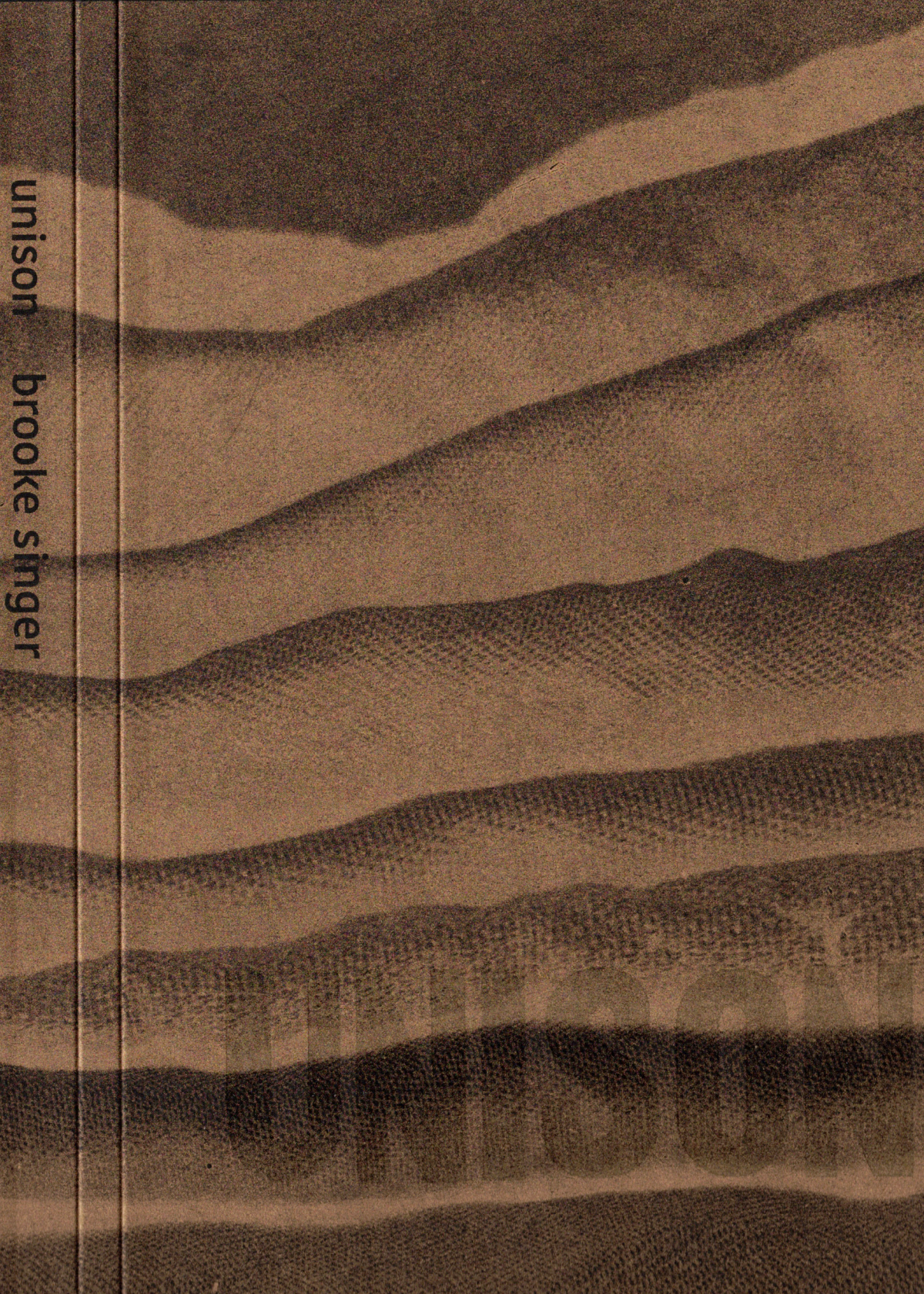
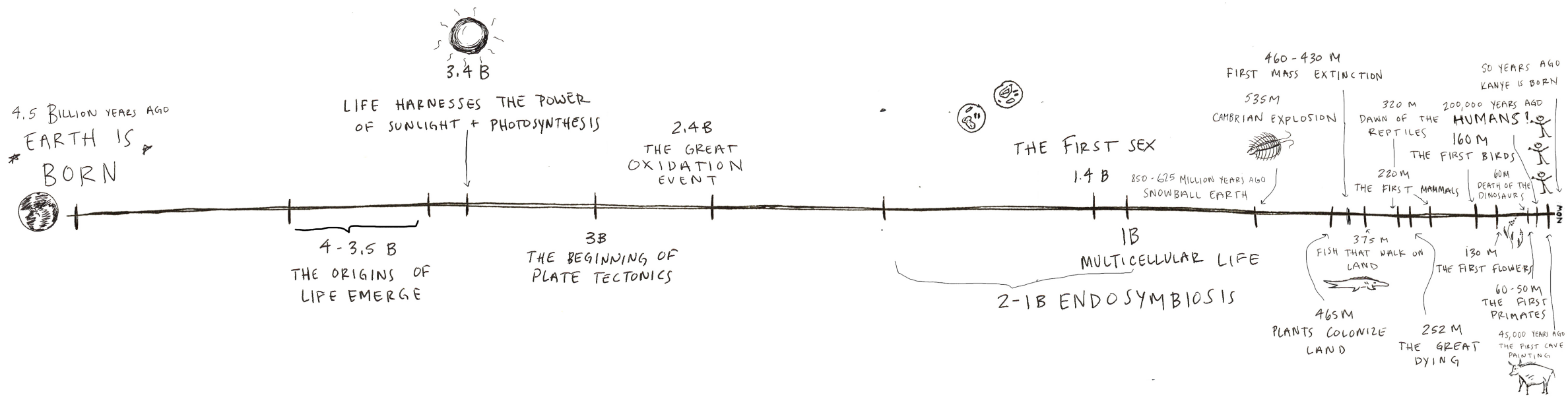


