

Special Theme

Landscape Memories, Archival Ecologies

Parallel Archives: Photographic Silver & Its Landscapes

Alice Cazenave

Department of Anthropology, Goldsmiths, University of London

DOI: https://doi.org/10.51002/trajectoria_025_03

(Published March 27, 2025)

Abstract

This photo essay explores the materiality of photography by looking to the ground. Silver, used extensively in analogue photography, is blasted from the depths of the earth to be smelted, traded, and coated onto photographic film. This short provocation explores the parallel histories of analogue photography and silver extraction. The essay narrates fieldwork encounters surrounding Silver City, Nevada, which produced silver in the 1850s alongside European developments in photography. It examines the legacies of Settler-colonial extractivism and the spaces that both provide photographic silver, and endure and its legacy. The photographs in the series are developed using low-toxicity, plant-based chemistry made from Yellow rabbitbrush. This plant grows in abandoned silver mines surrounding Silver City, and tolerates alkaline soils typical of ex-mining sites. It revegetates land and habitats disturbed by resource extraction. Its use as photo-chemistry foregrounds the ecologies touched by silver extraction, and explores their agencies by engaging with them visually, chemically, and materially.

Key Words: analogue photography, anthropocene, extractivism, settler-colonialism, political ecology



Figure 1 Abandoned silver mines in Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush plant photo-chemistry.

Silver, Dust, and Rabbitbrush

- 1 Silver shapeshifts. It moves through this universe in unimaginably complex ways.
- 2 It has many forms and historical currencies, sitting at the core of colonial projects, global trade, civil war, and statehood (Stein & Stein, 2000). It has different molecular configurations; sometimes inert, sometimes lethal. It is medicinal - for those with access to it - for those born with silver spoons in their mouths. It images teeth, bones and outer space through its capacity to react with light. Its toxicity is selective. In pure forms it is inactive, but in water it transforms into bioactive states. It crosses membranes, altering the genetic information and blueprints of whole microbial worlds (Clement & Jarrett, 1994).
- 3 My engagement with silver focuses on one dimension of its journeys: the spaces it occupies and the worlds it collides with as a photographic metal. When dissolved into nitric acid, silver transforms into silver nitrate. Through the act of being struck by light, it is this basic compound that makes analogue photography possible.
- 4 This photo essay is concerned with the ground works at play - the infrastructures and violences - that brought silver to the eye of the camera. What land was silver plucked from before being traded on the global stock exchange? What are the legacies of this extractivism (Liboiron, 2021)?
- 5 It's October and my rented city car bobs up the hillsides like a buoy out of control. It does not have the clearance for the dirt roads carrying it through the deserts of Silver City. I lower my head to the steering wheel to peer through the dust. No-name road. I take in the scene - the Sierra to my left, and ahead, a scattering of dispersed wooden houses. They sprawl unevenly down the mountain like a handful of marbles steadying to a stop.
- 6 A flock of brown ground-dwelling birds explode near me as I approach them. They hang out in the bushes that pepper the landscape. One of these is a bright yellow bush - it is hardy, rough, and everywhere. A quick google reveals to me that what looks an insipid yellow weed, is to Wikipedia botanists:

<Yellow rabbitbrush >

It rapidly establishes in disturbed habitat, including burns and rockslides. It is a valuable shrub for revegetating damaged land such as abandoned mining areas.



