

not the hands holding plastic bottles
and tin cups under the leaking pipeline,

not the lives that don't count.

From the highway traffic picks up—
wheels whirring numbers changing.

Her face bright in firelight
she stirs the embers in the morning

singing softly for the daughter
who vanished into bits one night

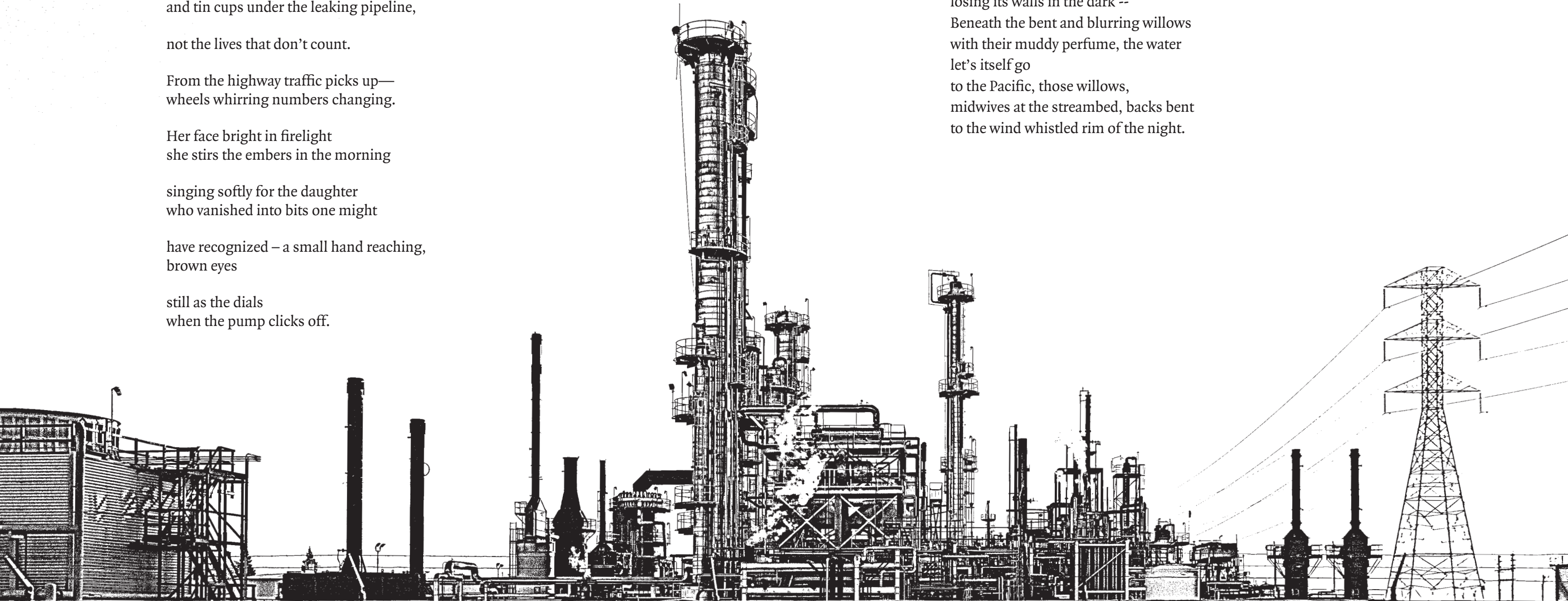
have recognized – a small hand reaching,
brown eyes

still as the dials
when the pump clicks off.

LIT WINDOW

Elizabeth Herron

Willows along the creek bank
hunched against a faint salt haze
drawn up the valley by twilight's chill.
Rows of eucalyptus lining open fields.
Someone walks past
the first lit window. Who is it
forgetting even the names of the dead,
the quick hours
before starlight,
forgetting the tableware
and teacups waiting
in another house
losing its walls in the dark --
Beneath the bent and blurring willows
with their muddy perfume, the water
let's itself go
to the Pacific, those willows,
midwives at the streambed, backs bent
to the wind whistled rim of the night.



THE RANGE OF EDEN

Elizabeth Herron

Once we were earth
was beautiful was water
flowers
under sea
in forest even
deserts bloomed
here
blossom and bee all shaped in lovely
and dancing in flit and suck and honey
and languid-limbed we brought forth
and died back
in our season and lived again
in the long line of mother to mother
earth
to seed to flame of spring—
in balance did we. In balance
and beauty.

Sweet of windfall fruit
smell of damp ground
glimmer of wet leaf.
Each season ever and ever
unfolding into complexity
even the smallest intricate interweaving
returning to begin again.

