



"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 THINK THAT ARTISTS CAN DIRECTLY AND INDIRECTLY ADDRESS THIS EXISTENTIAL MOMENT."

—RICHARD MISRACH



Above: Lawrence Gipe, *Bisbee, large version*, 2012–13, oil on unstretched canvas, 84 by 120 inches; Previous page: Lawrence Gipe, *Russian Drone Painting #1 (Mir, Siberia)*, 2018–19, oil on canvas, 72 by 96 inches



Lawrence Gipe, *Study for Bisbee*, 2012, oil on panel, 14 by 17 inches



David Maisel, *American Mine (Carlin, Nevada) #2*, 2007

Excerpt from

UNDERMINING

Lucy R. Lippard

Somewhere in an indeterminate time zone between the Old and New Wests loom the massive outdoor sculptures dubbed earthworks in the late 1960s, now more broadly defined as land art. In the U.S., the best known of these sculptures drawn or cut from the earth itself, or made from its products, are Robert Smithson's *Spiral Jetty*, Nancy Holt's *Sun Tunnels*, the late Walter De Maria's *Lightning Field*, Charles Ross's *Star Axis*, James Turrell's *Roden Crater*, and Michael Heizer's *Double Negative* and *City Complex*—titles indicative of the ambitious visions driving them. All of the artists are white; all but one are men (sporting cowboy boots and ten gallon hats), as it is rare for women artists (Holt is the exception) to raise the thousands of dollars it takes to create such monumental works. Three of those listed above focus on the heavens; three have been under construction for some thirty years; one has been changed constantly by nature during its forty-year existence. All are endowed with extraordinarily beautiful surroundings and enhanced by weather, seasons, light and shadow. They surrender scale to the adjacent spaces, while drawing their emotional power from distance—distance from people, from environmental issues, and even from places. Land art tends to be site-specific but not overtly place-specific. Local geology, history, and identity are secondary, if acknowledged at all. Local residents are considered primarily in their roles as workers and incidental audiences. The on-site viewer is as likely to be deeply affected by the landscape as by the art object. It is this combination that is so compelling.

Most of us envision rather than visit the classic sites, where open space becomes a kind of mat within the frame around the photograph. Even if we have actually seen them, our impressions are mediated by the glamorous aerial photographs in publi-

cations, which are critical to earth art's esthetic impact and dissemination. Early land artists without frequent access to the "timeless" western deserts often adopted readymade pits (quarries in New Jersey, for instance), where the "timeliness" of nearby skyscrapers could be ignored. Smithson, Michelle Stuart, and Charles Simonds, among others, employed these geographically ambiguous sites as temporary substitutes for the West. Their works are sometimes inspired by the ruins of great monumental civilizations of the past. Some also visited, and lusted after, the gigantic western open pit mines (epitomized by the Santa Rita/Chino pit in New Mexico, the Bingham pit in Nevada, and the Berkeley pit in Butte, Montana). Aside from their visual impact, these awesome earthworks, created by Kennecott Cooper, Rio Tinto, the aptly named Anaconda, and other global giants, also raise questions about the sustainability of the classic artworks. How does Heizer's *Double Negative*, for example—the biggest gully around—protect its matrix from the erosion that cuts through every arid western landscape, where roads, trails, and even animal paths can become running streams and then harsh arroyos when the infrequent rains descend?

"One's mind and the earth are in a constant state of erosion," wrote Smithson, a New Jersey native and one of the originators of the earthworks genre. It is impossible to talk pits in an art context without confronting his influential presence/absence; his romantic attraction to eerie, dreary, post-industrial landscapes; and his paeans to entropy. Although we often disagreed forty years ago, I now find Smithson's preoccupations with mirrors, pits, geology, the West, sprawl, and entropic suburbs reflected in my own life and work. And I am hardly alone. Smithson is the only one of his generation of land artists in the late 1960s whose ideas, disseminated through his compelling writings, seem particularly relevant and provocative today.

Smithson's first proposed earthwork, in 1966, was *Tar Pool and Gravel Pit* and just before his death he



Nancy Holt, *Sun Tunnels*, 1973–76, Great Basin Desert, Utah, concrete, steel, and earth. Photograph by Hikmet Sidney Loe.

was trying to persuade Peabody Coal to fund a reclamation piece. In his 1967 *Tour of the Monuments of Passaic NJ*, he wrote about a gigantic parking lot that covered old railroad tracks, dividing the city like two sides of a mirror, and noted how full of “holes” prosaic Passaic seemed in contrast to “solid” New York. He liked to quote his friend, sculptor Carl Andre: “A thing is a hole in a thing it is not.” Smithson was simultaneously involved in the place and self-consciously removed from it. Views, or vistas, interested him less than what was underfoot. When he and Nancy Holt visited me in coastal Maine in 1972, he peremptorily dismissed the sparkling ocean view and turned his attention to the geological history of the rocks on which we stood. Like Icarus, Smithson’s grand ideas ended tragically in 1973 when his small plane plunged to the earth as he was overseeing a Texas earthwork in progress.

Smithson’s account of finding the Salt Lake site for *Spiral Jetty* (the best known earthwork in the world, though it was underwater for decades) sounds like the reporter’s description of the Zuni Salt Lake: “a transplanted segment of crumbling New Jersey industrial shoreline,” but Smithson embraced rather than deplored industrial detritus.

At first, he couldn’t get to the “wine red” Salt Lake because of Keep Out signs and angry ranchers. (Welcome to the West.) The next day, he recalled, “We followed roads that glided away into dead ends. Sandy slopes turned into viscous masses of perception ... an expanse of salt flats bordered the lake, and caught in its sediments were countless bits of wreckage ... The mere sight of the trapped fragments of junk and waste transported one into a world of modern pre-history. The products of a Devonian industry, the remains of a Silurian technology, all the machines of the Upper Carboniferous Period were lost in those expansive deposits of sand and mud.” It was an epiphany, with orgasmic overtones. “From that gyrating space,” he continued, “emerged the possibility of the Spiral Jetty My dialectics of site and nonsite whirled into an indeterminate state, where solid and liquid lost themselves in each other.”

When land art was new, bringing provincial New Yorkers out of their lofts and into the hills, the expansion of consciousness it offered was both experiential and esthetic. Ideally part land and part art, it is best located deep in place, where one comes upon it unexpectedly, like ruins and rock art—poi-



Owen Gump, *Access Road*, Cortez Mine Complex, Lander County, Nevada, 2018, Pigment Print on Baryta Paper

gnant reminders of human agency and time’s victories. The viewer, like the artist, is so awed, so sensitized, so aware of seasons and materials, space and wildlife, that the work truly co-exists with the place it creates. Religious undertones and the nineteenth century “sublime” are part of the attraction. Artists were thinking on a grand (sometimes grandiose) scale. Forty years later, climate change, shrinking resources, threats of drought, and federal administrations bent on destroying the environment for corporate gain have changed the rules of the game.

In the mid-1990s, I called a talk I gave in Marfa “Land Art in the Rear View Mirror,” because by then I had gone on down the road. Cultural geography and the politics of land use have replaced land art in my windshield over the years I’ve been living in the West. My views haven’t changed because I have less respect for the older work, but because the better I know the New West the more my attention is claimed by peripheral vision—by the side-of-the-road shows, by life on the land. I argue now for the nearby, a microview of land and art, grassroots

connections rather than macro pronouncements. In fact, I’ve come to the reluctant conclusion that much land art is a pseudo rural art made from a metropolitan headquarters, a kind of colonization in itself. It offers an antidote to an urban landscape crammed with art and visual competition. In a rural setting, however, land art would more often entail subtractions (of “ranchettes” dotting the open landscape) than additions. The land art we know best in rural New Mexico is abandoned adobes, trophy homes standing out like sore thumbs in this beige landscape, and aging vehicles nobody can afford to haul away.

When I was a city dweller, I welcomed visual extravagance, graffiti, oddities, or subtle alterations in my already hectic daily surroundings. Public art belongs in towns, places where people interact with the built environment on a frequent, familiar, pedestrian basis where art can literally inform or enhance a neighborhood or public domain. The task of land art, on the other hand, is to focus landscapes too vast for the unaccustomed eye to take in, or to

give us views into the cosmos, connecting the places where we stand with the places we will never stand.

Significant objects have their place in the art world. It remains to be seen if they still have a place in land art. There is a point where artists too must take some responsibility for the things and places they love, a point at which the colonization of magnificent scenery gives way to a more painfully focused vision of a fragile landscape and its bewildered inhabitants. The land is not separate from the often harsh realities of lives lived upon and around it. A land art in the New West could acknowledge the rough edges as well as the romance. It could be integrated into a cultural landscape, which is a forever changing production featuring vegetation, wildlife, water, and human agency. A vernacular land art might include commemoration that looks to the smaller scale, land-based notions of nature, remembering small farms and common lands, the disappearing histories of places and ecosystems.

I have to admit that today my favorite art in the land is not contemporary but aboriginal earthworks—rock art (petroglyphs and pictographs), earth mounds, geomorphs, the ruins of ancient puddled adobe towns found by roadsides, on golf courses, and in the most remote deserts, forests, and canyons. Where contemporary land art demands all the attention, rock art quietly absorbs us into its place, even when we understand very little about the messages we are getting. Although individual images stand out, they are most evocative in relation to each other and to the place and clues they offer about the cultures that created them. (Many of these sites are still utilized ceremonially.) And of course it is easier to identify with the people who were once relatively peaceful stewards of that particular landscape than with today's property owner, who is likely to appear with a rifle and arrest you for trespassing.

"Adventurers" from more populous parts of the country and abroad forge their way over bumpy dirt roads, deciphering labyrinthine directions, to see the classic earthworks. They have become trophies on

the art tourism checklist and attract a rarified coterie, contributing to regional economic development while also calling attention to the fact that many famous western landscapes are surviving precisely because of cultural tourism. The Land Arts of the American West programs at the University of New Mexico and Texas Tech, led by artists Bill Gilbert and Chris Taylor, offer students a temporary nomadism, a rugged art-making intensive, and a chance to consider not only art and non-art but also "forms of travel as different measures of the landscape," as Chris Taylor has put it. They explore old and new ideas in increasingly contextualized frameworks, stretching the initial tenets of land art with pop culture, humor, and new technology, inaugurating a whole new field—institutionalized student tourism.

The earthworks play their part as the myth of the Old West gives way to the mundane real estate realities of the New West in a region where the land itself is more compelling than any museum; or, more pessimistically, where protected land and beauty strips are "museumized" in a landscape marred by extraction and greed. Eventually, *Star Axis* and *Roden Crater*, already under construction for a more than a quarter century, will boast visitor centers and tourist facilities. The DIA Art Foundation's *Lightning Field* is meticulously stewarded, but even the sought-after overnights cannot cover its maintenance. Reservations for a six-person cabin must be made months in advance; supper and breakfast are provided and exactly twenty-two hours (from pick up in Quemado to pick up at the cabin) are spent on the site for a hefty fee. Photographs are not allowed. My own experience was somewhat tempered by the fine old time we had in the cabin after dark, which blotted out the feeling of full immersion I anticipate when wandering through a landscape, taking my time, picking my focuses. We expected no lightning in May, and got none, but as the light shifted and the sun set, turning the silver poles gold and then black, I was struck by how lonely earthworks are.



Jonathan Clark, *Mine Tailings from Tuzigoot*



Jonathan Clark, *Canyon View Through Mine Ruins*

MEMORIAL

for Ed Dobb

klipschutz

It's too dark to read Chinese poems
out here by the edge of the water.
Sweat dries under my thin cotton shirt,
pleasure craft blink white and red.
Summer, take another final bow.
Words I can make out, but which words
are they? Not yours, not mine,
although the book itself
belonged to you for a spell
before it became a burden
to your son in his small house
on Bernal Heights, bursting
with three stampeding kids.
Who would know and who would care
if I make them up, anything
to not think about you on this bench,
surprised by the sudden gift
of my wife's distant laughter
punctuating her engagement
with a child, your grandson
as it happens, the one
who never got to know you.

THREE OUT OF FOUR

for Ed Dobb

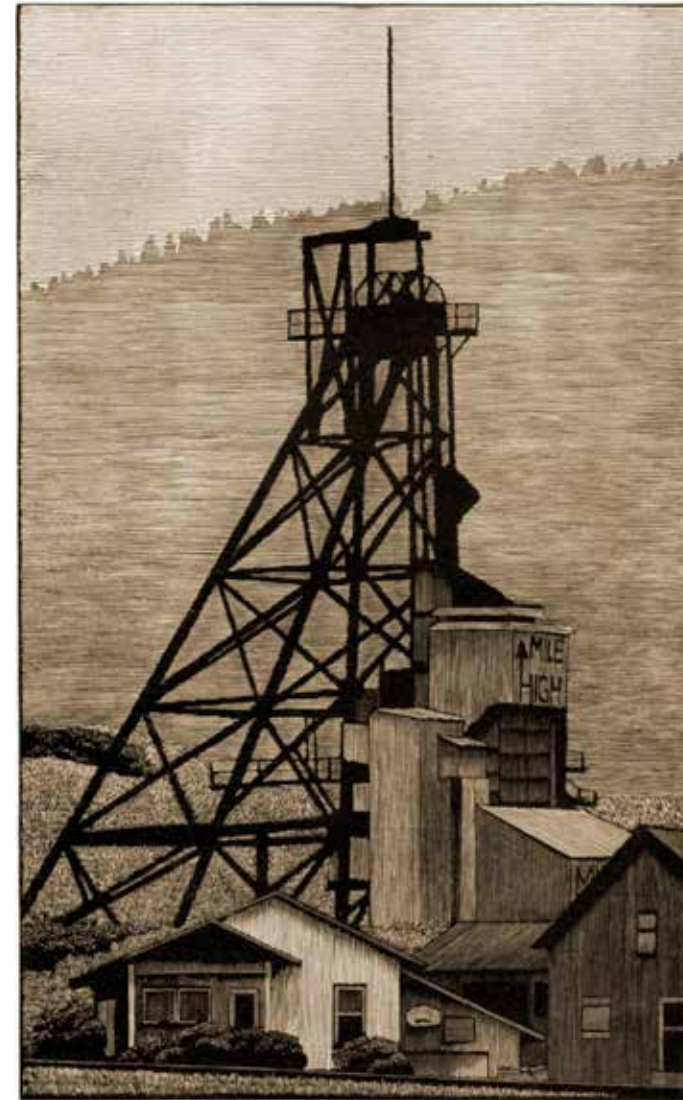
Elizabeth Herron

Ed's death shocked me
left me
feeling like a three-legged dog

though know how they are —
cavorting and prancing,
celebrating three
out of four.

Do they ever suffer
phantom limb syndrome?
Do they ever gnaw the air
where the old leg would have been?

Sometimes I feel my poems
are just gnawing the air
for what I have lost.



Richard Wagener, *Mile High Mine, Butte*, 2019, woodcut

ALTERED STATE

A PLACE FOR WILDLIFE, 2014 SYMPOSIUM

Monte Dolack

Montana has a notable and sometimes volatile relationship with its industrial legacy. Blessed with an unusual abundance of natural beauty and resources, the Treasure State's legacy includes mining, timbering, coal, oil and gas extraction, ranching, and real estate development. A powerful tension exists between the natural and diverse Montana landscape and the civilization that has been created here. Vast wealth for a few and jobs for many have been a result of this notable heritage and continues as we advance into the future. Some of Montana's great natural beauty has been set aside in National and State Parks. It's abundant rivers and wildlife is astounding and draw tourists from around the world. Conversely, byproducts of industry and development include water and air contaminated with toxic waste, species loss, and the introduction of invasive plants, fish and animals.

When Lewis and Clark and the Corps of Discovery passed through the area now known as Great Falls in 1805, they described wildlife sightings and encounters that surpassed anything else they would see on their journey. The area was also the Blackfoot Nation's buffalo-rich hunting grounds. This *American Serengeti* would soon become an industrial hub with little of the profuse wildlife remaining by the 1950s, when I was growing up there. The Great Falls of the Missouri became a series of dams powering the copper refinery, which boasted the tallest smokestack in the world. The Anaconda Company smelted the rich ores of Butte and made most of the copper wire that would link the world's first major communication network.

My grandfather, Steve Dolack, was a Slovak immigrant who started his own coalmine in Belt ap-

proximately 1914. My father, Mike Dolack, worked for more than thirty years at the Great Falls Anaconda copper refinery. After graduating from high school, I too worked at the smelter in Great Falls during summers while attending college. It was a good paying job and an education into how mineral rich ore from Butte's mines was turned into copper and other metals.

Because of my family history in mining, it seemed natural that the materials of copper and coal might be interesting to integrate into the art making process. Like a painter's palette, there is a full spectrum of colors exposed on the sidewalls of the colossal Berkeley pit in Butte. The toxic water, which has a rich concentration of dissolved metals, forms the lagoon in the bottom of the pit. The colors of the lagoon change from red to turquoise depending on the time of day. In 1995 a large flock of Snow Geese died as a result of exposure to the lethal effects of alighting on the water, which they mistakenly misidentified as a normal lake. But there is something alive in there. A team of researchers has recently discovered microscopic organisms living in the contaminated waters of the Pit.

Yellowstone National Park is one of the few places on earth where similar colors to those of the Berkeley Pit can be found occurring naturally. These hues are the fabulous results of volcanism and thermal water with adapted pigmented microorganisms and have long attracted painters and photographers including Thomas Moran and Ansel Adams.

Many of these paintings are on copper panels allowing some of the iridescent quality of the copper to show through multiple thin paint glazes. The making of constructions and sculptures, which are assemblies of various found materials, also relate to our industrial and natural resources.

The problem in making these paintings has been how to find the irony and beauty as well as honesty and truthfulness and not lose one's sense of humor. Almost everywhere I look in Montana there is subject matter that speaks of our altered state.



Monte Dolack, *Occurrence*, 2013, acrylic on copper, 10 by 9 inches



Monte Dolack, *Sacred and Profane*, acrylic on copper, 12 by 11 inches



Monte Dolack, *Oil and Water*, 2013, oil on copper, 10 by 9 inches



Monte Dolack, *Horizon Lines*, 2020, acrylic on canvas, 48 by 36 inches

DISAPPEARING EARTH

—for Virginia, Minnesota

Sheila Packa

Beneath the map, a bolt
of heavy lightning
reached into pre-protozoic time
and threw a vein of iron into
the molten ground before the ice age

—we mine it.
The river winds like threads
around the coordinates.
Railroads stitch across the grid.
Towns that sprung up around the open pits
and roads that were built—move.

In Hibbing, the Hull and the Rust
and the Mahoning
became one mine.
The neighborhood teetered over the edge.
Houses were lifted by jacks and
travelled south somewhere.
The hotel slid off the back of a truck.

Now the highway has been called back.
The companies own the mineral rights.
The signature's affixed.
Bulldozers tear up concrete
and shovels take over beneath.

There is no there here—
every map becomes obsolete
on this temporary topography called tonnage.

MY GEOLOGY

Sheila Packa

I excavate these words from a vein of iron
from stones broken
beneath old growth
from the open pit — lit by dynamite
by men whose lives are punctuated by midnights
who drive new cars to the plants
the crusher and agglomerator
later suffer mesothelioma.
I drive in acid rain
my compass gone awry
through geomagnetic fields with four wheel drive.
These words are test drills and core samples
from the Boundary Waters.
These words wrung from the whistles
and wheels that turn.
These words have never projected
into board rooms.
I have yet to yield these powers or capitalize.
I have yet to see the returns.
I claim my words from the broken
English, damaged roots,
Finnish syntax and geomagnetic fields,
from Eminent Domain
and small print, unreadable clauses.
I find my vowels
from labor contracts and mine dumps
from factories and invisible contamination.
My words, in the run off
in open streams — oxidize
form like tree rings
in industrial circles
heat in the smelters, pour like lava into steel
form these rails that carry the trains
these trains
that carry this freight.

MEMORY / THE MINE

Sheila Packa

I return but it's all excavation—me
an employee of the organization.
I remember a long road past a gate,
a dead landscape.
Dust. Noise. First the crusher and then
where I worked, the Agglomerator
with conveyors to the trains.
First stop, the dry.
A sink like a Roman fountain.
Clothes blackened by taconite, yellow and white
hard hats, coveralls, steel toed boots,
safety glasses, the whistle
starting and stopping each shift.
For this, I'd propped myself on a ledge
for the paycheck.
Steel beams, high voltage. Dripping grease.
One of the crew leaning on high pressure
water hose, blowing dust out of the nose
into a handkerchief, pushing spillage
down the sloping concrete floors
below rolling furnaces,
swallowing salt tablets from dispensers.
On a swing shift, counting
days till the long weekend
taking smoke breaks, and calculating
what falling asleep on graveyards might cost.
All night and day the trains came to load
and carry to the ore docks.
In the lunchroom I took from my lunch pail
a paperback. Kept myself awake
with coffee from my thermos
avoided pellets and their third degree burns
stared into the middle distance
not the ends but the means —
the first place I'd worked
below the surface.

OLIVER MINE, WWII

Sheila Packa

An all female crew
in the pit on day shift—
pickaxe, shovel, crowbar.

They wear work boots
men's bib overalls
plaid wool shirts and beneath

thermal underwear
bras stained with iron ore.
They tie their heads with triangle scarves.

They don't mind getting dirty
working in the mine while the men
are off to war.

In the pocket heavy with coin
a flask, a pack of cigarettes
a navy handkerchief.

Lunch boxes gray as artillery.
No heels to wobble
after the whistle blows

when they put a nickel in the jukebox
in neon glow, dance
to a love song

fingernails stained by toil.
Ton after ton loaded on rails.
They went deeper

after the dynamite,
bent to the task and took out the soil
they were standing on.



Michael Light, Earth's Largest Excavation, 2.5 Miles Wide and .5 Miles Deep, Looking West, 2006

BINGHAM MINE/GARFIELD STACK 04.21.06

Michael Light

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Located at 8,000 feet in the Oquirrh Mountains twenty miles Southwest of Salt Lake City, the Bingham Canyon copper mine is the largest man-made excavation on the planet, its hole reaching more than half a mile deep and its rim nearing three miles in width. It has produced more copper than any mine in history. The mine's Garfield smelter stack, situated at the edge of the Great Salt Lake about ten miles away, is the tallest free-standing structure west of the Mississippi River, and is thirty-five feet shorter than the Empire State Building. It was the Guggenheim family that capitalized Bingham Canyon in 1906 to allow open-pit mining to begin there. The next year, the Guggenheims' American Smelting and Refining Company (ASARCO) built the Garfield smelter to refine Bingham's copper ore, and owned and ran it until 1959.



Michael Light, Side of the Pit, Looking East; Trucks Each Carrying 218 Tons of Ore, 2006



Michael Light, Garfield Stack, Oquirrh Mountains and Ancient Beach of Great Salt Lake, 2006



Erika Osborne, *The Chasm of Bingham*, 2012, oil on linen, 48 by 90 inches



Erika Osborne, *Split Estates*, 2016, oil on linen, 32 by 48 inches

AMERICA, I DO NOT CALL YOUR NAME WITHOUT HOPE

after Neruda

Dean Rader

America, I do not call your name without hope
not even when you lay your knife
against my throat or lace my hands
behind my back, the cuffs connecting
us like two outlaws trying to escape
history's white horse, its heavy whip
a pistolshot in the ear. Lost land,
this is a song for the scars on your back,
for your blistered feet and beautiful
watch, it is for your windmills, your
magic machines, for your fists. It
is for your wagon of blood, for your dogs
and their teeth of fire, for your sons
and the smoke in their hearts. This is for
your verbs, your long lurk, your whirl.
This is for you and your fear, your tar,
for the white heat in your skin, and
for your blue bones that one day may sing.
This is for your singing. This is for the past,
but not for what's passed. This is for daybreak
and backbreak, for dreams, and for darkness.
This song is not for your fight but it is a song
for fighting. It is a song of flame but not for burning.
It is a song out of breath but a plea for breathing.
It is the song I will sing when you knock
on my door, my son's name in your mouth.

ETIOLOGICAL SELF-PORTRAIT

Dean Rader

Not with a bang but a baby's breath
not with a scream but a scratch
not with the angel but its after-ash
not with the dead but with their dreams:

we all want to rise up into that which
we have only now begun to know—
time might be a cup of tea
or a hummingbird above the rosebush—

we can never be sure, just like now,
after a day of fog and heavy gray
we wonder about the sun in its little barrow
of light and who might be pushing it.



Right: Erika Osborne
Hoover Gates, 2011
oil on canvas, 42 by 30 inches



Erika Osborne, *Westward*, 2012, oil on canvas, 20 by 42 inches



Erika Osborne, *The View Down Canyon*, 2013, oil on canvas, 36 by 60 inches

LANDSCAPE

Julia Clift

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Any physical landscape, i.e., an area of natural land shaped by human intervention, is defined by the entanglement of its ecology, its socio-political history, and the plurality of stories told of it over time. How we conceptualize and represent landscapes matters, especially in the midst of our current climate catastrophe. This essay stems from research questions within my own studio practice; it offers an artist's perspective on issues that, I believe, bear widespread relevance today.

1. PEOPLE

Colin Woodard's 2011 book *American Nations* interprets the United States as a precarious coalition of eleven warring regions. Woodard tells U.S. history through the lens of tracking each region's evolution and migrations within the country over time, from the first arrivals of European colonizers to the present. The book was a revelation for me in that it gave language to a truth that I'd sensed of my country for years, particularly after the 2016 election.

I've always been fascinated by how, in the United States, different worldviews center around distinct, geographic regions. On a recent road trip from Philadelphia to Orlando, I was struck in North Carolina by bright yellow billboards punctuating the walls of foliage lining I-95, reading "Jesus is Savior," or more concisely, "REPENT." In South Carolina, a roadside field had been cleared for an enormous confederate flag. The views from my window seemed the perfect illustration of how landscape is more than land shaped by practical human needs; landscape is branded by the ideology of its inhabitants.

Trump country is beautiful. There's tension in the thought because the landscape's formal and political reality are at odds (for me, at least). There's an awkwardness to feeling moved by a landscape that's in-

timately tied to a culture far from one's own. I think the discomfort is telling; it suggests some reciprocity between a place and its people, it implies landscape's animacy. Another way to think of it might be that landscape is steeped, ontologically, in its human history. Mustn't any representation of a landscape, then—such as a painting or photograph—signify that landscape's socio-political placehood?

2. MODERN SIGHT & THE ANTHROPOCENE

In the summer of 2015, I was accepted to a month-long residency in a picturesque village in Northwestern France. My work was figurative at the time, but I decided to take advantage of the scenery and spent the month making landscape paintings. As the residency progressed, I found myself in a new pattern: upon discovering an attractive scene, a determined energy would kick in, a drive to capture it. Looking back, I wonder about this impulse of possession. It might be described as the desire to pin down some essence of nature, to cage it in a portable object for spectatorial consumption at a viewer's leisure. To be fair, I think my intentions that summer had much to do with awe. I wanted to transmit, through painting, the profound emotions that natural landscapes evoke in me. But I'd be lying if I didn't acknowledge the hubristic energy that was present as well.

Image-makers have both power and responsibility. We don't just reflect cultural movements, we can generate them. I often think of Thomas Moran and William Henry Jackson's sublime, romantic representations of American landscapes, which are widely credited with convincing Congress to establish the country's first national park (Yellowstone) in 1872. It was landscape imagery that transformed an actual place in the public consciousness, from undesirable wilderness to a land worthy of admiration and protection. To an extent, American painters are responsible for propagating the zeitgeist of Westward expansion.



Julia Clift, *American Space*, oil on canvas, 2020, 66 by 91 inches

In *The Panorama, History of a Mass Medium*, author Stephan Oettermann provides another historical example of landscape painters impacting how people view the natural world. In the late eighteenth century, popular panoramic paintings trained their bourgeois audience members on how to relate to actual landscapes from a privileged, elevated position; the paintings cultivated a taste for "getting a grip" on things, a grip that leaves what is observed undamaged, but surrounds and seizes the whole." Panoramic landscape paintings were symptomatic of, and reinforced, domineering attitudes toward nature.

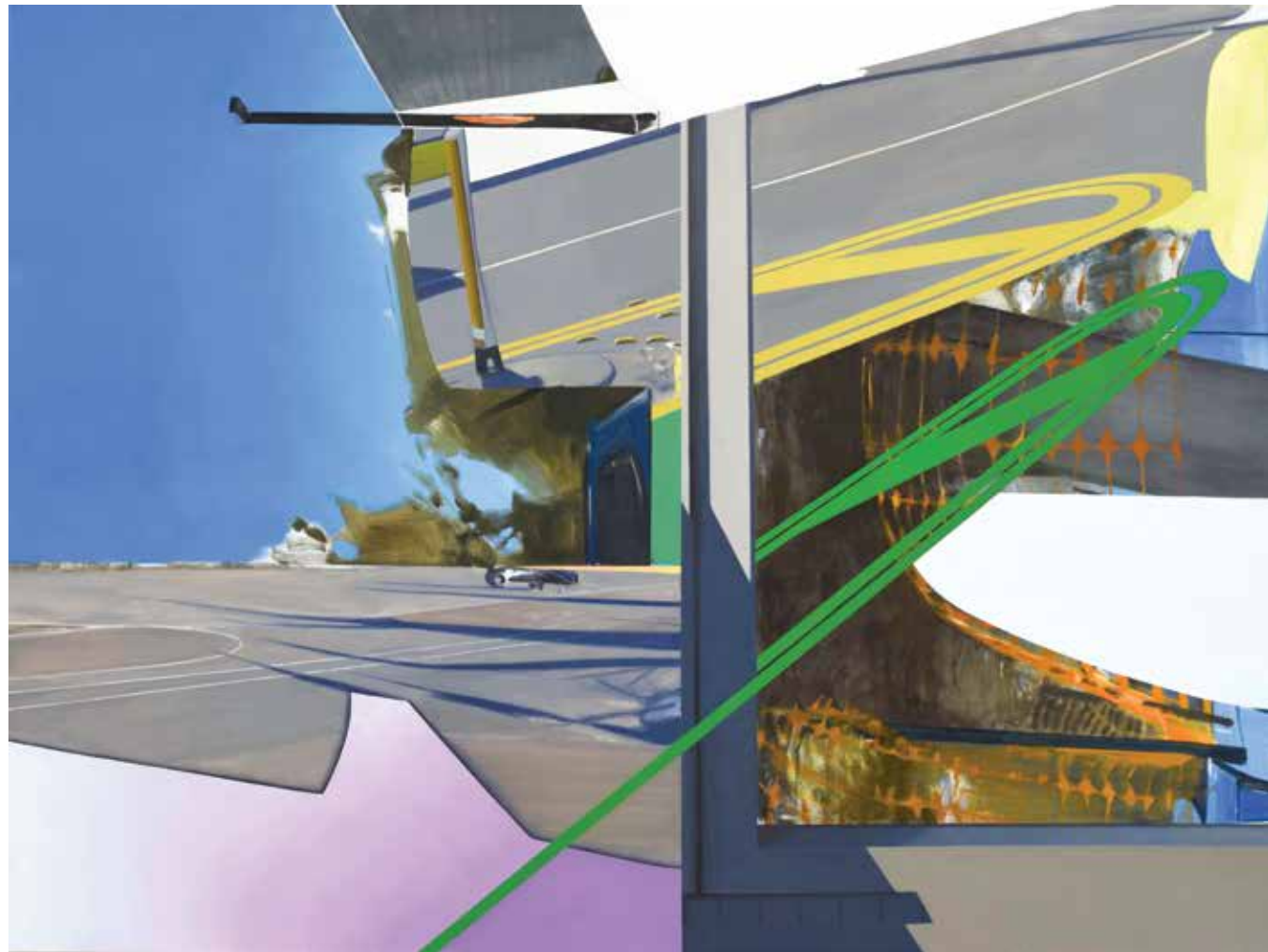
Oettermann sees panoramic perception of the actual world as central to modernity—the very culture that's led us to the uninhibited plundering of Earth's resources and a global mass extinction. It's at least plausible that images steeped in the modern

ethos of "getting a grip" on nature, like my own early landscape paintings, might sustain and advance a destructive worldview.