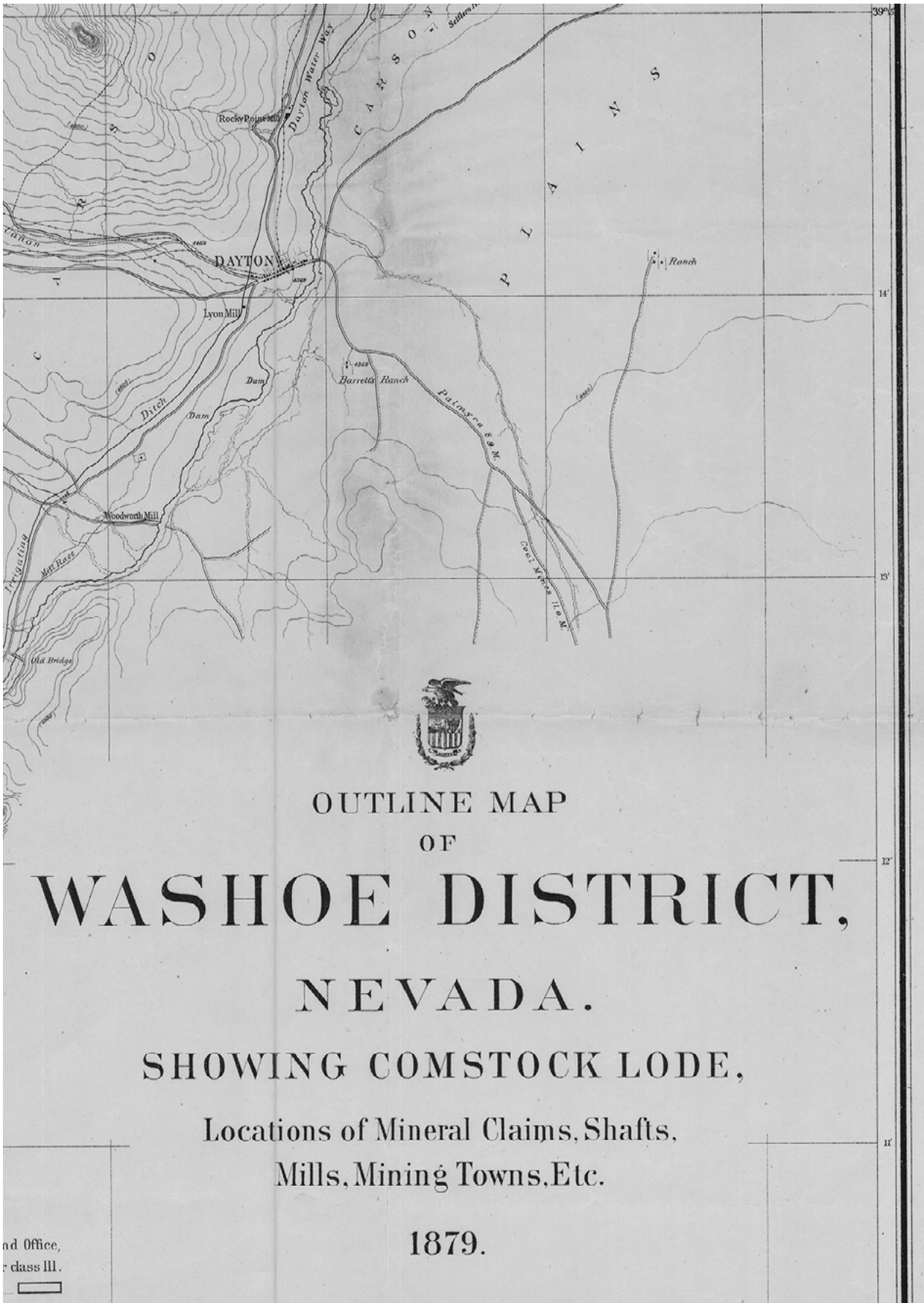
Figure 2 Road name sign, Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush plant photo-chemistry.



Figure 3 Abandoned mining structures, Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush plant photo-chemistry. Digital image of Yellow rabbitbrush growing in Silver City.

