2026

Benjamin Menschel
Fellowship Exhibition

2026

and tracks and traces and changes

an exhibition at the cooper union

The Benjamin Menschel Fellowship Program to support creative inquiry was endowed by a grant given to The Cooper Union by the Horace W. Goldsmith Foundation to support work in the fields of art, architecture, design, and engineering. This generous grant was intended to provide funding to exceptional students who propose scholarly, independent projects that will in some way provide a culmination to their educational endeavors at The Cooper Union. It is the hope of the Goldsmith Foundation that students designated as Menschel Fellows will be encouraged by their awards to complete bodies of artwork, develop scientific protocols, or otherwise further their intellectual investigations in a manner that will provide inspiration and illumination to the community as a whole.

Director's Note
Buck Wanner

This year's Benjamin Menschel Fellows have taken us beneath the surface. Across five distinct investigations, they have excavated, figuratively and literally, what lies beneath: soil that remembers the weight of mountains removed, earth stamped into walls that expand what architecture permits, reeds that reveal the entanglement of ecology and human systems, sediment that archives economic transformations, ancestral ground that eludes simple claims of belonging.

At one of our cohort meetings in the fall, the fellows asked whether the selection committee had chosen projects around a deliberate theme. The answer was "no" — yet the overlap among the fellows' interests this year is hard to miss: each working with earth and land, each asking what histories are held in materials and in places, each discovering how those histories have, in turn, shaped the very ground beneath them.

Perhaps what connects these investigations most deeply is their shared understanding that the ground beneath us can't be taken for granted. It holds the weight of what has been extracted, imposed, cultivated, erased. To work with earth and what emerges from it — as material, as archive, as contested territory — is to carry this weight. The fellows have done this not through declarative statements but through sustained engagement: visiting, testing, observing, making. Their work shows us that rigorous forms of inquiry can begin simply with attention.

What we encounter in this catalog and its accompanying exhibition represents a significant milestone, but it would be a mistake to read these as finished works. Several of these investigations began germinating much earlier in the fellows' time at Cooper; all of them continue to branch into further inquiry. I hope you'll find in these pages both the specificity of each project and the resonances that emerge between them: conversations about what it means to inherit, to transform, to care for the ground we stand on.

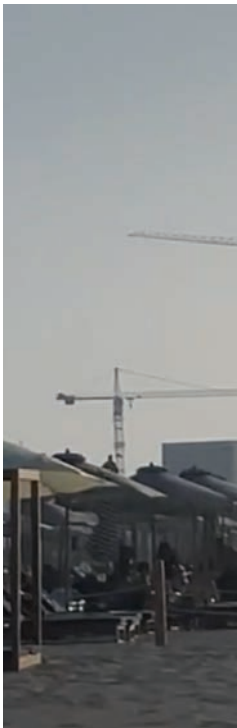
Puncture: Three Debates in Ecological Commodity

Jayne Ellen Miller

The odds of finding a natural pearl are said to be 1-in-10,000. The pearl is formed when the mantle tissue of an oyster is punctured by a crab, triggering the defense mechanism that induces the secretion of nacre layers around the puncture, slowly forming the shiny bulb.

Puncture emerges from a munadara or "debate poem" titled "The Debate of Pearl-Diving and Oil-Wells," written by Ariya B. Ali on the coast of Bahrain in the 1930s. The poem spins "pearling" and "oil-wells" into a disputant pair, bringing them to life as they argue lyrically for superiority over each other. At the time of its writing, the primary export product in the Arabian Gulf was shifting from the natural pearl to crude oil, positioning the two characters as natural opposites, fuming against each other for economic and political dominance. I began with three weeks of travel between Dubai, Sharjah, Ras al Khaimah, and Abu Dhabi. Moving through these Emi-rates by foot, bus, and taxi, I focused on the architectural and developmental treatment of their shorelines — specifically along Dubai Creek, Sharjah Creek, and the Ras al Khaimah Mangroves as they feed in and out of the Gulf. It stood out to me how each Emirate has its own particular attitude towards the waterfront, reflecting the presence of multiple narratives regarding the United Arab Emirate's process of rapid urbanization over the past half-century.

It is remarked that Dubai, Sharjah, and Abu Dhabi have three distinct developmental strategies that typify their urban evolutions. Dubai is conceived of as a hotbed for the country's imagineered urbanism, marked by outlandish mega-projects like artificial archipelagos, underwater hotels, and a man-made canal that severs an entire district into its own island. Sharjah remains at a habitable scale, acting as a "cultural capital" that facilitates the coexistence of past and present with preserved



coral stone buildings and “museumified” historical districts. In Abu Dhabi, they tried the Doxiadis approach, masterplanning the city with superblocks carefully laid in gridiron formation.

In reality, it felt impossible to claim these cities could be reduced to any clear cut developmental strategy or aim. On the contrary, their landscapes held so much tension as they transitioned between waterfront programs that they actually seemed to resist much distinction or definition as a whole. It seemed the only “strategy” I could name was really just a string of accumulated practices that were or had become local to the region through surviving historical traditions, foreign interventions, and diplomatic economic decisions.

This type of landscape first revealed itself in Dubai. My first accommodation was Ibis Deira Creekside Dubai, part of a French brand of budget hotels and a subsidiary of Accor. I woke the first morning to watch the sky lighten through the window over an organically shaped construction site in the distance, still twinkling under its cloak of night lights. Below me were trucks unloading at the Carrefour tucked into the Deira City Centre mall. I gathered my things and attempted to

Guggenheim Abu Dhabi
in construction

Coral stone wall in the Heart of Sharjah

walk to the creek, first heading towards “Dubai Creek Street” as it was labeled on Google Maps. I had assumed it was a park or corniche through which I could access the creek.