3. SPIRIT

There are two consequences of romanticizing natural landscapes that I'm currently concerned with, as an artist and an image-maker. One is the detachment of a natural landscape from its identity as a specific, historically situated place, or the glossing over of how landscapes are tied up with social politics. The second is the masking of nature's ecological reality, for one must see nature as ecology in order to adopt a mentality of stewardship.

For as long as I can remember, I have been sensitive to, and inspired by, landscapes' emotional tex-



Julia Clift, *American Space*, oil on canvas, 2019, 72 by 96 inches

tures. The first time I ever saw mountains, I was seven years old, on a road trip with my Dad. We passed through North Carolina after nightfall, and I made out their shadowy forms through the car window—I felt awash in joy. Different natural landscapes resonate different psychological notes within me, and, it seems, within others. My sentiments harken back to ideas about natural landscapes that nineteenth century Romantic artists and writers perpetuated, but such feelings needn't be romanticizing. In everyday speech, to romanticize something is to raise it on a pedestal by way of flattening its complexities. Cannot one maintain an awareness of a landscape's intertwined identities while letting herself be moved?

To be sure, the Romantics' conception of natural landscapes as sites of universal truths conflicts with an understanding of landscapes as specific,

historically situated locations. But the notion of natural landscapes' connection to the human soul or psyche, and the notion of nature's sacredness, both of which have ties to the Romantics' legacy, are not in themselves incompatible with an understanding of natural landscapes as historically situated places and as ecosystems. Robin Kimmerer is a botanist, writer, and indigenous American who advocates for the perception of natural landscapes as intimately, spiritually connected to humans in a reciprocal relationship. Kimmerer sees the health of such relationships as key to both ecological harmony and people's psychological well-being:

I once knew and loved a man who lived most of his life in the city, but when he was dragged off to the ocean or the woods he seemed to enjoy it well enough—as long as

he could find an internet connection. He had lived in a lot of places, so I asked him where he found his greatest sense of place. He didn't understand the expression. I explained that I wanted to know where he felt most nurtured and supported. What is the place that you understand best? That you know best and knows you in return?

He didn't take long to answer. "My car," he said. "In my car. It provides me with everything I need, in just the way I like it. My favorite music. Seat position fully adjustable. Automatic mirrors. Two cup holders. I'm safe. And it always takes me where I want to go."

Years later, he tried to kill himself. In his car.

He never grew a relationship with the land, choosing instead the splendid isolation of technology. He was like one of those little withered seeds you find in the bottom of the seed packet, the one who never touched the earth.

I wonder if much that ails our society stems from the fact that we have allowed ourselves to be cut off from that love of, and from, the land. It is medicine for broken land and empty hearts.

While I am not a member of the Indigenous community, I deeply relate to Kimmerer's words. At a time when so many humans increasingly experience the world virtually, I wonder if a useful path for landscape painting might be to remind audiences of the psychological or spiritual impacts of being physically present in a place.

One of my favorite films is Werner Herzog's *Into the Inferno* (2016), a documentary about volcanoes. Herzog trains his lens on scientists studying volcanoes, and on people whose ancient religions impart volcanoes with a spiritual dimension. A sizeable



Julia Clift, *American Space*, oil on canvas, 2019, 72 by 84 inches

section of the film is shot in North Korea and addresses how the Kim family uses a claimed relation to Mount Paektu to legitimize their political rule. Throughout *Inferno*, Herzog intersperses footage of bubbling lava lakes and cascading pyroclastic flows accompanied by operatic music; these moments unequivocally revel in volcanoes' beauty and sublimity. By implicitly defining volcanoes as the sum of their aesthetics, their scientific facts, their inscribed histories, and the meanings they've held over time, the film models a way of representing natural landscapes truthfully and responsibly in the twenty-first century.



Philip Zimmermann, *Santa Rita/Chino Copper Mine, Santa Rita*, 2004, photograph



Erin Wilkerson (Creative Agitation), *Western Section of Unknown Mine in McKinley County*, from the series "Extraction Settlement," acrylic on canvas, 24 by 34 inches

WILDTIME

Sandra Dal Poggetto

WWW.SANDRADALPOGGETTO.COM

Northern California's coastal hills and valleys where I grew up are smaller in scale and gentler than the Rocky Mountains where I now live. As a girl, there was much to explore, imagine and discover in the chaparral and mixed oak forests that surrounded my home. The native peoples who had understood the land infinitely better than I were absent. Pomo, Wintuns and Wapo had lived in those hills for thousands of years but were never a topic of conversation at home or in my history lessons at school. Only later did I see and marvel at their intricate grass baskets woven to gather, process and store wild food-stuffs: oak acorns, wild oats, fish, game, berries, seeds and roots. The only Indian presence in my life was invented in Hollywood, seen on television. Like many children then, I enjoyed playing cowboys and Indians and usually chose the Indian role because I loved being bare-chested. My incessant, imaginative outdoor play marked me for the arts, not the sciences. And so, when the time came, I studied art at the University of California at Davis.

The renowned ceramic artist Robert Arneson often jibed me, as a student, for bringing my painterly investigations into his famed TB9, a corrugated metal-sided building that housed workspace for ceramic classes and his own studio. Two cavernous firing kilns were the heart of the building and Arneson, the brains. Signing up for independent study with Arneson was hazardous because as a Funk artist, and one who expressed strong political and social opinions in clay, he could be quite caustic in his criticism. Further, I had chosen to be a painter, and to be Funk was to be a descendent of Dada, irreverent, often ribald and mischievous opponents of the Western tradition of painting. But I was undeterred, and he let me be as I claimed a wall for my large abstract clay reliefs, which, once leather-hard, I cut-up

into blocks, arranged on the floor, and made drawings and paintings of them from various perspectives. When I graduated, Arneson asked if I was going to face down the wolves of New York; instead, I moved to Montana where the real wolves were.

Slowly I entered the enormous space of the inland West, where the land comes forward and people recede. With the land come the animals and birds, unfamiliar trees, grasses and forbs. I learned to hunt game birds—blue, ruffed and sharp-tailed grouse, pheasant—and mule deer, which took me ever deeper into the land. I learned where the animals live, what they eat, and the soils in which their food grows. I learned the shape of their beds and the contours of the land that holds their water.

I learned the weather they endure, the predators they suffer. I learned how their bodies are structured by literally taking their bodies apart. I learned to savor wild meat. In this way, I entered into what Ortega y Gasset described as primal engagement.

Through hunting, I experience the sensation of a place. My body becomes more permeable; my senses simultaneously relax and intensify. I become vividly conscious of the swell of a hillside, the shape of a meadow, the color and texture of wildrye, the snap of a twig under hoof, the chattering alarm of a squirrel, the chill and density of cold air. A breeze at my back, whoosh of thrush, flick of a tail. There are no words. I respond to these cues with caution, delicacy, discernment, patience, and then action.

Hunting in this way is not unlike my painting practice: situated in the forest or on the plains, charcoal in hand, I make marks with the stick of burnt willow. The impulse to make a mark is centered in my body, shaped by the moment when I hear the whistle of a red tail hawk, flap of raven's wing, drumming of a grouse, see a beetle labor over the white of my canvas, a butterfly's lilt, aspen leaves quivering. These sensory impressions move through my fingers, and tooth of canvas catches charcoal. These dark marks are also shaped by memory—years of



Sandra Dal Poggetto, *Surprise Creek #1*, 2017–2018, oil, whitetail deer hide on cardboard, 10 by 16 inches

seeing, hearing and feeling. If my attention flags, the mark is false.

Next comes the paint: a golden ochre wash brings the sun—light absorbed and refracted by grass or dust-glow in the air. Passages of translucent golden-green signal first growth or brown-green late season. Ochre-green decaying growth, blue-green plants still with water running in their veins. Umbers and siennas soil and stone, or not. Scrubby olive greens of deer browse, sage browns of grouse and sparrow shelter, piercing vanadium yellow of feathered calls, alizarin blue lake. Soft pastel marks tracks in ether and dust. Thick concentrations of oil paint—pockets of water and muck, the wet and heat of blood—animal and human absorbed by the dirt for centuries.

There are always erasures: charcoal, pastel and oil marks come and go, and come back again, like the day and the seasons; animals appear then with-

draw into the shadows; plants reach vitally for the light then shrivel and disintegrate, losing their once crisp edge; deer hair ripples over firm muscle, and months later lays on the forest floor disappearing into bird nests or scat; mayflies outlined by cerulean of sky vanish into the throat of a swallow; vernal ponds ebb and dry up, the moon waxes and wanes.

Moving along mountain flanks or grasslands, streams, or the edges of high mountain lakes—sensing color, texture, space, line, shape, light and dark, I come to know the fundamentals of art. This knowledge is an intrinsic part of what it means to be alive.



I walk over the high plains near the Missouri River in central Montana, once home to the Blackfeet. Cattle have been allowed to overgraze. The land is



Sandra Dal Poggetto, *Deep Creek #1*, 2015, oil, Canada goose feathers on cardboard, 14.25 by 17.5 inches

bare in places. Knapweed, low in nutrition, flowers. And from a distant, plowed field drifts a faint smell of Roundup sprayed on wheat crops. My hunting dog is in the lead. After a few miles, with shotgun in hand, I shimmy under a barbed wire fence onto better ground: blue grama and buffalo grass of differing heights rustle in the breeze, old growth at their base; coneflower and rabbitbrush mingle with the grasses; patches of wild rose offer tasty rosehips; and, in places, dried moss covers the soil indicating healthier ground. There are signs of rabbit or possibly hare. A foxhole? I pass an anthill, and a little beyond, see grouse beds under the sage and at my feet, the beginnings of a game trail. I pause for a while to scan the horizon that wraps wholly around me before following the trail and dropping into a steep-sided coulee, escaping the wind and technology's ever more sinister eye.

The stratified walls are covered by luxuriant grass and absorb sound. A plow cannot reach this place and there are no fences. My dog's nose is close to the ground following a scent that leads to a stand of berry-covered bushes. Eerily, silently she goes on point. I approach, but no birds burst from the cover, although we both know they have been here. We continue down the dry, narrow path marked with deer tracks. The coulee forks and I take the wider



Sandra Dal Poggetto, *Surprise Creek #7*, 2020, oil, dyed deer hair on archival cardboard

arm that has more cover. On the right is a high, flat stone face. A site for petroglyphs? I come upon coyote scat laced with fur and bones and farther on find the feathered remains of a sharp-tailed grouse—the work of an owl, a coyote? As I descend into this crack of earth, animal and sapient commingle, tensions arise, potent and rich with complexities. Tint and tone, thick and thin of paint may capture them. A small stand of cattails grows in the grassy bottom. My dog drinks the water flowing from them. There is a fresh deer bed nearby, and I lie down to rest in this place of wildtime.



Sandra Dal Poggetto, *Targhee #1*, 2016, oil, Blue grouse feathers on cardboard, 30 by 35 inches

DOWNHILL WHITE SUPREMACISTS MARCH ON SACRAMENTO

Tess Taylor

High in the Sierra
green summer aspen

whisper to the lake.
The snowpack glitters.

Over the passes
Winnebago thunder

out of the wide red flats of Nevada.

Huge crooked knuckles,
the dark scree loom.

Deep in the roadbeds,
the bones of the Irish

& Chinese workers
whose lives were pitted

against one another
to drive down & down

the price of their labor
—who shattered their bodies

dynamiting these crossings—

blaze in their graves.

TRAIN THROUGH COLMA

Tess Taylor

But will anyone teach
the new intelligence to miss
the apricot trees

that bloomed each spring
along these tracks?
Or the way afternoons

blazed with creosote
& ponderosa?
Spring evenings flare

with orange pixels
in the bay-scented valley.
Where in the algorithm

will they account for
the rippling ponies
that roamed outside Fremont?

When the robots have souls,
will they feel longing?
When they feel longing,

will they write poems?



Owen Gump, *Fence Line*, Northern Nevada, 2018, pigment print on Baryta paper



Owen Gump, *Untitled*, Storey County, Nevada, 2019, pigment print on Baryta paper



Owen Gump, *Mine Tailings*, Lyon County, Nevada, 2018, pigment print on Baryta paper



Owen Gump, *Tool Marks*, Bitterroot Range, Idaho, 2018, pigment print on Baryta paper



PETER RUTLEDGE KOCH

with sixteen serial collage poems by

ADAM CORNFORD

book structure engineering by

JONATHAN GERKEN

LIBER IGNIS, the third volume* in a collaborative project of appropriations, constructs, and inventions documenting the ongoing civilization of the American West

WARNING: CONTAINS LEAD

*HARD WORDS, NATURE MORTE, & LIBER IGNIS
comprise the three-volume project

EDITIONS KOCH
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THE BOOK OF FIRE

Peter Rutledge Koch

The following is intended as a guide to the imagination and construction of an idea.

In May of 2013, during a visit to the Städel Museum in Frankfurt, Germany I found myself in a small gallery saturated with ashes and grey shades of suffering. I felt I had entered into a set design for a reading of Baudelaire's poem "La Béatrice"

*Dans des terrains cendreux, calcinés, sans verdure,
Comme je me plaignais un jour à la nature,
Et que de ma pensée, en vaguant au hasard,
J'aiguissais lentement sur mon coeur le poignard,
Je vis en plein midi descendre sur ma tête
Un nuage funèbre et gros d'une tempête,
Qui portait un troupeau de démons vicieux,
Semblables à des nains cruels et curieux.*

—Through ashen fields, burnt to a cinder, where no green thing grew,
one day I lamented..."

I had chanced upon an exhibition of selected works by Joseph Bueys, Anselm Kiefer, and Sebastião Salgado, three artists deeply affected by the dark side of human nature. The massive lead sculpture *Zweistromland*, a shelf of mysterious impenetrable volumes by Kiefer, and Salgado's photographs of the Serra Palada gold mine in Brazil converged on me with catalytic force while I stood transfixed in the gallery. A cast iron sculpture of a charred corpse by Bueys, possibly summoned from the artist's memories of being shot down over the Crimea during WWII, lay on the floor. I felt a sudden deep connection with these evocations of the terrible weight and power of exploitation, war, and the aftermath of suffering and devastation.

Struck with echoes from my own life reflected in the ruins that littered the gallery walls and floor, I was deeply moved. Born in Montana in the midst of the Second World War, I grew up surrounded by magnificent landscapes in various states of dereliction and decay. After the war the great gluttony for minerals abated and copper prices declined. The corporations withdrew, leaving ruins everywhere; ghostly smelters, abandoned mines, and where once great forests stood, burned slash and stumps remained. Landscapes of extraction and erosion filled my peripheral vision for years. The concrete and marble monuments erected in our municipal cemeteries and public parks to the war dead were but feeble responses to the terrible costs of that war. Now, seventy-six years after the invasion of Normandy (where my father was killed) I am bearing witness—pursuing my work in the archives of mining and smelting, appropriating images, and constructing my own memorials.

I left the Städel Museum that afternoon clutching a notebook half-filled with sketches and plans for a *Book of Fire*. I began imagining a distorted ode to the drilling machines, hard-rock miners, crushers, furnaces, and railroad engines serving the "dark satanic mills" of William Blake's anthem "Jerusalem." The powerful engines of destruction, built to extract the mineral wealth that lay beneath the thin surface layer of our vegetation-covered earth, haunted my thoughts. I drew closer to peer into the mirror that human nature provides us to examine the scattered seeds of raw power and the subtleties of self-destruction.

Without a conscious or deliberate plan, I had been building a personal response to the disasters of war for my entire life. That day in Frankfurt, I suddenly felt that the time had come to give shape to my thoughts. Eventually, painfully, I composed a small chaotic dirge, as an office for the dead—freely adapted from Charles Baudelaire's "de profundis clamavi":



INVERSION, 1

1890: All day long
 the smoke arises from the works
 stretches across the valley
 no higher than the town
 a still, calm sea, deep, murky
 Carriages have to be driven slowly
 trolley cars have to creep
 workers lose their way
 many people bleed from their noses
 some vomit in the streets
 inversion layer
 invisible hand
 godlike transparent
 palm fingers thumb heavy with value
 holding the smoke down
 on the flayed valley

ORESCAPE

In the copper area
 slopes gridironed by railway tracks
 steel bolt frames mark
 the course of the greater veins
 monotonous slopes
 occasional shaft houses
 innumerable pits and trenches
 heaps of waste everywhere
 Only by digging through the veneer
 of gravel-like debris
 can the limits of the intrusive masses
 be established

The city is a blackened pit
 A sombre graveyard poured of lead
 For sixty years a red sun burned
 No leaves were born – the streams lay choked and dead
 What horror remains yet unfortold?
 Old chaos is refreshed – curses are renewed
 Greed is spread like honey on our tongues
 Fear – a blackened factory choked with dust
 Dangerous as a glacial sun
 Chaos once again becomes our hope
 And night our closest friend

Upon our return to Berkeley, I began at once to assemble photographic evidence and documentation to bring the project into focus.

“Never has any poet been able to describe Styx, Regnum Subterraneum and Plutonis, nor any theologus hell as gruesome as we can see it here. For outside a poisonous,

acrid and sulphurous smoke rises and poisons the air far and wide so that one cannot without pains go there. The smoke corrodes the earth, so that no plants can grow around.”

– CARL LINNAEUS,
 describing copper mines in Falun, Sweden in 1734

ON LEAD

Kiefer’s use of lead as a medium for sculpture and Salgado’s silver-gelatin prints were the triggering elements. Ten years earlier I had printed the *Defictions of Diogenes* using lead as the substrate for a work of critical philosophical imagination. Suddenly I was once again preparing an homage to our classical roots along with a cynic’s urge to shock while educating the senses. Lead, an element toxic in its salts and acetates, accompanies the arsenic that often leaks from a copper mine and its smelt-

ing operations into local water sources. There, at the mouth of Hell Gate Canyon on the banks of the Clark’s Fork of the Columbia River, I grew up fearing the poisonous waters that ran out of the sulfurous heaps of Butte and Anaconda, just a hundred miles upstream.

Lead is a dark material “a chthonian medium, ‘of the earth,’ a medium of grinding subterranean force, of the bowels and not the surface or face of things. Curses, insults, reproofs, spells, *defixiones* are drawn to lead, drawn on lead. There is an instinctive reach for lead when the work is crude, binding, and painful as the truth” (from “On lead as a text transmission object,” *Diogenes, Defictions*. Peter Koch Printer, Berkeley, 1994). In spite of its lethal associations, lead is the matrix and ideal medium for my work as a printer. A malleable and essential element in the typefoundry, I feel comfortable in its presence.

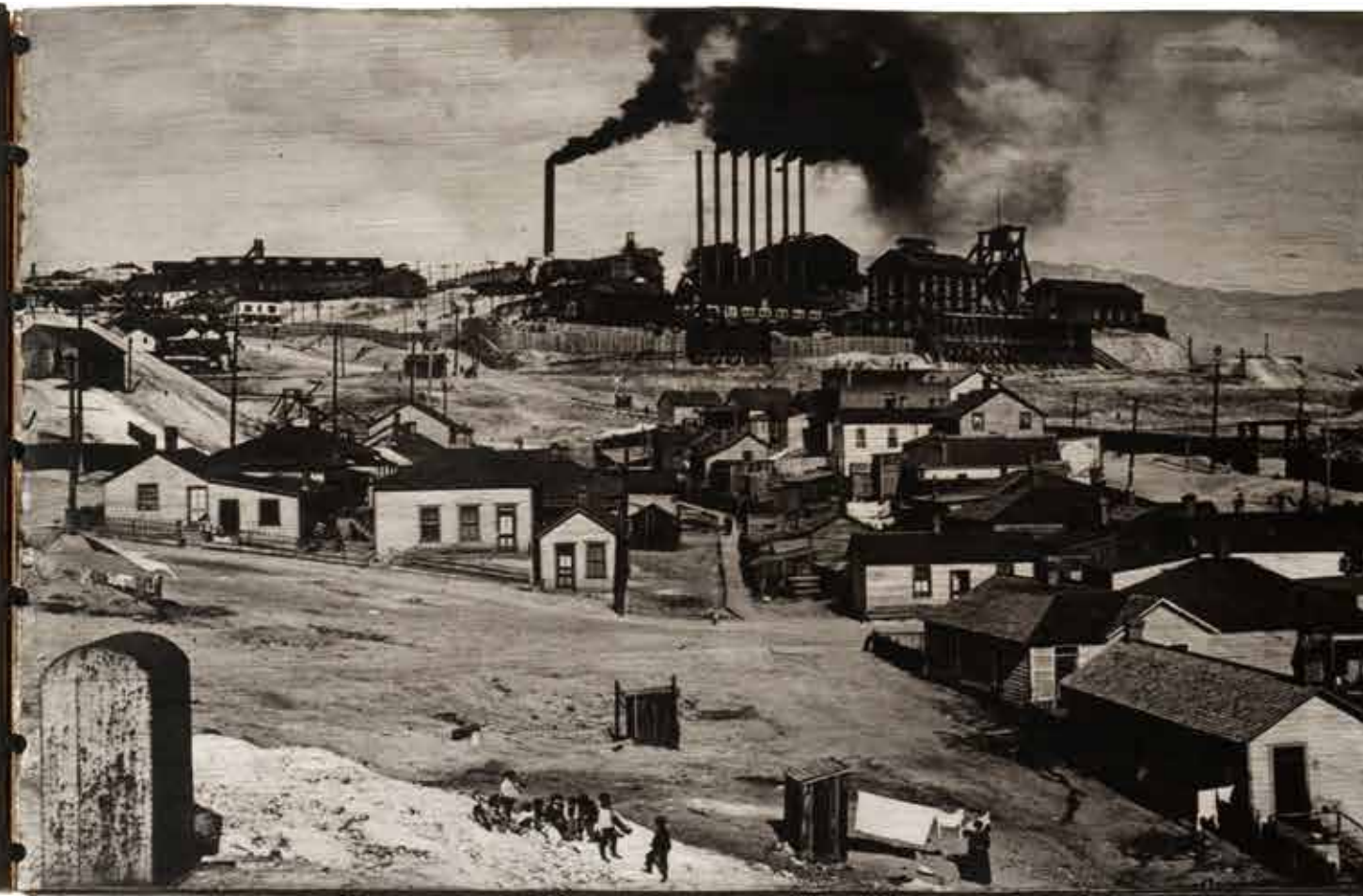
The work progressed slowly. I spent months compiling source photographs, then weeks traveling during the summer of 2014, digging through mining archives in Montana. There followed a period when I examined each promising photograph for alterations and cropping to produce the maximum impact. For much of that year my assistant Jonathan Gerken and I engaged in a protracted series of experiments aimed at preparing a suitable surface for printing photographic images on large sheets of lead. Once the lead leaves were printed to our satisfaction at Magnolia Editions in Oakland, we over-painted each image with acrylic medium impregnated with bone-black to dirty the brilliant whites and lighter grays. Our next challenge was to design a binding structure adequate to support the extreme weight of the leaves.

At first I was intent upon adding a text composed entirely of quotations from poetic and scien-

MODERNITY

Like the hand guiding enlarging
demand for copper wire
1882: Edison installed his first electrical
generating and distribution system
27-ton "Jumbo" dynamo
heavy copper bars and brass disks
spinning around a magnetic core
nearly 20 miles of thick copper wires
thruaded through underground conduits
clean modern metal
extruded into arteries
of Power and Light
1902: 21,920 miles of electrified streetcars
with copper-coiled electric motors

fed by copper wires
1925: Bell Telephone had bought more
than seven hundred million pounds of copper
for its nationwide phone network
vast horizontal ever spreading
voltage tree whose roots are here
copper bound with sulfur
iron and arsenic
the veins nearly vertical
a depth of over one mile
ascending to be purified
in airborne drifts of silt



tific observation regarding mines and exploitation. However, before finalizing I wanted to confirm that all the structural concepts were workable. Lead's malleability couldn't be exploited as part of a book's binding structure. Repeated folding and unfolding subjected a lead sheet—already one of the weaker metals—to fatigue and tearing. Model after model was tested and rejected in our search for a design both rugged and flexible. Jonathan experimented with woven copper electrical grounding straps, small soldered ferrules linking one page to the next, interlocking copper brackets soldered to the edges of pages, etc; all were rejected. Eventually, and much to my relief, Jonathan arrived at a singular solution of copper refrigeration tubing soldered to the edge of each leaf and weaving a black linen belt to aid in binding the pages (both lead and Evelon) together to form a codex structure.

While we were confirming that the unusual parts and disparate materials could be unified and function successfully as a book, I began showing bits and pieces of the project to English-born poet Adam Cornford. After a few visits and serial viewings of the progressive stages of the design, he brought me a poem that revealed a sympathetic understanding of the symbolic nature of the whole project. I was so impressed that I asked him to write a series of pieces to accompany the images. He accepted the challenge. (Adam and I first collaborated in a pro-situationist action group in South Berkeley in 1973. Later, I printed his poems in *Montana Gothic*, a literary magazine that I published in the mid-1970s; and subsequently printed his first book of poems *Shooting Scripts* (1978) under my Black Stone Press imprint.)

We succeeded in producing our first successful prototype a few days before the opening of the 2015

biennial CODEX International Book Fair where it debuted to lively interest.

Working backwards from the moment of publication—via the perspective of publishing as a social artform—I began to see the architecture of the book and the in-forming of content over months and years of experience and experiment, as the material result of both chance and prolonged concentration. Through diligence and paying strict attention to each nuance of the idea's development during the growth of the project, I understand how this making is my being, my way of staying alive under the stress of perpetually divisive and destructive forces. The great feeling of accomplishment that accompanies a successful collaboration between highly talented craftsmen and women is the true reward of my work—and, while I'm at it, I consider it my honor to frustrate the bastards who perpetuate the destruction of the planet in pursuit of irresponsible profit.

Is this work of unconcealing the apocalypse art work? I believe so. For me, work is life revealing itself in all its mystery and sublimity.

COLOPHON

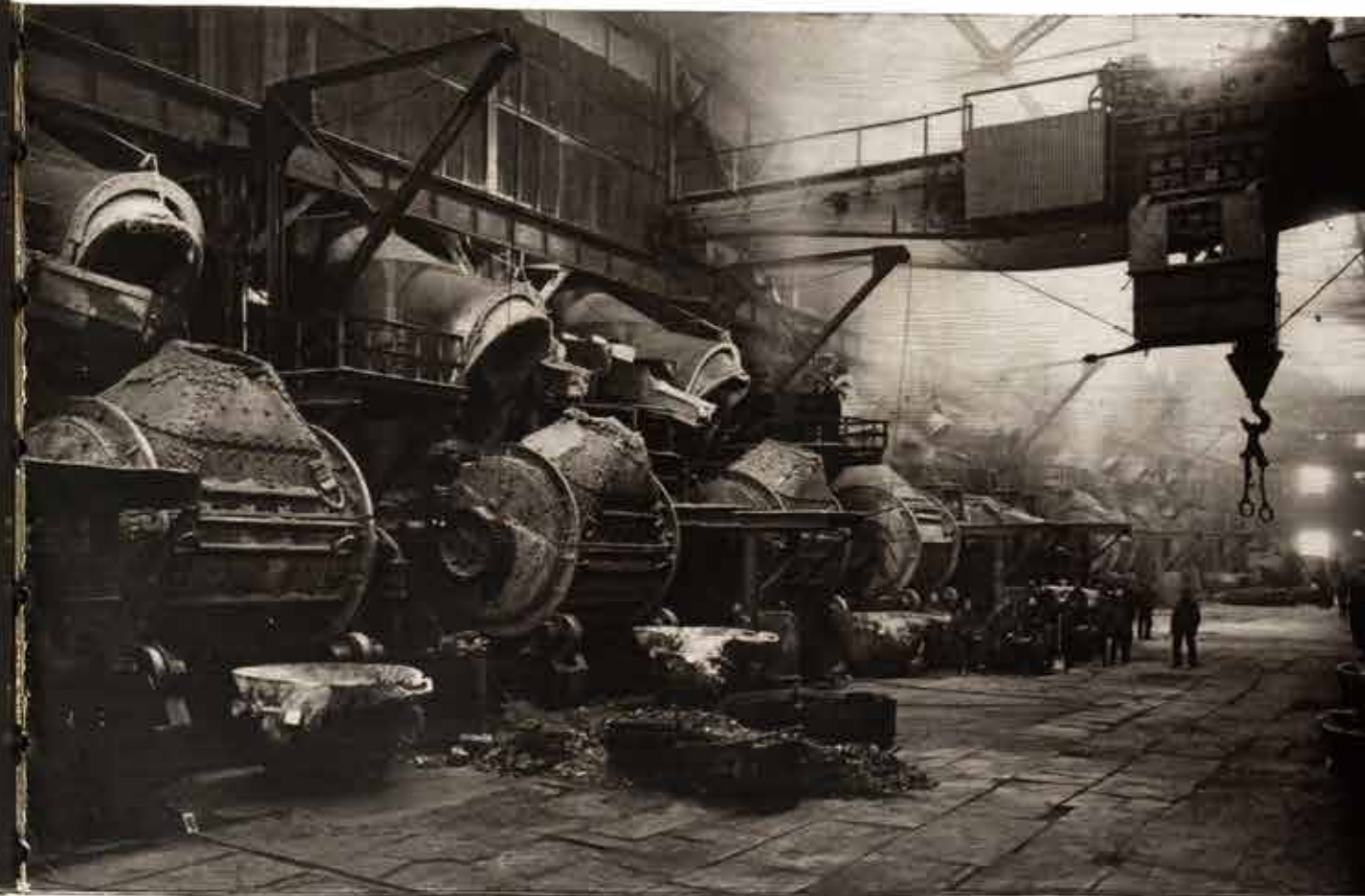
Liber Ignis consists of six .033" lead sheets printed at Magnolia Editions on a UV cured acrylic flatbed press interleaved with laminated felt and Evolon split microfiber sheets dyed black and printed from polymer plates on the Hacker Test Press at Peter Koch Printers. The binding is constructed with soldered copper tubing and linen thread. The text was composed in Fell Roman and Italic with Rockwell for titling. Box construction by John DeMerritt, Bookbinding, Copper and gold leaf cover plate executed by Christopher Stinehour. 12 x 18 inches, 22 pp., weight: thirty pounds.

SMOKE FARM

Deer Lodge Valley
Bielenberg Ranch
autumn 1901
more than 1,000 head of cattle
800 sheep, 20 horses
grazing under
a steady stream
of stinking yellow smoke
sulfur centipedes
bristling with wire feet
crawl down their long throats
claws tearing their alveoli
with each breath
gray metal white metal
static disrupting
their cells' converse
nerves transmit spam
hearts falter and seize
bodies founder
in dusted fall grass

INVERSION, 3

*the mines of Butte somehow
carved out of the surrounding rock
as a single block
lifted up inverted and set back down
a mile high at its tallest point
the resulting structure of
stone steel and wood
twice as big as the world's
largest skyscrapers
nearly two miles thick at its base
forest-maze of hollow branches
ghost world-tree
empty necropolis
inside a vast grave marker
for the smoke-strangled
and rock-crushed dead*



THE POETICS OF LIBER IGNIS

Adam Cornford

My involvement in the *Liber Ignis* project began when Peter Koch asked for my help in finding text that would work with the historical photographs of copper mining and smelting at Butte, Montana he had recently found as part of his ongoing project to document the conquest and environmental rape of the West in unique books and print works. I was haunted by the ghastly power of the images, all the more because, evidently taken simply as documentation, they did not seek to exaggerate or dramatize in any way what they recorded.

One of us, I don't remember which, suggested that I find some quotes from William Blake, since I know his work very well. I did find some verses from his unfinished and never-printed epic, *The Four Zoas*.

The relevant section was the one in which Blake's "Zoa" of the Fallen analytic intellect, Urizen, attempts to create a world in his own image and produces something like a cross between ancient Babylon and the hellish industrial Midlands of Blake's day—an aborted mechanical universe that soon collapses. But there was not enough material to serve as captions or companion text for more than a few of the photos. I suggested that I have a go at writing a poetic text of my own, which Peter encouraged.