Photographic Extractivism

- 7 Silver mining in regions now known as the Comstock boomed in the 1850s (Tingley et al. 1993), around the time that photography was being popularised in Europe. It is for this reason that I start my journey here.
- 8 I am interested in the often-overlooked materials of photographic reproduction – the metals, minerals, and salts that make up photographs (Parikka 2015). Previous engagements with the visual have focused on questions of representation; analyses of colonial photographs often attend to how landscapes and people are visualised (Arni & Pushpamala 2004). More recently, anthropologists have turned their attention away from image content to image materiality (Edwards 2012; Pinney 2001; Wright 2013). These engagements with photographic materiality have examined the material supports of photographs - the paper substrates, albums and frames which hold photographic images (Edwards & Hart 2004).
- 9 My research extends these enquiries to consider the chemistries and metallic elements that precursor material and representational form. The research bridges studies in material culture (Bennet 2023) with anthropological studies of photographic materiality (Edwards & Hart 2004). It does this by looking to the silver that constitutes the image itself, to extend debates surrounding photography and extraction (Arni & Pushpamala 2004). It asks, what is the role of photography in shaping the world, from material rather than representational starting points (Jacka 2018)?
- 10 Extractive industries impact and transform the topographies of landscapes. This kind of destruction is almost spectacular in its explosiveness; whole mountain sides are blasted open and reconfigured to serve colonial ideas of progress (LeCain 2009). But what are the less visible forms of destruction in photography's history, that are equally as explosive, but invisibilised (Nading 2020)?
- 11 The Comstock region in Nevada is the homelands of Nūmū (Northern Paiute), Newe (Shoshone), and Wašišiw (Washoe) peoples, who endured land theft and mass murder alongside 19th century gold and silver extraction. There are many plaques romanticising the mining history of the region. There are none referring to Native American histories, with the exception of sites marking Settler-colonial - Paiute wars.