We saw winter snow untracked
each flake a sacred fractal world.
We saw the raindrop caught
on the iridescent web in the woods
before the angle of the light changed.

We were happily motes on spears of sun
in the morning of it all.
We were blossom and bee
and shaped in love and dancing.
We were earth and tree and sky and sea
and drifted all unknowing
in the Goldilocks Zone of Eden.

As we also chewed the bitter seeds
and separated and hoarded
and broke the pattern
and were punished with loss
and were lost to what we loved
and lay in the darkness lonely
and un-entwined.

*The Goldilocks Range is the range of temperature within
which life evolved on earth, also known as the range of
habitation or range of life.*

GHOST DANCE

Elizabeth Herron

Door open
Quiet spaces in the mind, Jack said,
wide as the Great Plains

into the bell jar of the cell phone
into the places of black stone

In Nebraska and Kansas
closed in the air conditioned cab
of the huge harvester

earphones and a Country music beat
occupy the mind as the machine
pitches over acres

pocked for thousands of years
by burrows and warrens that caught the rain
for the Ogallala aquifer

The harvester shambles on
lumbering over the bones of the buffalo
grinding over the quiet spaces in the mind

of the First Nations—
the Lakota and the Cheyenne
whose Ghost Dancers chanted

to restore their lost world
Father, give us back our arrows
and the Father says, *You shall live! You shall live!*

Stones
Black stones
Machines and silicone chips

How will we live
without the quiet
spaces in the mind, Jack?

In the far cities
under indifferent towers
that hunt our sleep and glean our dreams

harvesting the algorithms
of the Twenty-First Century
the cash register rings

in the irregular rhythm
of the ghost dance
of zeros.



Michelle Waters, *Land of the Free*, acrylic on canvas



Susan Crile, *Conflagration*, 1992, oil and pumice on canvas, 92 by 168 inches



Susan Crile, *Encrusted Tar*, 1994, oil and tar on canvas, 60 by 60 inches

THIRTEEN WAYS OF LOOKING AT SMOG

—after Wallace Stevens

Anna Yin

I
mountains or bridges?
cannot tell...
we are only the moving blackbirds

II
blue sky— merely a dream,
green— out of sight,
black somber escorts...

III
in this dark watercolor
under a red alarm
we fantasize feathers pure

IV
plunging, plunging,
nearly all indexes...
except the Air Quality

V
speechless,
masks against tongues. . .
newspaper's brazen statement: non-toxic

VI
blue skies shy away
dark nights...
darkened eyes

VII
Ignorance Is Strength...
today's hotline:
crimes for wearing masks!

VIII
2+2 =5...
in dreams,
someone is coughing

IX
watch out!
watch in
and out...

X
out of order!
who fashions
this tide of smog disaster?

XI
poison thick in the air
poison sinking into the body
poison leadening our wings. . .

XII
mountains or bridges?
it doesn't matter...
we are blackbirds still

XIII
in this dark watercolor
at the dark dawn
we lose our feathers

published in "Undocumented Great Lakes Poets Laureate on Social
Justice" (Michigan State University Press 2019)



Lisette Tardy, *Ténèbres / Shrouded in Gloom*, 2015, oil on canvas, 90 by 90 cm



Lisette Tardy, *Père pourquoi m'avez-vous abandonné ?*, 2015, oil on canvas, 61 by 50 cm

DARK ENERGY

Adam Cornford

Black inhuman plumes of entropy ascend from bombed Iraq wells and exploded tanker cars in Quebec

Great black snake sways its many-eyed head as it tries to find a way south from boreal tar desolation past Lakota drum-shields

Black coal soot coating the earth's lungs paling to ghost-gray and pink coughing froth as all Beijing becomes a forbidden city

Capital intelligent black cancer swirling in the eyes of executives commands them to create Venus climate in the skies of Gaia

Blackness invisible in well-lit rooms and cubicles rises through the floors to form face-eating mirrors like liquid obsidian

Despair transmutes to viridian light in alembic hearts as voice-crowds face down the black uniforms of planetwide extinction

Energy of convection flows between black outer robe and white inner robe of a Bedu woman soaked in sun

THE SEASON

Adam Cornford

No longer the Salton Sea
with its necklace of fishbones and collapsed marinas
guano spatter reeds algae stink
it's the desert they want

Huge mobile homes and RVs
painted in flaring stripes and swirls
stream
one after another
south on the 86
race bikes racked in back jeeps in tow
pull in at Arco AM-PM oasis
tacos bottled water beer cigarettes ice fuel
right turn out along the Salton Seaway
corrugated into asphalt waves
they ride like ships
headed away
from the Sea