When I entered through a security gate and told the man working at the booth that I wanted to walk down Dubai Creek Street, he asked, “to the hotel?” and I shrugged and nodded and he gestured with approval for me to pass through the gate. I had already realized that it was not a park or corniche as I had assumed, it was in fact an access road for a chain of private white villas sheltered by giant manicured bushes and palm trees, but I wanted to see how far I could get. I hadn’t made it very far when a security member drove towards me on a golf cart and escorted me out, saying that Dubai Creek

A natural pearl

Street wasn't a park, and it definitely wasn't a public street that brings you to a nice view of the creek. Across the street from the security gate was Deira Dubai's next jump toward unparalleled luxury and hospitality in the form of Marriott Marquis' Jewel of the Creek hotel — where Dubai's legacy meets modern luxury. I walked along the construction site until I got to Al Maktoum Bridge, built in 1963 as the first permanent connection between Deira and Bur Dubai which could facilitate the movement of goods and people across the creek. On the other side of Al Maktoum there is an "Attraction" marked on Google Maps called "Dhow Wharfage". The details describe it as a, "historic quay with colorful wooden 'dhow' cargo boats still in use, plus views of the city." As I wandered through the wharf I realized that though I could access it and walk along the creek, I wasn't necessarily meant to be there, especially not as a curious tourist looking to record footage of the city. I spoke to a man from one of the dhow boats, which he told me had come from Iran. Studio Camp explores this idea in their project Wharfage, describing how a "cheap port" like those in the UAE — where goods in transit are exempt from customs duty — produces "free trade" that is not governed by the WTO and thereby avoids the business of war and other geopolitical aggravations

View from the 77th floor of
The Torch

that may disrupt trade. My prior research concerning Britain's imperial role within the Trucial States was critical in understanding the construction of these urban centers as a separate process from what we canonically understand "urban development" to be — this is a new process, and it reflects a particular attitude that can only be described within its own locality, not by external narratives. "The Debate of Pearl-Diving and Oil-Wells" served as a consistent reference in this study, depicting the Gulf's economic transitions by circulating through them dialectically. It provides a speculation upon these events, ultimately looking for a deeper understanding of their role in their particular context. I sought to achieve a similar dialogue, not by heavy-handing any opinions or truths about these waterfront spaces, but letting their programs, qualities, histories, and ecologies speak for themselves while I intently listened.

Until the 20th-century invention of artificially cultivated pearls in Japan, made by impregnating oysters with a pearl growing nuclei, Khor Dubai was used as a maritime center for the export of natural pearls farmed by pearl divers throughout the Arabian Gulf. While evidence of pearl diving as an indigenous market in the Gulf dates back 8,000 years, the pearl industry wasn't considered the major economic stronghold in the region until Britain's protectorate via the "General Maritime Peace Treaty" in 1820. This treaty was meant to

Dhow wharfage off
Baniyas Rd.

protect the East India Company from what Britain deemed "Arab piracy" in the Gulf. With control of trade and industrial labor structures, British colonialism turned the city of Dubai into an entrepot for global goods, integrating it into the world market with the natural pearl as its singular commodity.

The pearl industry began its decline in 1920 due to a decreased yield from the overfishing of oysters and the success of cheaper cultivated pearls from Japan. Another economic stronghold was soon to come as British and American companies sought concessions from local Sheikhs to secure rights to survey the region for oil. By the 1960s, commercial exports were based on the extraction of another ecological commodity — crude oil. Oil forms from organic-rich source rocks deposited in ancient shallow seas, then transforming under heat and pressure into oil, and migrating to porous limestone reservoirs to keep until extraction. It is extracted by drilling through theseabed and using pumps to bring the oil to the surface for processing, sale, and transport.

Throughout the (mostly state-funded) exhibitions and museums I visited, I noticed another method of constructing a narrative for each city — a kind of erasure, or perhaps a failing to mention. While each Emirate had a different story to tell, they all began with the country's independence from Britain in 1971 and the establishment of the United Arab

Emirates. Their stories credit their respective Sheikh for daring to transform what were impoverished fishing villages into thriving metropolises of innovation and advancement.

Zayed, when they say Zayed to the people:
The light of the unclouded dawn.
Zayed, when they say Zayed to the people:
The moonlight in the dark of night.
Zayed, when they say Zayed to the people:
The well that gives in times of plight.
Zayed, when they say Zayed to the people:
To quell thirst its water is drawn.
Zayed, when they say Zayed to the people:
His Majilis is open to all.

My observation here is not so much to critique the semi-constitutional monarchic government of the UAE as it is an inquiry into why its history of British colonialism goes largely unacknowledged in the way it narrativizes and displays its history to the public. This overarching narrative also becomes complicated upon deeper scholarship within the UAE, particularly looking at Sultan Muhammad Al-Qasimi's book, "The Myth of Arab Piracy in the Gulf," in which he argues that "piracy" was a myth used to justify Britain's imperial expansion and elimination of local Arab traders.

If Ali's poem were to be rewritten for the United Arab Emirates in the 21st-century, it may need to be written into a series of three debates in order to explain the total physical manifestations of the region's economic transitions within the past 100 years.

The first debate would be between "natural pearls" and "cultivated pearls," where a natural pearl bolsters its significance as an origin emblem of wealth and quality against a synthetic pearl, claiming the honor of an emergent eco-tourism economy. In a second debate, "oil" and "concrete" would argue over what catalyzed the UAE's mid-century modern metropolitan growth. The British and American oil companies might claim responsibility for discovering the region's bituminous goldmines beneath the seabed of the Gulf, but the local Sheikhs would take

responsibility for the chosen approach towards developing their Emirate, down to the very method by which the architect laid down the concrete. Maybe the concrete itself would speak, suggesting how well its material lends itself to rapid urban expansion and the foundations of showpiece architecture.

A third debate would occur, between "curtain-walls" and "speculative real-estate", suggesting that the resource commodity has moved beyond natural material to an economy that speculates on its own creations. Dubai has not only cultivated sustainable pearls that can be marveled at by eco-tourists, it has cultivated a pearl in the form of a shiny metropolis. Instead of being found 35-feet deep in the Gulf's oyster beds, it is found 2,722-feet high on the tip of the Burj Khalifa as it stands the world's tallest building. It recalls the breathlessness of the pearl diver, free diving into the deep off a singular breath, yet it is made of something else. It is that of a tall desert tower, defying gravity in geometry and structure, rooting itself into the earth while soaring weightlessly into the sky.

In this research, I attempted to put these debates into form. At first, I injected plastic oysters with building materials to create synthetic pearls that might emerge from this new urban ecology. Then, I suspended streaks of color between plates of glass, looking at the symmetry between the formation of a pearl beneath the shell of an oyster and the formation of oil beneath the surface of the earth. Although occurring at vastly different scales, a formal pattern emerges between the microscopic and macro when reduced to the natural laws of pressure and extraction. The glass plates came to resemble marbles, another way of looking at the city as if through a rendered window, its promise of innovation drifting in transparent streams of bright colors. It culminates with stills taken from a series of videos captured on site, overlaid with text from trade logs, ship descriptions, and exports from the United Arab Emirate's ports since the 1800s.