Peter then handed off to me three books—or rather, two books and a pamphlet—that dealt with what happened in Butte. The pamphlet, *Butte & Anaconda Revisited: an Overview of Early-Day Mining and Smelting in Montana*, (Shovers, Fiege, Martin, and Quivik. Butte, 1991) was a guide from the mid-1980s to the history and remaining traces of the mining and smelting works formerly operated by Anaconda Copper. The two books were *Smoke Wars: Anaconda*

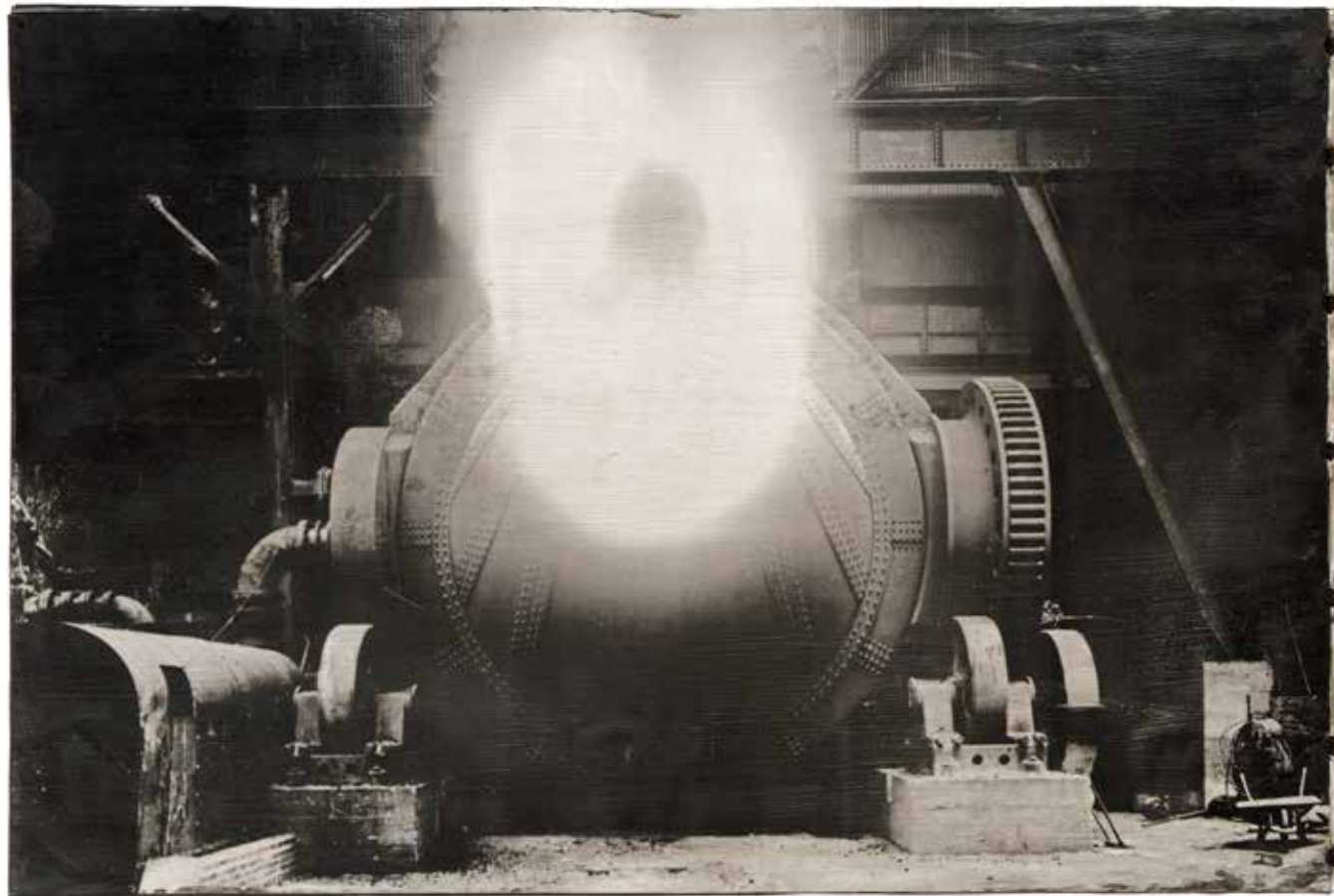
Copper, Montana Air Pollution, and the Courts, 1890–1924, (Donald MacMillan. Helena, 2000) which recounted the efforts of the citizens of Deer Lodge Valley and nearby areas during that period to curb the pollution that was killing them and their farm animals; and *Mass Destruction: The Men and Giant Mines That Wired America and Scarred the Planet*, (Timothy J. LeCain. Rutgers, 2009) a work of critical social history on copper mining in Montana and Colorado.

I opened *Butte & Anaconda Revisited* and was immediately struck by the descriptions both of the mining and smelting operations and of the way that the entire city of Butte would disappear for days beneath smoke so thick that it looked like a grayish lake. In *Smoke Wars* I found accounts of the toll taken by the pollution from open-air smelting—lead, arsenic, and sulfur—and in *Mass Destruction* more of the same, along with a detailed account of the technological innovations used to burrow more

and more deeply into the copper deposits and of the almost explosive growth of electrification and telegraph-telephone infrastructure that Butte's dearly bought copper made possible.

From that point on the poem began—to use a clichéd expression—to write itself. Passages I had marked, snipped out, and stripped down syntactically (printed in italics), gave rise to imagery of my own (printed in Roman), and material from all three books and various Internet sources was generally easy to integrate with the new writing. Although I have described the text as a collage, it is actually more of a montage, with elements partly blending into each other as in the photomontages of John Heartfield, Jess, or (latterly) Winston Smith.

The poem found its form in short lines, generally of two to three beats but quite often four, with the line breaks mostly at stress shifts or syntactic turns. The effect I realized belatedly I was aiming for was a



combination of driving rhythm and short breaths—almost panting—as if someone with trouble breathing was struggling fiercely to get across vital information, unable to pause more than briefly before starting to talk again. A rhythm of urgent gasps and blurts. The tone, by turns sardonic, furious, horrified, and resigned, emerged directly from the text, and the tempo shifted accordingly.

I cannot claim any significant originality in form. The poem's ancestry is easy to trace: the Neruda of *Canto General*; the documentary poetry of Hans Magnus Enzensberger (notably his serial poems "Mausoleum" and "The Sinking of the Titanic"); some work of Tom Clark and Ed Dorn from the 1980s; and looming behind them, Muriel Rukeyser's great and unjustly neglected *The Book of the Dead* from her 1938 collection *U.S. 1*, a poetic account of the worst industrial accident in American history, the Gauley Tunnel disaster of the early 1930s, which led to the deaths of between 700 and 800 mostly black work-

ers from silicosis. And behind all of them, William Blake's infernal visions from the prophetic books he collectively labeled *The Bible of Hell*.

To that very small group familiar with my earlier work—and with my enthusiastic acceptance of the label "neosurrealist"—this work may seem out of character. In some sense I suppose it is. But the marvelous (in the surrealist sense) and the nightmarish are close cousins. Moreover, much of my work over the last quarter-century has addressed science and technology. The beginning of this for me was exploring the phenomenological aspects of being a "cyborg"—starting from I.T. experiences like coding or exploring large networks and segueing into activities as ordinary as wearing sunglasses or driving a car. At around the same time I was working on a long narrative science-fiction poem, "The Snarling Gift," which addresses the environmental and social consequences of profit-driven technology (including chemical pollution and

global climate change) at a time now about twenty years in our future.

There is, besides, an eerily science-fictional quantity to the story of Butte. Some of it is the overlaid contradictions of its history and wider significance: the almost space-program-like efforts to drill deeper more safely (using technology adapted from deep-sea diving) and then to expel the pollution from taller and taller stacks with more and more elaborate filtration systems—while miners and smelter workers and locals and cattle went on getting sick and dying. Meanwhile, American capitalism was burning billions of tons of coal and oil to generate more and more electricity. So all this earlier work was preparation for writing *Liber Ignis*. I am honored to have been part of what is, in Blake's sense, a prophetic project.

A FEW ILLUMINATING QUOTATIONS

"More than 65,000 acres at the southern end of Deer Lodge Valley have been affected by operations at the Anaconda Company Smelter. One hundred years of milling and smelting operations, including discharges into the air and stream, have scattered wastes that are high in arsenic and metals over a wide area. These contaminants pose potential risks to human health, to life in nearby streams, and to plants and animals in adjacent lands. In addition to the millions of cubic yards of tailings, furnace slag, flue dust, and square miles of soil contaminated by airborne wastes, millions of gallons of ground water have been polluted from wastes and soils."

"The plant stack was designed to eject lead, arsenic, and other metals in wastes from the processes. As a regular practice, tailings, smelter wastes, slag and flue dust were dumped into the Missouri River until 1915, when most wastes were to be deposited on-site. The state estimated 27.5 to 31 million tons of slag and tailings were dumped directly into the river. Contaminants associated with these sources included antimony, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver and zinc."

— website extract. Superfund Records Center, United States Environmental Protection Agency. 2012.

"Over the course of nearly a century, miners excavated an extraordinary ten thousand miles of mine tunnels and shafts, leaving behind something more like termite-infested wood than terra firma. Sometimes the filigree of rock gives way and the ground collapses. The residents of Butte have long told stories of animals and buildings swallowed up by subsiding earth, disappearing into the ground as if pulled down by the

very demons of hell."

— Timothy J. LeCain. *Mass Destruction: The Men and Giant Mines That Wired America and Scarred the Planet*. Rutgers, 2009.

"The hellish sulphur smoke from the Butte Reduction Works and other offending smelters has been smothering the city for several days again and yesterday afternoon and last night it was as strong and as yellow and thick as at any time this winter. The official organ of the reduction works, however, says the smoke is all right; that healthy people get fat on it, and that it kills only persons with weak lungs and delicate throats."

— *The Anaconda Standard*. February 12, 1899, page 11.

IMAGE SOURCES (IN ORDER)

Converters #1 Great Falls type showing tuyers, [1913 December 8]
Photographer Unidentified.
Photograph from the Anaconda Copper Mining Company.
Courtesy of Montana Historical Society Research Center
Photograph Archives,
Helena, Montana.
PAC 82-62 2238

"birds eye view of the great mining camp / Butte City Mon't."
[no date]
Photographer Unidentified.
Photo courtesy of The World Museum of Mining,
Butte, Montana. 03181

B & M Copper Smelter at Great Falls, Montana [1910]
G.V. Barker, photographer.
Montana Historical Society Research Center Photograph
Archives,
Helena, Montana. 949-542

Converter, Anaconda smelter [1906 November 22]
Photographer Unidentified.
Photograph from the Anaconda Copper Mining Company.
Montana Historical Society Research Center Photograph
Archives,
Helena, Montana. PAC 82-62 1554

Converter, Great Falls type, first charge, 1913 December 13.
Photographer Unidentified
Photograph from the Anaconda Copper Mining Company.
Montana Historical Society Research Center Photograph
Archives,
Helena, Montana. PAC 82-62.2243



Thomas Ingmire, *Truth*



Betsy Stirratt, *Chronicle*, 2017, archival pigment print



Betsy Stirratt, *Evidence*, 2017, archival pigment print

EXTRACT

Jesse Nathan

i.

Drove out of Reno on 580
headed south, hooking past the huddle of casinos
in the white dusty morning light
along the haze of the airport, jets parallel and gliding
much faster than we in our corridor
of highway, concrete walls
decorated by images meant to accentuate
“place”—mountains in relief, bighorn sheep,
salmon swimming in the direction we’re driving
as if to say all journeys are upriver—
and beyond these tan and turquoise friezes
desert country streams by,
blisters of malls the color of dust, the square squashed architecture
sprawling into parking, neon signs, billboards
that seem to shout things like DREAM
WITH YOUR EYES OPEN (hot air balloons) or TO HAVE
AND TO HOLD (a diamond ring). R E N O W N
rides a hospital’s upper edge, and on the face of
distant Mount Rose, ski runs in summertime claw downward
as if torn by acid or landslides,
as if the mountaintop had cried, leaving tear-trails
in the ponderosas, tracks in no snow,
an alphabet of runes for giants.

ii.

Divorce, somewhat famously, was legal here
earlier than most places, but this was only one of the freedoms
persuading settlers, gamblers, artists
to Reno, rising in its nest of mountains, a town that reclines
4 or 5,000 feet above sea level in back of the Sierra. Toward the southern end
we lean onto 395, then through a roundabout
slinging us onto 341, the elevation lifting quickly. Geiger Lookout. Smokey
says danger ORANGE. Lodgepoles, Jeffreys,
Ponderosas pinned to the lapel
of steep sides, these shoulders of I think cinder,

limestone, granite, jasper’s red and blackened shades dancing—
I don’t have the proper vocabulary, really,
to say what these cliffs are made of—
junipers and gnarled pines whose habits I don’t recognize
spurt up less and less, an absence that reveals roads
veering off our two-lane with names
like Calaveras and Chaparral. Inside the rock
things have been compressed into existence,
lead, copper, barium, silver, gold,
and horses graze on the surface, flick their tails, never look up.
Motorcars to them must be part of the weather,
steady as the sage brush in its pale bluish green.
The road snakes around us as we sway in our seats
absorbed in talklessness—passengers, witnesses.
SEE THE FAMOUS SUICIDE TABLE
reads a sign, and another, a few miles later, promises the past:
THE WAY IT WAS. The land wears tans
and tweeds, and reds. Occasional mansions
rip up out of the mountainsides,
and one even balances on the tip-top
of a small peak, a whole side a glass face
pointed west toward the faraway resort.

iii.

And then we’re here. Virginia City. As if to bind that
far-removed coast to this craggy tract. And under the name
run the town’s watchwords: “Our first tweet
was by Pony Express.” There’s St. Mary’s in the Mountains, built and burned
and built again, all in a span of ten years
long ago. A hawk regards us from its cross, then vanishes.
C Street is Victorian facade, carnival colors, signage, old-timey
photo ops, cowboy hats, not bars
but saloons, an alley for staging gunfights,
a post office (real), a ward school (fake), various shops
for boots (of shark, elephant, kangaroo, ostrich,
teju, rattlesnake, bison, calf) and spurs,
and rock candy, and antiques and folk art—the sidewalks
formed by, it seems, wood palettes. Cheap magnets, flags,
funky t-shirts, outrageous bumper stickers, replicas
of mining tools, a rust-covered shiv, hats of all sorts ...
The enormous open doorway

is the entrance to The Ponderosa,
established in what were once offices of a bank,
a photo from 1892 of the local champion baseball team,
The Stars, and photos of the bank tellers, unsmiling
men in suits with timepieces draped from vests
standing in front of the vault—
but only the vault is still here, open for inspection.
It once gave up \$32,000 in broad daylight
and the loot was never found,
reputedly hidden somewhere in Six Mile Canyon,
simmering—I imagine—with some unpanned volume
of earth in that expanse named for a fast-talking prospector
called Comstock, a man painted
on the Ponderosa's high walls
just returning from a walk with Twain
(Samuel became Mark here writing for the *Territorial Enterprise*)
along with a painting of a lovely woman,
she looks bronze, long-haired, eyes wide open
naked (of course) on her back, Madam Julia Bullette
who threw fancy dinners for the gentlemen
and was murdered for her jewels by John Milleain
in 1861, “hung 1868,” says the painting—
no pun meant, I don't think—
and Milleain, haggard claw stirring in the roil of pigment
fresh from the deed and clutching a handful
of gelt, fades into his frown
while across from the murder a portrait of Sam Brown
renders the moment he stabbed a man while the bar folk
looked on like it was entertainment—I first typed entertainment—
and it hangs there conjured in beautiful dole colors
like a Thomas Hart Benton craze
above the rows of beautiful booze bottles,
there's a glass case, too, of what's come out of Mount Davidson—
what this tourism is terraced into—
tiger's eye, cinnabar, scheelite, greenish sulfur, nickel a goldish silver,
pyrite a silverish gold, wonder stone swirling, pure
oro-bit obtained when its “matrix was removed
with hydro-fluoric acid,” a bit of dark light extracted
from Midas Mine in 1932
looking now like a dried-out sponge,
desiccated paint rags, sweet mountain fart.

iv.

I hear Adolf Sutro jacked riches from these rocky slopes,
burnt, nubbed, wrenched, cracked,
all profits carted off to San Francisco
where he was building a gate and a cliff house
and a garden guarded by stone lions,
commissioning statues of Diana hunting and a stag hiding,
refurbishing a “cottage” in the fog on the bluff
near the farthest point of land
from which he could mayor the city
dreaming a eucalyptus forest
to cover the scrubby dunes and little sand flowers
wherever there weren't to be houses, streets, a park, shops.
Here, a glass case full of guns
lines one wall of the Ponderosa
and there's something in there called a Sweetwater,
two barrels and a fat stock: a Winchester
that puts me in mind of the mansion just south of the Bay
that the company heir built as she fled and chased the ghosts
of, she believed, everyone ever shot by one of her family's works,
she built room after room
for the dead, and brick walls
behind doors, tunnels colliding and missing and going nowhere
like the crisscross of hollow miles
running under this town. I can't help but wonder
what this particular Sweetwater did before retirement.

v.

Then the official tour takes us
under the Ponderosa
and we hear that the average lifespan of a miner was 42 years,
that the temperature in the tunnel was always 50 degrees,
that the men making \$4 a day (above average) in the late nineteenth century
to run drills that could blow up if slightly mishandled, pneumatic teeth
known as widowmakers, a tool that had replaced
slamming a forty-pound drill bit featuring, at one end, a four-pointed star
pattern of ridges—one man would twist it
a quarter turn between sledges, the other slamming it into the rock
and they would switch after thirty minutes
checking regularly for hot surface development

which would mean a steam pocket,
an underground hellstream boiling at 170 degrees
and capable of separating a man
from his skin in seconds—
so says the guide whose dentures bulge out
when he looks around, looks at bit like Kurt Vonnegut
when he names *the bonnet of steel*,
a thing that hung over the hoist
that hauled men up and down at high speeds,
the bonnet protecting against most falling rubble
but not all. One bell toll meant hoist, two meant *lower*,
three meant *man on, run slow*, nine meant
DANGER! DANGER!
Struts made of ponderosa pine reinforce
our tour route's tunnel
past a "dynamite room" smelling gently, says my girlfriend
like grandma's cellar, the best smell there is,
comfort of changelessness
of what ages to get more cantankerous—
no need for cap or fuse by the time they found
the abandoned sticks, all you had to do,
says the guide, was drop the pieces and everything would blow,
winze, drill, struts, vault, bar
out into the unmonetized sunlight—
but it has, of course, been safely removed
save the scent of cellar.
Beside the little compartment there's a flume,
a piece of what diverted water from the high Sierras
down across the Washoe Valley up to the reservoir
five miles outside town, a flume whose
boards got polished by all that fluming,
polished into outrageous cryptic shades
of red and brown, boards now lining the walls of the Ponderosa.
At the back of the dark cool narrowing way,
the guide shows us a stuffed canary in a cage
signifying the many who need oxygen,
and if it stops singing
it is because the earth has rejected
our digging, it is time to go
says the winged prisoner
with silence.

vi.

Later, after a beer named for a sea-dwelling dinosaur,
we stop back in the Ponderosa to pee
and I get to talking with our guide from the tour
on the question of what rock it is that's so red on the way in
and he says hard to say, you should go ask Mister G.,
he owned this mine and he's on A Street.
Well, he had dug the mine,
it turned out, which is a big difference, and he lived on B Street,
and he came out when we walked into his quiet crumbling courtyard
populated with mining refuse, his face pickled red,
his watery eyes wavering in a crimson juice,
his puffy cheeks clean-shaven, giving way to a little drip
down the corner of his mouth, and the perfume
of chew wafts mintily around his head.
Jasper, yes, and obsidian, silicate rose, quartz
is what the mountains on your way
mostly were, he says. And then he says he has a hummingbird
who's nested—right here, see?—on the rack of a buck
hung from the awning, the bird's two babies
each the size of a human nostril
hold perfectly still in the hopes we'll think them
ornaments or, better, won't think of them at all.
The mother peeps and flaps at us
until she gets tired and rests on a near-petrified saddle.
Then she's bobbing
somewhere behind me again and squeaking
at our presence, trying to get us to look at her
and not her babies in the nest a couple of feet away.
Will the town make it? I ask Mister G.
He laughs. It's a gentle snuffle.
Of course, he answers. They sell all that junk
down on C street to tourists.
He shows us what he's dug up. Bottles, picks,
knives—some for shaving, some pocket-size—
containers of all sorts, wheels, crucibles
to melt the money.



"NATURE WORKS BY BUILDING THE BLOCKS THAT BUILD LIFE. AND OUR SPECIES, AS WITH ALL OTHERS, IS BUILT FROM EXTRACTION AT EVERY LEVEL."

—WILLIAM L. FOX

CAN'T FIND MY WAY HOME

Janet Biggs

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Janet Biggs, a 2018 John Simon Guggenheim Foundation fellow, is known primarily for her work in video, photography and performance. She lives and works in Brooklyn, New York. Biggs' work focuses on individuals in extreme landscapes or situations and often navigates territory between art and science. She has captured such events as kayakers performing a synchronized ballet in Arctic waters and sulfur miners inside an active volcano. Recent projects have explored the creation and loss of memory from personal, physical, and scientific perspectives. Biggs' work has taken her into areas of conflict in the Horn of Africa and to Mars (as a member of crew 181 at the Mars Desert Research Station). She has collaborated with neuroscientists, Arctic explorers, aerospace engineers, astrophysicists, Yemeni refugees, and a robot.

In *A Step On the Sun*, the artist focuses on hardships overcome by a sulfur miner in the Ijen volcano, in the East Java province of Indonesia. Biggs' video centers around a crater situated almost two miles above sea level, which houses the world's largest sulfuric lake. We watch as the miner collects hardened sulfur crystals and packs them into a basket. Amid clouds of toxic sulfur dioxide gas, he carries heavy loads up a steep, rocky path from the crater floor to the rim, then to a distant weigh-station. The footage confronts us with a provocative mixture of natural beauty and human exploitation.

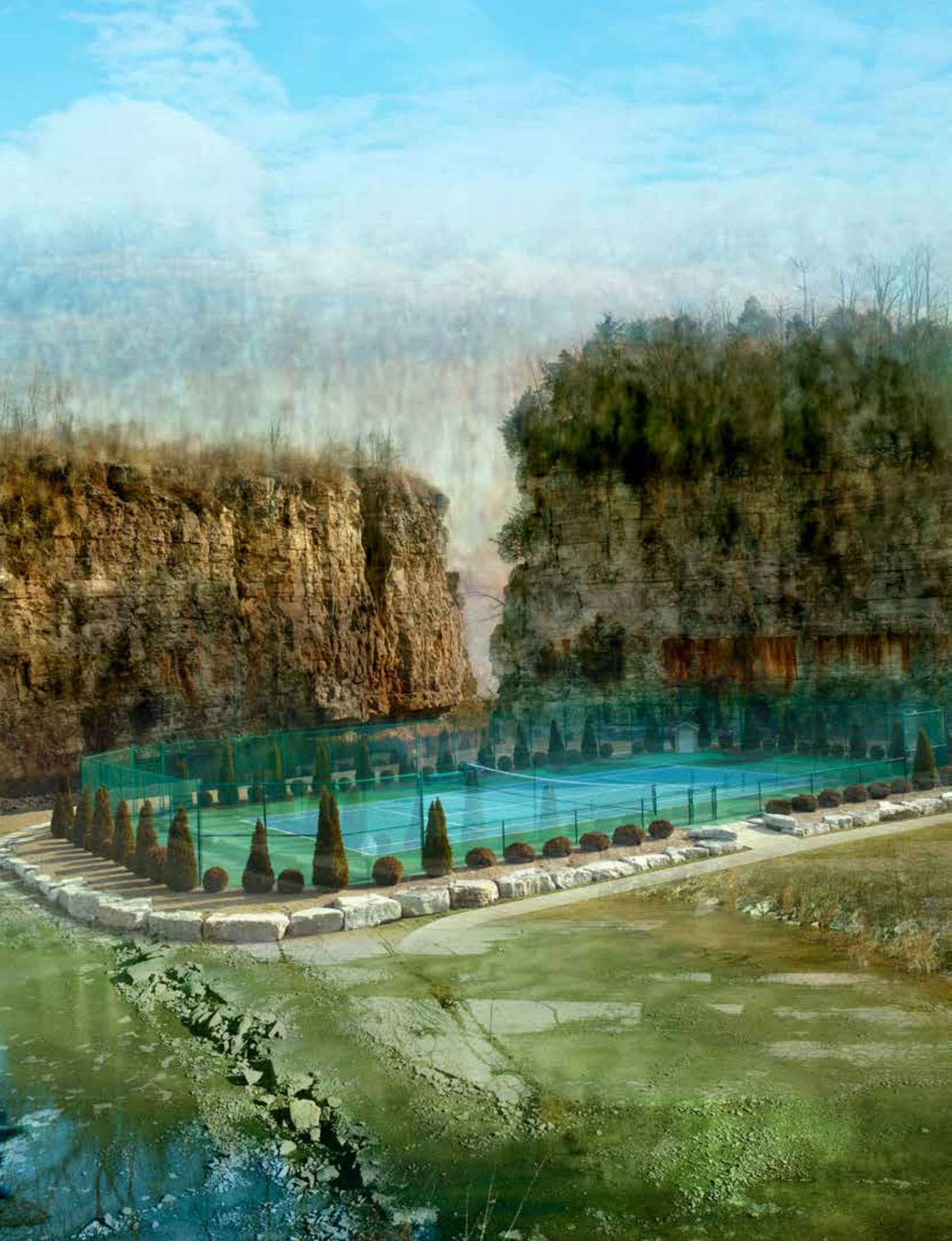
Can't Find my Way Home juxtaposes footage shot in the crystal caverns below the German Merkers salt mine with documentation of neurological research conducted in laboratories in New York and Houston. In doing so, Biggs draws visual connections between the structure of these crystals and the proteins that determine the biochemical conditions of a hyper-excited brain, such as one afflicted with Alzheimer's. By physically exploring the Merkers crystal cavern, Biggs figuratively sets out to investigate the diseased brain of her grandfather, tracing fading memories and making astonishing discoveries as she herself experiences disorientation and confusion, some of the same symptoms endured by Alzheimer's patients.



Above: Janet Biggs, *Can't Find My Way Home* (installation view at Blaffer Art Museum), 2015, four-channel HD video installation with sound. Running time: 08:19. Courtesy of the artist, Cristin Tierney Gallery, New York, NY, Galerie Analix Forever, Geneva, Switzerland and CONNERSMITH, Washington D.C.

Previous page: Janet Biggs, *A Step On the Sun*, 2012

Single channel HD video with sound. Running time: 12:28. Courtesy of the artist, Cristin Tierney Gallery, New York, NY, Galerie Analix Forever, Geneva, Switzerland and CONNERSMITH, Washington D. C.



Above: Elena Dorfman, *Empire Falling 21*, 2012, chromogenic print on metallic paper, 96 by 43.5 inches; Left: Elena Dorfman, *Empire Falling 6*, 2012, chromogenic print on metallic paper, 50 by 37 inches

EMPIRE FALLING

Elena Dorfman

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Elena Dorfman's photographs and video installations have been exhibited in both the U.S. and worldwide at venues including the Fondazione Prada, the Triennale di Milano, and the San Francisco Museum of Modern Art.

Empire Falling is artist Elena Dorfman's 2013 series of photographs, conceptual landscape images exploring the abandoned and active rock quarries of the Midwest, in Kentucky, Ohio, and Indiana. Using images made over the course of several years and numerous locations, the work presents a contemporary view of an ancient—though evolving—landscape.

"These seemingly ordinary sites, whose aggregate is mined until the earth has nothing left to give, have been a constant source of wonder to me," Dorfman writes. "What began as a sociological exploration of the communities that gather at quarries to jump from rocky precipices into water, evolved into a study of these massive pits, often overlooked and unseen. Using an archeological approach, I manipulate and reconstruct the landscape, reassembling and layering the pictures just as the oldest rock begins at the bottom and works its way up to the surface."

As globalization and consolidation continue unchecked, these astonishing landscapes are transfigured—with landfills, golf courses, and exclusive housing communities—wherein the quarry water element has, ironically, been incorporated into the development as a scenic or recreational point of focus. The images from *Empire Falling* present the quotidian rock landscape in an unexpected way, such that the viewers' perception is challenged not only by the imagery itself, but also by their own personal subjective relationships to industry and the evolving earth.

THE LANTHANIDE SERIES

Erin Marie Espelie

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Rare earth elements are not rare; rather, they are difficult and expensive to separate from minerals, such as bastnäsite, and surrounding rock. Moreover, their atomic orbits tend to get tangled together. Therefore, very few places on the planet have mined them successfully and it wasn't until the 1960s that any significant quantities were mined. The rapid rise of color televisions called for brighter hues in cathode ray tubes, and the vibrant and seductive red emitted by europium (Eu, atomic number 63) set mining companies into motion. To satisfy demand, the Mountain Pass Mine in California's Mojave Desert—roughly equidistant between Los Angeles and Las Vegas—churned out europium and then other rare earth elements. Until the 1980s, the U.S. dominated the production of rare earths, then China entered the market, with mining in Tianjin, near the Mongolian border, and both Jiangxi province and Guangdong provinces. By the late 1990s China had overtaken the Mountain Pass mine in production, with lower prices and higher yields, though not without environmental cost in Ganzhou and Baotu, where groundwater contamination along the Yellow River led to mass die-offs in livestock, soaring cancer rates in people, and the evacuations of entire villages.

The Mountain Pass Mine suffered its own environmental disaster in 1996 when a routine pipe cleaning went awry and about 300,000 gallons of radioactive waste spilled into the Ivanpah Valley. That event, compounded with other factors, sank the profit margin of the mine, causing it to close in 2002. China subsequently gained a 97 percent monopoly on production and started withholding stock, imposing taxes, and annual limits on exports, thus driving up prices. In its search for alternative rare earth sources, the U.S. turned to Afghanistan. Under military protection in 2009, scientists with the U.S Geological Survey scoured southern Afghanistan and pinpointed an extinct volcano, Khanneshin in Helmand Province, that contains an estimated 1.3 million metric tons of desirable rock upon which the Pentagon has placed a value of \$7.4 billion, with another \$82 billion more potentially to be mined. (According to *The New York Times*, in 2010, "American officials estimated that Afghanistan had untapped mineral deposits worth nearly \$1 trillion...")

Horribly, or thankfully, military action has been slow. Perhaps for that reason, the Mountain Pass Mine in California reopened in 2012, a time when dysprosium (Dy, atomic number 66), which is also mined there, was selling for more than \$1,000 per pound. That was when I visited the mine, in shooting for my 2014 film *The Lanthanide Series* (2014, 70 minutes). The mine was shuttered again in 2016, but has recently been purchased by MP Materials, which plans to resume mining sometime in 2020.



Erin Marie Espelie, *Automorphic 2*, from *The Lanthanide Series*, 2014, HD video still



Erin Marie Espelie, *Automorphic*, from *The Lanthanide Series*, 2014, HD video still



Erin Marie Espelie, Mountain Pass Mine 9, from *The Lanthanide Series*, 2014, HD video still



Erin Marie Espelie, Mountain Pass Mine 12, from *The Lanthanide Series*, 2014, HD video still

THE LANTHANIDE SERIES

(From the Periodic Table)

LANTHANUM: La, 57

Used in camera lenses and digital projectors; translated from Latin as “to escape notice”

CERIUM: Ce, 58

Used to polish optical glass and make lighter flints

PRASEODYMIUM: Pr, 59

Used in jet engines and to block UV rays

NEODYMIUM: Nd, 60

Essential magnetic force in headphones, microphones and speakers

PROMETHIUM: Pm, 61

Converts light into electricity; named after Prometheus, who stole fire from the Sun and gave it to humans

SAMARIUM: Sm, 62

Used in spacecraft motors and electric guitars

EUROPIUM: Eu, 63

Emits red light integral to televisions and digital projectors

GADOLINIUM: Gd, 64

Used in night vision goggles

TERBIUM: Tb, 65

Emits a yellow and green light in fluorescent lights, LCD screens, and banknotes

DYSPROSIUM: Dy, 66

From the Greek, dysprositos, “hard to obtain”

HOLMIUM: Ho, 67

Used in brain scans and other medical imaging

ERBIUM: Er, 68

Used to amplify fiber-optic communication

THULIUM: Tm, 69

Named for Thule, translated from Latin as “the northern most land”

YTTTERBIUM: Yb, 70

Used to gauge earthquakes, strengthen steel, and to locate cancer

DESERT GOLD, PART II

THE MOJAVE PROJECT

Kim Stringfellow

The General Mining Act of 1872 encourages exploration, claiming, and mining of valuable mineral deposits by U.S. citizens of “ordinary prudence” within public lands that are unclaimed and open for mineral entry [1]. *The Diggings*TM website states that 3,856,269 mining claims have been recorded within the U.S., of which about 10 percent are currently active. The U.S. Geological Survey (USGS) lists 139,591 records of mines in North America with California leading the nation with its inventory of 25,673—more than double that of the runner up, Nevada [2]. However, the majority of these mines located throughout the U.S. were closed or abandoned long ago.