Gather on bare flats backdrop a looming arc
of stark gray-pink scree slope mountains runneled
by gone rain
scrub-dotted in slate twilight Assemble
temporary suburbs wheeled oblong bungalows
spaced well apart
just like home
faraway burr of diesel generators
blue propane stars under grills
lawn chairs chilled six-packs

Anza-Borrego Desert State Park
where they park

sedimentary layers buff taupe faded rose
ancient Pacific floor
tectonic uptilted then weather-planed off
under traveling cloud shadow
winding canyons and arroyos
ghost rivers where water once found ways
no flow in years
but wind

Now ORVs and dirt bikes buzz and snarl along them
swarming metal insects
eat the dry
Martian silence
piloted by boys in helmets visors masks
tight coveralls
patterned with death's-heads or flames
so many
fine dust plumes rise merge into beige haze
under pale blue winter vault

their other plumes invisible
combusted
clear refined aromatic
hydrocarbons
not just the engines theirs and parents'
24/7 A/C fridges lights

while the young riders faceless in their spaceman gear
veer bouncing along washes
track ruts between sandstone hill hummocks
low mesas
like those desert kingdom princelings
carefully taught
never to pick up what they drop

After they pass
scatter crows return as silhouettes on ridges
quick rabbits re-emerge to nibble
coyotes nosing resume the hunt
the vague dust slowly
settles
the carbon
keeps going
the desert forgives it is made of abraded time
the climate
not

PAYSAGE MENACÉ

BAY FARM ISLAND SHORELINE, ALAMEDA,
NOVEMBER 2006

Adam Cornford

To our left are clustered new stucco castles of Business
some turrets near finished, some windows x'ed with white
others awash in horizon and the dark of peninsula hills

as we stroll sunset hand in hand on this artificial island
The twilight-pale concrete path with its sea rail and lamps
immaculate de Chirico perspective receding southward

along it range angled fishing rods, thin black diagonals
one after another arcing at the tips with the line's weight
and the brown men watching them idly with open cans

in work-thick hands talking quietly in Spanish or Khmer
waiting for fish bodies bright as the mercury compounded
into infinitesimal death-bells in their pink-white flesh

Your dogs thrust black nostrils into palimpsests of smell
and the blank fast-food picnic litter overflowing the bins
adding their own odors to shrubs and ornamental grasses

The sky layers with photochemical slate, rose, umber
above the silhouettes of San Francisco and the Golden Gate
Airliners at this range bulky in black-and-flame livery

angle up silently towards and over us, one after another
dragging blank thunder in a slow crescendo behind them
through blast-wakes of kerosene and hot invisible carbon:

carbon that joins the breath of traffic whose far-off softer roar
draws a line of white sound below the window-glitter hills
and the whitewashed plumes of power plants further south—