Thank you to Clara Syme, Owen Nichols, Ninad Pandit, Ahmad Makia, Buck Wanner, Nora Akawi, Layo Mussi, Kit Nichols, Matthew Bower, and many more.

Phragmites: Remaking Invasiveness

Jonas Margono, Eli Hicks, Santiago Helbig, Deedee Kinzie, Shannagh Crowe.

Driving on roads which cut across the wetlands of the Great Lakes region, one will more likely than not find themselves gazing out at dense fields of reeds, rippling and sprawling outwards into the distance. While it is easy to imagine that any landscape populated with an abundance of plant life is a product of nature, free from human interference, the reality is that this ecosystem is already intricately linked to our human-made systems. The nature of such interconnected relationships is illustrated by the case of *Phragmite australis*, (known as the "common reed" but also frequently referred to as "phragmites") a reed species which likely originated in Eurasia and was carried to North America in the 19th century, where it quickly began to outcompete other vegetation in wetland regions.

Phragmites growing near an industrial site.

Among the phragmites in early summer.

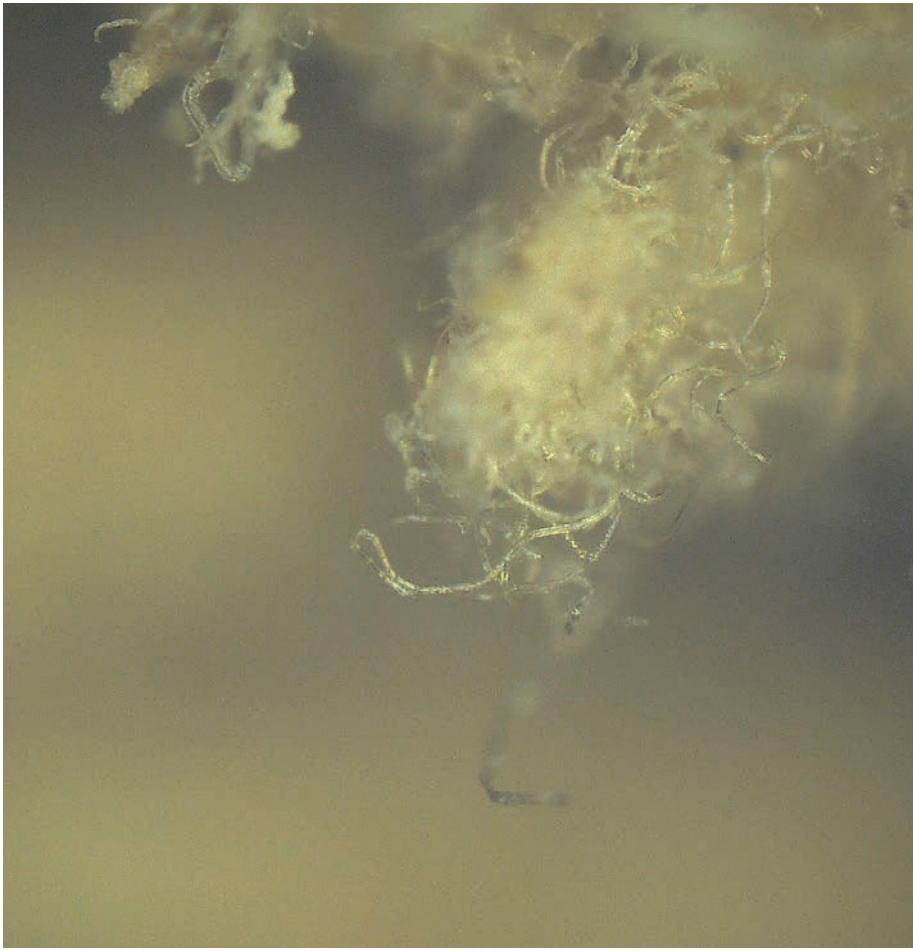
At the outset of our research project, we drove through and around the landscapes of the Great Lakes region, and once we knew what to look for, we began to recognize phragmites growing in bodies of water and alongside highways. On walks through nature areas and state parks along the route, the effect of dense phragmites patches was often disquieting: eerily silent and imposing in height, they grow too crowded for either humans to walk through easily or for other flora and fauna to grow. Despite this initial sense of uncanny out-of-placeness, we also recognized and marveled at the height and rapid growth of the phragmites as we worked handling and harvesting them.

Adding to the challenges of scale facing removal and restoration projects, non-native phragmites are visually similar to a native, non-destructive subspecies of North American phragmites, *Phragmites americanus*. On our trip through the Great Lakes region, we often struggled to differentiate between native and non-native growths. Identifying and differentiating between the two types required extended engagement and careful visual observation. The visual confusion between native and non-native species was another reminder of the ways that phragmites have become an irrevocable element of the landscape in one form or another.

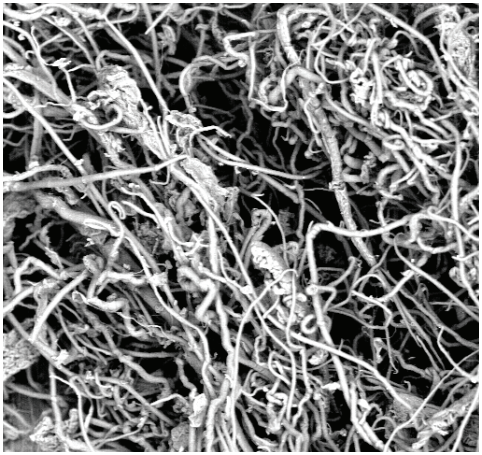
Although they have great capacity for destabilizing native ecosystems, phragmites are also remarkable for their beneficial effects on their native wetland ecosystems and their potential to sequester carbon due to their rapid growth. We debated as to what kind of attitude we should take towards invasive species. Are they a blight on the landscape to be eliminated, or a potential material resource? Can they offer something of tangible or even intangible value to humans, or do we simply have a duty of care to remove them for the health and biodiversity of the larger ecosystem? Scholarship on the history and politics of the categorization of non-human species into "native" and "alien" illustrates the xenophobic assumptions of such categories, which position non-human species as belonging only and permanently to their place of origin. A more nuanced approach to remediating environmental harm acknowledges the movement of species as part of the history of places and ecosystems, while finding new ways to relate to non-native species. As the sheer scale of phragmites spread makes its complete removal from the landscape practically impossible, many efforts at curtailing its effects focus on finding ways to integrate it into ecosystems and cycles of human production and consumption.