Numbers aside, the statute is considered by its detractors as archaic, in that it imposed little, if any, regulation in an effort to encourage the development and exploitation of the nation’s mineral resources. Opponents argue that the law provides a “free ride” for mining interests as no royalty has ever been levied on profits earned on metallic minerals over the nearly 150 years the act has been in place. It is estimated that \$400 billion worth of gold and other lucrative minerals have been extracted in public lands without the American public receiving a dollar in return even though \$1 billion of metal continues to be mined annually [3].

In addition, the per-acre patent fees allowing for the outright purchase of mineral bearing of public lands—originally set at \$2.50 for placer claims and \$5 for lode claims while patenting was active—had not been raised since President Ulysses S. Grant first enacted the law. Although Congress imposed a moratorium on mineral patent applications on October 1, 1994 and no new patents have been issued since, mining watch dog groups argue that more than three million acres of public land have been

“given away” for a pittance to foreign and domestic mining entities since 1867 [4]. For instance, Canadian-owned Barrick Gold Corporation, who owns 75 percent of gold mining interests in Nevada, secured patents for over 1,800 acres of public land in 1994 just before mineral patenting had ended for around the price of \$9,000—at the time estimated to yield over \$10 billion worth of gold. In 2018 alone, Barrick’s worldwide operations generated \$7.24 billion and provided their shareholders with a 33 percent increase in annual dividends [5].

More perplexing is the fact that lawmakers have mostly failed to amend or modernize the 1872 law on these and other key issues. For instance, multinational mining corporations (many Canadian and foreign owned) operate within U.S. public lands without paying a cent on gold, silver, copper and the other valuable metallic minerals from which they profit most handsomely [6]. In contrast, the federal government collects annual royalties from 8 to 17 percent from corporations extracting coal, oil, and gas within U.S. public land and waters—representing billions of dollars in royalties. The Pew Charitable Trusts’ Campaign for Responsible Mining estimates the federal government, along with taxpayers loses, at minimum, \$160 million annually by failing not to impose similar levies on the hardrock metallic mining industry [7].

Some bold U.S. lawmakers have sought to reform the industry’s egregious tax breaks and hefty federal subsidies, dubbed “reverse royalties,” beginning as early as the mid-1860s—but with little success. The late Arkansas Senator Dale Bumpers had an ongoing annual debate on this divisive issue with Nevada Senator Harry Reid over an eight-year period beginning in the early 1990s. It should be noted that both Senators are Democrats. Reid, born and raised in Searchlight, Nevada, a dusty gold town sixty miles south of Las Vegas, explains his hardline and unrelenting support of the mining industry [8]. Reid’s opponent, Bumpers, considered the 1872 law to be “a license to steal and

a colossal scam.” Bumpers fought hard during his Senate tenure to see the act reformed—but to no avail—having stated that members of Congress “who perpetuated this unbelievable scam are never held accountable, because the public knows little, if anything, about the abuse [9].”

Although several bills have been introduced in recent years seeking to impose royalties on corporate mining profits—including one unsuccessful bid in 1993 by former Secretary of the Interior Bruce Babbitt—mining special interest groups such as the National Mining Association have also lobbied hard and very successfully to keep bills from passing, arguing that they pay their share of taxes and provide rural jobs. Babbitt’s push fell flat after Reid publicly opposed his bill along with another one that would have eliminated a tax break for corporate mining companies—saving them around \$327 million a year in taxes [10]. As long as Reid remained in office he would continue to thwart any similar bill that came his way.

A later effort to reign in industrial mining activities occurred in 2007 when the House of Representatives passed The Hardrock Mining and Reclamation Act that would, if enacted, levy a 4 percent royalty on existing mining at unpatented claims and 8 percent on any new mining operation. Private or previously patented claims were to be exempt. 70 percent of the royalty fees were to be set aside to remediate abandoned mining claims with the remaining 30 percent given out as aid to communities negatively affected by such activities. Even the Bush administration toyed with the idea implementing royalties on metal mining production [11]. In contrast, during his 2007 presidential election campaign, then Senator Barack Obama balked at imposing royalties on mining interests, commenting, “legislation that’s been proposed places a significant burden on the mining industry and could have a significant impact on jobs [12].” Nevada, as it turned out, was a crucial swing state. The U.S.

Senate eventually killed the bill in 2009. Another version of this bill similarly died in 2011.

Senator Tom Udall (D-NM) and Chairman of the House Natural Resources Committee Raúl Grijalva (D-AZ) have co-sponsored a reform bill in 2019 that would require a 12.5 percent royalty on any new hardrock mining operation and an 8 percent royalty on existing ones—making more than \$50,000 in annual income. With this bill, 25 percent of the collected revenues would go to the state where the mine is located and the rest will supplement a federal reclamation fund [13].

Notably, eighteenth and early nineteenth century mining operations were miniscule in scale compared to today’s open pit cyanide heap leach operations. Consider the massive scale of the largest gold mine in North America—the Goldstrike Mine owned by Barrick Gold Corporation—geographically positioned along the microscopically gold-rich Carlin Trend of northeastern Nevada. The company’s website states that the “ultimate pit will measure approximately two miles east to west, 1.5 miles north to south, and have an average depth of approximately 1,300 ft [14].”

Regardless of their physical footprints, many smaller historical mines have resulted in lingering environmental damage, dangerous physical safety hazards and, at times, staggering ecological devastation. Thousands of historic, abandoned small-scale mining operations remain physically accessible and many require extensive environmental site remediation. With owners long gone or bankrupt, the federal government and consequently, the taxpayer, are left to foot the bill.

The Bureau of Land Management (BLM) manages these abandoned extractive follies on public lands throughout the West. Although the actual number of historic mining sites in the California Desert District is unknown, a 2014 USGS study estimates that there are 22,730 abandoned mine sites with 79,757 individual features located across thirty-five million acres of arid lands of central and southern Califor-



The historic Yellow Aster gold mine above Randsburg, CA was transformed into an open-pit cyanide heap leach operation during the 1990s.

nia. The BLM's Abandoned Mine Lands (AML) program whose mission is to "mitigate and remediate hard rock AML sites on or affecting public lands" suggests that within the Mojave Desert region there are 17,060 AML sites alone that require further study and possible remediation [15].

It should come as no surprise that the 1872 act did not include a requirement for post-operational mining reclamation—the idea was simply unheard of at the time. It would take one hundred years—with the passing of the Federal Land Policy and Management Act (FLPMA) in 1976—for specific reclamation requirements to be implemented once mining operations ceased. The Surface Mining Control and Reclamation Act (SMCRA) of 1977 was then federally enacted by the Carter administration to counter the environmental effects of coal strip mining. SMCRA additionally administers abandoned mines on

federal lands and requires all active mining operations to post a bond to ensure that adequate funds are set aside for reclamation purposes. Two years before SMCRA, the California state legislature enacted The Surface Mining and Reclamation Act (SMARA) of 1975, "to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative impacts of surface mining to public health, property and the environment."

In 2003, the California State Mining and Geology Board adopted regulations requiring the backfilling of open pit metallic mines within the state "to a condition that approximates the natural condition of the surrounding land and topography [16]." Although most large open pit metallic mines are not required to fully backfill the excavated pit upon closure they must recontour the pit's slopes to lessen the steepness of the grade. Spent heap leach pads,

overburden and waste piles, sometimes miles in length, must be graded and revegetated. All mine buildings, mills and other structures must be dismantled and torn down.

The EPA lists industrial metallic mining as the largest toxic polluter in the nation. Consequently, many former mining sites require costly, and mostly continuous, environmental, health and/or safety remediation. Closure or reclamation bonds have been mandatory for mineral mining operations in the U.S. since 1977 in an effort to guarantee that former mining sites will be properly remediated and reclaimed once operations cease. It is important to note that a number of mining companies have been shown to be inadequately financed due to the fact that they are "self-bonded." Once bankrupt, these same mining operations abandon the site leaving future cleanup costs in the hands of the taxpayer—illustrating how current financial assurance of reclamation bonds fails to cover the true, long-term cost of reclamation.

Responding to the failed self-bonding practice, the Obama administration later mandated that the Environmental Protection Agency (EPA) force hardrock mining operations to secure separate sources for mine clean up funding. The Trump administration, who is unraveling years of hard-won environmental regulation at many federal agencies, reversed this decision in late 2017. The reversal is being contested in court as it violates the 1980 law that spawned the Superfund program. Further, the Trump administration has very enthusiastically reopened 1.3 million acres (more than 2,000 square miles) of mining claims within the California deserts during 2018 that had been previously made off limits for extractive industry use by the Obama administration.

All in all, open pit, industrial-scale metallic extraction processes—especially those involving the cyanide heap leach method—are extremely problematic on a multitude of levels so a detailed overview of its history and process is warranted.



Cyanidation is a hydrometallurgical leaching method where aqueous cyanide is used to dissolve and extract microscopic gold and other precious metals from lower grade ores. As early as 1783, chemists knew that aqueous cyanide solution could dissolve gold, however, it took nearly one hundred years for the technique to be refined and utilized at large-scale gold extraction operations [17]. In 1887, Scottish mining chemists developed the MacArthur-Forrest cyanide process, which was first implemented successfully at South Africa's Witwatersrand mining district in 1890. The Mercur Mine in Utah was the first American outfit to make use of the process during the following year. By suspending crushed ore in aqueous cyanide solution, up to 96 percent pure gold could be recovered. Cyanidation would revolutionize and replace the mercury amalgamation process at larger mining operations by the 1920s. Today, the process is used in 90 percent of all gold production worldwide.

Although cyanide is highly toxic and capable of causing immediate death in a variety of forms, it is relatively cheap and readily available for industrial purposes. Cyanide, for the most part, is biodegradable; exposing cyanide to sunlight, oxidizing it with bleach or hydrogen peroxide and allowing microbial processes to convert it into ammonia are ways cyanide is neutralized or broken down.[18] Although cyanide is manufactured primarily for industrial mining purposes, it also occurs naturally. A variety of plants and organisms, including some insects, along with certain bacteria, fungi and a surprising number of common vegetables, such as cassava root, along with seeds and pits from a variety of stone fruits, contain a form of the chemical.

The mining industry was once again transformed through an updated variation of the cyanidation process during the 1970s with wide-spread implementation of industrial-scale, open pit cyanide "heap leaching"—which allows lower-grade



Retired miner Tom O'Donnell, a.k.a. "Ordinary Tom" in front of his historic home in Randsburg, CA

gold ores, containing as little as .02 ounces, to be mined profitably. Because conventionally mined, high-grade ore bodies were largely exhausted, mining industry enthusiasts welcomed the technology when the U.S. Bureau of Mines began promoting the cost-effective technique in 1969 [19]. Detractors of the cyanide heap leach method have compared it to "dirt mining."

Indeed, cyanide heap leach operations require massive earth moving, along with the energy to do so, plus billions of gallons of groundwater for processing ore. At some Nevada heap leach operations, whose production equals three quarters of all gold mined within the United States, up to one hundred tons or more of material is unearthed to yield a single ounce of gold [20]. Earthworks, a mining watchdog

group, estimates that the production of one gold wedding ring today generates at least twenty tons of mine waste along with thirteen pounds of toxic emissions containing lead, arsenic, cyanide and mercury [21]. The Environmental Protection Agency (EPA) ranks the industrial-scale metallic mining as the nation's top polluter of chemical compounds released into the environment [22].

The process is designed as a closed loop system where highly alkaline aqueous sodium cyanide solution is dripped or sprayed onto industrial plastic-lined concrete pads laden with massive mountains of ore [23]. Once applied, the oxygenated "lixiviant" or leaching solution percolates through the heap, binding with the gold, eventually collecting into underground piping leading to the "preg

pond," which, as its name implies, is "pregnant" with microscopic gold. The process takes several weeks to months to complete—depending on the grain size of the ore and the height of the pad.

This concentrated gold-bearing cyanide liquor is then pumped into the recovery plant where giant vertical tanks containing very fine activated carbon that my friend, Tom O'Donnell, former metallurgist at the Rand Mining Company (RMC)[24] and long-time Randsburg, California resident, gleefully states, "the gold loves." Attracted to the carbon, the gold abandons the cyanide to wait for further processing. The now-barren cyanide solution is replenished and re-circulated onto the leach pad. If, during the process, the massive mountain of ore somehow collapses—the entire operation is halted so the heap can be bulldozed back onto the pad. The ongoing threat of cyanide escaping this closed loop system is never taken lightly; "You never, ever, let that stuff get off that pad. You got people there 24 hours a day and that is their job to keep that cyanide inside the fence," O'Donnell states.

After filtering this gold-bearing carbon concoction, caustic soda is added, dissolved and heated, which in turn, releases the gold from the carbon to produce a highly-concentrated gold-bearing solution. This mixture is pumped into a "cell" with positive and negative termination where it undergoes the electrowinning process first developed in 1807. A strong electrical current causes the gold to collect in the cell's negatively-charged steel wool that is later recovered by melting the wool with flux in the furnace at around 2,100° Fahrenheit. Eventually, the iron rises to the surface and the heavier gold sinks to the bottom. The iron and flux is discarded leaving the remaining gold to be poured and molded into gold doré buttons ready for further refinement.

Magical, yes, but when all is said and done, a number of the world's biggest cyanide heap leach operations have failed miserably over time. To date, the largest cyanide-related catastrophe in the U.S. occurred at the Summitville Mine in southwestern

Colorado. In 1992, after leaching around ten million tons of gold and silver ore over a five-year period, resulting in 160 million gallons of cyanide-laced water, Canadian-based Galactic Resources Ltd. filed for bankruptcy and abandoned the site.

Soon it was disclosed that nearly 85,000 gallons of cyanide-contaminated waste along with acid mine drain containing heavy metals had leaked in the neighboring watershed including the nearby Alamosa River completely killing off all fish and other riparian wildlife over a seventeen-mile stretch of the river [25]. The mine became a Superfund site in 1994, eventually requiring \$250 million of federal funding for remediation plus an ongoing \$2 million per year bill that Colorado taxpayers will need to continuously pay for many years to come. The Summitville Mine's owner, Robert Friedland, who holds dual citizenship in both Canada and the U.S., ended up paying only \$20 million out of pocket for remediation work of the Alamosa River but took in an estimated gross income of \$150 million from the mine while it was operational [26].

The Zortman-Landusky mines, bordering the Fort Belknap homeland of the Assiniboine (Nakoda) and Gros Ventre (Aaniiih) Nations in the Little Rocky Mountains of north central Montana, provides another example. One of the first heap leach operations in the county, the Zortman-Landusky had numerous cyanide spills while operational with the largest single incident involving 50,000 gallons [27]. Over time, related surface and groundwater pollution has resulted from their gold and silver mining activities in the form of extensive acid mine drainage plus arsenic, lead, and other heavy metal contamination. The mine's owner, Canadian-based Pegasus Gold Corp., began mining operations in 1979. Nineteen years later they went bankrupt and walked away from this ongoing water pollution disaster that has to date cost \$100 million along with an additional \$2 million a year paid by the state of Montana to contain the contaminated wastewater. Even though Pegasus set aside bond monies for

such disasters, as required by law, taxpayers have taken up the bulk of the reclamation costs with the total clean up estimated to be in the tens of millions of dollars.

Understandably, a Montana citizen's initiative banned cyanide heap leach operations in 1998. Wisconsin followed in 2001. Since that time other disastrous spills have occurred in North America include the 2014 Mount Polley Mine tailings pond dam breach at Imperial Metals in British Columbia and the Colorado's 2015 Gold King Mine acid mine drain spill where the Environmental Protection Agency (EPA) and subcontracted workers charged with cleaning up the abandoned mine ended up accidentally releasing toxic water into the Animas River watershed. Cyanide heap leach operations continue to operate in California and Nevada—even though the EPA states that mining interests have polluted streams in 40 percent of the West's watersheds [28]. In 2017 alone, metallic-bearing mines generated nearly two billion pounds of toxic waste—equaling half the amount produced by all industries combined nationwide [29].

Nevada, the nation's largest producer of gold, currently allows new mines to begin operations with full disclosure that they will pollute the surrounding watershed—possibly in perpetuity—which could require indefinite remediation to clean up contaminated groundwater, streams and pit lakes. The 2019 Udall/Grijalva bill, if passed, would ban this practice [30].

Jim Kuipers, a hardrock mining engineer consultant, stated in a 2003 Mineral Policy Center report that taxpayers are likely to foot \$1 to \$12 billion in projected clean up costs at hardrock metallic mining sites across the country due to lax regulation and inadequate financial assurance upon mine closure or abandonment. The EPA says this figure is higher—\$35 billion or more to remediate abandoned mines found across thirty-two states [31].

But this story is more complicated than it appears at first glance. Tom O'Donnell, a.k.a. "Ordinary Tom,"

defends the process, having overseen the cyanide heap operation at RMC from 1989 to 1994. RMC's 2,520 acres of public and private holdings included the historic Baltic, Lamont, and Yellow Aster mine, whose original "glory hole" was subsumed by RMC's heap leach operation. During active production, RMC, on average, processed 45,000 tons of material ultimately recovering one million ounces of gold over the eleven years the mine complex was operational [32].

Tom, a kind, gracious, progressively-minded man, now in his mid-sixties, began his career path in the Air Force where he served in Vietnam as a Crash Rescue Firefighter. Having been honorably discharged from the military in 1968, Tom worked a variety of jobs throughout the western United States and Alaska, including a stint as a photojournalist stringer for the Seattle Post Intelligencer, a cook on a tugboat, a logger and long hauler. After delivering a load to a mine in New Mexico, he was hired on the spot as a hardrock miner, which led him back to Alaska until he returned to New Mexico, eventually enrolling at Socorro's New Mexico Tech chemistry program. After graduation he worked at a number of western mining operations, including RMC, plus a later stint at Panamint Valley's Briggs Gold Mine located near Ballarat, California. But by his late thirties he had already determined that he could physically toil underground for just so long so overseeing heavy equipment operators, massive earthmovers and construction crews required for this new type of "mining" operation at RMC served him well.

O'Donnell is fascinated by the alchemy of the cyanidation process stating that "we don't know exactly how the gold complexes with cyanide, or, for that matter, why it releases into the carbon." When asked about the downside of the cyanide heap leach process, including its poor environmental report card, he'll defend his work at RMC stressing, "who lives closest to the mines—the miners!" Although our opinions differ about the merits of cyanide heap leach technology and mining microscopic gold and



The Consolidated Mine adjacent to O'Donnell's Randsburg home. A couple of old timers worked this underground mine into the 1980s. It has been shuttered since.

other profitable metals at such a massive scale, I respect Tom immensely as he is open to debate and willing to consider multiple sides of this contentious issue. Tom, reflective of many other men and women like him, are proud of their careers in the mining industry, which provides much needed skilled and higher-than-average paying jobs in many rural regions of the West. His friendship provides an insider's look into an industry that I would not have encountered in my day-to-day life if I had not embarked on a project looking closely at the culture and geology of the Mojave Desert.



Large-scale, industrial mining in Randsburg faded out during the early 2000s when RMC shuttered operations leaving off-roading and related tourism

as the primary economic force driving the community. The BLM continues to manage the Rand Mining District's public lands, including the plethora of abandoned mines surrounding the town.

It should be mentioned too that RMC, like many other industrial operations of similar scale, had its share of accidents and wildlife fatalities, but no single incident was exceptionally newsworthy [33]. This is perhaps due to the fact that catastrophic surface stream and watershed contamination is less of an issue in the Mojave Desert due to the absence of such pronounced aquatic features near most of the region's desert mining sites [34]. Still, these former mining operations present other serious environmental challenges including ground, airborne and groundwater contamination.

In early 2006, it was determined by the Department of the Interior (DOI) that the Rand Mining



Thousands of abandoned mining hazards like this one in Goldfield's historic mining district are scattered across the Mojave Desert.

District (RMD) had severe levels of arsenic contamination measuring 4,700 times higher than what the EPA considers acceptably safe, triggering a rarely-enforced DOI Flash Report [35]. Arsenic is a common, naturally occurring element. Generally, it is a significant component of gold deposits found within the western United States. In areas that have been extensively mined arsenic levels are often elevated, which can lead to environmental contamination.

This well-known poison can be toxic and can cause mortality to both humans and wildlife. Mining processes unearth and concentrate arsenic in spent mine tailings and waste ponds, which sometimes leads to groundwater contamination. The 2007 DOI report identified “arsenic contamination in over 3,000 acres of mine tailings and 500,000 tons of additional mining related waste rock” within the RMD estimating the cost to cleanup at \$170

million—at the time considered to be the largest BLM remediation project in its history [36]. Responding to the DOI report the BLM initiated their Abandoned Mine Lands (AML) program in 2009 to deal with the issue.

In addition to arsenic contamination, high levels of toxic mercury, lead and other heavy metals were also measured throughout the site but airborne arsenic hazard carried by dry desert winds and exacerbated by recreational off-road use is still the main health concern. The 2007 DOI report listed as many as 30,000 visitors utilizing the area on holiday weekends. For many years, off-roaders drove on the popular Route 110 trail leading across a sixty-acre arsenic-contaminated former mill site before it was closed in 2007 due to its potential to expose riders to toxic dust. Off-highway vehicle (OHV) trails on desert public lands within the surrounding area were

posted with warning signs and/or cordoned off thus limiting recreational access.

Because Randsburg is economically dependent on OHV recreation and related tourism the closures proved controversial for business owners and many local residents. After BLM oversaw mitigation work at the mill site that included fencing off and capping the arsenic hazard with an earthen berm, rerouting Route 110 alongside the fence line and posting arsenic warning signs, the trail was reopened to riders. When asked about the arsenic contamination O'Donnell casually brushes the issue aside commenting, “Well, no one in town has died from arsenic as far as I know and we've have had our share of old timers that have lived to nearly one hundred.”

In 1984 and 1997, the BLM allowed the Randsburg and other area residents to purchase titles to their properties but only if buyers agreed to indemnify or hold harmless the federal government in regards to exposure to hazardous materials from mining activities. BLM supervisors had known about the district's arsenic contamination for decades but failed to officially test and assess how widespread and serious the hazard actually was. A 2008 DOI audit report additionally criticized the agency for its marginalization of the arsenic contamination issue along with its neglect to identify and secure physical hazards at the many abandoned mines found across the public lands they manage. Indeed, the report stated that some BLM employees had even received threats after identifying grossly contaminated or unsafe former mining sites because their supervisors worried, that in some cases, by identifying the hazard the agency would be more susceptible to lawsuits [37].

True, these physical safety hazards are not exaggerated. Every year, curious explorers of abandoned mines, both seasoned and amateur, along with a number of unwary victims are seriously injured or even die after knowingly or unknowingly entering one of these many dark, subterranean spaces. Accidents include falling or driving vehicles into shafts,

encountering poisonous gasses or no air at all deep inside tunnels, drowning in flooded chasms, being crushed when aging mine support structures fail or even being blown to bits by long forgotten stashes of dynamite.

Forty plus accidental deaths have been documented in abandoned California desert mines since the mid-1970s. In separate incidents, three people accidentally fell to their death upon entering the “ant trap” funnel mine shaft of the Goat Basin Mine bordering the eastern edge of Joshua Tree National Park. Several deaths have occurred in the Rand Mining District, including that of twenty-one year-old Matthew Frey who would plunge to his demise in November 2004 after riding his motorcycle up a moderate incline and falling into a 700-foot-abys in the neighboring Spangler Hills OHV area.

Two years before Frey's death, a fourteen-year old boy would be luckier—this dirt bike rider would tumble into a nearby 780-foot shaft but was saved after landing on a support beam some 200-feet below. Sterling White, who administers the BLM's California AML program commented that Randsburg's Baltic Mine area alone had 300 holes to his agency had to contend with. In 2019, they will oversee sixty mining-related “features” requiring securing in the Red Mountain area. Indeed, out of the thousands of identified abandoned mining sites, each has up to a dozen hazardous mining-related features that require mitigation. Millions of dollars have been spent so far in an ongoing effort to do so.

Other OHV-related fatalities resulting from falling into abandoned mines would occur in the Calico Hills OHV area and other areas of the Mojave Desert. In 2007, a young girl died when she and her sister accidently drove their all-terrain vehicle into a 125-foot mineshaft while riding in the Windy Point Recreation area outside of Kingman, Arizona. Unsuspecting tourists have nearly backed into holes large enough to swallow entire vehicles. A rancher on horseback survived a fall into a collapsed horizontal shaft or adit. Dogs have been successfully

rescued, but certainly this has not been case for the multitude of livestock and wildlife that have unwittingly plunged to their deaths. Sadly, dead bodies are sporadically found dumped in mineshafts as well. The BLM, NPS, private landowners and even recreational off-roading clubs such as the Havasu Four Wheelers have secured some of the most egregious hazards, often using steel bat gates, but many remain humanly accessible—sometimes because fences or warning signs are illegally removed. Still, the BLM discourages community involvement because anyone or group doing so then becomes legally liable for any accident or death that may occur after the modification.

Abandoned underground mines have found reuse as Cold War-era bomb shelters, and more creatively, as a community-led time capsule project. Various municipal civil defense entities have in the past outfitted subterranean spaces for nuclear fallout shelters—some equipped with enough supplies to support 17,000 survivors, provide decontamination plus a water supply. Such was the case of U.S. Borax’s tunnel shelter constructed within the old Suckow colemanite mine now part of the open pit Rio Tinto Mine in Boron, California [38]. Victorville provided a similar service for 200 individuals at the nearby Apex Mine. The Sidewinder Mine, located between Victorville and Barstow, could host 859 people in the event of a nuclear war providing them with 200-bed hospital, a library and exercise room in exchange for materials, cash and/or labor to secure their spot. A seed bank was also housed here.

Rosamond, California’s 300-foot long Tropic Time Tunnel, housed in a former gold mine [39] of the same name donated for the purpose, was sealed with concrete on November 20, 1966 containing a brand new Yamaha motorcycle, a baseball autographed by Willie Mays, a model of the XB-70 bomber, a typewriter, twelve copies of the Antelope Valley Press, a packed suit case, a female mannequin and a local’s favorite fishing shirt among many other mundane domestic and everyday objects donated for

the purpose by local residents. The time capsule was the brainchild of Jack Tomlinson, a San Francisco State University biology professor. The public mine sealing event coincided with Kern County’s centennial with the “unsealing” of the capsule scheduled for the county’s 100th birthday in 2866 [40].

Just a few miles north of the Tropic Mine is the only industrial cyanide heap leach operation currently active in the Mojave Desert. The Canadian-owned Golden Queen Mine LLC in Mojave, California runs 24/7 on Soledad Mountain, located just west of State Route 14. Gold was originally discovered here in 1894. Along with the Randburg’s Yellow Aster, these two mines produced half of all gold mined in Kern County. Several of Soledad Mountain’s mines were consolidated into the Golden Queen Mining Company in 1935 which operated until 1942 when Limitation Order L-208 was enacted effectively outlawing mining of non-strategic metals such as gold and silver during wartime. The majority of the Mojave District gold and silver mines have remained inactive after WWII ended.

The company that currently runs Golden Queen purchased it during the mid-1980s but did not commence operations until 2016. As of July 2019, Golden Queen LLC’s stock was listed at \$0.0155 per share. Their website published a one-month loan payment extension in the amount of \$75,000 posted on January 31st, 2019.

Further west, on the southwestern slope of the Panamint Range near Ballarat in Inyo County, lies the inactive Briggs Gold Mine named after Harry Briggs who operated a mill and cyanide plant below nearby Manly Falls during the 1930s. CR Briggs Corporation began their open pit heap leach operation in 1996, producing 550,000 ounces of gold until they shuttered operations in 2004 [41]. CR Briggs was invariably a highly controversial mining operation due to its proximity to Death Valley National Park, which is a mere stones throw away. When gold prices rose in 2009, Atna Resources LTD reopened the mine but went bankrupt by 2015. DV Natural Re-



A view of Columbia Mountain, Goldfield, NV. Just north of the peak are the infamous Sandstorm group of claims that launched Goldfield’s rush in 1902.

sources, LLC, a Virginia-based company currently owns the mine. Renewed attacks on the 2016 Desert Renewable Energy Conservation Plan (DRECP) by the Trump administration that have previously protected Panamint Valley from further industrial mining activities may allow Briggs to resume operations along with a separately proposed lithium mine on the valley floor.

East of Briggs and about one hundred miles west of Las Vegas, the Castle Mountains rise out of northern Lanfair Valley. The Hart Mining District had previously sprung to life here in 1907 after gold had been discovered. Hart faded out by 1915 but seventy-five years later Viceroy Gold Corporation would resume mining operations via cyanide heap leach until they, too, closed in 2001. NewCastle Gold Ltd. would purchase the 1,375-acre site in 2012 and re-

sell it in October 2017 to Vancouver-based Trek Mining Inc., soon after renamed Equinox Gold [42].

A year before the sale, President Obama had signed an act designating a remote 20,920-acre parcel surrounding the site as the Castle Mountain National Monument—just before he left office in January 2016. His effort would fill a missing piece of the Mojave National Preserve that borders the mine on three sides. Obama’s designation was celebrated as a suitable compromise for both the mining industry and environmentalists but with one hitch—the deal included an option to continue mining through 2026.

Behind closed doors it is apparent that NewCastle was not entirely happy with the Obama administration’s earlier deal. By mid-2017, if only by coincidence, Representative Paul Cook (R-Yucca Valley) demanded that former Interior Secretary Ryan Zinke reduce the monument by 50 percent. It



The town of Goldfield, NV at sunset viewed from the historic mining district

should be noted that NewCastle was in the process of selling the mine to Trek/Equinox during Cook's request. More revealing is the urgency to suddenly reopen the mine—apparently driven by language within the monument designation stating that if no mining resumes within ten years of the act's signing then the holdings would be transferred to the National Park Service thus becoming part of the larger Mojave National Preserve. Cook's boundary adjustment request continues to be under consideration by Zinke's replacement David Bernhardt. If realized, the mine's activities will create ongoing vehicular traffic, noise disturbances, possible pollution along with excessive groundwater depletion that will most likely impact the sensitive Piute Spring, the only perennial stream in the area.

Equinox Gold completed their pre-feasibility study in July 2018. Construction of the heap leach pad and commissioning of the processing plant is

expected for late-2019. Their website states, "The Castle Mountain heap leach gold mine in California produced more than one million ounces of gold from 1992 to 2004. Equinox Gold intends to put the mine back into production with the expectation of producing 2.8 million ounces of gold and generating U.S. \$865 million in after-tax cash flow over a sixteen-year mine site [43]." To do so, Equinox will need to re-excavate fifty-one million tons of material that was previously dug out and used to fill the pit it had created during the process. It appears that looser federal mining regulations bought on by the Trump administration are the incentive to begin gold mining here and in other areas of the Mojave.

Perhaps most disturbing is an ongoing proposal for an open pit cyanide heap leach operation within the Inyo Mountains' remote Conglomerate Mesa, located west of Death Valley National Park. The mesa lies directly south of Cerro Gordo Peak and just

north of the Malpais Mesa Wilderness. Unlike the heap leach mining operations at Soledad and Castle mountains or even Randsburg, where extensive mineral extraction had previously occurred, Conglomerate Mesa has never been historically mined although the area was used to primitively produce charcoal for the nearby Cerro Gordo Mines. The mesa is an important indigenous site for local tribes having served historically as a seasonal piñon seed harvesting area. Since 1984, no less than ten mining companies have tested for gold at this rugged, roadless 7,000-acre site and left, dissatisfied with their findings.