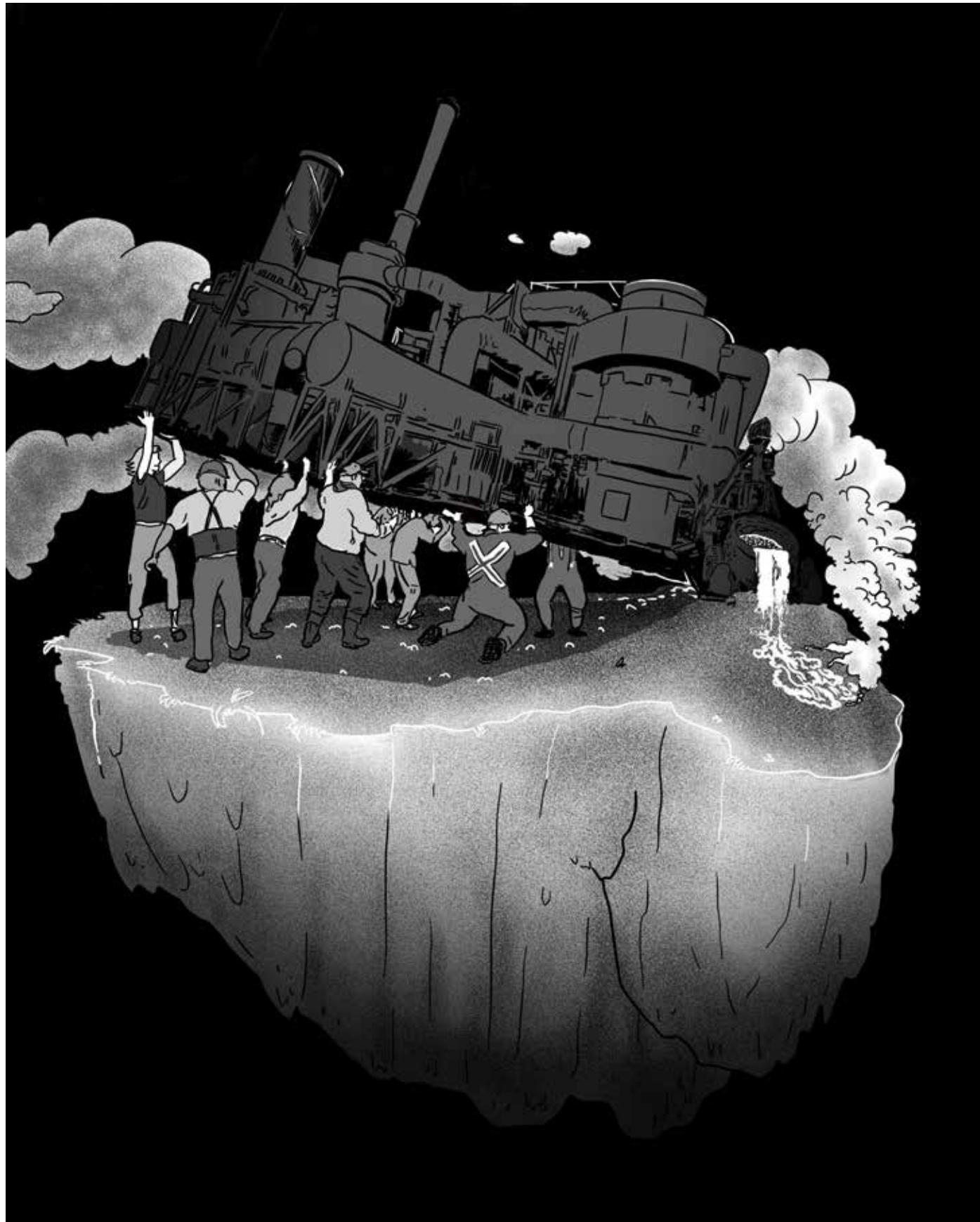
You point at the bay overlaid with wrinkled indigo mirrors
exclaiming at five dark bird-shapes taking it easy there:
pelicans whose beaks like seismograph pens trace breeze

into ripples, watching for fish-gleam or lifting themselves
on crescent wings, brushing up tiny wakes with the tips
as they swoop then glide down to a brief ruffle of surface—

worlds of delight almost extinguished four decades ago
by designer chlorides gathered in the fatty livers of perch
Today precariously restored they laze and feed up for when

they will squadron south to Baja's warm whale-nurseries
Meanwhile we bear the perishable niche between our bodies
in linked hands through November lightfall back inland

in gratitude to Tomas Tranströmer



Nicole Marie Burton, *Overthrow Extraction*, 2019, digital illustration from the book *Unearthing Justice*, by Joan Kuyek, published by Between The Lines



Nicole Marie Burton, *Externalized Costs*, 2019, digital illustration from the book *Unearthing Justice*, by Joan Kuyek, published by Between The Lines

FRACTURED: THE SHALE PLAY

Nina Berman

WWW.NINABERMAN.COM

Fractured: the shale play, documents the altered landscape and human consequences of unconventional gas drilling in the Marcellus Shale formation in Pennsylvania, USA.

In this time of climate crisis, rather than concentrate on sustainable solutions, energy companies are using the decline in peak oil as incentive to exploit new sources of fossil fuels in places and in ways previously unimaginable. From Ohio to Australia the globe is now mapped according to shale rock deposits and the treasure of natural gas that lies within.

Through an unconventional process called hydraulic fracturing, or fracking, companies drill down then explode the shale using millions of liters of water laced with toxic chemicals and sand to release the gas to power our world.

Serious environmental hazards have been associated with this type of unconventional gas extraction: Water contamination, livestock death, human health impacts, increased air pollution and VOC emissions from associated infrastructure. Unusual earthquake activity has been reported near drilling and waste injection sites. Methane flared off and released as fugitive emissions is twenty-three times more potent a greenhouse gas than carbon dioxide burned from coal and oil. Used frack water becomes toxic and, in some cases, radioactive waste. Fracking is water dependent requiring 20 million liters for just one well. With hundreds of thousands of wells planned worldwide, this form of energy extraction appears anything but sustainable yet has been presented as a bridge fuel solution.