In conversations with park rangers and organizers who work on the removal and management of phragmites, we were reminded that natural sites are created and maintained through networks of labor and management. The large

Comparing Phragmites australis and Phragmites americanus.



amounts of phragmites' stems, leaves, and rhizome networks that are removed through mowing are often then treated as waste to be disposed of, sometimes through composting and often through burning, which results in carbon being re-released into the atmosphere. These burnings are only one of the more visible aspects of an ongoing ecological crisis as native flora and fauna are crowded out by the phragmites, reducing the ecosystem's effectiveness as a carbon sink. The work of repairing environmental damage involves reconsidering how we conceptualize and respond to matter that is considered to be either invasive or a form of waste. Rather, finding ways to materially repurpose the biomass produced by phragmites acknowledges the ways that it is already embedded in the



Microscopic images of cellulose.

metabolic webs which constitute local ecologies.

As part of our research, we sought out experts working across disciplines in science and engineering finding ways to combat the negative effects of invasive species. While in Ontario, we were able to speak with researchers at the University of Toronto's School of Forestry, which brings together researchers in the fields of biology, engineering, and architecture. Research in the context of fieldwork, lab work, and design each take different but often compatible approaches to the challenges of invasive species. Guided by discussions with biologist Dr. Sandy Smith and mechanical engineer Dr. Mohini Sain, we chose to begin investigating the material potential of phragmites at the molecular level. Dr. Smith spoke with us about her prior experience of fieldwork using biocontrol to manage the species purple loosestrife, and Dr. Sain explained how he used organic waste from industrial paper mills in engineering materials. These discussions also helped us to situate our project as a contribution to the recent history of sustainable environmental management and design.

In the chemical engineering lab, we sought out practical and sustainable ways to repurpose the biomass of harvested phragmites. Phragmites contain large amounts of cellulose, which is what gives plant material its structure and strength. Cellulose can also be broken down and refined into nanocellulose, which is cellulose whose fibers have dimensions of a few hundred nanometers (tens of millionths of centimeters). Nanocellulose has applications in material science,

Blended phragmites in the lab.

such as structurally reinforcing biodegradable PLA plastic. PLA (or polylactic acid) is commonly used in 3D printing and provides a more sustainable alternative to traditional plastics.

Referring to papers published by researchers working with cellulose and refining it into nanocellulose, we developed our own protocols using phragmites. This process consisted of grinding up the raw plant matter mechanically and then immersing the blended plant solution in aqueous NaOH (sodium hydroxide, or lye) to chemically break down the non-cellulosic biomass, which is mostly composed of lignin and hemicellulose. We tested multiple versions of this process and found that the stems of the plant were much more difficult to break down than the leaves, and that even this can only be achieved by thoroughly grinding the plant material beforehand. The non-cellulose material was washed out using limonene, a non-polar organic solvent which removes oily residues, followed by ethyl alcohol, bleaching, and rinsing to remove other impurities. Traditionally, cellulose extra-ction techniques require toxic organic solvents such as toluene, but limonene is a non-toxic and renewable alternative which we were successfully able to use as a replacement.

Simultaneously, we processed phragmites using papermaking techniques, extracting the cellulose and experimenting through trial and error to create a strong paper. Following traditional hand papermaking techniques, we fermented the stems and leaves of reeds to remove as much waxy and acidic material as possible and then cooked the fiber in an alkali solution. After this, the fiber was beaten into a liquid pulp with cellulose fibers suspended in water, which was then formed into sheets of paper. We found that turning phragmites into paper takes more time than the processing of

Washed and bleached cellulose.

Paper samples drying.

more traditional plants used for papermaking, so instead of attempting to make a substitute for commercial paper we chose to focus on creating a unique paper which maintained the intrinsic colors and textures of the phragmites.

The work of carefully observing and recording was at the center of our experimental efforts at transformation of material. We used traditional papermaking techniques which involve seeing, smelling, and feeling the material; we also used chemistry lab equipment such as microscopes to measure and visualize the molecular qualities of our materials. The images of cellulose taken using a microscope give access to textures which are invisible to the naked eye, often mirroring abstracted landscapes or topographical images. By moving between scales and technological means of observing and representing phragmites, we are seeking ways to intervene in paradigms of seeing which separate the natural world from human observers, as we are never able to neutrally represent a landscape or site without also intervening and remaking it. By seeking multiple approaches to documentation and experimentation in labs and studios at the Cooper Union, we focused on the layered and entangled relationships which underpin all restoration and stewardship work.

We would like to extend our thanks to Akemi Martin, Pamela Cabrera, David Wootton, Radmila Janjusevic, Augusta Thomson, Sandy Smith, Ian Jones, Mohini Sain, Janice Gilbert, and the park service staff we spoke with for their expertise and generous guidance.

Regrounding Architecture: A Rammed Earth Exploration

Phoebe Zhang, Ashley Wu, Ilea Wunder, Natalia Naugle

Rammed earth is a building technique practiced across time, cultures, and climates. Formed by compressing damp soil — clay, sand, gravel — layer by layer into a stamped structure, it often uses material drawn directly from the ground on which it stands. The practice is inherently local, grounded in touch, labor, and proximity. In New York City, however, rammed earth is rarely implemented at an architectural scale, limited by labor costs, restrictive building codes, and persistent aesthetic assumptions.

Within architectural discourse, rammed earth is often framed as an ancient practice, an idyllic solution, or a form of craft. This framing raises recurring questions: could it meaningfully address contemporary sustainability concerns, given the ubiquity of soil? Is rammed earth truly sustainable, or does this depend on sourcing, transport, and stabilization? Can earth construction operate at an urban scale, or is it inherently rural? How does it perform structurally in relation to concrete or masonry? How does it shape thermal comfort, acoustics, or air quality? This research does not seek to resolve these questions, but to surface them again within an academic setting. By revisiting rammed earth beyond manufactured constraints and conventional code logics, the work invites students to reconsider how context, material, and labor shape architectural thinking — beyond the systems that typically define the built environment.

Martin Rauch is an Austrian architect who has focused his practice on rammed earth. Proposing projects for noise barriers, modern homes, and exhibition

Vienna Garden

spaces in the 1980s, Rauch was considered to be “ahead of his time” as most around him questioned the viability of the material. Now having built over 100 projects around the world and accumulated decades of experience with rammed earth, Rauch is an invaluable resource for this construction technique.

Our project was sparked by a moment in the architecture Building Technology course, where a proposal to build a mock up of one of Rauch’s project walls was rejected due to a lack of institutional familiarity, and the class defaulted instead to concrete — a material that was easier to approve and construct. At the end of the semester, the concrete projects were demolished and discarded, with students removed from any responsibility for their material afterlife. This gap — between what materials are permitted and how their consequences are considered — became the catalyst for our research.