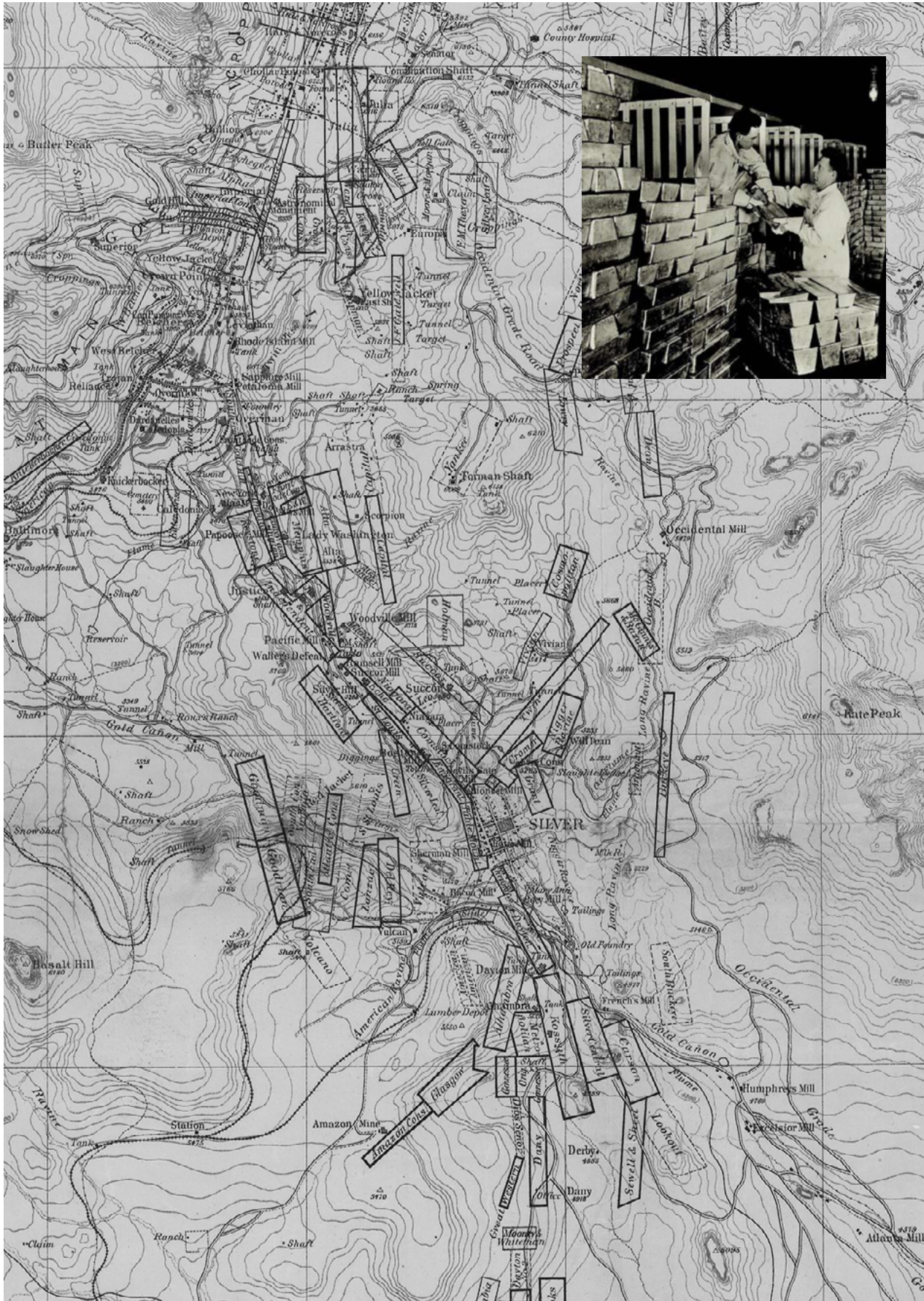




Figure 4 U.S Geographical survey West of the 100th meridian. Outline map of Washoe District, Nevada. Showing the Comstock Lode, locations of mineral mine shafts, mills, mining towns, etc, 1879. By order of the Hon. the Secretary of War, under the direction of Brig. Gen. A. A. Humphreys, Chief of Engineers, U.S Army.

Figure 5 U.S Geographical survey West of the 100th meridian. Outline map of Washoe District, Nevada. Showing the Comstock Lode, locations of mineral mine shafts, mills, mining towns, etc, 1879. By order of the Hon. the Secretary of War, under the direction of Brig. Gen. A. A. Humphreys, Chief of Engineers, U.S Army. Archival photograph. Unknown photographer, Silver bars in the Kodak vault, 1945. Gelatin-silver paper, Kodak Historical Collection #003, Rare Books, Special Collections, and Preservation, University of Rochester, Eastman Kodak Company.

Figure 6 Stop Open Pit Mining sign, Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbit-brush plant photo-chemistry.



Figure 7 Nevada near Virginia City. Stereograph by Alfred A. Hart, official photographer of the Central Pacific Railroad, 1868. University of Reno, Special Collections.

Desert tree, power lines and Pinyon pines in the distance, Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush plant photo-chemistry.

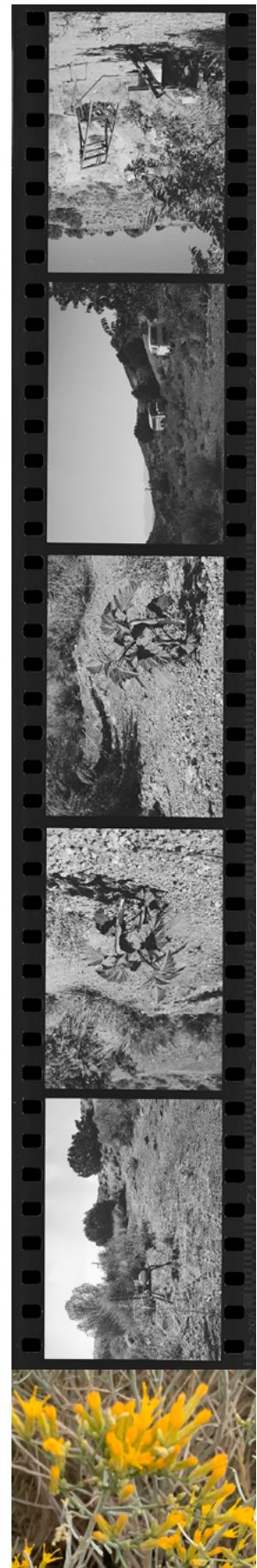


Figure 8 Silver City, Nevada. Stereograph by Eadweard Muybridge circa. 1868. University of Reno Special Collections. Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush plant photo-chemistry.

And Then, What's Left?