In the USA, unconventional gas drilling is occurring in poor rural areas that are in deep economic distress. A land man knocking on the door holding

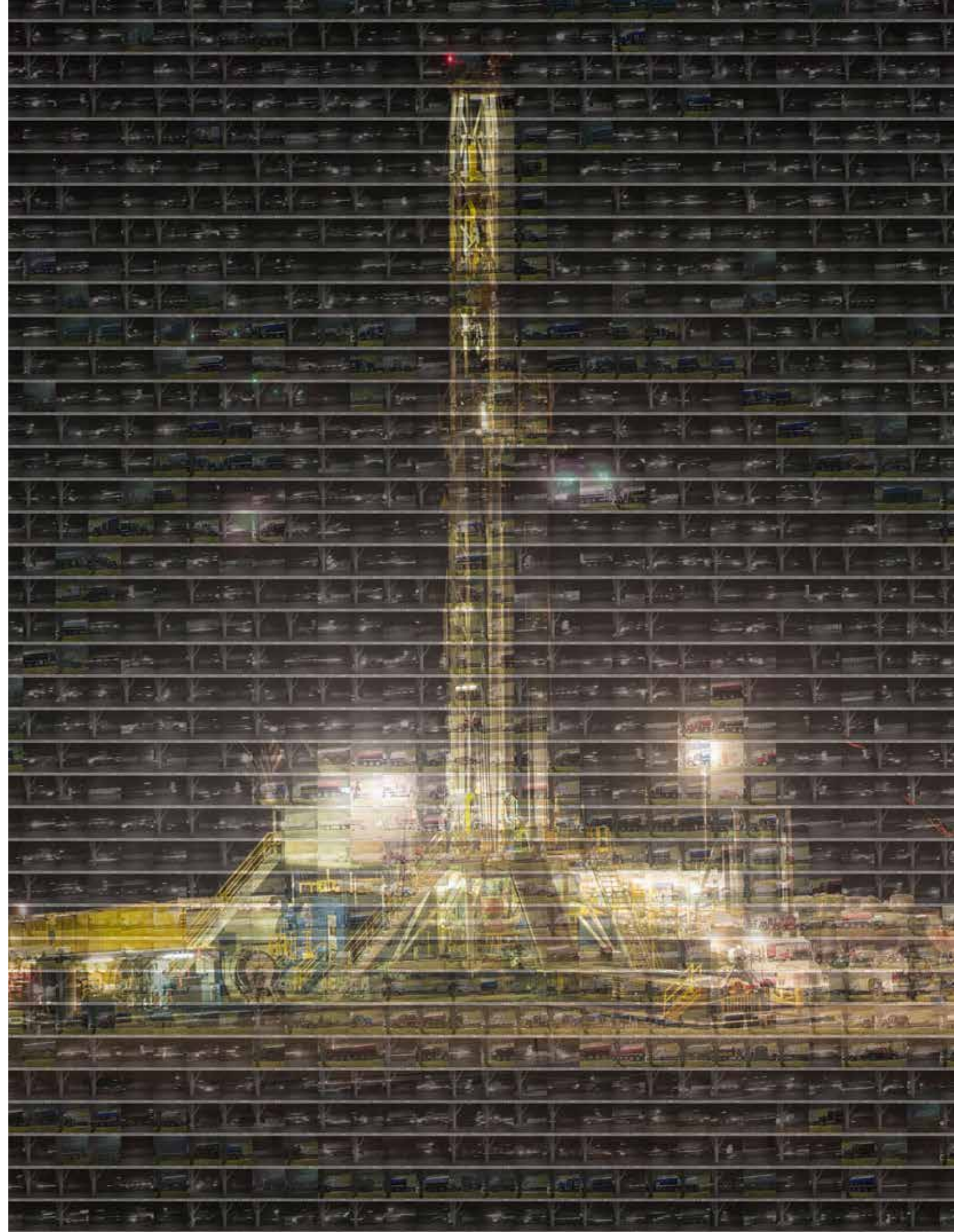
a gas lease promising an easy path to lucrative reward is an irresistible opportunity. The result is an all out gas rush presenting two competing visions: a vision of environmental preservation and a vision of short term economic gain through extraction.

Where these two visions collide is where this work is based.

Industrial activity is visually dramatic. Yet the activity is fraught with toxic impacts, presenting a visual paradox. Acknowledging this paradox, I focus on the strange beckoning and disconcerting allure felt when landscapes shift from natural to industrial. Yellow rays, which seem like sunshine, are methane flares; pitch-dark dirt roads unfold into bursts of poisoned light. In this unsettling environment, I include portraits of individuals who are psychically and physically trapped amid this compromised landscape.