The latest outfit to do so is Vancouver-based Silver Standard Resources (now SSR Mining Inc.), owner of Nevada's Marigold Mine, an enormous Carlin-type heap leach operation located in northwestern Nevada. SSR obtained permits in May 2018 from the BLM for seven 1,000-foot exploratory test-drilling sites to be accessed entirely by helicopter for their speculative "Perdito Exploratory Project." SSR's exploration activities would have necessitated up to 1,000 gallons of water per day requiring a hose line to be laid from an existing road to the drilling site, 24/7 illumination of the work area to allow for continuous construction and drilling plus multiple daily helicopter flights to transport crew members, drilling rig, generator, out-house and other necessary equipment—in a setting devoid of human activity other than an occasional jet flying miles overhead [44].

Conglomerate Mesa is designated California Desert National Conservation Lands under the 2016 Desert Renewable Energy Conservation Plan (DRECP) with an Area of Critical Environmental Concern (ACEC) requiring "special management attention" by the BLM. Previous test drilling at the Perdito site yielded unsatisfactory results. Not surprisingly, under mounting opposition from public and environmental groups, SSR withdrew its application by mid-summer. However, the actual claim-holders, partners Steven J. Van Ert and Noel Cousins, both of Chatsworth, California, who have 444 twen-

ty-acre active mineral lode claims between them, on or near the mesa, covering 8,800 acres, were given the option to transfer the drilling authorization to themselves [45]. This provides Van Ert and Cousins with an opportunity to "indefinitely pitch the project to other mining companies, leaving the future of Conglomerate Mesa in limbo [46]."

Keep in mind that the annual maintenance fee for each of these Conglomerate Mesa area claims is \$155 so the duo must pay a total of \$68,820 in federal fees a year just to retain their active status [47]. According to a December 2017 article by Tom Budlong in Desert Report if they had been successful in securing SSR to test drill here, Van Ert and Cousins would have collected \$710,000 for a three-year lease option and several million more once production began, according to SEC documents filed on March 22, 2016 [48].

Friends of the Inyo and several other environmental groups filed for the BLM to conduct a formal review by the state director of the project in November 2018 expecting to hear a decision within three months but the winter 2019 government shutdown delayed it until May when it was announced that the "Perdito Project will stand and exploratory drilling can move forward [49]." If Van Ert and Cousins enlist some new company to explore and mine at Conglomerate Mesa, a bleak and discouraging precedent in wildlands protections will be set allowing multinational extraction corporations to swoop into California and other western states and set up industrial-scale heap leach operations wherever they see fit.

Biologists stress, too, that keeping Conglomerate Mesa remote and undeveloped is critical for the endemic Inyo Rocky Daisy (*Perityle inyoensis*) that is classified a BLM-sensitive species and also for the Joshua tree (*Yucca brevifolia*) in that as the species begins its retreat due to climate change from lower elevations, including Joshua Tree National Park, to higher areas at 3,800 to 7,700 feet, wilderness areas such as the mesa will afford a haven for the retreat-

ing species and provide a crucial habitat for its ongoing survival.

Over the state line in Nevada, the Bullfrog/Beatty Mining Districts remain the only active large-scale gold mining areas within the state's eastern Mojave Desert. Nevada is the nation's top gold producer with the majority of the state's active open-pit industrial-scale gold mines located in its northwestern Great Basin interior where massive Carlin-type gold reserves are geologically situated.

At the start of 2019, the Pahrump Valley News reported that Beatty was undergoing a gold mining renaissance—two major international gold extraction corporations were conducting exploratory drilling, including South Africa-based AngloGold Ashanti, noted to be the third largest gold producer in the world. Several smaller players, including a couple of U.S. based mining companies, were also conducting feasibility testing and research.

The Sterling Gold Mine, located fourteen miles southeast of Beatty, California, was operated between 2007 and 2011 by Vancouver B.C.-based, Imperial Metals—the same outfit responsible for the August 2014 Mount Polly mine tailings breach. Canadian-based Northern Empire Resources, Corp. purchased Sterling from Imperial Metals for \$10 million in May 2017, flipping the property a year and half later when major player Coeur Mining Inc. acquired Sterling in August 2018 for \$90 million—a transaction reflecting the dizzying world of speculative international metallic mine trading.

It is interesting to note the Pahrump Valley News reported in March 2014 that Northern Empire's mining activities had forced the Nevada Department of Wildlife to relocate "herds" of bighorn sheep from the active mining area—operational for a mere four years. Sterling's general manager Chuck Stevens was quoted in the article stating, "Because the herd is so large they're flying them out of here and shipping them out of state. They net them on the mountain range, fly them down, then we give them a physical exam, measure them, weigh them, put

them in a trailer and haul them to wherever they're going to relocate them [50]."

In Arizona's northwestern Mojave Desert, known for its own rich history of nineteenth century gold mining, the historic 1902 Gold Road Mine at Oatman, Arizona, was operated as a cyanide heap leach from 1995 until 1998 and then reopened from 2010 to 2016. Columbia-based Para Resources Inc. which "specializes in low-risk, low-cost gold projects in North and South America that have strong development potential" purchased this fully-permitted modestly-sized mine for \$7 million in August 2017 and began underground mining operations in late 2018 [51].



Mining will always be a crucial part of our nation's economy. While many materials, chemicals and products used in everyday life are derived from rich mineral resources extracted within the Mojave Desert, gold, mainly mined worldwide for economic gain and adornment, serves no real benefit for humankind—other than the continued exploitation of publicly-held mineral resources that provide enormous profits for a handful of mostly foreign-based multinational enterprises and their investors [52]. Gold should be the first metallic mineral in line to be levied with a substantial, but sensible, royalty when commercially extracted. Regulators must additionally require independent and comprehensive closure bonds that cover the true costs of long term environmental remediation after production ceases. And last, tighter environmental regulations are needed to reign in this unbridled industry that has for over 150 years been a Congressionally favored recipient of the last remaining federal land giveaway plus many other generous federal and state subsidized tax breaks and perks.

Tom O'Donnell, and other pro-mining advocates like him, argue that industrial gold mining operations require owners to assume huge upfront financial risks just to begin operations and are lucky



The Canadian-owned Golden Queen Mine in Mojave, California runs 24/7 on Soledad Mountain, located just west of State Route 14. As of July 2019, it is the only cyanide heap leach operational within the Mojave Desert.

if they manage to make a 5 percent profit on their gross income. He stresses that for every dollar a mining company spends internally the amount is multiplied and dispersed seven fold within the local economy. Those statements may be true, but if the massive infrastructure, energy and human power funneled into the world's gold mining endeavors are, in turn, channeled to sustainably mine the materials required during our transition towards a non-fossil fuel-based clean energy future then there should be more than enough jobs for miners along with sustained regional economic development within the Mojave Desert and Great Basin for years to come.

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Rhyolite, NV was the last of the great Mojave Desert gold towns to go bust.

FOOTNOTES:

- [1] Legally “prudence” is defined as a reasonable person willing to expend additional money, time and energy into developing a mineral claim because they deem it to be of value.
- [2] The Diggings™ figures listed as of August 8, 2019. Nevada has the most active mining claims at 204,975. Source: <https://thediggings.com/usa/nevada>.
- [3] Josh Harkinson, “Harry Reid, Gold Member,” Mother Jones, March/April 2009.
- [4] “1872 Mining Law Patenting Fact Sheet,” Taxpayers for Common Sense, June 12, 2006.
- [5] “Barrick Reports 2018 Full Year and Fourth Quarter Results,” Barrick press release, February 13, 2019.
- [6] Associated Press, “GAO report shows royalties from hard-rock mining could generate billions for U.S., if collected,” Missoulian, December 13, 2012.
- [7] Pews’ annual figure includes the combined cost of lost royalties, tax breaks and federal subsidies. An additional \$20 to \$54 billion for annual cleanup costs is not included. “Reforming the U.S. Hardrock Mining Law of 1872: The Price of Inaction (Fact Sheet),” The Pew Campaign for Responsible Mining: Reclaim Our Future, January 27, 2009, 2.
- [8] Harkinson “Harry Reid.” Reid’s two sons work for law firms representing mining interests and his son-in-law is a

pro-mining lobbyist.

- [9] Senator Dale Bumpers, “Capitol Hill’s Longest Running Outrage,” Washington Monthly, January/February 1998.
- [10] Harkinson, “Harry Reid Gold Member.”
- [11] “Reforming the U.S. Hardrock Mining,” 2.
- [12] Jennifer Solis, “Reform of 1872 law would make Barrick, Newmont pay federal mineral royalties,” Nevada Current, May 10, 2019. The Obama administration later joined with lawmakers in supporting and implementing metallic mining reforms.
- [13] Solis, Nevada Current.
- [14] The Goldstrike mine and nearby Cortez complex are owned by Barrick Gold Corporation, the largest gold company in the world. Source: <https://www.barrick.com/English/operations/barrick-nevada/default.aspx>.
- [15] Karen K. Swope and Carrie J. Gregory, “Mining in the Southern California Deserts: A Historic Context Statement and Research Design,” Technical Report 17-42, Statistical Research, Inc., Redlands, California, October 2017. Submitted to Sterling White, Desert District Abandoned Mine Lands and Hazardous Materials Program Lead, U.S. Department of the Interior Bureau of Land Management, California Desert District Office, Moreno Valley, CA., 22.
- [16] “California Code of Regulations (CCR) §3704.1. Metallic Mine Backfill Regulations Explained,” State Mining and Geology Board, Department of Conservation, State of California, Natural Resources Agency, 2003.

- [17] Carl Wilhelm Scheele discovered that gold dissolved in aqueous solutions of cyanide in 1783.
- [18] Jane Perlez, “Behind Gold’s Glitter: Torn Lands and Pointed Questions,” New York Times, June 14, 2000.
- [19] The agency was abolished in 1996.
- [20] Perlez, “Behind Gold’s Glitter.” “Cyanide can convert to other toxic forms and persist, particularly in cold climates.”
- [21] Neha Inamdar, “With This Ring: The Environmental Cost of Gold Mining,” Mother Jones, September 10, 2007.
- [22] “TRI On-site and Off-site Reported Disposed of or Otherwise Released (in pounds), for All chemicals, By Industry, U.S., 2017,” Environmental Protection Agency (website), accessed July 29, 2019.
- [23] Ore is sometimes processed at a crushing/screening plant but often just moved onto the pad after the rock has been blown up. This type of operation is referred to as a “run of mine.”
- [24] RMC was owned and operated by Glamis Gold, Ltd. based in Reno, Nevada. RMC was later acquired by Vancouver, B.C. based, Goldcorp Inc. in 2006.
- [25] Michelle Swenson, “Legacy of Hard Rock Mining in the West—Death of a River, a Community’s Response,” HuffPost, September 2, 2015 (updated September 2, 2016). It should be noted that some of the area streams are naturally acidic due to natural geological processes thus exacerbating the man-made pollution.
- [26] “A total of 294,365 troy ounces (9,155.8 kg) of gold and 319,814 troy ounces (9,947.3 kg) of silver were recovered [from the Summitville mine].” If one does the math, considering gold prices averaged \$400 per ounce during the late 1980s, Friedman’s gross income hovers somewhere around \$150 million. “Summitville mine,” Wikipedia, accessed July 29, 2019, https://en.wikipedia.org/wiki/Summitville_mine.
- [27] Sara Orvis, “Zortman-Landusky Gold Mine, Montana, USA,” Environmental Justice Atlas, September 12, 2014.
- [28] EPA, Liquid Assets 2000: America’s Water Resources at a Turning Point, 2000, 12.
- [29] Mark Olalde, “Mining Companies Polluted Western Waters. Now Taxpayers Have to Pay for the Clean Up,” Mother Jones, March 18, 2019.
- [30] Solis, “Reform of 1872 law.”
- [31] EPA, Liquid Assets, 12.
- [32] RMC operations began in 1987 and ended in 1998.
- [33] David Darlington outlines RMC’s rather contentious tenure in Randsburg in his 1996 book, *The Mojave*. Darlington states that RMC ran its operation so tight in May 1994, 150 of its hourly-paid employees organized themselves under Local #30 of the International Longshoremen’s and Warehousemen’s Union in protest of “low wages, arbitrary dismissals and safety shortcuts.” For further reading see: David Darlington, *The Mojave* (New York: Henry Holt and Company, Inc., 1996), 213–221.
- [34] There are exceptions in the Mojave Desert including the seasonally flowing Mojave River, Amargosa River plus many springs and seeps found throughout the region.
- [35] “Flash Report: Environmental, Health and Safety Issues at Bureau of Land Management Ridgecrest Field Office, Rand

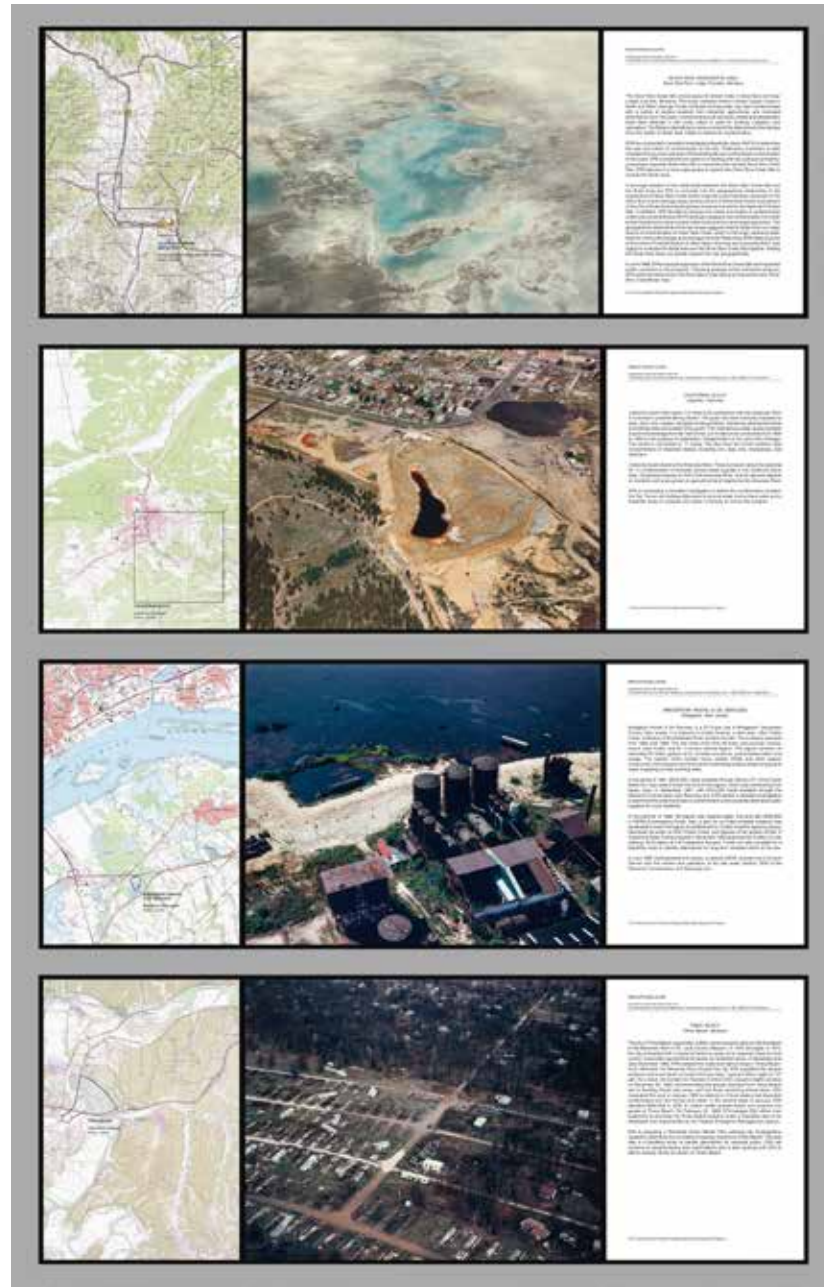
- Mining District (C-IN-BLM-0012-2007),” U.S. Department of the Interior, Office of Inspector General, September 2007, 1.
- [36] “Flash Report,” 2.
- [37] “Audit Report: Abandoned Mine Lands in the Department of the Interior (C-IN-MOA-0004-2007),” U.S. Department of the Interior, Office of Inspector General, July 2008, 1. It seems that BLM officials were worried about liability—identifying the hazards made them more susceptible to lawsuits.
- [38] Swope and Gregory, *Mining in the Southern California Deserts*, 62.
- [39] The Tropic Mine, originally called the Lida, began life as a clay mine until gold was discovered. The gold mine was worked from the 1890s into the start of WWII.
- [40] Swope and Gregory, *Mining in the Southern California Deserts*, 62.
- [41] CR Briggs’ parent company, Canyon Resources Corporation of Golden, Colorado, unsuccessfully led the fight in 2004 to undo Montana’s 1998 cyanide heap leach ban.
- [42] Equinox Gold additionally operates Imperial County’s massive Mesquite Mine, the largest producing open pit heap leach operation in California.
- [43] “Castle Mountain Gold Mine,” Equinox Gold (website), <https://www.equinoxgold.com/projects/castle-mountain/> – snapshot.
- [44] Perdito Exploration Project Environmental Assessment (Environmental Assessment, DOI-BLM-CA-Do50-2017-0037-EA), U.S. Department of the Interior, Bureau of Land Management, October 2017.
- [45] This figure was determined according to annual claim maintenance fees paid to the BLM in June 2018. Between the two men they have a combined 608 active and 1,771 closed lode claims within the Mojave Desert as of 2019. The duo also has a group of claims in the Malpais Wilderness. Source: <https://thediggings.com/owners/2278929> (Noel Cousins mining claims), <https://thediggings.com/owners/1176787> (Steven Van Ert mining claims)
- [46] News staff, “Update on mining at Conglomerate Mesa (Press release for Friends of the Inyo and the Sierra Club),” Sierra Wave Media, October 31, 2018.
- [47] As of September 1, 2019, the annual maintenance fee will be raised to \$165.
- [48] Tom Budlong, “Once Again Threatened by Gold Miners: Conglomerate Mesa, On the Western Rim of Owens Lake,” Desert Report, December 11, 2017.
- [49] The Friends of the Inyo: Conglomerate Mesa Newsletter, Vol. I, June 12, 2019.
- [50] Mark Waite, “Sterling Gold mine life may be extended,” Pahrump Valley Times, March 5, 2014.
- [51] “Projects: Gold Road Mine Project,” Para Resources (website), <http://pararesourcesinc.com/projects/gold-road/>.
- [52] It should be noted that many of these companies are foreign based-but primarily American-held in terms of their investors.

PEGASUS GOLD

David T. Hanson

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The Zortman-Landusky gold mine in north-central Montana is located on what was originally known as Spirit Mountain, considered sacred by the Assiniboine and Gros Ventre Native American tribes. Between 1979 and 1998, Spirit Mountain was completely destroyed—crushed into ore and processed for gold by Pegasus Gold of Canada. The Zortman-Landusky mine used the common mining technique called open-pit cyanide leaching to extract gold from crushed rock. The toxic waste produced by this process was stored in open pits at the site. From 1982 to 1998, more than one dozen leaks and discharges profoundly and permanently altered the regional water supplies of the surrounding communities and Native lands. The Zortman-Landusky mine used one million pounds of cyanide annually. One gram of cyanide can kill a person. In addition, acidic drainage from the mine is so severe that water released from the mine must be treated forever. After taking \$400 million of gold from U.S. public lands, the Pegasus board of directors voted themselves multimillion dollar bonuses, declared bankruptcy (on January 16, 1998), abandoned the mining operation, and left the \$50 to 100 million cleanup cost to American taxpayers. Under the provisions of the Mining Law of 1872, Pegasus Gold of Canada paid no royalties to the U.S. Treasury for the minerals that were removed from public lands, and they had no responsibility for cleanup.



David T. Hanson, *Waste Land*, 1986/2019, archival pigment print, 25 inches by 40 inches

In 1998 Montana voters overwhelmingly passed a citizen initiative banning open-pit cyanide leach mining in the state. Montana remains the only state in the nation to prohibit open-pit cyanide leach mining.

All of the major cyanide leach mines that operated in Montana caused significant water pollution, and some will require water treatment in perpetuity. Hard-rock mining produces more waste by vol-



David T. Hanson, *Pegasus Gold Co.*, Phillips County, Montana, 1991, chromogenic print, 16 inches by 20 inches

ume than all other industry sectors combined. Most hard-rock mines—gold, copper, or nickel, for example—west of the Mississippi were or are under the jurisdiction of the antiquated Mining Law of 1872. Its legacy includes 500,000 abandoned mines and the pollution of more than 40 percent of the headwaters of western watersheds, according to the Environmental Protection Agency. The EPA says that hard-rock mining is the nation's number one toxic polluter and has been ever since the agency started keeping track in 1998. History has shown that many operators abandon mines once the ore has been extracted, leaving the toxic waste and huge cleanup costs to the American public. The Mining Law of

1872 gives the U.S. government no ability to prosecute or go after polluters for cleanup costs. In most cases, the only money that the United States receives in return for the destruction of its public land is the paltry claims-maintenance fee. Since 1872 mining companies have extracted more than \$300 billion of publicly owned minerals without paying taxpayers a dime for them. Now the United States is faced with billions of dollars in cleanup costs.

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SPECTACLES OF SMALL SCALE GOLD MINING IN INDONESIAN BORNEO

Nancy Lee Peluso
University of California, Berkeley

On a sweltering day in October, 2014, eighty kilometers from the equator, every TV in the Singkawang metropolitan area was broadcasting pictures of a giant mining pit in the illegal mining complex they knew as Gowaboma. Police, reporters, and government officials tenuously negotiated the edges, debating whether the landslide's jurisdiction lay inside the city or the neighboring rural district. The extraction complex straddled both. Eighteen people had been buried alive, no bodies yet retrieved. The collapsing pit wall had entombed them under three to five tons of unstable peat and clay soils. Among the dead were eight men in a single crew who had been spraying the wall to break it down. Eight men and two women from Gowaboma village had been independent gold gleaners, searching for a few flakes among the tailings. Villagers had speculated that at least twenty or twenty-five were dead, based on a morbid local knowledge that had been built over the course of the twenty-seven-year gold rush. The rush had been marred by violence and accidental deaths, but was unmatched in its capacity for creating jobs. Within a week of the accident, the moratorium that police had imposed on mining in Gowaboma would end. Black smoke from diesel oil again rose over the site, the clatter of the multi-sized dredges and other sounds of extraction filled the air. Within a month, another pit wall collapsed, killing five. The following month eight more people died in a similar accident. Neither of the latter two episodes was reported in the news; neither garnered visits by the police.

The grandeur of the Gowaboma landscape inspires awe from rural residents who are not used to surveying a landscape from the top of a six-story

building. A few days before, I had been taking photographs from the edge of a twenty-meter-deep pit, when a worker remarked that the pit workers below looked “just like ants.”

The sprayers create a muddy slurry that the dredge sucks up. A generator or a truck engine then sends the slurry through plastic cable pipes and up a sixty-foot wall to a long, tilted, wooden sluice sitting above the pit. Carpet pieces lain on the sluices catch the gold as the lighter mud passes over. Some fifty to a hundred workers labored that day in a single pit, working alongside the ill-fated crew. The crews ranged from twelve miners manning dredges powered by repurposed truck engines to small miners working alone or in pairs with tiny 1.5 horsepower dredges. Gleaners work small shaker tables. Others attach two boards to the end of the carpeted sluices built by the crew.

This extractive landscape with its pits, sluices, diesel-powered engines, and scurrying workers covered in dried mud, creates the impression of a single large industrial mine, yet no overarching corporate structure links them all together. Each crew forms a unit that divides the gold they collect through a share system. For their shares, each crew depends on their relationship to the mining boss or to a smaller-scale crew boss. These bosses in turn bear the costs of extraction; they buy the machinery, generators, cables, sluices, oil and gasoline. They pay the rent for a section of the pit to a self-proclaimed “landlord,” even though parts of the complex had been leased to an oil palm corporation and invaded by the miners. Additionally, the boss pays the crew's subsistence needs while they work, along with “income taxes” to a mix of subdistrict officials, police, soldiers, city planners, and even local gangsters who make their rounds monthly, promise not to make trouble, and alert the miners when a raid is planned by the city or district office.

On drier land not far from Gowaboma, thousands of smaller pits occupy the back and side yards of houses, rice fields, and rubber gardens. My friend Joni took



Opening a New Pit, photo courtesy of Nancy Peluso

me to see his small mine, where a few years ago his mother and uncle had tapped rubber. A local river had flooded after a rainstorm the year before, carrying toxic tailings from a nearby mine into her rubber garden. Once the trunks of the rubber trees were engulfed by the gasoline and diesel-laced flood waters, they died. Although Joni's mom had rented access to the other four crews, Joni's crew paid no rent. The day we visited, we watched as men stood, sat, or swam in toxic water. A mechanic breathed in the fumes of the generator as he monitored a floating dredge underlain by four empty oil drums tied to a wooden raft. Nearby, three brothers worked in the panning pool, hard rubber pans glistening with a sheen of mercury as the sun was setting.

The minutiae of this industrial landscape are telling. Pieces of carpet and blue tarpaulin are strewn everywhere. The tarps make settlements and are

used for the walls and roofs of sleeping huts, as well as two-story “dormitories” where two dozen miners keep their clothes and sleep. Tarps also enclose drinking stalls where coffee, beer, and home-made moonshine are served by beautiful young women. The tarps are also used for making panning pools into which miners shake the sluice carpets, pan for gold flakes, and consolidate the gold into balls. Later the mercury used to consolidate the gold will be burned off with small blow torches.

The organization of gold extraction in these pits is reminiscent of the organization of other forms of natural resource extraction in Indonesian Borneo. Before the logging of the 1970s-90s, when state, military, and corporate logging concessions stripped the best lumber from the once extensive rainforests, non-timber products and logs were collected by men from forest settlements and mi-



Left: Morning Setup of the Sluice; Above: Beneath the Cracked Wall, photos courtesy of Nancy Peluso

grant crews from other parts of Indonesia. Workers organized around crew bosses and spent weeks or months at a time at the forest extraction sites. They, too, were paid in shares of the logs, rattans, or resins, and their food, coffee, sugar, and water were free while they worked.

In addition to the direct risks posed to mine workers, small-scale gold mining generates different risks for villagers living far from extraction sites. Hazards such as invisible mercury clouds and quicksand, which had recently swallowed a child on her way home from school, typify the risks of gold extraction in communities. On the driest ground, mining tunnels cave in—most are unsecured. When mining under rivers, at least one crew member has to dive to lay and maintain the cable pipe that carries the dredged river bottom to a sluice on shore. The hard-edged flexible four-inch-wide cable can slip and hit a worker with a wild smack, or parts of

a worker's raft can break and trap him underwater. The most dangerous environment is the marsh. Even with an oxygen tank strapped to his back and home-made goggles, an accidental collision with an invisible old tunnel stuck in the viscous stuff of the marsh can cause a massive rush of water as the pressure changes, drowning him as his mouthpiece and goggles slip off his face.

Miners attempt to protect themselves in ways that have nothing to do with the geological dangers of a site. Ritual practices are intended to appease, feed, and encourage the spirits to give up their gold, and to prevent against the spirits' depredations and tricks. Gold is a spiritual substance (*barang halus*) and rituals and food offerings are meant to preclude the more expensive and traumatic loss of human lives in mining accidents. Before beginning work or "opening new land" an indigenous or migrant miner will kill roosters or pigs to feed the spirits of



Above: Steamy Morning, Ketapang; Right: Placing the Dredge Cable, photos courtesy of Nancy Peluso

the land he is opening. Gold-colored jars are often placed in the shifted sands of mining sites in the hopes of appeasing both the gold and the souls of those lost in earlier accidents. There are behavioral taboos as well: All miners, from big bosses to workers sharing the finds, must mind their actions, their speech, and even their thoughts so as not to offend the gold spirits.

To see these disturbing scenes as chaos is simply wrong. The mining and other everyday practices of small-scale Indonesian gold miners are organized within social and economic networks that extend well beyond this site. They are entwined in myriad ways with Indonesia's formal economy. Thousands of large and small crews are transforming Borneo's previously forested landscape into vast pits and underground networks of tunnels. As Borneo's land is increasingly acquired by corporate concessions that

reduce rather than increase the work available, ordinary rural men have few choices but to seek jobs in the extraction of the gold that underlays their home territory. Small-scale gold mining is at once a curse and a saving grace; it has become a fact of their lives and livelihoods.

The exhibition "Spectacles of Small-Scale Gold Mining in Indonesian Borneo" will be on display at the Environmental Design Library at the University of Berkeley, California from January 12 to May 15, 2021.





Catherine Richardson, *Gold Ore*, 2018, mixed medium on Arches paper



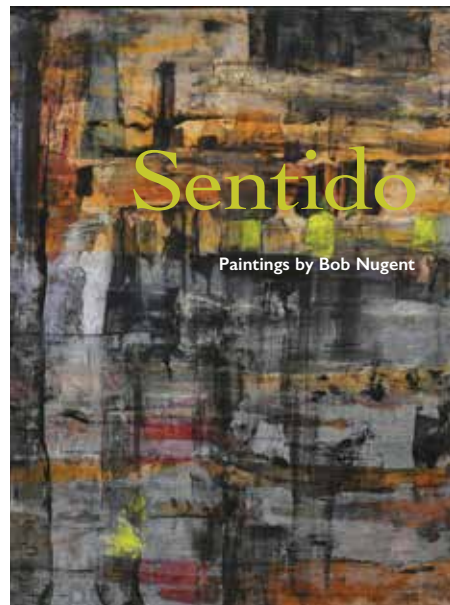
Catherine Richardson, *Small Mineral Hoard*, 2019, steel phone-wire box, plexi tubes, acetate, screen print

MINAS SERIES

Bob Nugent

I have been documenting the beauty of the flora and fauna of Brazil for over three decades. Over that time I have become increasingly concerned about its continued destruction. I am now addressing the issue head on.

Minas #3 is one in a series of paintings about the mines in Minas Gerais, Brazil. These mines strip the earth of minerals while toxic iron ore tailings are held in earthen reservoirs, polluting rivers and devastating the environment for indigenous communities in the surrounding areas. When a dam in Mariana, Brazil failed in 2015, it sent sixty million cubic meters of iron waste into the Doce River, polluting the river and creating water shortages for the inhabitants along its flow. This work and other paintings about the Amazon River, the Amazon River Basin and other parts of Brazil will be on exhibit at Galeria Dan, São Paulo, Brazil in the Summer of 2021. Other works by Nugent will be featured in the Extraction exhibition *Fire and Ice* at the Cummings Art Center in New London, CT in the Fall of 2021.



Bob Nugent first became interested in the indigenous peoples and rain forests of Brazil during a seminal visit to São Paulo in 1984. Here, among the rain forests and Amazonian vistas, the artist found the raw vitality of nature, sometimes in its undisturbed fullness, and sometimes as impacted by the incursions of man. Over the subsequent 36 years he would return again and again to the region to continue his research and study the flora and fauna of the Amazon Region and other parts of the country.

Already, Nugent's art was being recognized and praised. In 1977 he received a Louis Comfort Tiffany Foundation Artist Fellowship, and one year later a National Endowment for the Arts Individual Fellowship. But what would follow after his initial visit to Brazil was a succession of awards and recognitions for his work in portraying the meld of Amazonian life with the abstracted emotionality of our "civilized" response to it. A Fulbright grant, California Arts Council Artist Fellowship, U.S. State Department Cultural Exchange Grant, and others enabled him to continue what would become a life-long mission of depicting this world and its transformation before our very eyes.