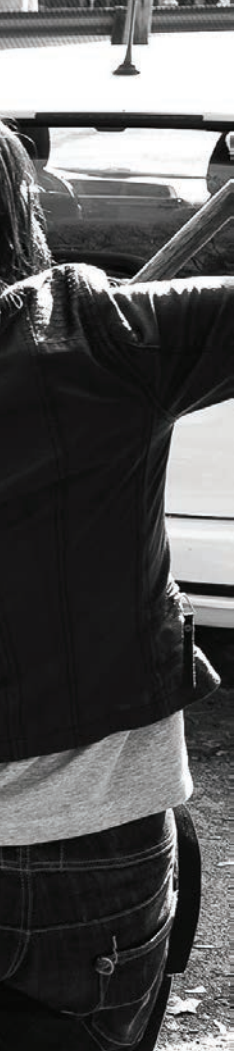
We structured our project into three — initially distinct, eventually blended — phases: field work, studio work, and experimental work. Our field work began with a two week trip to Austria, traveling between Innsbruck — where Ilea’s family is located — Salzburg, Vienna, Vorarlberg, and Traunstein, Germany, tracking 15 different earthen constructed projects and meeting with different professionals in the field.

At each site we split into four modalities: photographing, sketching, measuring, and writing. With each of us focusing on a singular method of capture, we were able to collect not only a baseline understanding of how each project was constructed, but also discover how each project weathered, aged, and was experienced and perceived by the people interacting with them each day. Some people spoke lovingly about the powerful symbolic meaning that rammed earth had to them. A funeral home director who commissioned a rammed earth wall for their chapel space shared,

White Plains Soil Bank

"We're coming from earth, we're going back to earth, but we are not lost. The earth keeps us… Life is not a soft surface; there's hills and stones and cracks. You take them with you."

Others — like the construction workers we met in Traunstein — remained unimpressed, questioning our interest and insisting that they preferred wooden construction in both function and aesthetic. Each project and person we visited played a crucial role in the overall arc of our understanding throughout these two weeks — an understanding that we hope



Traunstein School

Thuringen Bus Stop

to share and spread across our community here at Cooper.

Returning to New York, we transitioned to the studio and experimental work phases, translating these experiences into a studio-based investigation focused on scale and accessibility. Rather than working at the size of large prefabricated panels — which we saw in Austria — we adapted the system into modular rammed earth bricks. This shift allowed us to test construction logic directly, using New York soils and controlled mixtures. The goal was not replication — of the projects we visited or Rauch's work in particular — but understanding how changes in aggregate size, clay content, moisture,

NYC Soil Bank

Traunstein School

and compression affect strength, cracking, and surface quality.

We developed a collapsible wooden formwork system secured with hinges and hasps. Each mixture was placed in layers and compacted manually with wooden blocks, left to dry overnight or over a few days, then released from the formwork to continue to dry. This method avoided heavy machinery and emphasized iteration: failed bricks informed adjustments to mixture ratios, moisture levels, and compression force. We noticed how much more topsoil was needed than pure clay to fill an entire brick, how too much water and topsoil resulted in a brick that cracked and could mold, and played with this pure 70% clay - 30% aggregate ratio we learned from Martin Rauch's studio. Through this process, rammed earth became legible as a system of decisions rather than a singular technique. And maybe more importantly, it became clear that rammed earth as an experimental process was extremely accessible. "It's not rocket science," TU Vienna Professor and Netzwerk Lehm Chair Andrea Rieger-Jandl told us months earlier.

This process of experimentation culminated in two key aspects of our exhibition: the rammed earth brick wall and the rammed earth postcards. The wall is a nod at the Building Technology rejected mock-up project, reflecting both the constraints of scale and the accumulated lessons of travel, observation, and experimentation. The postcards are our attempt to spread this learned knowledge and understanding, provid-

ing both an image of the rammed earth conditions we fell in love with in Austria and a "how-to" diagram that encourages individual experimentation with materials found at home.

Throughout this entire project, rammed earth revealed itself as a material defined by process. It does not easily conform to standardization and requires constant adjustment depending on climate, scale, and use. Across the sites of Salzburg, Vienna, Innsbruck, Feldkirch, and Schlins, we observed how rammed earth functions differently in ceremonial spaces, housing, hospitals, factories, and schools. In each case, its surface recorded construction methods, labor, and long-term interaction with people and weather. The material performed as structure, as ritual, and as architecture in process.

Through testing this knowledge locally, we were confronted, again, by how process heavy the experience is — constantly testing, refining, retying, and experimenting again and again. As Martin Rauch still insists, "Every project is an experiment." Moving forward, we don't want or expect this process to stop. By bringing this work back to the Cooper Union, we aim to create a shared, hands-on understanding of material systems, where making, testing, and revising are treated as essential — not only architectural knowledges — but an overall knowledge of making. We hope that our work at least begins to remove some of the institutional boundaries or wariness around rammed earth and to encourage everyone — no matter the discipline — to experiment with earth as a material. It's not as hard as you think!

We thank Gabi Rath, Andrea Rieger-Jandl, Anna Heringer, Sina Grasmück and the entire Lehm Ton Erde team, Sam Anderson, and everyone else we spoke with who provided insightful guidance and support. This work could not have been done without your generosity.

Tracing a Dispersed Homeland; Ukrainian Hassidism, Palestinian Judaism, Brazilian Zionism

Sofia Fani Gutman

Niteroi, Brazil, 1935.
Berdychiv, Ukraine, 1807.

And what is a citizen?
A worthy son of the fatherland.
The son of what land am I?

Tracing a Dispersed Homeland; Ukrainian Hassidism, Palestinian Judaism, Brazilian Zionism, explores fictional constructs of nationalism and self-determination, critically examining the phenomenon of Homeland. Rooted in my family's migration and displacement, I question the validity of the nation-state as an imagined political form.

Tracing a Dispersed Homeland juxtaposes the shtetl in western Ukraine, the Jewish Quarter of the Old City in Jerusalem, and the synagogue in Niteró, in order to examine contemporary forms of nationalism. As I trace my family's footsteps, their journey is abruptly pulled into the present. It becomes impossible to deny the inherently sectarian and violent performance of national identities.