Right: Nina Berman, *Rig Mosaic, Pennsylvania*, detail, 2016, archival inkjet print

This photograph combines a high resolution image of a shale gas drilling rig with 1764 low resolution images captured by a wildlife camera which recorded truck traffic during shale gas operations. Truck images provided by Frank Finan.





Nina Berman, *Flammable tap water, Pennsylvania, 2011*, archival inkjet print



Nina Berman, *Methane Flaring, Farmhouse, Pennsylvania, 2011*, archival inkjet print

HERE'S WHAT SCARES US

Craig Czury

we don't know what's going on

we know what's going on
but we don't know all of what's going on

we know what's going on
but we don't know who's doing it

I mean we know who's doing it
but we don't know who exactly is doing it

we don't know their names
we only know the company names

the why is obvious
it's the how that leaves us a lot of questions

even when they explain it to us
even when their spokesman goes on tv

even when they parade their heavy equipment
past our farmhouses at breakneck speeds

even when they let us watch from the fence
in our cars afraid to get out

especially when they come to our door with papers to sign

II.

What scares us is their uniforms
their uniform trucks and their uniform masculinity
the uniform air of their unified occupation
the un-uniformity of their money uniform cash flow
ignitable youth with muscle
calling it water and buying us off to drink

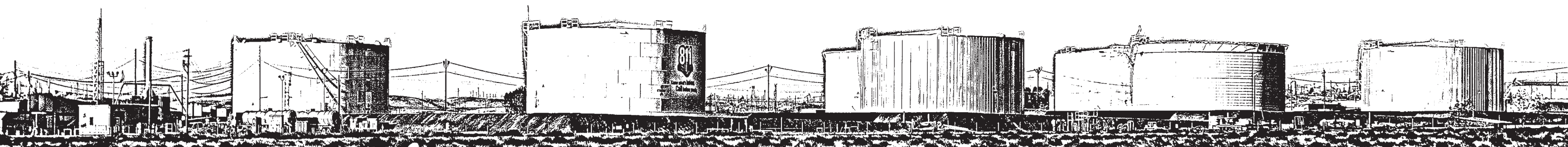
III.

What scares us is we have laws to protect us
but they buy off the laws
they buy off the commissioners who regulate
the laws that protect what we have to live with
they write the fine print loophole
a small opening through which small arms may be fired
the scary part is we know how to read

IV.

It scares us we don't know what to do
we don't know who to talk to about what scares us
we don't know who to contact
we don't have a number and when we do we get referred
we get re-routed we get put on hold
we get frustrated then we start yelling saying things we can't explain
that's what scares us how angry we've gotten with no one to explain
it will go away it won't go away like it doesn't matter to anyone
except our neighbors when they used to be our friends
except our families when they used to be our friends
except our friends when we didn't live under occupation
especially our friends who signed and moved away
what scares us is our daughters

from THUMB NOTES ALMANAC: Hitchhiking The Marcellus Shale
FootHills Publishing, 2016, craigczury.com



RE:PEAT

LAYERS OF PEAT IN NORTHERN FINLAND, A LOOK AND LISTEN

Anne Yoncha, Oili Tarvainen, Anna-Liisa Välimaa, and Anne Tolvanen

Re:Peat, Layers of Peat in Northern Finland, a Look and Listen is a current EDUFI Fulbright Finland Fellowship research project by visual artist Anne Yoncha and science researchers Oili Tarvainen, Anne Tolvanen, and Anna-Liisa Välimaa of Natural Resources Institute Finland (Luke), composer Daniel Townsend of University of Florida, and Gerard Sapés of University of Minnesota, culminating in an upcoming exhibition in April 2020 at Gallery MABD in Oulu Finland, with a potential future site-specific event at Latvasuo & Pikkusaarisuo peat extraction sites in Northern Ostrobothnia Finland.

PROJECT OVERVIEW:

Re:Peat aims to explore the often-hidden structure of peat and provide a new perspective on how we perceive and value post-industrial landscapes. Anne Yoncha made paper surfaces from plants sourced at the extracted site, using a small-scale paper-making process as a nod to Finland's paper-making industry (Fig. 1), and has experimented with using other materials from site for mark-making (Fig. 2). Attaching transducers to these surfaces allows the handmade paper—made from novel ecosystem components—to become speaker surfaces, playing sounds of the site. Anne then used hyperspectral imaging of core samples representing restoration treatments in post-extraction peatland study sites to generate a graphic score. By sonifying this data antiphonally, listeners may be able to hear differences between untreated soil in the left ear and soil which has been de-acidified with a peat-ash treatment (the residue from burning peat for fuel) in the right.