- 12 Historically, mercury was used to isolate silver from its ore. The Environmental Protection Agency estimates that 6,350 tonnes of mercury were released into the Carson river, Toinahukwa (Northern Paiute), Watahshemu (Washoe), across two decades of intense mining between 1850–1870.
- 13 Silver processing mills lined the Carson river and their stamp mills were powered by its water. Stamps pounded the extracted ore 24 hours a day, and mercury washed into the water from over 200 mills lining the river.
- 14 Today, cottonwood and willow trees follow the river's course. In the breeze, their leaves sound like a symphony of rain sticks. They provide yellow tones to the steady brown palette of the desert. The river is now dry, but the trees mark where the water once flowed. Willow is a mercury-remediation species; it draws up mercury through its root systems and accumulates it in its botanical matter (Greenplate et al. 2023). Working at small scales, it detoxifies mercury-contaminated spaces.
- 15 It is important to state that while existing as part of an extracted landscape, Silver City is not a neighbourhood experiencing extreme poverty and precarity, as is the case with many other neighbourhoods in the shadows of extractive industries (Auyero & Swistun 2009; Nading 2020). Generally, Silver City residents are not concerned with mercury contamination. However, ethnographies examining polluted landscapes help shed light on how people make sense of and cope with toxic dangers.
- 16 Some of the world's most acute respiratory issues associated with extractivism locate in La Oroya, Peru, and its silver refinery (Li 2015). Residents in this smelter town have been subjected to toxic emissions for nearly a century. Fabiana Li's research analyses how pollutants are perceived, defined, and dealt with (ibid). She asks when, and for which parties, does pollution matter, and when does it not? Conceptions of pollution, emerging from different forms of knowledge production,

Figure 9 Desert landscapes, Silver City, Nevada, 2022. 35mm black and white film developed in Yellow rabbitbrush photo-chemistry. Digital image of Yellow rabbitbrush.



made pollution visible and invisible at different times: 'the existence of pollution is dependent on the particular practices that bring it into being' (ibid: 37). In this way, pollution has a multiplicity: it came to matter when it was conceived as uncontainable, when 'toxicity beyond the smelter and its effects on the population at large' were measured (ibid).

- 17 My engagement with the toxicity of photographic silver processing examines the sources of people's perceptions of toxicity. This extends to how and why people may not feel threatened by toxic habitats, or may mis-recognise them. What is it that instils apathy or indifference? What shapes how surrounding dangers are interpreted?
- 18 Further up the hillsides away from the riverbed, is the occasional Pinyon pine tree. Pines are a species that colonise and grow easily in extreme environments, including rock and almost-deserts. They cannot survive easily in nutrient rich soils with warm temperatures, because they are outcompeted by broad-leaf species that quickly out-shade them. Prior to silver extraction in the 1860s, desert landscapes of Silver City were forested with Pinyon pines. Paiute peoples relied on the nuts in harsh winters, and Pinyon jays used the forests for breeding and nesting sites (Bettinger 1976).
- 19 Pinyon jays are a seed-storing species that can bury thousands of seeds each year. A flock of 250 Pinyon jays can store up to 4.5 million seeds in a single autumn. Pinyon jays would store their seeds and occasionally forget them, inadvertently planting the next generation of trees. Today, Pinyon jays are rare in Silver City. Their relatives, scrub jays, are common, but the Pinyon forests remain scarce. Silver is not extracted from abstract spaces, but spaces that are animated and responsive:

The ground creeks and collapses

Tarantula migration pathways are disturbed

Mercury contaminants settle in river systems

bioaccumulating today

in trout and willow

Indigenous peoples fished the trout and chewed the willow -

to soften and weave the branches;

one organism's nutrient is another's poison

Pinyon pines fell to wedge the jaws of the earth open

to reveal its silvery teeth.

Pine nuts became scarce and Pinyon jays no longer buried the seeds

no longer planted the next generation.

20 These entanglements remind us that the extraction of silver is an inscription on the desert, and the desert is a landscape of affect. Nineteenth century silver extraction is not part of the past. It crosses multiple worlds and temporalities; it is an active, violating force of the present, that compromises ecologies and future lives that are in-the-making.