My work is divided into three sections; Community, Language, and Militarism, braided together to answer a persistent question: Where is my home? I trace the historical lineage of my family's evershifting relationship to homeland and nationality. My family originates from western and southern Ukraine. When I press my grandfather further about where his great-great-grandparents emigrated to Palestine from, sometime in the 19th century, he points to an arbitrary spot on a map, dragging his thumb along the borders of three different countries, circling a vague region in Ukraine. The identities that my family held in Ukraine in the 17th and 18th century revolved solely around their religion. Their community, often criticized as a "mini-state" for being closed off from society, practiced closed cultural traditions rooted in Hasidic Judaism.

I am the first in my family to return to Ukraine after more than 300 years. As Hasidic Jews, they strongly opposed Zionism, rejecting the idea of a collective political return to the Holy Land and the establishment of Jewish sovereignty. At the time, the Jewish community in Jerusalem faced a shortage of kosher meat inspectors. In the early 19th century, my family received a formal invitation to serve the Old City's Jewish population as *shohatim*. Their migration

Berdychiv, Ukraine, 1808.

was driven by material necessity and occupational identity, against the backdrop of intensifying antisemitism in Eastern Europe. Early in this research, in a bustling Lebanese restaurant in Brooklyn, a friend told me about the Yiddish phrase סייהרעדניא. Literally translated, *In der Heym* means "at home" or "down home", implying a return to roots, tradition, and intimacy. It was used amongst Eastern European Jews living in Palestine to refer to "Homeland." According to my friend, it did not refer to the biblical land of Israel as Homeland, nor to Palestine. Instead, *In der Heym* named a condition of homesickness oriented toward Eastern Europe.

Following World War I, the Ottoman Empire fell, and its former territories, including Palestine, came under British occupation, bringing new legal and economic structures, and increased instability and food insecurity. Wartime disruptions to shipping and commerce, with the Ottoman Empire closing the Haifa and Akka ports, restricted financial transfers and trade. After much deliberation, based on longstanding trade relations, my family decided to relocate to Niterói, Brazil.

Through a hazy gaze, I look outside the window of my childhood bedroom. I witness a society that has abandoned any pretense of humanity. The people I once called my community now reveal themselves as racist, genocidal, fascist. People only use the word humanity when referring to a great act of kindness. Perhaps this is humanity at its most honest. My movement through these geographies is never neutral — my body is an *Implicated Subject,* entangled in the very ideologies this work critiques. Within the spatial formation of nationalism and identity, my body itself becomes a political playing card,

a bolt in the war machine. I am not an unbiased storyteller, and I refuse to perform neutrality in the face of genocide, ethnic cleansing, and state violence.

Tracing my family's movement under the Russian Empire, where Yiddish, Hebrew, Russian, and Ukrainian were differently regulated; to Palestine, where Yiddish, Arabic, and Turkish structured daily life; and later to Brazil, where nearly all of these languages were gradually erased except for Hebrew, I show how shifting regimes repeatedly reclassified identity through language. Jews were rendered linguistic "aliens" under Russification, Arabic and Judeo-Arabic erased in the Zionist project of state-building, immigrant presses criminalized under Brazilian nationalism. Language is not a neutral medium of culture or communication, but a primary technology through which empires and nation-states — colonial and post-colonial alike — fabricate legitimacy.

Whether framed as imperial continuity or national rebirth, both old empires and state configurations rely on the same mechanisms: language is subjugated, standardized, and weaponized to manufacture coherence, fear the "other," and naturalize hierarchy. Through cemeteries where forbidden scripts endure, songs sung in secrecy, unarchived newspapers, and family documents that slip between languages, the chapter exposes nationalism not as the awakening of an authentic past but as a recursive act of invention. What persists across these geographies is not the nation, but the cost of imagining one, dictated by the Nation-State.

I argue that nationalism — whether colonial, post-colonial, or framed as liberation — depends on the production of militarized subjects rather than protected citizens. I demonstrate how states and proto-states collapse the distinction between civilian, soldier, and settler, transforming everyday life, bodies, and lexicon into instruments of war. Liberation struggles, when absorbed into nation-state logic, risk reproducing the very violence they claim to resist: romanticizing sacrifice, disciplining dissent, and rendering populations disposable in the name of land, security, or historical destiny. By tracing visual culture; patches, slogans, and tattoos, architecture; monuments, checkpoints, and gated buildings, and propaganda; the figure of the "terrorist," the sanctification of the "fighter." I expose how nationalism requires an enemy to sustain

Safad, Palestine, 1917.
Berdychiv, Ukraine, 1802.

itself — and how that enemy is fabricated to justify state violence. Extremism is not an aberration at the margins but a structural byproduct of militarized nationalism, emerging wherever identity, territory, and legitimacy are fused. In order to enforce and maintain a national identity, you must have a national enemy, by any means necessary. Moral binaries between "terrorist" and "freedom fighter" are politically manufactured rather than ethically stable. The same language used to delegitimize resistance is recycled across empires to deny sovereignty, excuse collective punishment, and erase civilian life. What persists is not national protection, but the normalization of death: citizens recast as expendable bodies, soldiers as heroes, and violence as destiny. Ultimately, I ask not which nation is justified, but what nationalism itself demands — and whether any project that requires endless enemies, disposable lives, and permanent militarization can ever be called liberation.

My words do not offer solutions. They will not stop the blood from seeping into the roots of the ground(s) I call home. As we enter the third year of Israel's genocide in Gaza, the twelfth year of Russia's imperial invasion of Ukraine, and increased state violence in Brazil, we are forced to face not only the colonial, murderous, aspirations of Zionism, but, by extension, self-reflect on the legitimacy of global colonial nation-state projects. Through layered encounters — conversations with anarchists fighting on the Ukra-inian frontlines, bullets piercing the skin of those I love in the West Bank, and the warmth of grandparents' library in Brasília — I interrogate intricate relationships among communities confined by ideological constellations.

Tracing a Dispersed Homeland confronts the manufacturing of national identity; formed in particular by state controlled media, religion, and language. It is exposed as often imagined, imposed, paradoxical, and constructed at the expense of others — as one homeland is erected to erase another.

Niteroi, Brazil, 1935.
Berdychiv, Ukraine, 1807.

Soil Memory in Landscapes of Extraction

Isabella Ng

Memory of how we slipped into trouble and misery and what came before can help us journey out of it. We must remember. Not to be nostalgic, but to know that there is something better than chaos and decline.