The sound component is generated from hyperspectral images of core samples (Fig. 3), taken with Specim FX-17 (Specim, Spectral Imaging Ltd) hyperspectral camera using wavelengths of 900 – 1700 nanometers (nm). By looking at patterns in the known water absorption band at 1450 nm using Spectrometer PSR+ (Spectral Evolution, Inc; Fig. 4), we can see differences between healthy plants (green) and plants experiencing drought (brown)—a reflectance pattern which can also illuminate patterns in post-extraction peatland soil. Three wavelengths are assigned to three vocal tracks (red: 1650 nm, green: 1450 nm, blue: 1102 nm), so higher reflectance equals higher pitch. Evenly-spaced triad intervals in parts of the sample with higher water content may indicate a healthier potential marshland ecosystem, and dissonant chords in drier areas may indicate a less viable novel ecosystem (Fig. 5).

Imagery is sourced from microscopic photographs of hyaline cells in sphagnum moss, the empty space which allows the plant to store water, creating an anaerobic environment and engineering an ecosystem which is inhospitable to competition and allows the sphagnum to thrive. Anne Yoncha hand-embossed the handmade paper with laser-cut plates, leaving impressions of the cellular forms which used to be on site. (Fig 6 and 7).

Using a graphic notation format in the tradition of artists like John Cage and Cathy Berberian, we collaborate with U.S. composer Daniel Townsend as well as a potential future collaboration with Risto Laitinen the leader of Tuira Chamber Choir in Oulu, Finland to create an intertwining choral voicing of this data—literally inserting the human voice into this data about ecosystems we have altered.

BACKGROUND:

Peat, made of decomposed sphagnum moss, is an important source of heat and jobs in north-central Finland, and a complex extraction issue. Currently,



Fig 1: Handmade analog-process paper with plant fiber sourced from extraction site, embossed with image of hyaline cells (“dead” space in sphagnum moss which creates the anaerobic peatland ecosystem) embossed using laser-cut microscope image as plate (Anne Yoncha, Luke)

peat provides a majority of fuel for Oulu's Toppi-la Power Station, a combined heating and power (CHP) plant which uses a continuous underground water heating system throughout the municipality—hundreds of kilometers. Peat is mostly harvested from mires drained in the 1970s as part of a government initiative to increase timber production. On the coldest days, truckloads of peat are delivered every ten minutes to the power station. While Finland has some of the most advanced CHP systems in the world—probably because its climate demands them—Oulu municipality aims to phase out peat use in the next few decades. This move will require a move to a new power plant, as the current furnaces require a specific ratio of wood to peat matter to function.

While peat is technically a biofuel, it is not a renewable one. Sphagnum builds up slowly (humifying into peat at the rate of one millimeter per year, or less), engineering over centuries or millennia an acidic, water-logged desert in which it is one of the few life forms which can survive and thrive. It also sequesters carbon and preserves climate data in the form of pollen molecules (sometimes 50,000 per gram of peat). The study sites for this project underwent two to three decades of extraction, which

ended in 2014 and 2015, and even if it is possible for peatland to regenerate, no one knows how long that would take. A series of long-term studies explore alternative ways to rehabilitate these landscapes.

Revegetation of the peat extraction area is demanding because the peat layer left at site after extraction is devoid of plant seed and can be rather thick, acidic, and low in nutrients. Peat ash has been used to fertilize these areas to quicken revegetation, enhance tree growth, and

control erosion. In the present research projects one aim is to reintroduce local plant species that domestic reindeer can use in their diet (Latvasuo) and use sphagnum moss cuttings to promote the secondary succession of peatland vegetation (Pikkusaarisuo). Without human assistance the regeneration of vegetation would take decades and the extraction area would continue as a carbon sink.

Hyperspectral cameras can see the invisible; they capture both the visible light range (about 380–740 nm for human eye) and wavelengths that human eye cannot see. Hyperspectral imaging is a technology combining imaging and spectroscopy. Each material, due to the difference of chemical composition and inherent physical structure, reflects, scatters, absorbs, and emits electromagnetic energy in distinctive patterns at specific wavelengths. This unique characteristic of an object, called spectral signature or spectral fingerprint, can be identified with hyperspectral imaging. Hyperspectral imaging enables simultaneous detection physical and geometrical features of the product including shape, size, appearance, and color.