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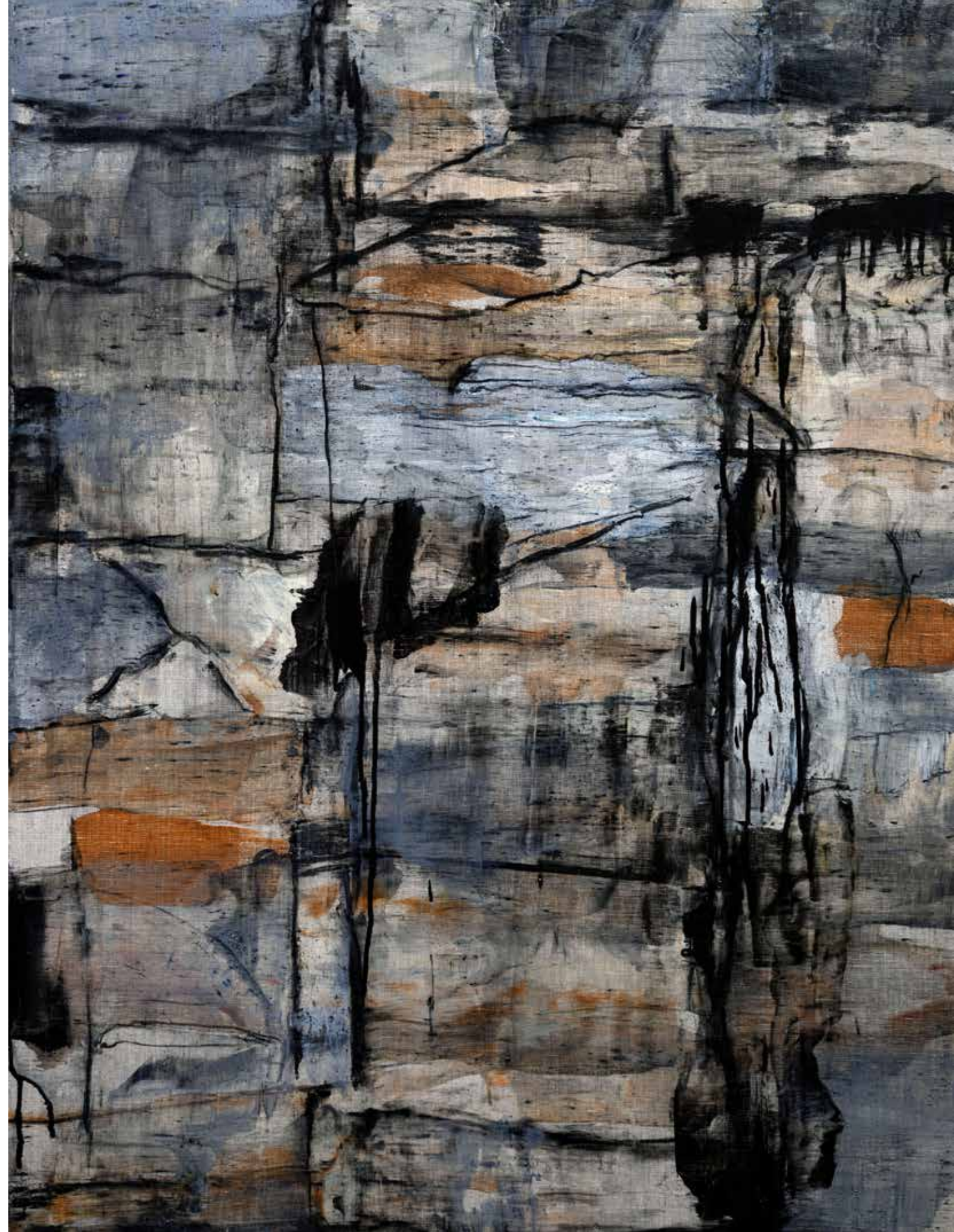
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Bob Nugent, *Minas #3*, 2019,
Oil on linen, 40 by 30 inches





Above: Paccarik Orue, *Tajo Raul Rojas*, *El Muqui series*, 2013, archival pigment print



Paccarik Orue, *Niños jugando en Champamarca*, *El Muqui series*, 2013, archival pigment print

CERRO DE PASCO

Paccarik Orue

Cerro de Pasco is a historical city of 80,000 people in the Peruvian Andes, situated on top of one of the biggest sources of income for the Peruvian government: mineral deposits. Throughout the years, each mining company that has been operating the open-pit mine has left its own mess behind; tailings in very close proximity to densely populated areas which are making children sick with very high levels of lead in their bloodstream, killing lakes and livestock, contaminating water supplies and polluting the air. Cerro de Pasco is on the brink of an environmental disaster.

The people of Cerro de Pasco are very proud of their culture and their contribution to Peru's economy. Their wish is not to shut down the mine but that it operates responsibly towards the community and the environment.

The title *El Muqui* comes from a folkloric character in the Andean mines who is highly respected, even feared, by miners, and has a strong moral code. Popular tales talk about how he is aware of the miners' desires and actions, but playful with children. *El Muqui* is the center of many of the celebrations and traditions in Cerro de Pasco. With this project I want to celebrate the inhabitants of Cerro de Pasco and give them a voice that they struggle to find and to save the memory of a place whose existence as we know it is threatened.



Paccarik Orue, *Ex-Laguna Quilacocha # 1*, *El Muqui series*, 2012, archival pigment print



Paccarik Orue, *Niños con caballo en la Ex-Laguna Quilacocha*, *El Muqui series*, 2013, archival pigment print



Paccarik Orue, *Viviendas y desmonte*, *El Muqui series*, 2013, archival pigment print



Paccarik Orue, *Campos deportivos, viviendas, desmonte y aguas ácidas*, *El Muqui series*, 2019, archival pigment print



Daniela Rivera, *Andes Inverted*, 2017, Museum of Fine Arts, Boston, MA, oil and soil on board, wood structure, 25 by 9 by 8 feet



Daniela Rivera, *Grey Copper*, 2017, Museum of Fine Arts, Boston, MA, Tilted wall, 8-channel sound installation, copper point drawing on wall, 25 by 37 by 6 feet

Daniela Rivera’s museum installations often focus on uncanny spatial and material dislocations. Breaking from the traditional mold of painting, she creates immersive experiences that draw from her personal history. Her 2015 Traveling Fellowship from the School of the Museum of Fine Arts at Tufts University inspired this ambitious transformation of Gallery 268 with materials, images, and sounds gathered from a landmark in her home country: Chile’s Chuquicamata copper mine.

Like an inversion of the naturally soaring Andes, Chile’s massive copper mines are machine-shaped canyons, a symbol of national pride and a driver of the Chilean economy, yet at a cost. Inhabited for generations, an employee town at Chuquicamata’s edge provided a world-class hospital, schools, theaters, sports fields, and homes for over 30,000 people. By 2008, new mining methods and increasing pollution forced the community to relocate; since evacuated, expanded digging has buried the site.

Andes Inverted aims to explore the mine’s disruptive impacts—at once environmental, political, cultural, and psychological—and evokes the paradox faced by Chuquicamata miners, many of whom described the jobs and joy provided by the same mine that consumed their homes, memories, and landscape. Rivera explains the miners’ situation is not black-and-white but grey: “Their labor is both productive and destructive, the self-sabotage is the complexity of the place.”

—“Daniela Rivera: The Andes Inverted,”
Exhibition Description, Boston Museum of Fine Arts



Barbara Boissevain, *Cement Factory VII*, 2019, archival inkjet print



Barbara Boissevain, *Extraction X*, 2019, archival inkjet print



Barbara Boissevain, *Extraction II*, 2019, archival inkjet print



Barbara Boissevain, *Salt Pond Grid I*, 2019, archival inkjet print

LICHEN SONG

Arthur Sze

—Snow in the air you've seen a crust on the ceiling wood and never considered how I gather moisture when you step out of the shower you don't care that I respire as you breathe for years you've washed your face gazed in the mirror shaved combed your hair rushed out while I who may grow an inch in a thousand years catch the tingling sunlight you don't understand how I can dive to a temperature of liquefied gas and warm back up absorb water start growing again without a scar I can float numb in space be hit with cosmic rays then return to earth and warm out of my sleep to respire again without a hiccup you come and go while I stay gripped to pine and the sugar of existence runs through you runs through me you sliver if you just go go go if you slowed you could discover that mosquitoes bat their wings six hundred times a second and before they mate synchronize their wings you could feel how they flicker with desire I am flinging your words and if you absorb not blot my song you could learn you are not alone in pain and grief though you've instilled pain and grief you can urge the dare and thrill of bliss if and when you stop to look at a rock at a fence post but you cough only look yes look at me now because you are blink about to leave—

SALT SONG

Arthur Sze

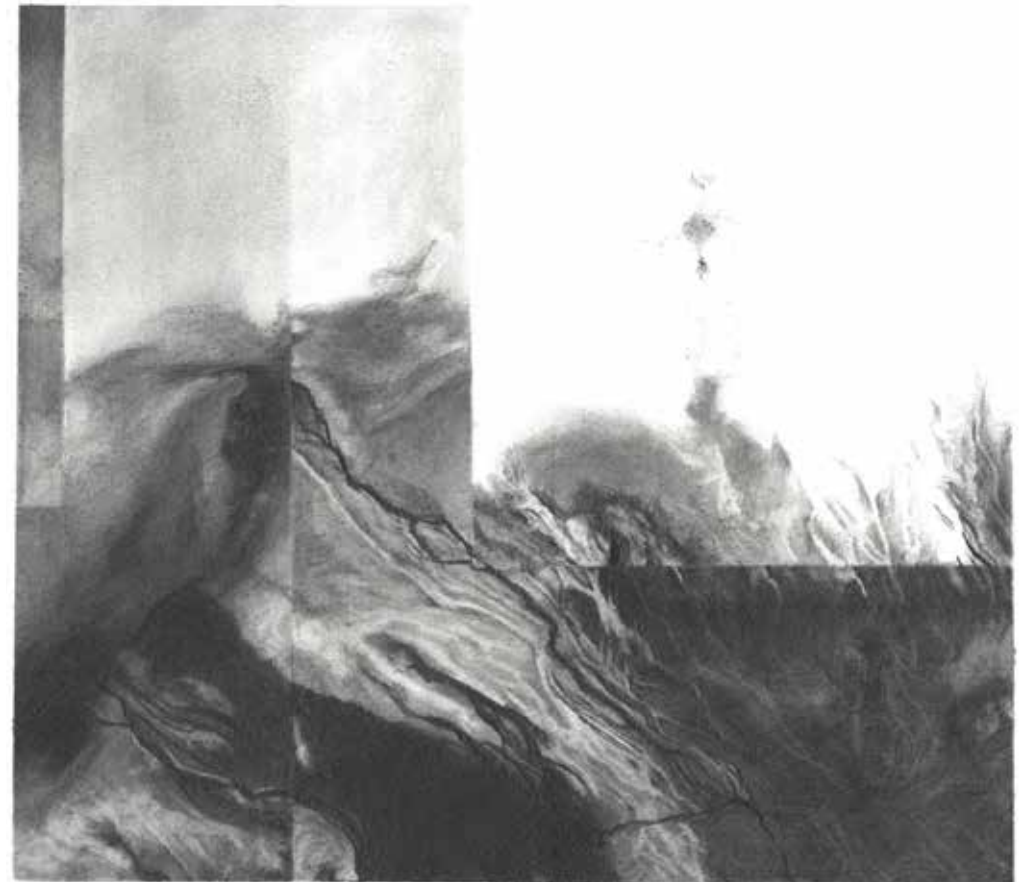
Zunis make shrines on the way to a lake where I emerge and Miwoks gather me out of pools along the Pacific the cheetah thirsts for me and when you sprinkle me on rib eye you have no idea how I balance silence with thunder in crystal you dream of butterfly hunting in Madagascar spelunking through caves echoing with dripping stalactites and you don't see how I yearn to shimmer an orange aurora against flame look at me in your hand in Egypt I scrubbed the bodies of kings and queens in Pakistan I zigzag upward through twenty-six miles of tunnels before drawing my first breath in sunlight if you heat a kiln to 2380 degrees and scatter me inside I vaporize and bond with clay in this unseen moment a potter prays because my pattern is out of his hands and when I touch your lips you salivate and when I dissolve on your tongue your hair rises ozone unlocks a single stroke of lightning sizzles to earth.



Rachelle Reichert, *Salt Circle*, 2018, San Francisco Bay Salt, resin, wood, and steel, 48 by 48 inches



Rachelle Reichert, *Salar 4*, 2019, graphite on paper, 9 by 11 inches



Rachelle Reichert, *Salar 1*, 2019, graphite on paper, 7 by 7 inches



Hikmet Sidney Loe, *Great Salt Lake Extractions*, 2017, pigment on aluminum

GREAT SALT LAKE EXTRACTIONS

Hikmet Sidney Loe

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These images were taken while flying over the west side of Great Salt Lake in March 2017, indicating both the radical beauty of the lake and pointing to a body of water that has undergone extraordinary change due to human use, intervention, and extraction [1].

My interest in capturing the lake through aerial photography began through the introduction to artist David Maisel's photographic series of the Great Salt Lake, *Terminal Mirage*, which includes images from "zones of mineral evaporation ponds and

macabre industrial pollution covering some 40,000 acres along the shores of the lake [2]." Maisel's images are powerful in their complexity, formal beauty, and mystery (he never discloses where the images originate around the lake). In turn, we are both influenced by artist Robert Smithson, who gave entrée to a new view of Great Salt Lake, not as a setting of idyllic scenes and picturesque views, but—as he indicated when he wrote of his earthwork, *Spiral Jetty* (1970) of a region strewn with "incoherent structures. This site gave evidence of man-made systems mired in abandoned hopes [3]."

Extraction of the lake's resources has taken place for thousands of years, as "the area was probably initially occupied about 10,000 years ago by Paleo-Indians who relied on a mix of big-game hunting and collecting of lake margin resources [4]."



Hikmet Sidney Loe, *Great Salt Lake Extractions*, 2017, pigment on aluminum

Native Americans were often cited by Euro-American explorers in nineteenth century expedition documents as investigations of the lake led to populations settling around its Eastern shores. Mormon pioneers choose the lake's valley to call home in 1847, considering the rich salt content of the lake as one of many positive attributes of their region. Salt extraction led to self-sufficiency and eventually economic development for the settlers, who used and exported this vital mineral in abundance.

By 2017, water use (personal, commercial, and agricultural) and mineral extraction had reduced the lake to half its size from 1847—from an average of 4,200 feet above sea level to approximately 4,195 feet. Water use, and misuse, are a way of life in a state that anticipates "the region's rapid growth, which state analysts believe could push Utah's population from 3.1 million today to 5.1 million by 2040 [5]."

Multiple industries populate the lake, exporting extracted minerals such as salt, magnesium, and potassium; it was reported in 2016 that U.S. Magnesium provided fourteen percent of the world's supply of this mineral [6]. Along with recreation and other businesses, mineral extraction and sales bring in \$1.32 billion dollars annually to the state [7]. Mineral extraction has contributed to lowered lake levels, and in recent years, those of us living on the edges of

the lake have learned that human-created water levels are contributing to increased air pollution along the Wasatch Front, adversely impacting human health. The Wasatch Front's many ski resorts are also impacted by lower lake levels: mountain snow is created, in part, through "lake effect snow," so if the quality of the water and lake levels decreases, that impact cycles to the snow in the mountains [8].

Our ecosystem is complex and all-encompassing: lake extractions, as noted, have adverse regional effects on human, avian, and wildlife populations. So, while the images I captured in 2017 may be aesthetically interesting, they illustrate a lake that looks radically different than it did ten years previously.

It is now 2020, and I continue to document Great Salt Lake both aerially and on the ground. Those of us who live on the lake's shores have not fully abandoned hopes of a healthy lake or ecosystem, but we have a lot of work to do to establish balanced systems to regain healthy ecosystems.

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NOTES:

- [1] For comprehensive information on Great Salt Lake, see FRIENDS of Great Salt Lake's website: www.fogsl.org
- [2] David Maisel, Terminal Mirage Project Statement. Accessed January 12, 2020: <https://davidmaisel.com/works/terminal-mirage/#1>.
- [3] Robert Smithson, "The Spiral Jetty," in *Arts of the Environment*, ed. Gyorgy Kepes. Vision + Value Series. (New York: George Braziller, 1972), 223.
- [4] David B. Madsen, "The Human Prehistory of the Great Salt Lake Region," in *Great Salt Lake: A Scientific, Historical and Economic Overview*, ed. J. Wallace Gwynn (Salt Lake City: Utah Geological and Mineral Survey, 1980): 19.
- [5] Emma Penrod, "Scientists say the Great Salt Lake is disappearing, but could Utah residents save it?" *The Salt Lake Tribune*, December 16, 2017, updated May 1, 2019.
- [6] Leia Larsen, "Miner extraction on Great Salt Lake has local, national and global impact," *Standard-Examiner*, May 1, 2016.
- [7] "Saline Lakes in Dire Situation Worldwide, including Great Salt Lake." *Utah State Today*, Utah State University, October 23, 2017.
- [8] Chris Miller, "Great Salt Lake levels at 50-year low, industry, wildlife impacted," *KUTV.COM*, July 22, 2016.



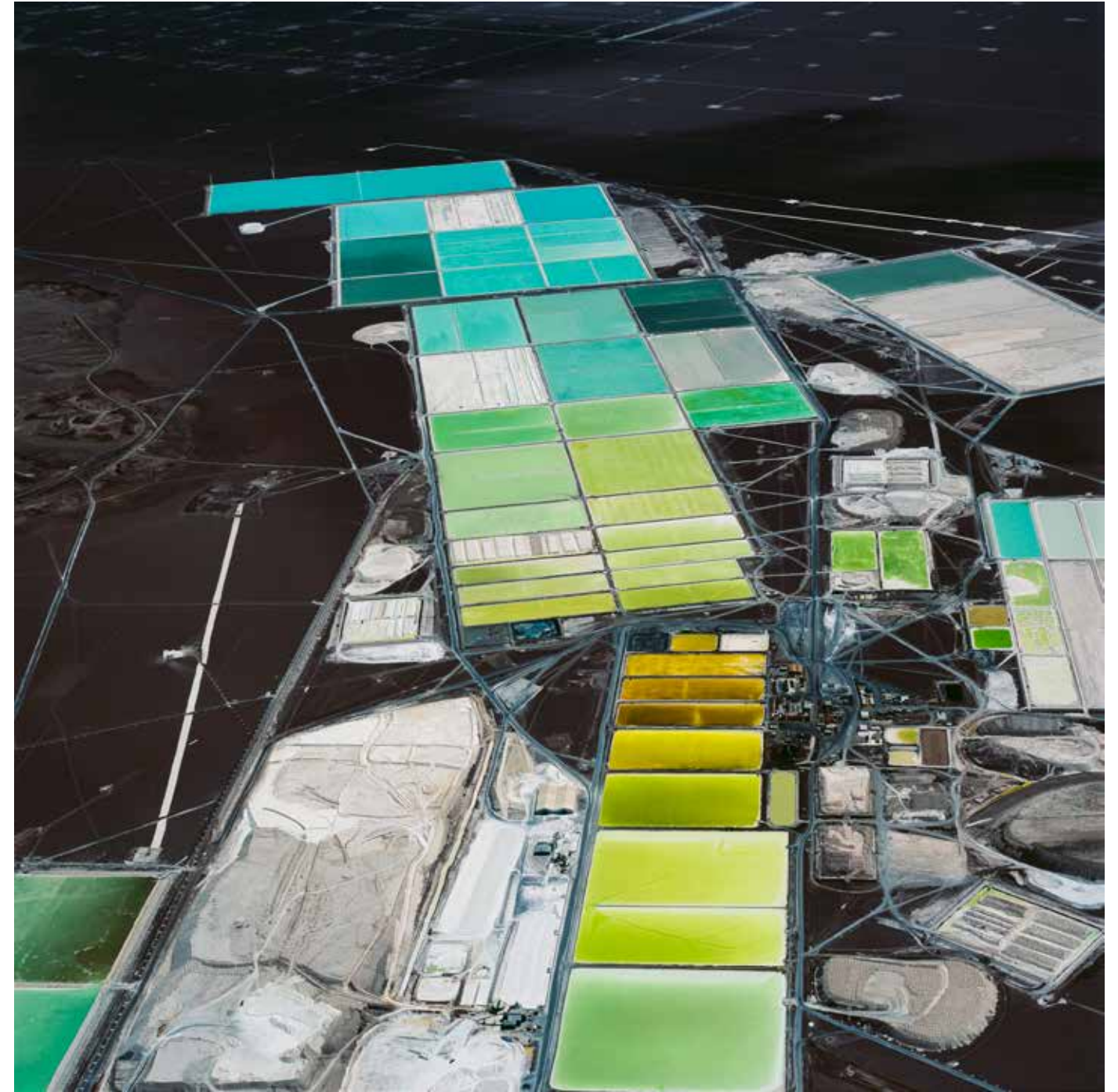
David Maisel, *Desolation Desert: Copper Mine 1, Chuquicamata, Atacama Desert, Chile*, 2018, Archival pigment print, 48 by 48 inches. Courtesy Haines Gallery, San Francisco and Edwynn Houk Gallery, NY



David Maisel, *The Mining Project, Butte MT9*, 1989, Archival pigment print, 48 by 48 inches. Courtesy Haines Gallery, San Francisco and Edwynn Houk Gallery, NY



David Maisel, *Desolation Desert: Abandoned Nitrate Mining Town*1, Pedro de Valdiva, Atacama Desert, Chile, 2018, Archival pigment print, 48 by 48 inches. Courtesy Haines Gallery, San Francisco and Edwynn Houk Gallery, NY



David Maisel, *Desolation Desert: Lithium Extraction 1*, Salar de Atacama, Chile, 2018, Archival pigment print, 48 by 48 inches. Courtesy Haines Gallery, San Francisco and Edwynn Houk Gallery, NY



Michael Light, Pentagonal Lithium Evaporation Pond and Chemetall Foote Plant At Right, Silverpeak, Nevada, 2006



Michael Light, Chemetall Foote Lithium Mine Groundwater Evaporation Ponds, Clayton Valley, Nevada, 2006

OLD FAITHFUL

David E. Thomas

From all over
the planet
they wheel
narrow roads
to arrive
at this junction
bigger
and busier
than a Wal-Mart
parking lot
and cluster
in a wide loose
circle
around a mudflat
oozing
a plume
of steam
drifting close
to the ground
an air of casual
expectation
builds
with the minor
eruption
of attendant
steam
and then rewarded
as the dormant
plume
rises
with sudden
liquid
force
spraying a white
arc
in the noon sky

then there's
a sigh
of satisfaction
as the multitude
throngs
away in every
direction
John Colter's
bloody
barefoot
tracks
long gone
in a diesel
wind.

15 August 2006
Gardiner, Montana

FLIGHT FROM PHOENIX

David E. Thomas

Gradually if not
slowly
buildings and grids
lose
definition
beneath the rising
wing
landscape
becomes topographical
as the silver wedge
catches
noon sun
a week in the desert
falling behind me
as I fly north
on the promise
of spring
red hued mountains
The Superstitions
The Four Peaks
Camelback
old friends
hiked me through
cactus
greasewood
paloverde and birds
rare to my eye
dust storms and museum exhibits
then quiet nights
home by the tv
ah here's
The Grand Canyon
what else could
this monumental
gorge
possibly be?
a vast gnarly
rift

even from
high
in the air
and this great hole
with its measured
terraces
can only be an open
pit mine
yielding precious metals
that give shape
to mathematics holding this
machine aloft
snow
begins to appear
sparse then thick
then isolated
by bare brown
pulp fiction
consumes the miles
then clouds
cover everything but Ranier's
massive white cone
as we begin
to descend
and gradually
if not slowly
grids
and buildings
assume
definition
again
and we come
to a stop
at vast Sea-Tac
humming
with electricity
and fossil fuel
and all of us
going to
and fro.

(for Bob and Colleen and Erin)

BRINK OF THE UPPER FALLS OF THE YELLOWSTONE

David E. Thomas

Mist off
 the roiling
 boiling water
catches
mid-afternoon
 sun
at a leprechaun
 angle
and rainbows it
 downstream
while eyes
 from all over
 the world
grab
a moment
 of this wild
 majesty.

15 August, 2006
Yellowstone Park

INDUSTRIAL MEDITATION

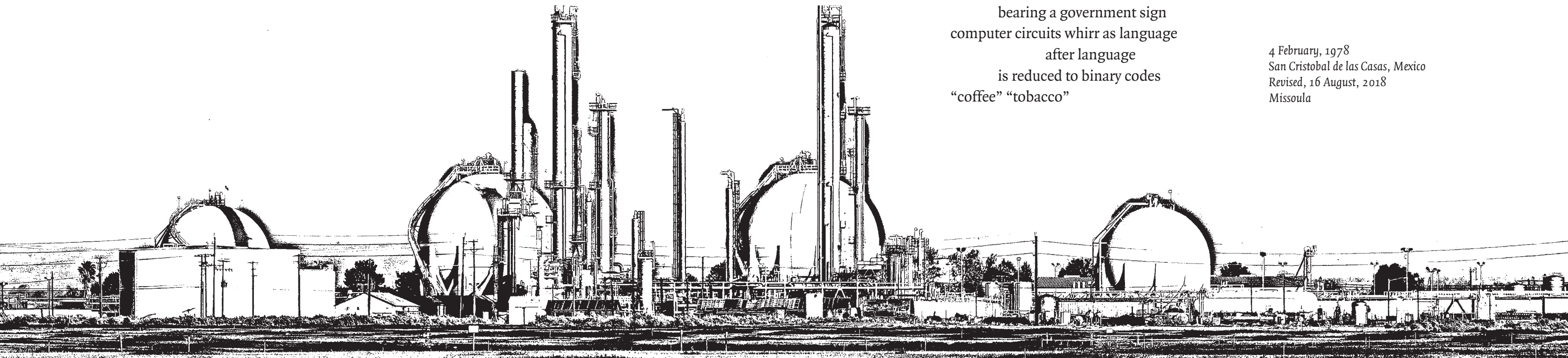
David E. Thomas

A dusty grove of Indians
 and campesinos
waits for a truck ride:

deep in the concrete
steel glass cocoon
 motor homes
 slick as beetles
proceed nose to ass along
 asphalt and concrete
laid out according to viral
 suggestion
 vibrating like Mayan
 glyphs
 in a child's dream
blind old Arizona cowboy tells
 stories of 666
 by a fruitpicker's
 fire
entropic algebras of cultural digestion
 yawn at daybreak
 in a high mountain
 village
 from a four wheel drive
 bearing a government sign
computer circuits whirr as language
 after language
 is reduced to binary codes
"coffee" "tobacco"

 "coal" and "oil"
 spells
the international countinghouse
 culture
myths and handwoven designs
carrying centuries of human breath
 and smell
 fade into dacron polyester
automated factories shuffle
between jungle and dawn
 a charcoal burner
 plies his dying
 trade
 in a volcano's sleeping
 fire
and on the streets of a Mexican town
 a freckle faced
 Indian woman
 is captured
by a loudspeaker her child
 slung in a blanket
 on her back
a flickering unfocused bone
 picked vulture clean
windy colors sprouting new feathers
 of life and death.

4 February, 1978
San Cristobal de las Casas, Mexico
Revised, 16 August, 2018
Missoula



NOW MORE NEAR

Em Joseph + Galen Pardee

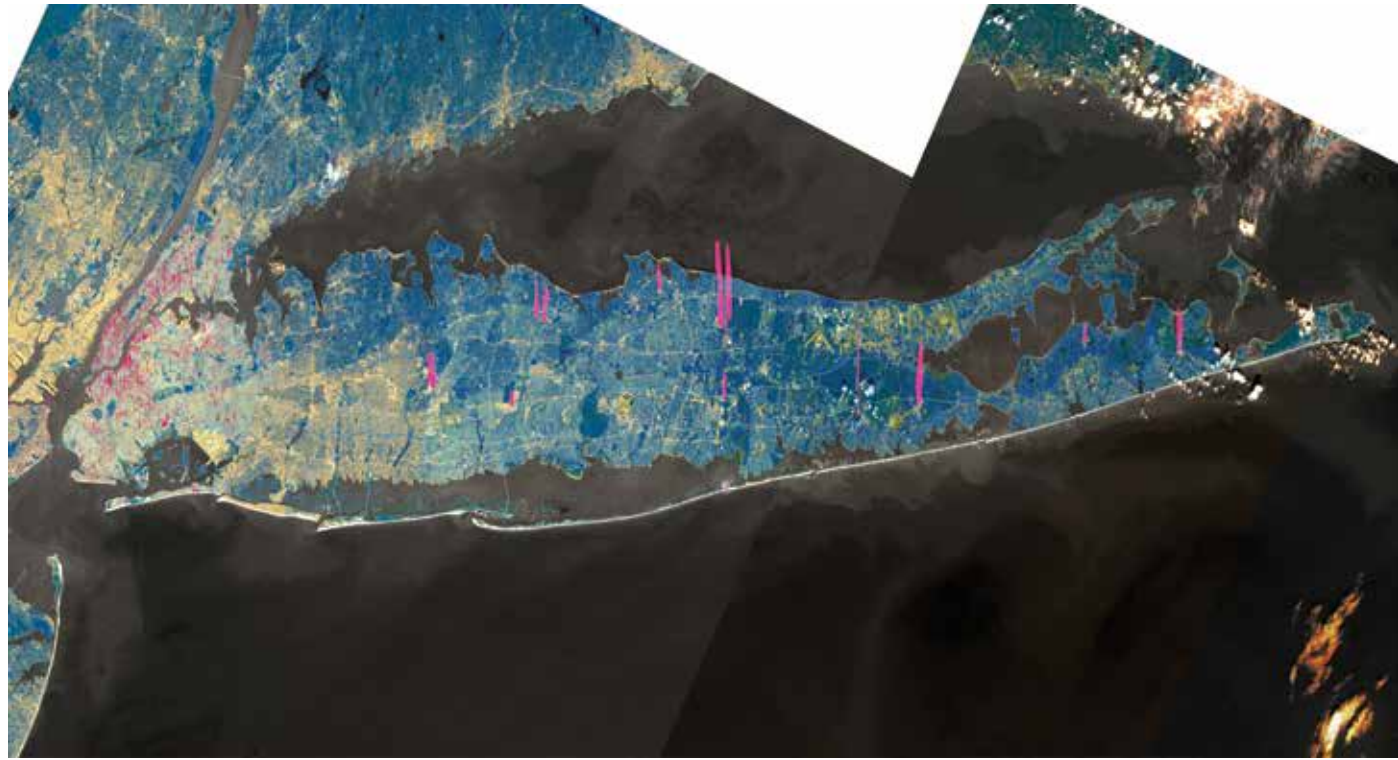
Sand is the lifeblood of New York City. Without sand, concrete cannot be produced; and without concrete, the city's construction industry would grind to a halt. Without construction, New York's powerful real estate interests would crumble. While new buildings throughout the five boroughs of New York attest to the power of development to change the character of the city almost at will, the concrete which frames these developments is produced in sites that are locked in place by even stronger forces: production logistics, land value, cultural zoning and capital exchange.

Proximity—and by extension, time—is the governing factor of concrete construction. Suffolk County, Long Island is a major location of sand mines, delivering aggregate to concrete plants in Brooklyn, Queens, and the Bronx's industrial heartlands. Sand's high density means inefficient and expensive transportation over long distances. Once mixed with cement and water to form concrete, concrete mixing trucks have ninety minutes to reach their destination before the material in their mixing drums cures and hardens, rendering the truck unusable and cargo worthless. To allow the the industry to remain a buffered yet proximal service to the New York real estate apparatus, a belt of concrete plants surrounds Manhattan, suspended by chemical anchors of curing sand, water, and Portland cement.

How do we begin to understand the triangulations between sand, concrete, and the limitations of landscape as represented by the sequestered value held within New York City's concrete plants? With facilities in Gowanus and Greenpoint increasingly surrounded by new residential buildings, how can we assess the human impact on these plants, and what they mean for life in these areas? What is their environmental toll and how can we measure the expanse of these material, temporal, and logistical underpinnings in New York City?