– Rebecca Solnit

Soil has memory. On a literal level, soil is an archive that holds fossils and artifacts. In the field of geotechnical engineering, "soil memory" describes how soil particles retain the effects of its past loading. In other words, soil remembers the weight of all that it has carried. Because soil bears a record of the environmental changes it has witnessed, it can serve as an archive for human-environment interactions. In landscapes of extraction, soil is both witness to and evidence of environmental violence.

Nowhere is the application of soil memory more relevant than in the southern hills of West Virginia, where the practice of mountaintop removal (MTR) coal mining is permanently altering the Appalachian Mountains. In August, I traveled to West Virginia, where I documented the geoenvironmental, social, and cultural soil effects of MTR across Raleigh, Boone, and Wyoming County. During my trip, I learned that the environmental issue I had originally understood through simple oppositional aphorisms (e.g., "energy versus environment" or "community versus corporations") was far more complex. MTR is deeply enmeshed in a network of interactions

West Virginia calls itself the "Mountain State." Formed over hundreds of millions of years, the mountains of the Appalachian Plateau are built from ancient sedimentary layers, including thick coal beds that were once peat swamps.

between economic and cultural forms, which are shaped by the construction of the coal economy, interdependencies between Appalachia and the broader United States, and conceptions of human-nature interactions. Soil memory, which considers the historical significance of the landscape and the textured "hauntings" of the space, is a framework that permits a critical analysis of MTR's past, present, and future in West Virginia.

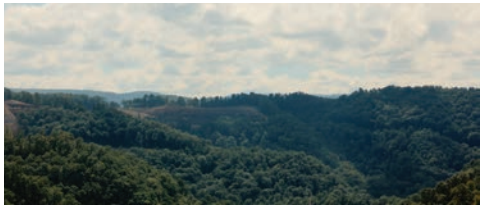
West Virginia calls itself "the mountain state" — wild and wonderful. Driving on Interstate 77 from Beckley to Cha-rleston, I saw nothing but forested hillsides that were densely populated with hardwood species; maples, oaks, poplars, walnuts, and dogwood colored the landscape in every shade of green. The mountains of West Virginia are also among the oldest in the world. Over millions of years, they were formed as heat and pressure folded the earth's crust into rolling landscapes composed of layers of shale, limestone, and, of course, coal.

Since the first quarter of the 19th century, naturalists have noted Appalachia's vast coal deposits, prompting land speculators to purchase mineral rights across West Virginia. At the height of the Industrial Revolution, the development of efficient mining technologies allowed the United States to extract more than 190 million tons of coal annually from Appalachia. Advancements in mining technology have culminated in the ultra-efficient practice of mountaintop removal, a modern

surface mining technique that involves the top-down destruction of mountains to access hidden coal deposits. In 2005, the US Environmental Protection Agency defined mountaintop removal coal mining as "a surface mining practice involving the: (1) removal of mountaintops to expose coal seams, and (2) disposing of the associated mining overburden in adjacent valleys." This process significantly alters topography over hundreds of feet, resulting in the reconfiguration of hardwood forests into shrubby flattops and engineered valley fills. The disappearance of the Appalachian mountains echoes Marx's characteristic experience of modernity: "all that is solid melts into air."

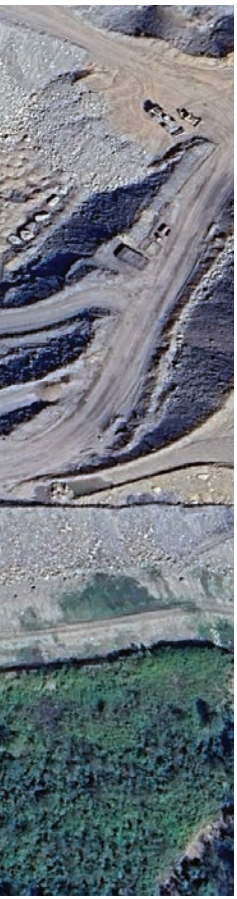
Since 1977, the form of surface mining landscapes has been dictated by the Surface Mining Control and Reclamation

At a closer scale, the scars of mountaintop removal become visible in the paths left by dragline excavation.



The first step of extraction begins with the removal of vegetation from the forested slopes.

Act (SMCRA), which sets forth regulations for reclamation practices that aim to restore mined landscapes. The key provision of SMRCA requires surface mines to be returned to "approximate original contour" (AOC), which is defined as a topography that "closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain." However, coal companies can circumvent this provision if they offer an economic incentive for the flattened land, such as new development.

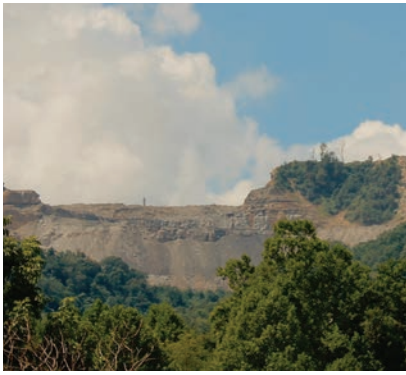


On a material level, soil memory resists the logic of reclamation, which is based on the idea that mined landscapes can somehow be reshaped into mountains once again. In West Virginia, I collected soil samples from both a reclaimed mountaintop and from native soil located in a nearby, unmined landscape. My soil classification analysis revealed significant textural differences between the two samples. While the native soil was dark brown, moist, and fine-grained, the mine soil was gray, dry, and coarse, containing large amounts of fractured rock. Reclaimed flattops and valley fills are not equivalent to their original mountains or hollows; their altered topography rearranges geological strata and produces mine soil that differs drastically from their native profiles. In addition to these textural differences, minesoil bears the long-term environmental consequences of coal extraction.

Despite the massive scale of these operations, mountaintop mines are often invisible from the ground. This is because coal companies strategically plan their mines so that they are hidden just behind the mountain ridge visible from major roads. However, MTR operations are signaled by sparse tree growth at the top of a ridge where normally there would be thick forest.

During my trip, I relied on satellite imagery and online mining databases to find these sites. I followed hiking trails and veered off course, walking down company-owned roads

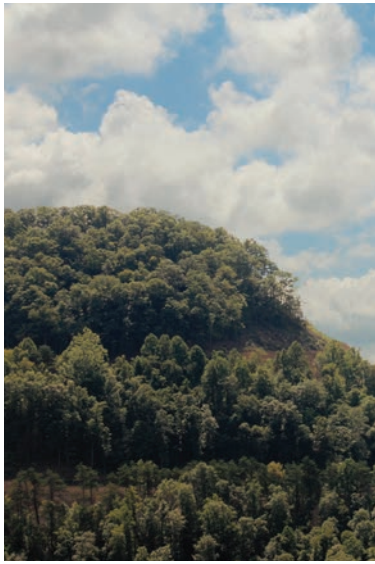
Wyco Surface Mine



The destructive practice of mountaintop removal reconfigures the landscape.