Fig. 2: Handmade dye altering traditional iron gall ink recipe using tannic plant matter from extraction site, and altered paint mixed with peat ash, a sandy substance created as an industrial by-product from peat burning, and later used as a restoration treatment to neutralize soil pH (Anne Yoncha, Luke)

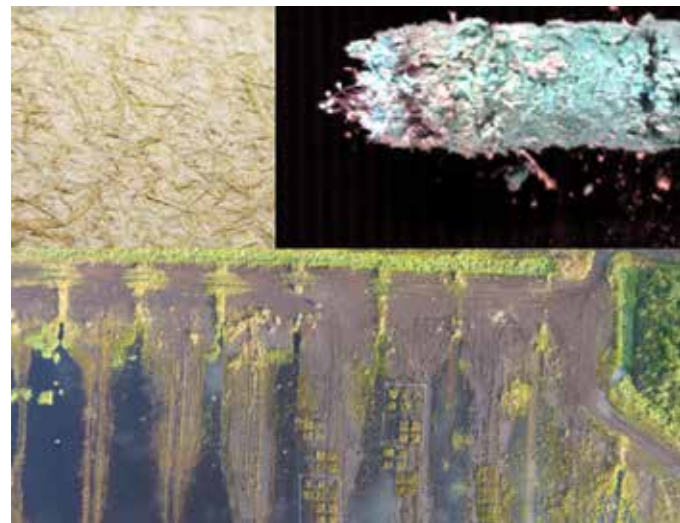


Fig. 3: A false-color image from hyperspectral camera (Specim FX 17, Specim, Spectral Imaging Ltd, Finland) data of core sample taken from post-extraction peatland (Anne Yoncha, Luke)

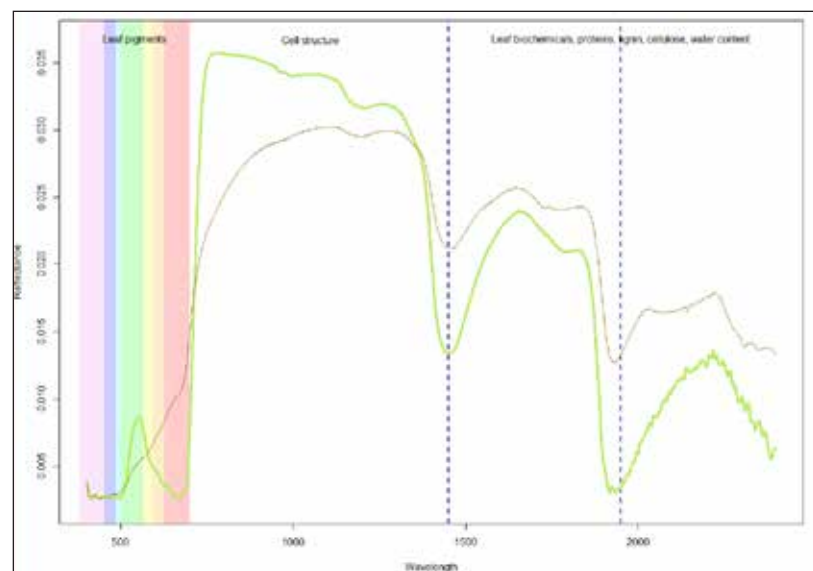


Fig. 4: A graph showing reflectance by wavelength of a healthy plant, including 1450nm water absorption band. The graph was generated using Spectrometer PSR+ (Gerard Sapés, University of Minnesota)

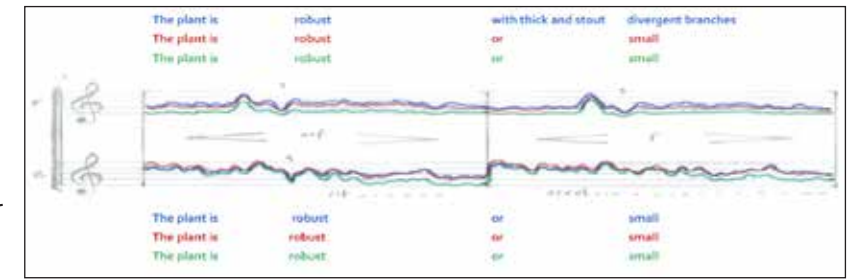


Fig. 5: Part of a page of graphic score using reflectance data collected with Specim FX-17 camera, lyrics sourced from a taxonomy of Finnish sphagna species (Anne Yoncha, Luke)



Fig. 6: A detail image of drawing combining physiological structure of sphagnum moss mat (extracted ecosystem) with Calamagrostis species growth (novel ecosystem), using gouache, graphite, and ink made from plants and water from site, aiming to illustrate murkiness of potential distinctions between 'natural' and 'artificial' in this ecological system (Anne Yoncha, Luke)



Fig. 7: A laser cut collagraph plate with negative space representing hyaline cells, the 'dead space' in sphagnum crucial to creating the characteristics of peat and peatlands (Anne Yoncha, Luke)