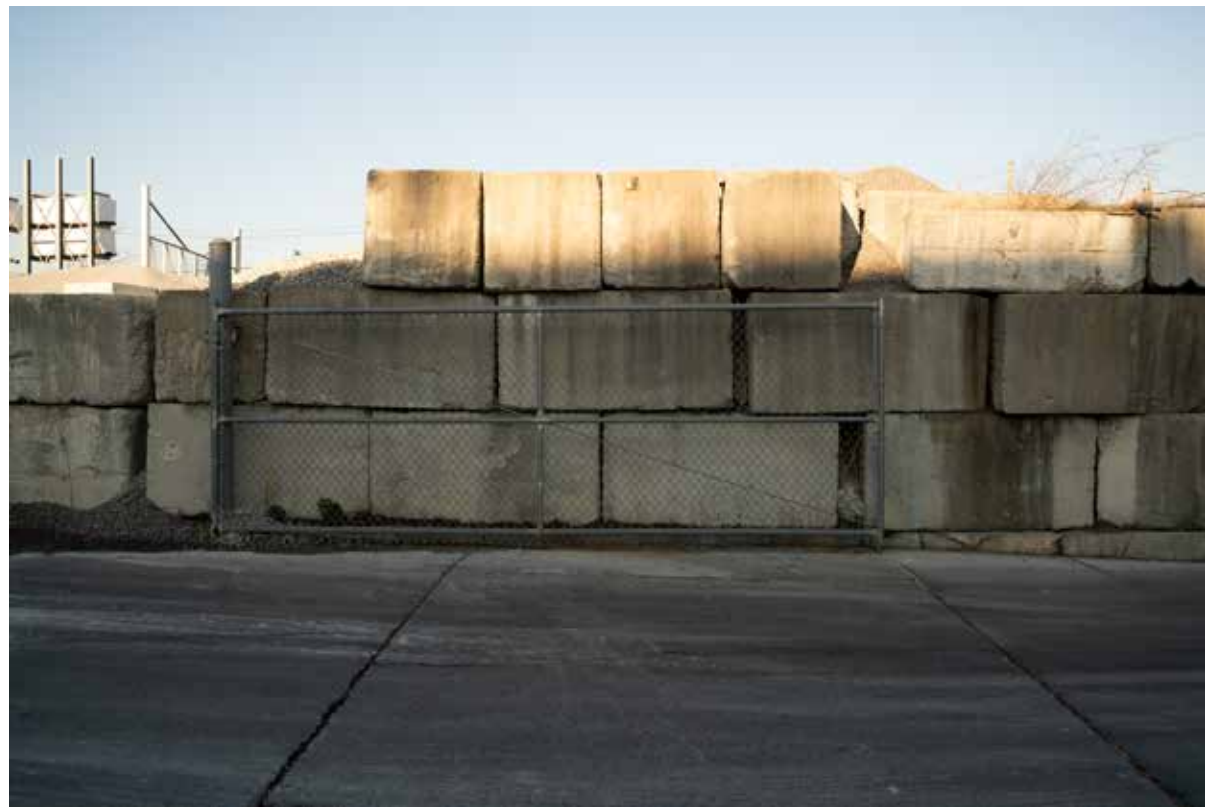
Em Joseph and Galen Pardee, *Now More Near #4*, 2019–2021, video, sculpture & installation



Em Joseph and Galen Pardee, *New York Sand and Concrete*, 2019–2021, video, sculpture & installation



Em Joseph and Galen Pardee, *Now More Near #6*, 2019–2021, video, sculpture & installation



Em Joseph and Galen Pardee, *Now More Near #1*, 2019–2021, video, sculpture & installation



Em Joseph and Galen Pardee, *Now More Near #5*, 2019–2021, video, sculpture & installation

BEAUTY IN THE TWILIGHT OF THE ANTHROPOCENE

Aaron Parrett

Our oldest and most venerated Western myths begin with earthly extraction: both Yahweh and Prometheus breathe life into handfuls of mud, and thus clay clawed from the earth is made into human form. In Genesis, God goes on to extract a rib from Adam in order to create Woman, a reversal of the actual order of things so inherently blasphemous that it cannot possibly be a metaphor for anything other than the brute transgression of extraction itself and the limitless ironies that spool out in consequence.

Life itself, for example, goes on to perform a relentless, repetitive play of extraction and decay, an *ouroboros* in which the mineral world rises up to ingest itself over and over again. That rib mined from the body of Adam is the bone flung skyward by an ape in *2001: A Space Odyssey* to evolve in the blink of an eye into something more complex, more interesting, something sleeker and more feminine, a uterine spacecraft ready to return humanity to the stars from which we originated, as explained in both Plato's *Timaeus* and the most modern physical science books.

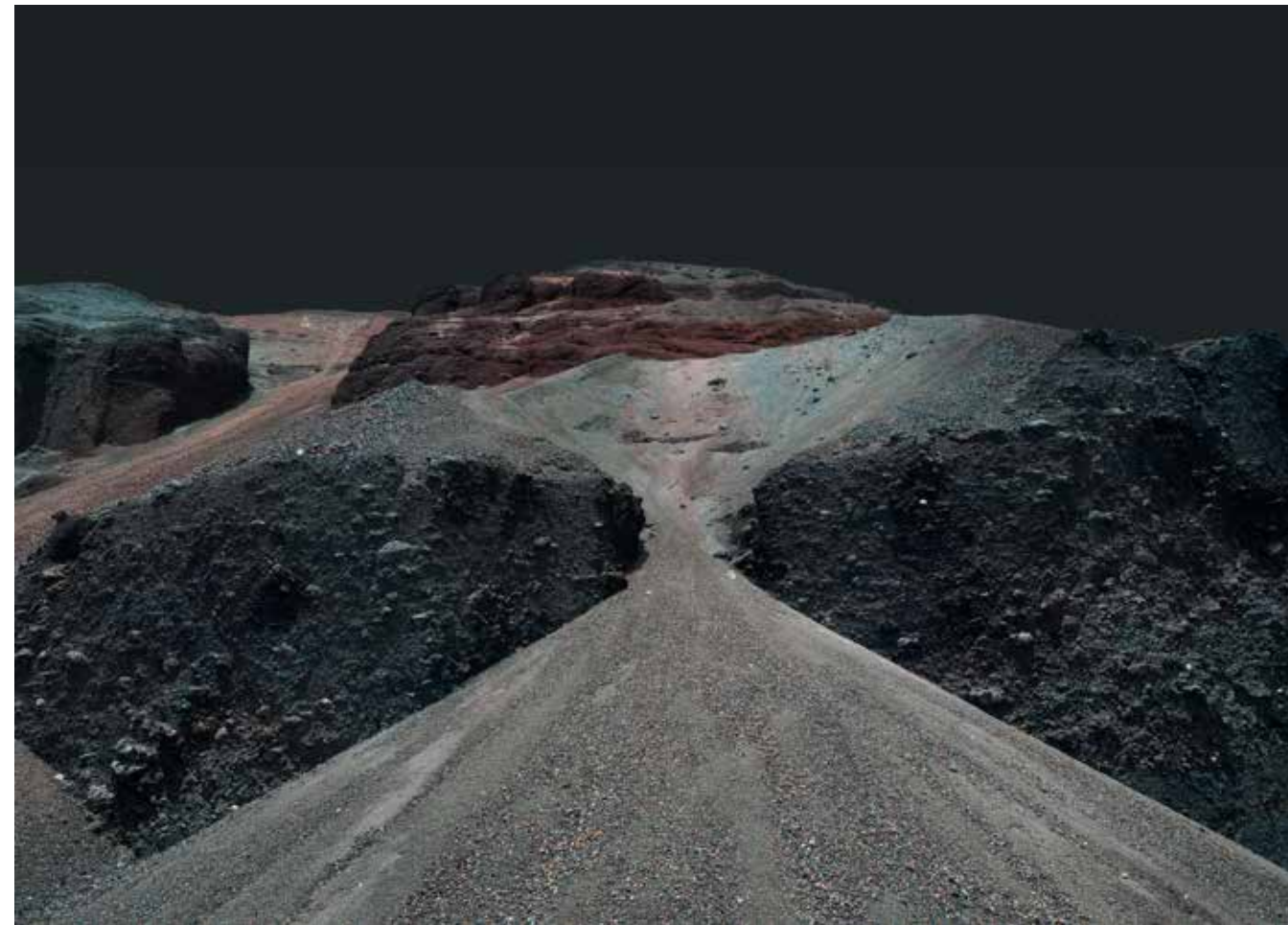
The root of the word “extraction” is Latin *tra-herere*, to drag, the past participle of which is *tractus*—having been dragged—so that *ex+traction* refers to something literally “having been dragged out of” something. It's a word that envisions the stark labor of mining, to be sure, but also describes the way we often arrive at an uncomfortable truth. A recalcitrant witness must have the truth “dragged out of” him, akin to the way one drags grappling hooks through a river to recover a body, but also the way one drags the business end of a steam shovel through hard rock ore to get copper for bullet tips and shell casings, or to get coal to burn for melting copper.

By the time it gets to English, “extraction” has been euphemized to a clinical gloss of its original

savagery. The word has become neutral and detached in our mouths, its Latinity obscuring its transgressive origins. Yet that original meaning does endure in the industrial sense: we drag what we want from the earth in the way of natural resources, our machines having become insensate extensions of our hands—hands that once dragged forth coals from the ashes so we could carry the fire, hands that once clawed the earth to get roots for food, and then gold for baubles, and then ore and coal—always in imitation of how our gods clawed at the clay to get the raw material from which to make humans.

But beyond the realm of myth, these are merely evolutionary facts. Chemicals accrete out of the raw elementary matter generated by stars gone supernova, and eventually those chemicals achieve a state in which they actively seek themselves out. We call it the miracle of life, but what is life but a chemical cascade, a series of molecules extracting other molecules from the primordial soup? The key to all this is that certain molecules possess an urge to replicate, to make copies of themselves. There is no better word to describe this miracle than to say that it is beautiful. Elaine Scarry opens her brilliant essay “On Beauty and Being Wrong” with this relevant passage: “What is the felt experience of cognition at the moment one stands in the presence of a beautiful boy or flower or bird? It seems to incite, even require, the act of replication. Wittgenstein says that when the eye sees something beautiful, the hand wants to draw it.”

Or, think of it this way: a lost desert traveler whose body is more than fifty percent water, feeling thirst, slices into a towering cactus to suck out the moisture for survival. Water so constituted finds other water to extract. Given sufficient time and the inexhaustible evolutionary imperative, the metaphor mutates and becomes symbolic: we extract meaning from the universe, seeing signs and wonders in the meaningless array of nature, giving words to things, and pulling from those accumulated words accretions of new meanings for which



Michael Lundgren, *Eroding Cinder*, 2017, Pigment Print, 40 by 56 inches

we must coin new words—a fascinating unspooling of cultural evolution. Long before human beings sank deep shafts to extract coal or metal ores, they searched the skies with caveman eyes and raked the stars for meaning and information. To hear Dawkins and the other proudly incorrigible evolutionary biologists tell it, we are “meat machines,” capable of processing both abstract information and other life forms for energy. We extract protein and carbohydrates from the plants and animals we extract from the environment, but we also extract information, which accumulates, but almost always in ways that enhance our ability to extract and accumulate. Meanwhile, the recognition of beauty in this universe impels us to create art—a different version of the same impulse for extraction.

Thinking about ourselves and what we do in this way leads inevitably to science fiction or religion, two things which are, perhaps, different sides of the same coin: a coin we began flipping the moment we emerged from the muck, having mastered the ability to extract oxygen from the atmosphere rather than from seawater. Religion, simply put, is just the idea that there's more going on here than meets the eye and that the mystery itself must be part of what compels us. The so-called “God of the gaps” is a suitable phrase, as far as it goes, except that what we mean by gap is something more like an abyss. God is merely that which remains to be extracted. We heathens simply murmur, “Beautiful.”

Science fiction perhaps is not quite the right word for the alternative tendency, which is to imagine the future and to envision what lies beyond the



Chris Ruston, *Fault Lines*, 2019, Indian ink and pen on paper

horizon of our senses, and then use our rational capacity to make it happen. “Fiction” is a placeholder for the vision, “science” is the vehicle that continually brings the imaginary into focus more and more clearly until it becomes real. What is embodied in the phrase “science fiction” slides across the page of history from left to right: fiction leading the way, science fast on its heels, always erasing the abstract vision with concrete reality.

The difference between these two visionary tendencies is that religion approaches the mystery of the future on an individual basis, seeking salvation, while science fiction imagines the future of the race itself, offering survival. Religion offers a presumably private pact with God over the inevitability of death; if science fiction offers anything like salva-

tion, it is something more like a philosophical long view, an acknowledgement of how wondrous it is to be a conscious part of the universe unfolding. If you read very much religion or science fiction, you begin to realize that both of them offer flights away from the world. Each impulse, in its own way, takes a dim view of the world we actually inhabit, seeing the world as a way station along the way to something better, whether heaven or colonization of new planets. In the way that an organism extracts its nourishment from a clam and leaves the shell behind as detritus, it seems human beings have some vague notion that once we have exhausted Earth’s resources, we shall move on to extract them from other planets.

For this reason, neither religion nor science can furnish a convincing argument for why we should rethink extraction. All religions are eventually dominionistic (taking for granted that human beings are the pinnacle of creation and therefore have dominion over the Earth), and so the psychology of extraction is woven into the worldview. Science fiction, which might be thought of as the secular religion of the modern age, is powerless to repudiate extraction because once you’ve erased the line between “organic” and “inorganic” by acknowledging that life is just a kind of stellar evolutionary machinery, extraction becomes woven into biology.

Out of science, an environmentalism often emerges in which we acknowledge our unprecedented power over nature and urge ourselves toward some kind of wise stewardship. Buckminster Fuller’s *Spaceship Earth* essays offer a fine example. Similarly, from the religious side, we often see environmentalism based on the idea that it is our obligation to take care of Creation.

At root, these are both arguments for survival: if we witlessly destroy our earthly habitat, we shall perish, either because God will punish us, or because we will have irredeemably fouled the nest. This line of reasoning presumes that, because we are conscious and have the capacity for reason, we would be irresponsible if we did not take steps to prevent the sort of environmental destruction we presently see threatening us with mass extinction, including the extinction of our own species.

The problem with stewardship arguments, and environmentalism is general, is that the overarching worldview giving rise to them contains the seeds of its own refutation. On the religious side, stewardship is simply refuted by the occult omnipotence of God: everything humans do is all part of God’s plan, including the irresponsible destruction of our own habitat. And if science teaches us that humans are part of nature, then everything we do is natural, including the irresponsible destruction of our own habitat. The survivalist outlook cannot convince

those for whom survival is merely one possible outcome in a larger “plan,” whether devised by God or unfolded through natural evolution. Perhaps—and this is a truth made plain both in the Genesis flood story as well as the paleontological fossil record—we are not meant to survive.

It strikes me that the only way out of the dark woods of this cynicism is to look for a narrow path hidden in a certain philosophical thicket we call aesthetics. I will summarize the aesthetic argument in this way: rather than saying that we should reconsider, and carefully control, our impulses to extract coal and oil and gas and rare earth metals because doing so has created an imminent threat to our survival as a species, we should instead argue, by availing ourselves of all the means we possess for the production of beauty, that we should reconsider, and carefully control, our impulses to extract coal and oil and gas and rare earth metals because doing so is aesthetically untenable. Put even more simply, the mess that extraction processes leave behind is not pleasant to look at or live among. Those processes and their aftermaths deny *beauty*.

The survival instinct cannot save us. It should be manifestly obvious by now, in fact, that our urge to survive is what has led us to this sublime twilight of the Anthropocene in the first place. From the viewpoint of eternity, whether we survive or flourish does not matter, because the universe is indifferent. If value is to be assigned, it is up to us to assign it, and for value to be meaningful in a way that will transcend the self-defeating mode of survivalism, it must be *aesthetic*. We must live for beauty, not for survival.

In a way, even the environmentalist argument reduces to an aesthetic argument: the end will not be “pretty,” or “no one wants to see” the oceans rising 200 feet and the attendant havoc that would wreak. My point is that the horror we feel at the prospect of it all vanishing, whether because we burned too much coal or because of a wayward asteroid, is fundamentally an *aesthetic* horror. It is the horror of knowing that without us to perceive it, the world

and the universe would cease to be beautiful. This too may be a kind of selfish arrogance, but fighting for the endurance of the beautiful is the only convincing course we have left.

Some will object that beauty is nebulous, or that it lies in the eyes of the beholder, which is to say that conceptions of the beautiful are always subjective. And if beauty is subjective, who is to say that the vast destruction of hundreds of square miles of pristine Canadian forest into poisonous holding ponds for Tar Sands oil recovery is not also in some sense “beautiful”?

What if we acknowledge that Beauty is universal, even if, like Justice Potter, we cannot define it, though we know it when we see it? In a sense, since he was writing of obscenity, he inadvertently referred to Beauty itself: after all, isn't it the case that only because of some innate module in our minds conditioned by 200,000 years of evolution are we able to distinguish the beautiful from the obscene? The extent to which we are willing to let the natural world succumb to the rapacious greed of human impulse is a reflection of our abandonment of objective beauty and the ideal aesthetic object that has always inspired the greatest accomplishments of humankind.

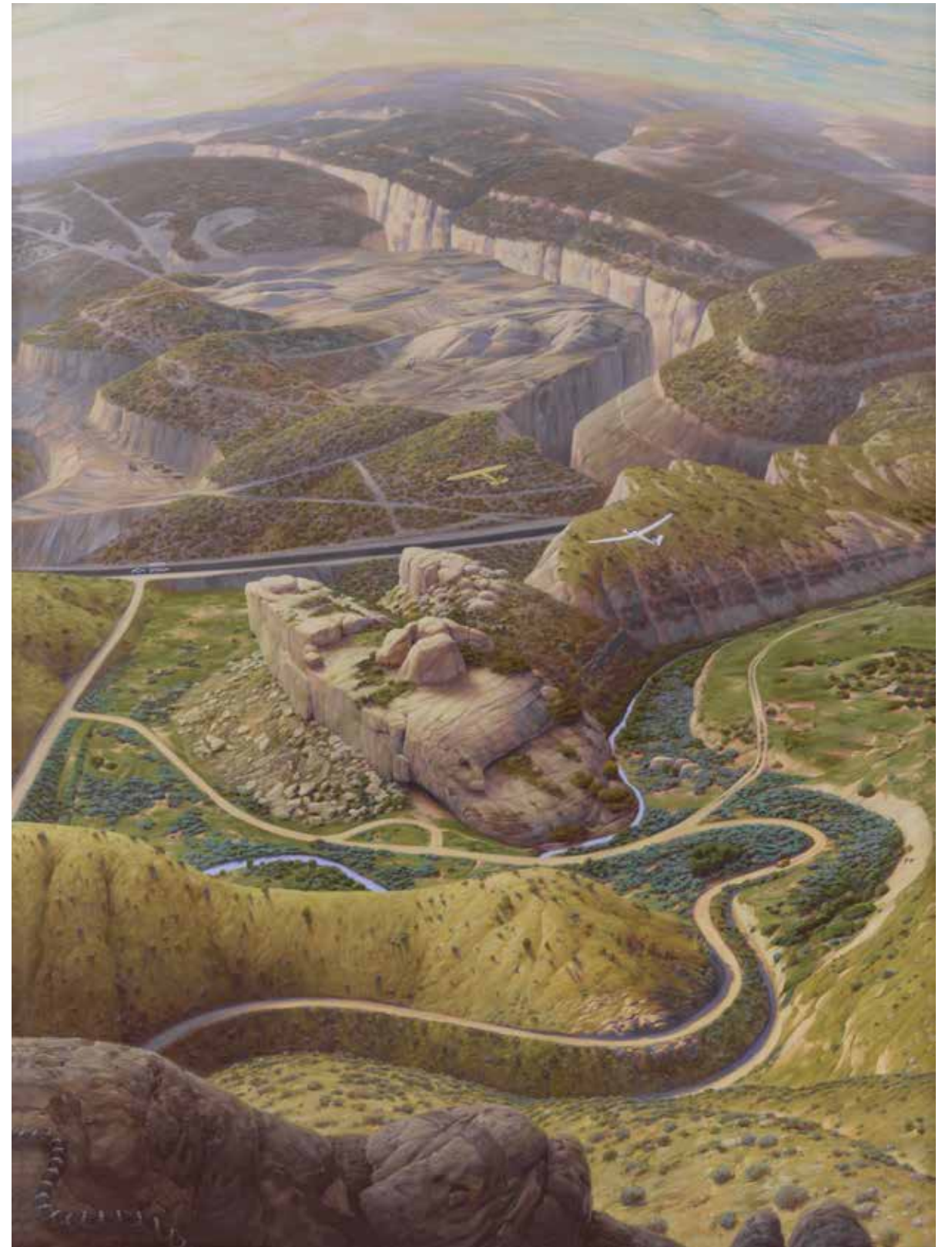
Ugliness is always the residue of a cynical subjectivism, which is what we are up against in the impending twilight of the Anthropocene. We should not go gently into that night.

The evolution of consciousness is intimately bound up with the aesthetic sense and offers us perhaps the only useful tool for thwarting the more rapacious, but natural, impulses. Scarry writes, “The thing perceived, the beautiful object, has conferred on it by the beholder a surfeit of aliveness: even if it is inanimate, it comes to be accorded a fragility and consequent level of protection normally reserved for the animate; if inanimate, like a poem, it may, by being memorized or read aloud to others, thereby be lent the aliveness of the person's own consciousness.”

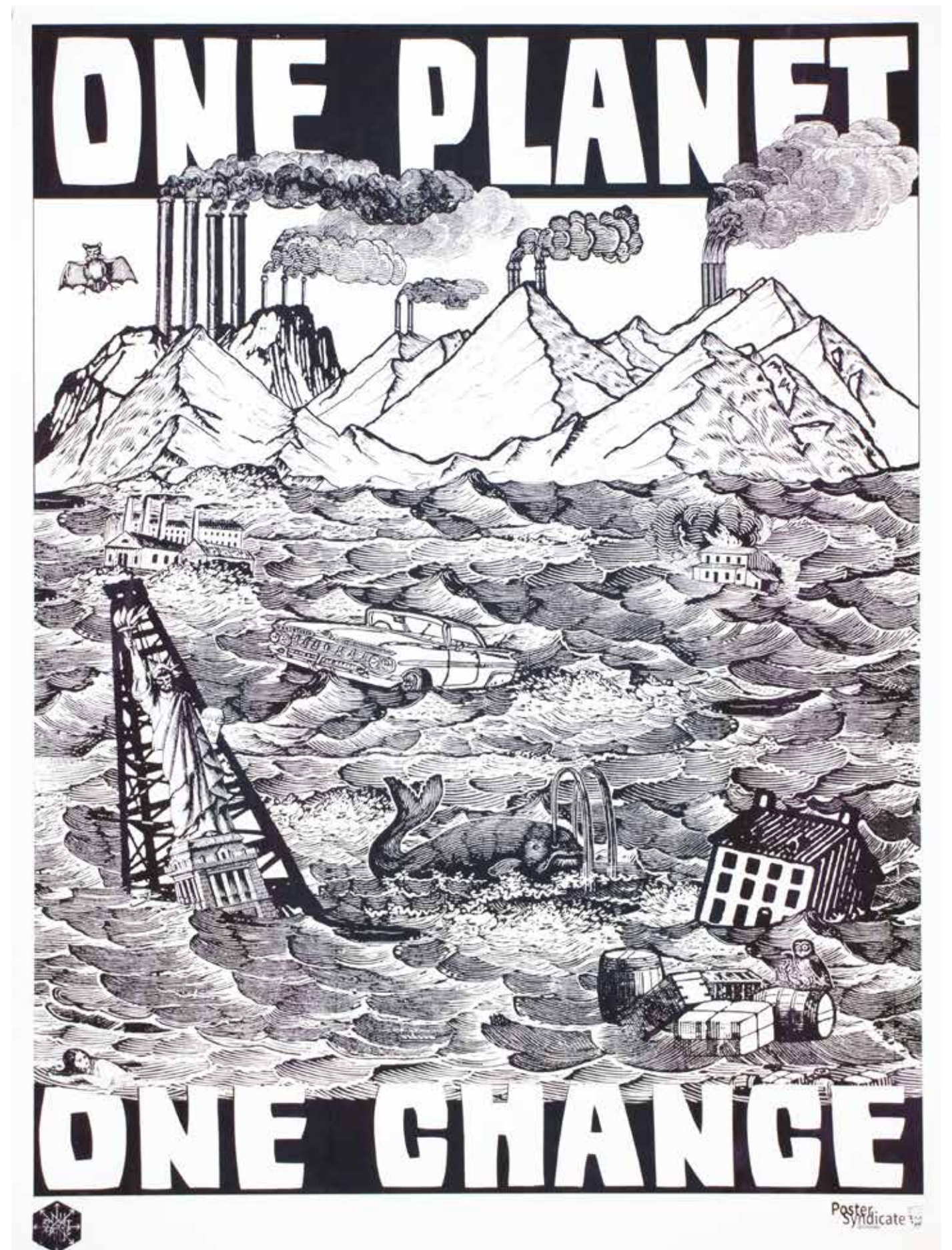
It will not do to conceive of the Earth as a spaceship or any other vehicle of survival. Survival mentality contains within its genetic code the instructions for our undoing, analogous to the way in which any normal cell can at any moment go rogue and become cancerous. There is no way out of the twilight of the Anthropocene but to reimagine the world and ourselves in it as an immense Apollo project dedicated to the cultivation of Beauty.

Let this be a manifesto:

All human production must be reorganized to generate ideas and objects that are beautiful, such that we feel a moral imperative to protect and preserve them for their own sake, whether it is the manufacture of copper wire, or the layout of rice fields. We must replace the invisible hand of the marketplace with the all-seeing eye of the Pythagorean God who yearns for the perfect expression of the beautiful. If we are to be caretakers, we must be caretakers of the Beautiful, for nothing else under heaven is worth preserving. We must live for Beauty without succumbing to decadence, understanding in our bones that what we value most is not survival, or security, or satiation, but rather the leisure that each of those affords so that we can contemplate and generate Beauty.



Chuck Forsman, *Snake Meridian*, 1997, oil on canvas, 67 by 48 inches



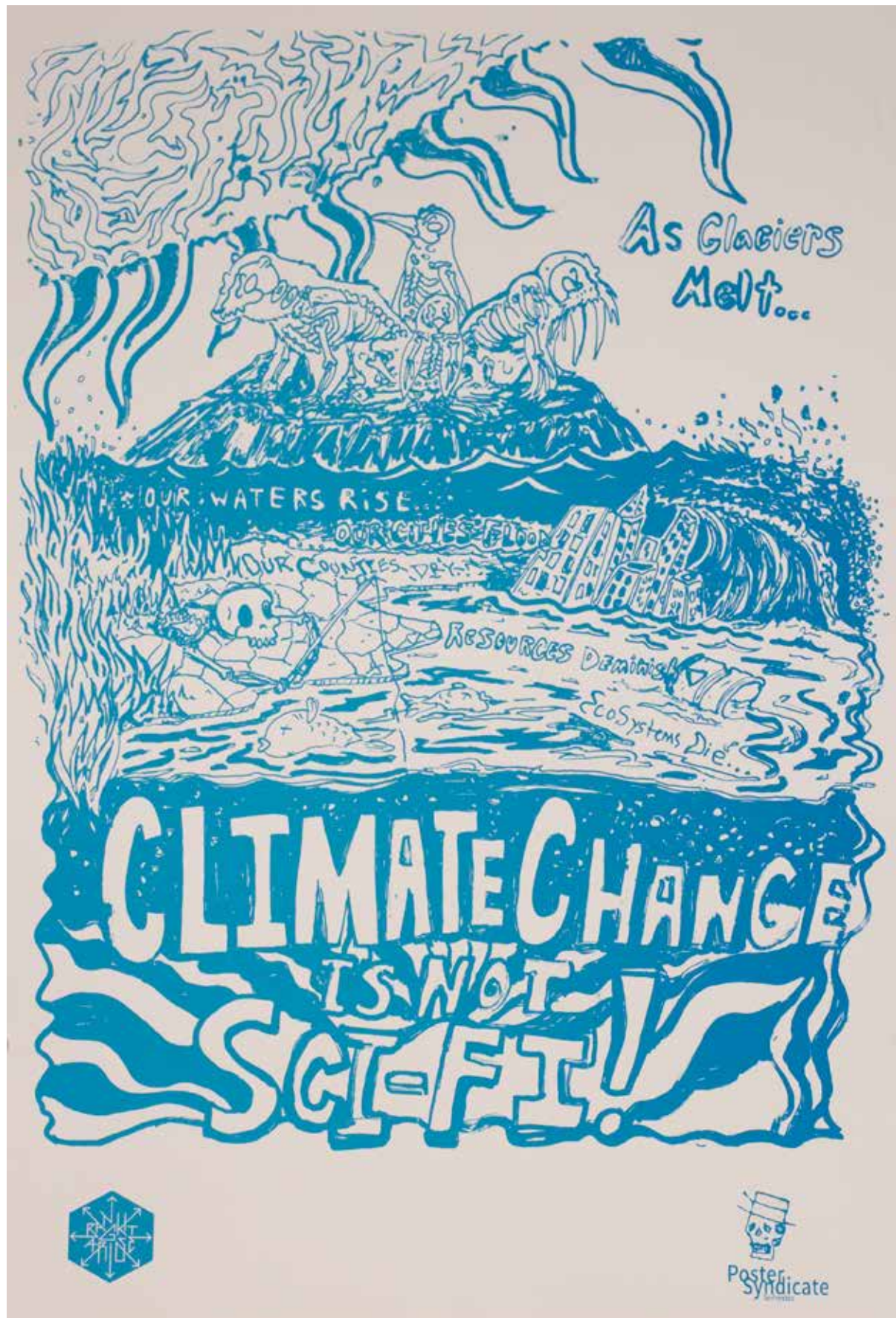
CLIMATE ACTION POSTERS

SAN FRANCISCO POSTER SYNDICATE AND BANGKIT ARISE

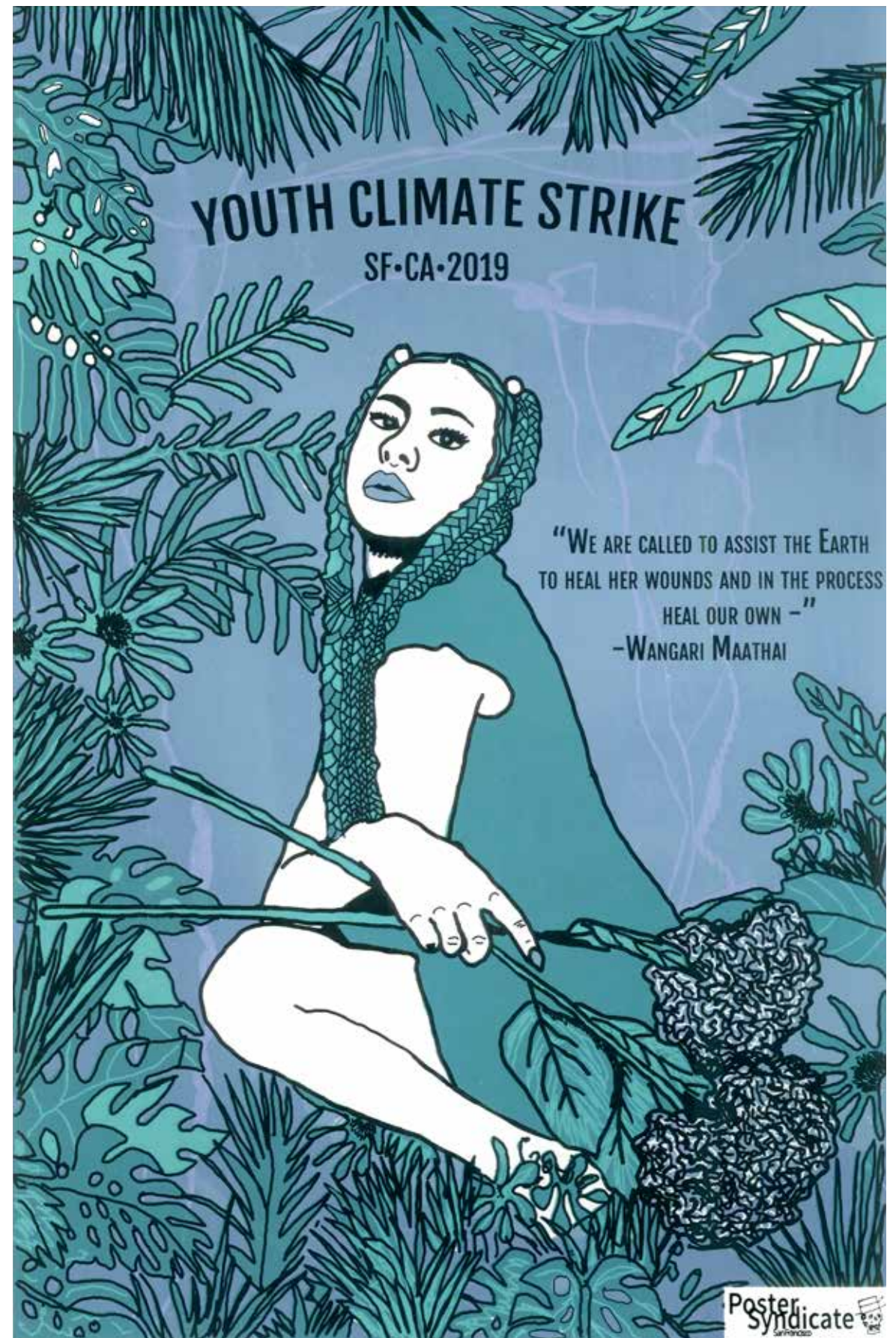
Art Hazelwood

San Francisco Poster Syndicate (SFPS) is a street art collective that prints and freely distributes screenprint posters at political actions. We have participated in multiple climate actions giving graphic support to the activism needed to address climate change. In 2018 SFPS teamed up with Bangkit Arise, a collective of artists from Yogyakarta, Indonesia to print at the march before the Global Climate Action Summit in San Francisco. SFPS has also distributed posters at Youth Climate Strikes in San Francisco in 2019.