Between Aperture and Earth: Plant-based Photographic Chemistry

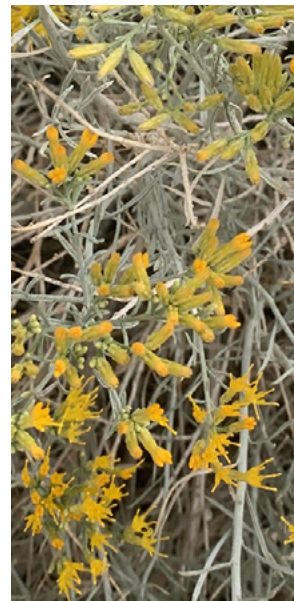
21 I return to the humble Yellow rabbitbrush. This species, like almost all plants, links the botanic world directly with the chemical world of analogue photography. This is because plants hold special compounds in them that can be used to generate photographic chemistries. These compounds are called phenols.

22 Phenolic compounds are critical to plants because they help them tolerate extreme conditions like drought and infection (Dai & Mumper 2010). Very high levels of UV radiation, combined with low rainfall, can increase the production of dangerous molecules that cause cellular damage. The plant responds to this by increasing phenol production.

23 Phenolic compounds are also a basic element of photographic developer chemistry (The Sustainable Darkroom 2024). This is the chemical used to develop the initial image in analogue photography. It is the first of a three-step process; the photograph is then 'stopped' and 'fixed' in separate chemical baths. These keep the image from wandering off and continuing its exposure to light.

24 Developer chemistries can be mixed by hand, using phenolic compounds, vitamin c, and sodium carbonate. There exists a whole world of analogue photographers that embrace DIY photo-chemistry (The Sustainable Darkroom 2024). Their recipes range from using scraps of cardboard to discarded tea leaves; anything that has emerged from the plant world. Phenolic compounds can be isolated by boiling plant matter with water. Mixed with vitamin c and sodium carbonate, the plant-based developer is complete (ibid).

Figure 10 Digital image of Yellow rabbitbrush. Pot of plant extraction used to make Yellow rabbitbrush photo-chemistry, developed in plant-based developer.



- 25 When the camera shutter releases, light reflected off a photographed scene hits the film inside. In this micro-second, electrons move, and the silvered film changes form - it becomes exposed silver. A photographic image has been generated, but it is still hidden. It needs developer chemistry to bring it into the visible world.
- 26 In the complete darkness of a developing tank, developer chemistry interacts with the film surface and a molecular dance begins. The exposed silver kind of bursts into action. In the chemistry world, it is known as autocatalytic. This means that silver speeds up the formation of its own image development - it explodes into visibility. As soon as a few silvered particles are touched by the chemistry, the reaction expands by itself. This chain-link reaction is what you see in a darkroom tray when a photograph slowly emerges.
- 27 Making photographic chemistry from species growing in abandoned silver-mining sites is one way of foregrounding the agencies of ecologies that are touched by silver. This way, stories of silver mining are not confined to the physical edges of roadside plaques and historic markers. They can be read in the Yellow rabbitbrush that stabilises mountainsides honeycombed for silver. They can be seen in sites of attempted mass destruction: the Indigenous lives that were violently uprooted, and the Pinyon forests that recede into the distance.
- 28 Looking to the ground, water, and plants that enable photographs provides a different reading of photographic indexicality. The photograph may point to one referent, but its silver points elsewhere.
- 29 It is in these scattered spaces that this research situates itself.