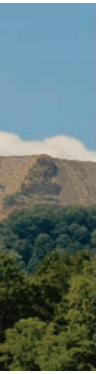
lined with PRIVATE PROPERTY signs and WARNING notices. Along the Coalfields expressway, I spotted a MTR operation that I later identified as Wyco Surface Mine, a surface mining operation spanning 650 acres and owned by Pocahontas Coal Company, a subsidiary to United Coal Company (UCC). I took photos of the leveled mountain, which had been stripped clean of its vegetation — its top blasted off.

That evening in my hotel room, I clicked through UCC's website and read through their "Sustainability" section, in which they proclaim: *We are committed to maintaining a balance of safe and efficient, clean coal production with minimal environmental impact.*



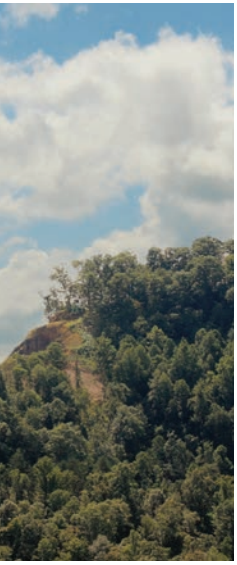
Active mountaintop removal operations can be spotted from Coalfields Expressway.

As I continued exploring southern West Virginia, I began to understand why MTR persists despite its visible destruction. I visited the Beckley Exhibition Coal Mine, a retired mine that has been reimagined as a "must-see" experience for all visitors in southern West Virginia. In addition to a tour of the coal mine, the $20 experience includes a park in which a few original coal camp buildings have been relocated to simulate a small coal company town. These buildings include a one-room schoolhouse, a church, and miners' accommodations. The neigh-



boring Youth Museum also features a row of wooden log houses, barns, and outhouses that depict a homestead from the nineteenth century. The tour was a safe, pleasant packaging of the coal mining industry that neglected the realities of coal mining labor history and the present actions of massive energy corporations. It conveyed nostalgia for the old-timey charm of coal towns, a sentiment articulated through the idea of "coal heritage." This narrative locates coal mining culture within a narrative of American technological modernity, writing West Virginia history into a national story of progress.

From the earliest days of its settlement, West Virginia has been conceptualized in the popular imagination of the United States as "the coalfields," a place where the coal industry's priorities determine the local economy, culture, and geography. The designation of Southern Appalachia as a coalfield marks the region as an internal resource colony and a national sacrifice zone — an internal "other" to modern America. Over time, these cultural constructions reinforced the idea that Appalachia is both marginal to and exploitable by the broader nation, creating a symbolic framework in which region's suffering is justified. These epistemologies of social distance have created conditions that make environmental exploitation in landscapes of extraction possible.



These cultural constructions also inform how West Virginians narrate their own past and future. Coal has long defined the state's economic life through familiar "boom and bust" cycles, making West Virginia dependent on the whims of the market. However, highly efficient, mechanized mining techniques such as MTR have significantly altered employment patterns, reducing the amount of coal miners employed in the region. To adapt to these changes, West Virginians are envisioning a "post-coal" economy in which tourism contributes a major role, with attractions designed around the state's natural landscape and history of coal extraction. Coal-based tourist attractions, such as mine tours, ATV trails across reclaimed flattops, and gift shops with coal-related paraphernalia illustrate the status of coal as a mythic commodity.

Implicit in coal heritage nostalgia is the idea that extractive industries promote economic development initiatives capable of modernizing West Virginia. Here, West Virginia history is written into a national story of progress that culminates

Satellite imagery from Google Earth reveals the scale of mountaintop removal across the landscape.

in the ultra-efficient practice of. The desire to "modernize" West Virginia, as if the region is somehow lagging behind mainstream America, is the cultural logic that underlies the industry's justification of MTR. Supporters of the practice often contend that the flat land created by MTR offers opportunities for development in the form of constructing a more diversified economy. This perspective supports the idea that nature is merely property awaiting improvement by human means, reaffirming West Virginia as territory of extraction — a place made valuable only by its mineral value.

As I hiked through the forested trails of Kanawha State Forest and sat on rocks overlooking the New River Gorge, I had this feeling that I was completely embraced by the mountains and the valleys. Driving through the narrow roads between hiking trails, I noticed that there were small houses with narrow yards squeezed on the hillsides. These residential properties were remnants of coal camps, evidence of how West Virginians have continu-

ously lived in the mountains and developed a rich local culture of land use. Coalfield residents have continually used the forest around them, hunting deer, fishing, and collecting plants such as ginseng and goldenseal. Anthropologist Tim Ingold articulated the impact of cultural systems on the construction of place by developing the "dwelling perspective" on place, which understands the physical landscape as a partner in human livelihoods. In other words, the physical place is not a passive recipient of human actions, but an active agent in shaping society.

Through this perspective, MTR is entirely incompatible with local patterns of land use. By reconfiguring entire mountains into unrecognizable territories, MTR reduces the geographical specificity of West Virginia, standing in opposition to the coalfield cultural tradition of attachment to place. Thus, soil memory resists the idea that the mountains of Southern West Virginia must be made economically useful by the practice of MTR, providing a critical counterpoint that emphasizes the historical and cultural importance of the landforms themselves. Soil memory insists that the land has intrinsic value dependent from its extractive value. It reframes the mountainous region from being an empty, unproductive land into a rich, complex, and textured place in which generations of Appalachian communities have lived.

Although West Virginia is 500 miles away from New York City, the soil memory framework highlights how humanity impacts the environment, engaging with larger questions about what it means to live, build, and create in the spaces we inhabit. These are the key questions that lie at the heart of the Cooper Union's creative and intellectual disciplines.

This project emphasizes the long-term ecological consequences that humans leave on the environment. Learning from soil memory demands a long-scale time view, a perspective that reveals the undeniable effects of climate change – a crisis that emerges most dramatically through the scales of eons and eras, rather than seconds and days. On the scale of geological time, the earth comes alive. Nothing goes away.

Thank you to Buck Wanner, Hejintao Huang, John Lundberg, Appalachian Voices, Raleigh County Public Library.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February 3rd–20th 2026

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Design by Regina Cervantes Ellis A'26