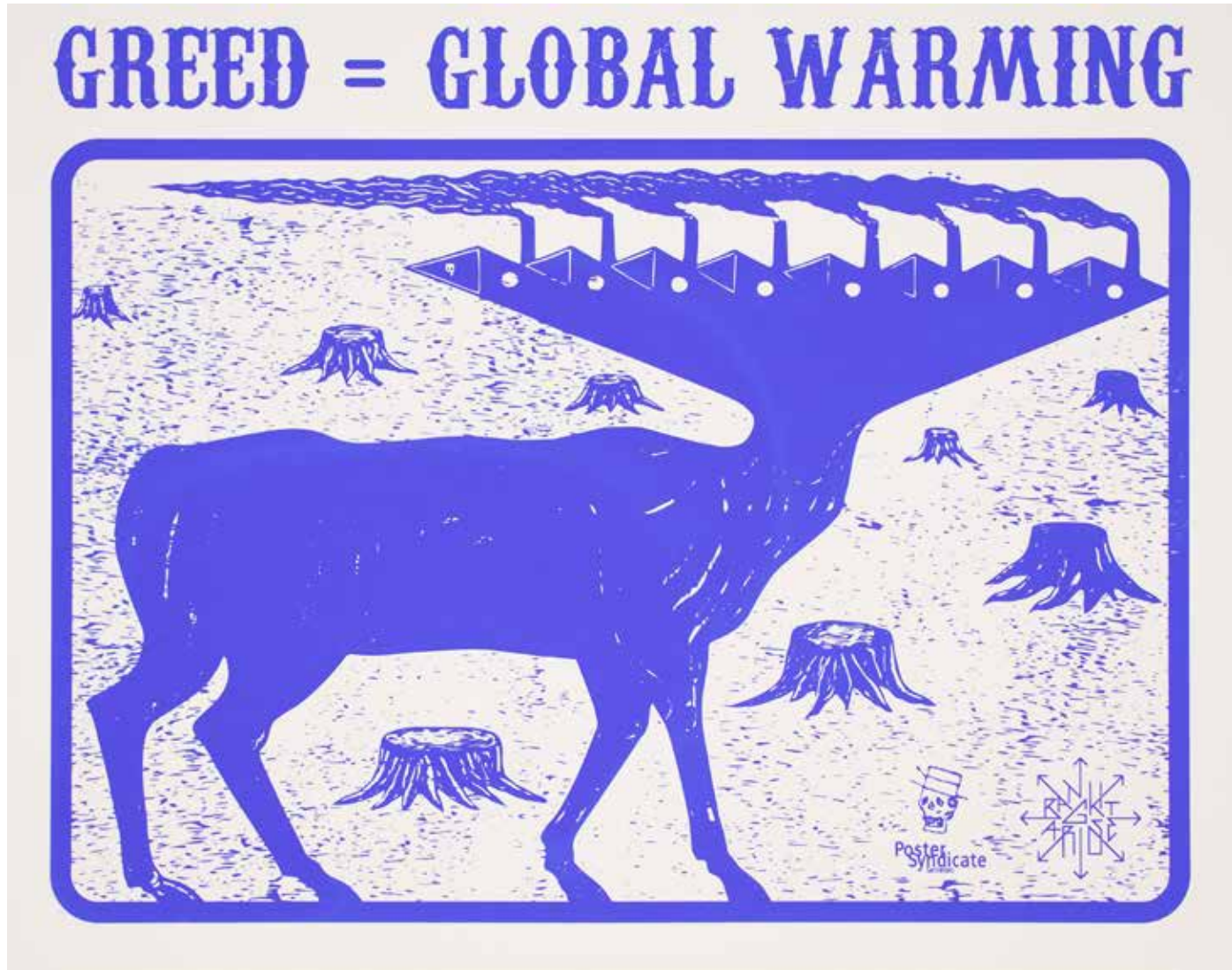
Above: Michelle Williams, *SEE Our Impact*, 2018, San Francisco Poster Syndicate, screenprint; Right: Patrick Piazza, *One Planet One Chance*, 2018, San Francisco Poster Syndicate, screenprint



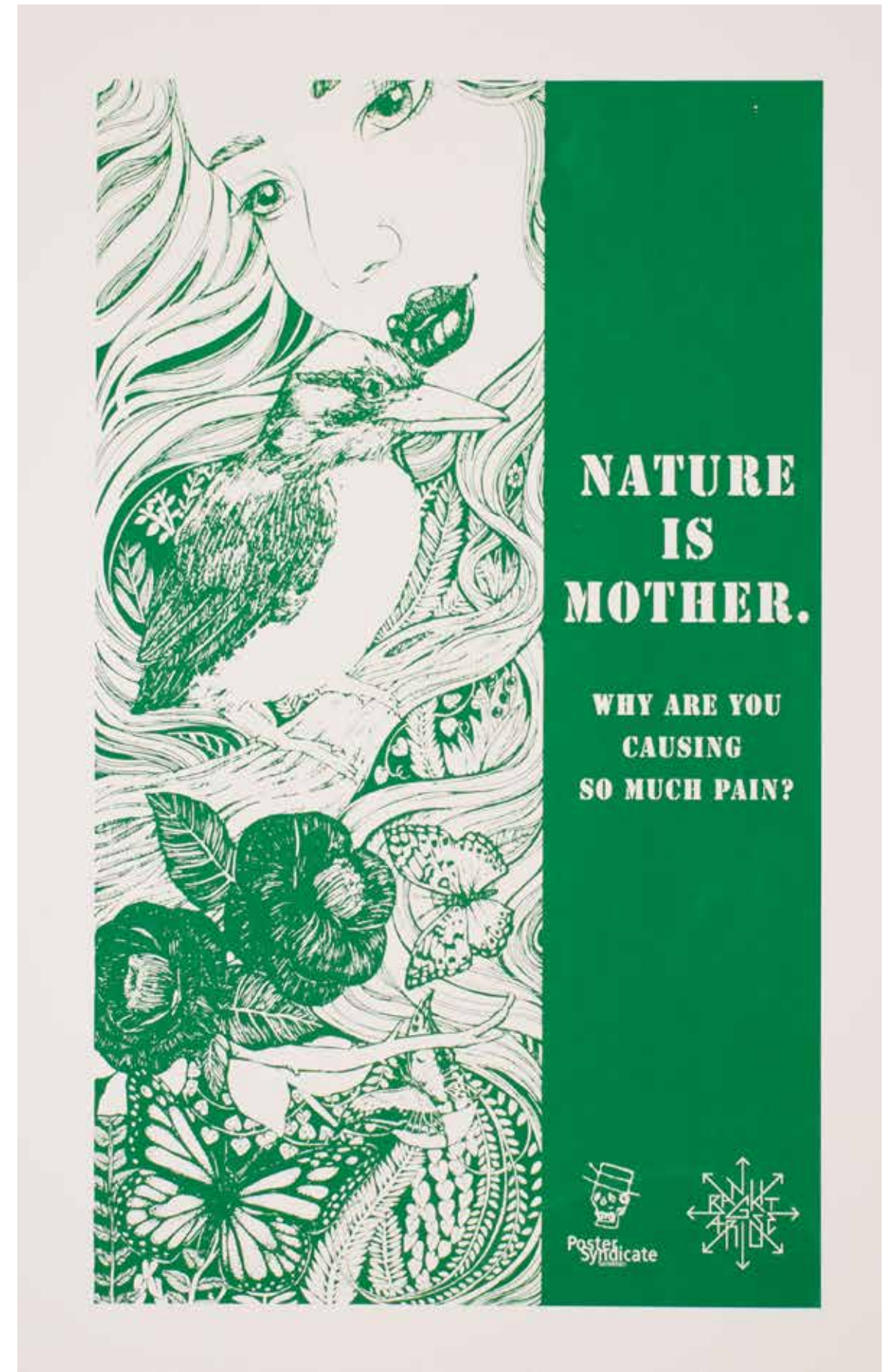
Krista Wright, Climate Change is not Sci-Fi, 2018, San Francisco Poster Syndicate, screenprint



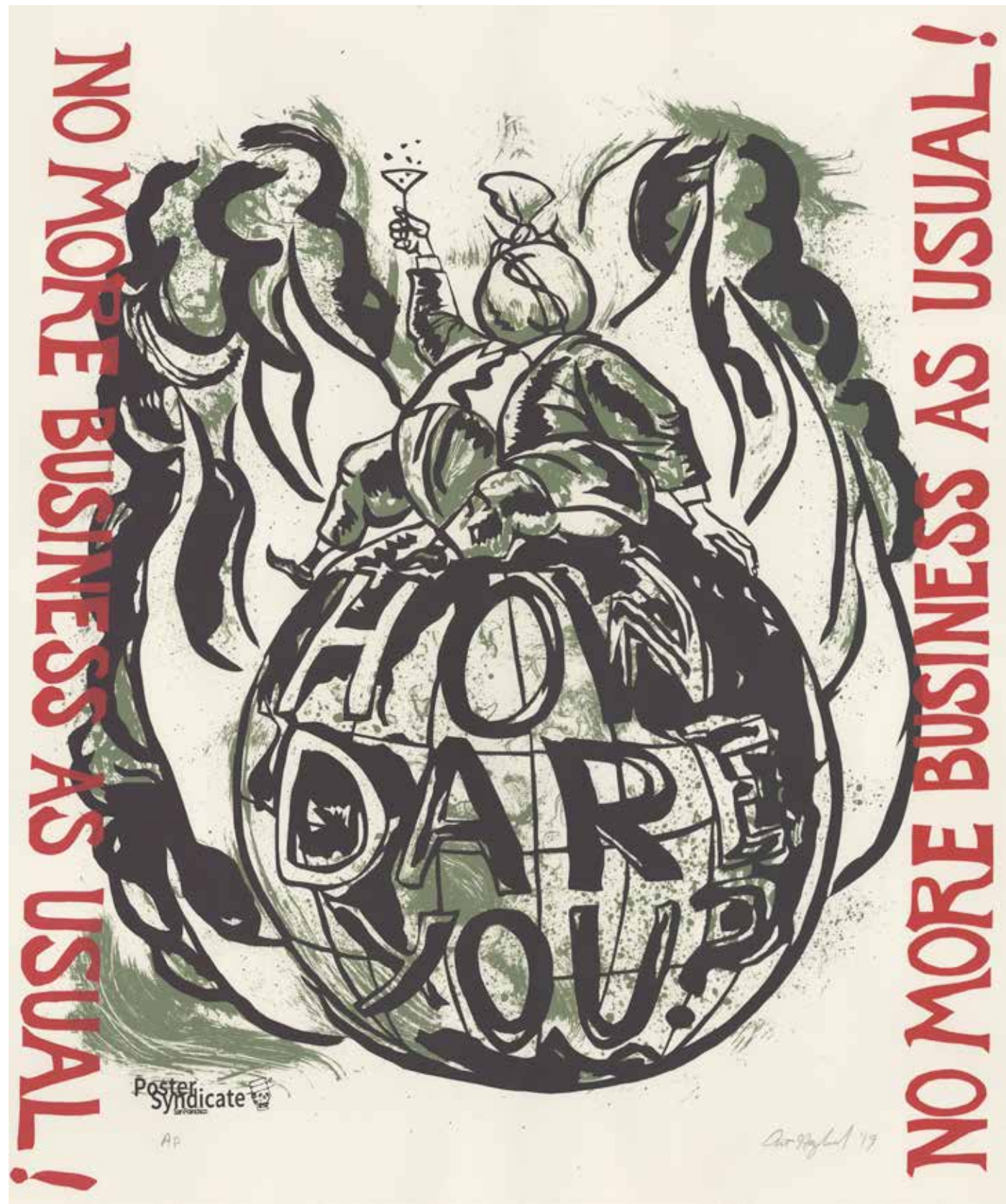
Samantha Companatico, Youth Climate Strike, 2019, San Francisco Poster Syndicate, screenprint



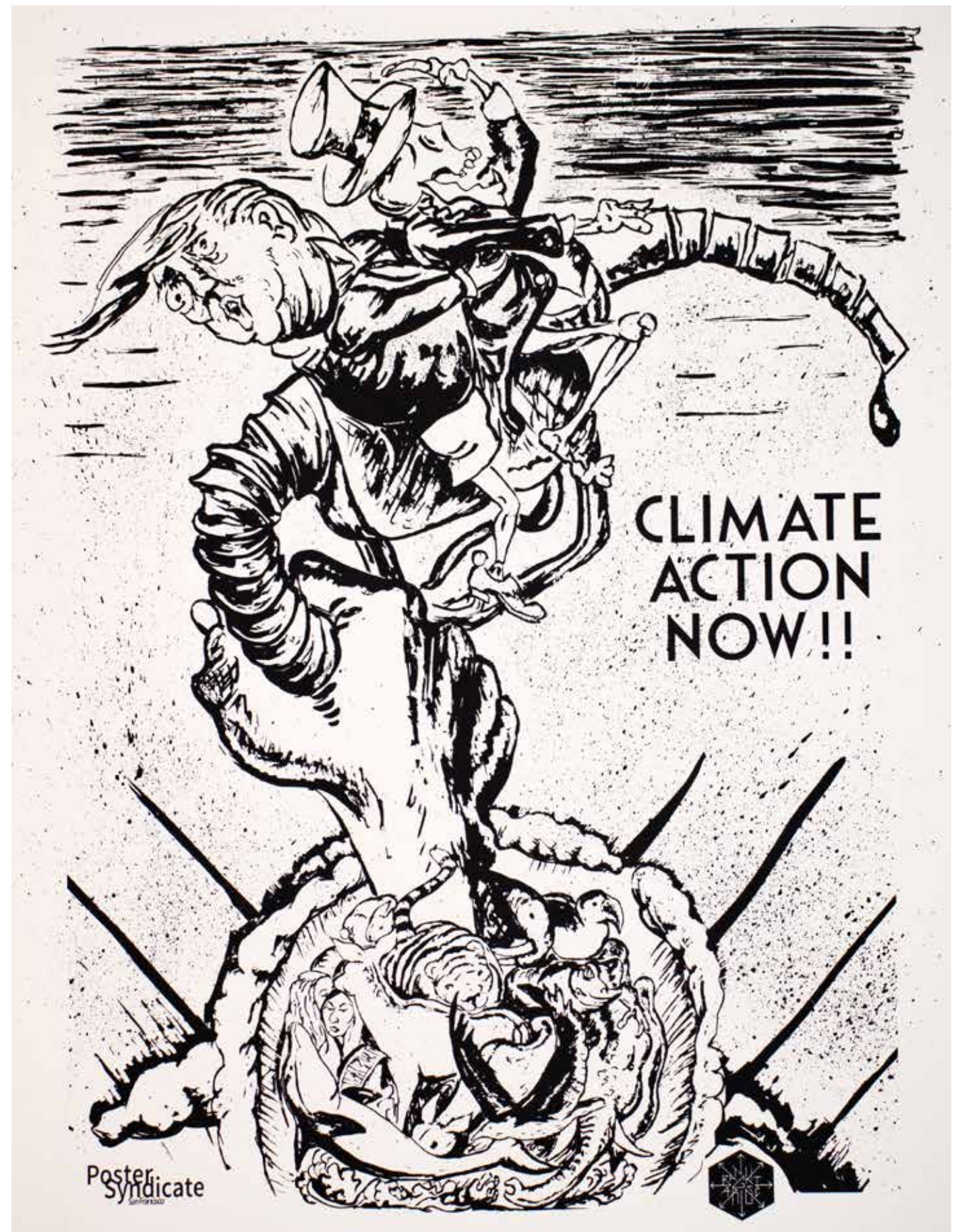
Ucup, Greed=Global Warming, 2018, Bangkit Arise, screenprint



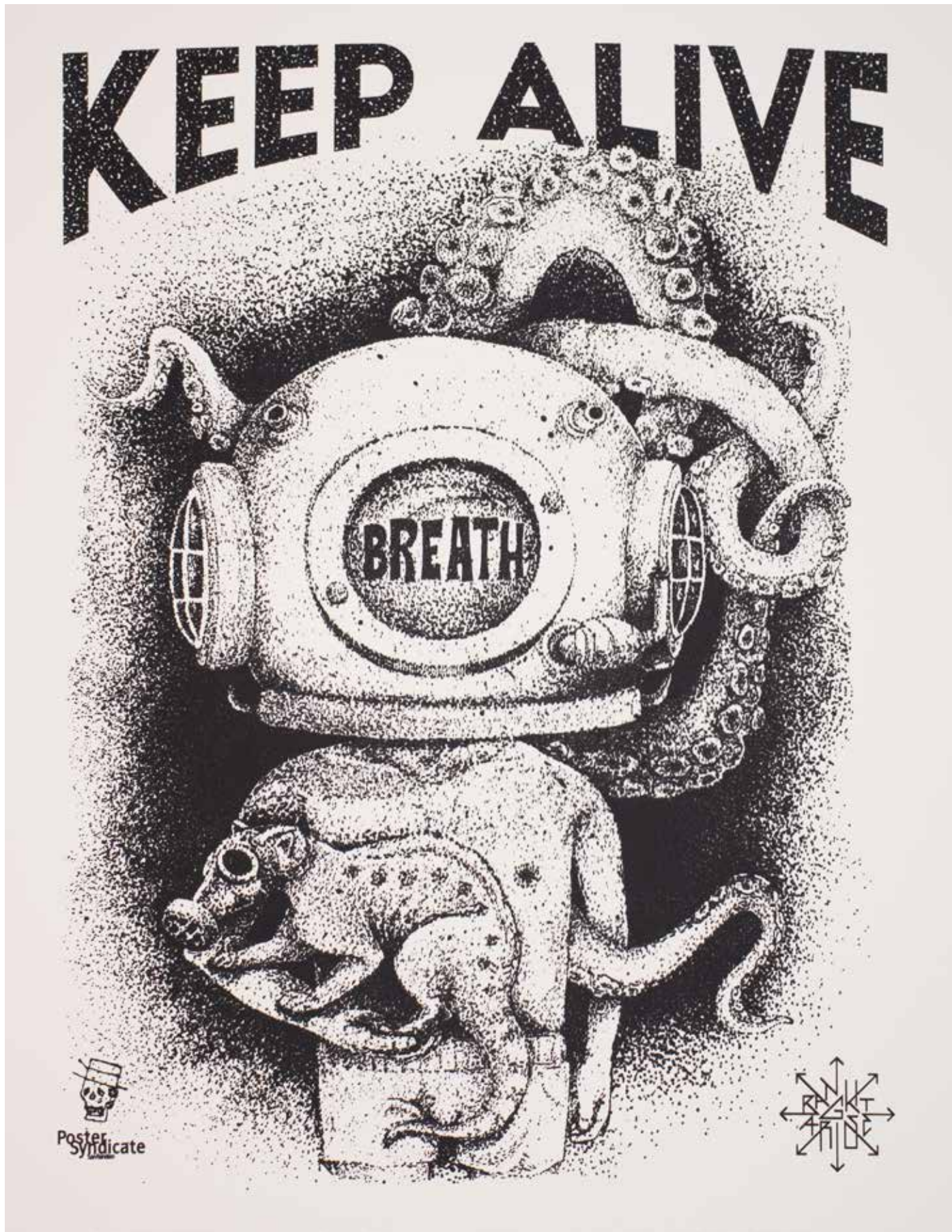
Harind Ndarvati, Nature is Mother, 2018, Bangkit Arise, screenprint



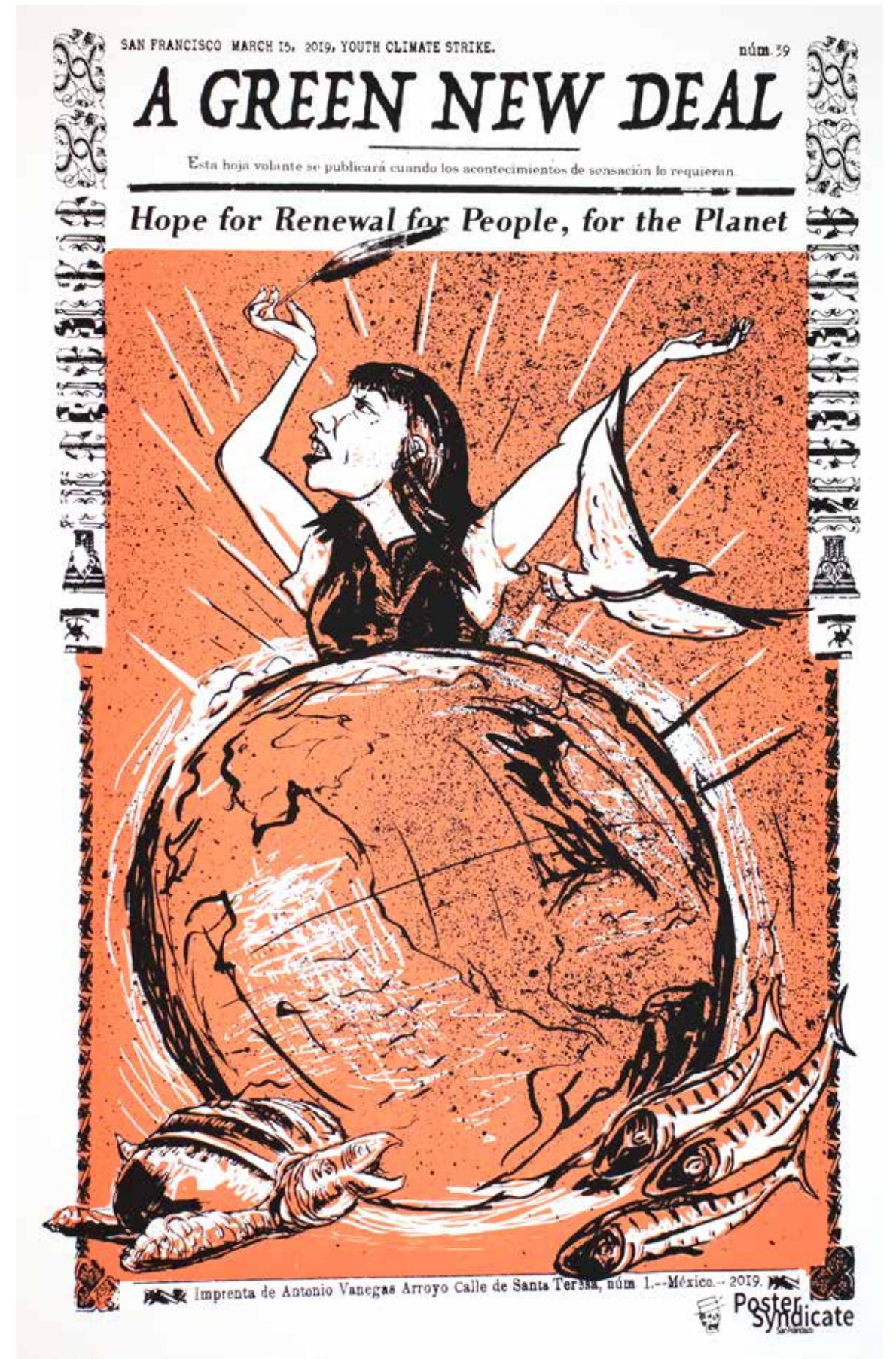
Art Hazelwood, How Dare You?, 2019, San Francisco Poster Syndicate, screenprint



Art Hazelwood, Climate Action Now!!, 2018, San Francisco Poster Syndicate, screenprint



Vine Puspita, *Keep Alive*, 2018, Bangkit Arise, screenprint



Art Hazelwood, *A Green New Deal*, 2019, San Francisco Poster Syndicate, screenprint



Art Hazelwood, *The Peaceable Kingdom*, 2019, San Francisco Poster Syndicate, screenprint

“My name is Greta Thunberg, I am sixteen years old and I’m from Sweden. I am grateful for being with you here in the USA. A nation that, to many people, is the country of dreams. I also have a dream. That governments, political parties and corporations grasp the urgency of the climate and ecological crisis and come together despite their differences – as you would in an emergency – and take the measures required to safeguard the conditions for a dignified life for everybody on earth. Because then we millions of school-striking youth could go back to school.”

– Greta Thunberg
Address to the U.S. Congress
September 18, 2019

BAD FAITH

ART ON THE EDGE OF THE ABYSS

poster series by IMPEDIMENT PRESS, Australia

In 2013, we began researching material for our new book, drawing influence from the writings of Ludwig Leichhardt, the German scientist who in the early 1800s had successfully carried out the world's longest overland expedition. Leichhardt's journey remains a powerful influence in Australia to this day.

Arriving in 1842, just fifty odd years after the beginning of white settlement in Australia, Leichhardt was astonished by the enormous amount of activity and development that had taken place over so short a time. Fascinated and dismayed by the colonists' race to glean as much wealth for themselves as they could (prefiguring the opportunism of 1850s era gold rushes), he observed their incurious disregard for the unique world that surrounded them. Leichhardt recognized that in Australia, the scientist and the artist both found themselves in a difficult place—a place where brawn was preferred.

Our interest in Leichhardt grew after we replicated a number of his journeys, viewing our country and its land in vivid and minute detail through the scientist/explorer's unique perspective. Through Leichhardt, we observed within the peaks and depths of the Australian landscape a fragility that called for understanding and protection. Consequently, our book has taken shape through close observation of the landscape from Leichhardt's time to the present.

In 1953 Australian author Kylie Tennant's introduction to her book *Australia: Her Story* includes Mark Twain's quote which declares Australia as "curious and strange—full of surprises, incongruities, and incredibilities [...]" And yet, the people have continued to plunder and destroy this land, largely insensitive to the ancient culture to which it is spiritually tied, whose people are imbued with an apprehension of mutuality.



Sue Anderson (letterpress), Gwen Harrison (lino cut) *Mammon Led Them On*, printed by IMPEDIMENT PRESS, Sydney, Australia

Former Chairman of the Commonwealth Bank Board Dr. H.C. Coombs—a man of high reputation according to Tennant—was questioned in 1970 whether the mineral boom had done much to improve the Australian economy as a whole. He responded that Australia had three assets which other countries did not possess: an unequalled view of the Milky Way, the age-old culture of the Aborigines, and the Great Barrier Reef. And yet, by that time, the Milky Way had already been obfuscated by smog and dust in the nation's cities and industrial towns, the age-old culture of the Aborigines was nearing extinction, and the health of the Great Barrier Reef was under threat by the invasive encroachment of crown-of-thorns starfish as a result of the plundering of that species' natural predators, the trochus and the triton shell.

New roads had been opened up in the search for treasures—a continuation of the systematic land clearing that had taken place uninterrupted for the previous hundred years with little regard for native species, habitat and vegetation. Above the new mines and towns, clouds of dust could be seen for miles out to sea. The term "squatter," which had originally applied to men who occupied Crown land without permission, subsequently became a term of respect by virtue of the wealth these men accrued. Just over one hundred and ten years after Leichhardt wrote his observations of the colonial society, Tennant's comments are strikingly similar; the "squatter" mentality had continued to reign supreme.

In 1967, in Queensland, as Joh Bjelke-Peterson was about to come to power, industrial interests were pushing for "developing" the Great Barrier Reef. In addition to proposals for mining the Reef for limestone, the Bjelke-Peterson government was also engaged in serious and advanced talks to open up the Reef to oil drilling, and had secretly zoned up to 80% of the Reef for mining. It was artist John Busst who saw the small notice discretely placed in a local paper. Being an activist, he alerted two friends: the poet Judith White, who was president of the Queensland Wildlife Preservation Society, and Len Webb, a CSIRO forester. The three began the long fight that ultimately saved the Reef and led to the creation in 1975 of the Great Barrier Marine Park.

In October 2017, environmentalists and scientists from the 1960s returned to fight for the Great Barrier Reef once more. Though it had since been listed as a UNESCO World Heritage Site, threats to the Reef's survival had only grown in the intervening years.

During our travels, a local tour operator adroitly articulated the mindset that predominated in those early years of colonizing: everything was there to be exploited. "We had a fairly full-on development-orientated government [...] and mate, if they couldn't drill it, mine it, chop it down or whatever, they really didn't want to know about it."



Gwen Harrison (photograph), Sue Anderson (letterpress), and Malcolm King (silkscreen), *Paradise Lost*, printed by IMPEDIMENT PRESS; Silkscreen on Somerset paper, KING STUDIO, Sidney, Australia



Gwen Harrison (image) and Sue Anderson (letterpress) *Dance with me*, printed by IMPEDIMENT PRESS, Sydney Australia

APOCRYPHAL SELF-PORTRAIT

Dean Rader

The coldest winter I ever saw was the summer I spent in San Francisco.
—Attributed to Mark Twain, but its origins are unknown

The darkest night of my life was that morning in your car. My heart would not stop storming. You said it was climate change. I may not

be able to prove you wrong, but that doesn't mean the end is near. The end is always near. I read somewhere that the sum of the earth's water

will never change. Nothing is taken away, nothing added. Every drop is the same age, every age dyed in the same drop. The

Cut-up clouds stretched and strung out have had about enough. Each day is a boat on a lake that we row ourselves into. We try

to pick at the scab of sunlight itching overhead, but we can't take our eye off the little crack in the hull we know keeps growing.

The Buddha says every place we've been we stay. Right now, he's in my dream sitting alone at an empty table, my tiny chair about

to collapse beneath him. Mark Twain walks into the room looking exactly like Colonel Sanders. In one hand, he cradles a bucket

of chicken, in the other he carries an ax. *The heaviest weight is the lightness of the soul*, he says to the Buddha. *Give in to the dark*,

the Buddha replies, *and you won't feel the darkness*. The longest drive we ever took was that evening we parked next to the cliff.

The sidereal dashboard, the cracked windshield of the body. I want you to know that it is never the darkest right before the dawn.

I want you to know the truth about everything. I want you to know that when those memories drop down, my umbrella opens.

FORECAST

Dean Rader

A storm is blowing in from Paradise; it has got caught in his wings with such violence that the angel can no longer close them. The storm irresistibly propels him into the future to which his back is turned, while the pile of debris before him grows skyward. This storm is what we call progress.

—WALTER BENJAMIN ON PAUL KLEE'S *Angelus Novus* (1920)

I
Origin is the goal.

II
A weather vane
all a-spin on the roof
points everywhere at once.

Drunk with wind,
the angel keeps going in circles.

III
The world's screen saver clicks off.
Everything reboots.

IV
And you with rain on the inside,
soaked beyond bone, beyond
the beginning of bone,
refuse to open the window.

V
Don't worry, it's already here.

VI
We know the past
only in relation to itself—

the future on the other hand,

VII
The new angel will rise
and fall at the same time,

like a sequence of events inverted,

thunder and lightning,
the reverse,
then back again.

VIII
Evolution is more than growth,
it's a mix of conservation
and revolution.

What does not happen,
cannot.

IX
No match for the winds.

The angel's wings
beat at the storm the way the heart hammers
against cessation.

X
Stop.
Just for a second. The tornado
will carry you wherever
you want to go.

XI
The prediction calls for
darkening skies, more wind,
heavy turbulence.

Though we
are advised to remain grounded
in the landscape of the self,
we take flight.