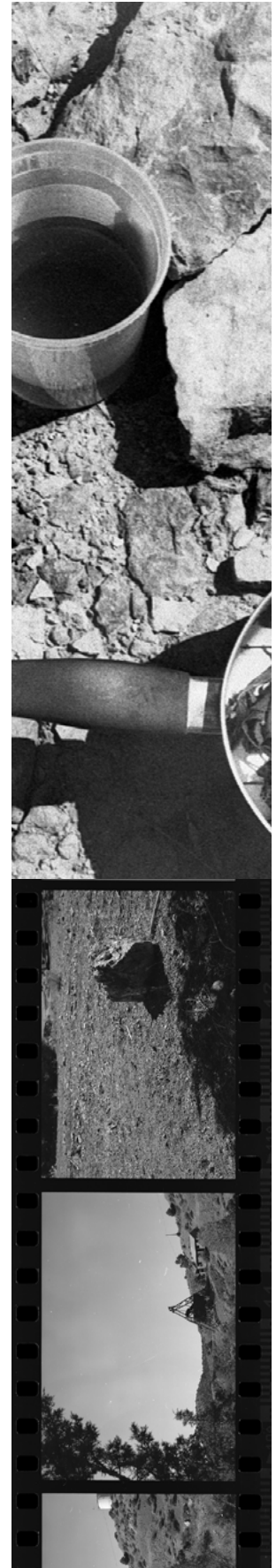


Figure 11 Pot and pan used to make plant extractions for photo-chemistry, developed in plant-based developer. Silver City desert ecologies, 35mm film strip developed in Yellow rabbitbrush plant photo-chemistry.

References

Auyero, J. and D. A. Swistun

2009 *Flammable: Environmental Suffering in an Argentine Shantytown*. Oxford: Oxford University Press.

Bennet, A.

2023 The Material Culture of Empire. In *Routledge Historical Resources*. Routledge.

Bettinger, R. L.

1976 The Development of Pinyon Exploitation in Central Eastern California. *The Journal of California Anthropology*, 3(1): 81–95.

Clement, J. L., and P. S. Jarrett

1994 Antibacterial Silver. *Metal-Based Drugs* 1(5–6): 467–482.

Dai, J., and R. J. Mumper

2010 Plant Phenolics: Extraction, Analysis and their Antioxidant and Anticancer Properties. *Molecules* 15(10): 7313–7352.

Edwards, E. and J. Hart (eds.)

2004 *Photographs Objects Histories: On the Materiality of Images*. London: Routledge.

Edwards, E.

2012 Objects of Affect: Photography Beyond the Image. *Annual Review of Anthropology* 41: 221–234.

Greenplate, R., S. Thomas, A. Danley-Thomson and T. M. Missimer,

2023 Phytoremediation Potential of the Coastal Plain Willow *Salix Caroliniana* for Heavy Metals with Emphasis on Mercury. *Water* 15(20): 3628

Jacka, J. K.

2018 The Anthropology of Mining: The Social and Environmental Impacts of Resource Extraction in the Mineral Age. *Annual Review of Anthropology* 47: 61–77.

LeCain, T. J.

2009 In the Lands of Mass Destruction. In T. J. LeCain *Mass Destruction: The Men and Giant Mines That Wired America and Scarred the Planet*, pp. 1–23. New Brunswick: Rutgers University Press.

Li, F.

2015 Toxic Legacies, Nascent Activism. In *Unearthing Conflict: Corporate Mining, Activism, and Expertise in Peru*, pp. 35–70. Durham: Duke University Press.

Liboiron, M.

2021 *Pollution Is Colonialism*. Durham: Duke University Press.

Nading, A. M.

2020 Living in a Toxic World. *Annual Review of Anthropology* 49: 209–224.

Parikka, J.

2015 *Geology of Media*. Minneapolis: University of Minnesota Press.

Pinney, C.

2001 Piercing the Skin of the Idol. In C. Pinney and N. Thomas (eds.) *Beyond Aesthetics: Art and the Technologies of Enchantment*. pp. 157–179. Oxford, New York: Berg.

Stein, J. S. and B. Stein

2000 *Silver, Trade, and War: Spain and America in the Making of Early Modern Europe*. Baltimore: John Hopkins University Press.

The Sustainable Darkroom (ed).

2024 *Back To Basics I*. London: Folium.

Tingley, J. V., R.C. Horton and F. C. Lincoln

1993 *Outline of Nevada Mining History*. Reno: NBMG Publications.

Wright, C.

2013 *The Echo of Things: The Lives of Photographs in the Solomon Islands*. Durham: Duke University Press.

Websites

Arni, C. and N. Pushpamala

The Ethnographic Series.

<http://www.pushpamala.com/projects/native-women-of-south-india-manners-and-customs-2000-2004>

(accessed June 20, 2022)

United States Environmental Protection Agency

Carson River Mercury Site Dayton, NV.

<https://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=0903020> (accessed April 14, 2023)