unison brooke singer







*for my mother*



## UNISON

*a deep map exercise between eleven people and the grounds of Unison Arts Center  
in New Paltz, NY, during the summer of social distancing (2020)*

Brooke Singer

with: Michael Asbill, Tal Beery, Stuart Bigly, Salvatore Engel-Dimauro,  
Katie Grove, Amanda Heidel, Nance Klehm, Laurel Mutti, Peter Pitzele,  
Steven Schimmrich and Connor Stedman

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I left a stressful job and was newly unemployed in the summer of 2009 as the economy was still reeling from the subprime mortgage crisis. My girlfriend at the time, who is now my wife, was also unemployed and starting grad school in the fall. She is more adventurous than I am, so it took her weeks to convince me to rent our room in Brooklyn, borrow her brother's old Camry with the faux wood interior, and drive and camp around the country for two months.

We packed the car and hit the road. Our first stop was Liberty, New York, a small town in the Catskill Mountains where we had some friends. We didn't have a clue where we would head after that. Except for one flight to California, I had never been west of Pennsylvania. Uncertainty makes me anxious, so I picked up a road map of the US at our first gas exit. It was a large colorful book with a two-page spread for every state in the union. Looking at the map helped me plan, gave me context, and calmed me down.

As we drove into Michigan, then Illinois, Iowa, and Nebraska, the thrill and fear of plunging into unfamiliar territory was softened each time I located us on the map. But something in me shifted as the corn and soy fields of the great plains receded behind us and the foothills of the Rockies bubbled up ahead. I was so enthralled by the dramatic changes in landscape, so impressed with the scale of the world around me, that the map began to seem like a nasty prank, flattening mountains and unifying places with wildly disparate characters.

Throughout our drive, I couldn't help but wonder: What unites the United States? There is no distinct territory that one can claim, no climate or vegetation, no single resource cycle or bioregional identity. Only two things other than my map reminded me we were still in America. One was Subway. Each Subway restaurant had the same furniture, same advertisements, and served the same sandwiches in the high desert of New Mexico as in the Douglas-fir forests of Oregon and the grasslands of Montana. The



yellow and green Subway logo cropped up in the most unexpected places. It was indifferent to landscape or the unique cultural character of a place. In all its blunt mediocrity, the logo was fully and uncompromisingly American.

The second reminder that we were still in America was the ol' Stars and Stripes, popping up on bumper stickers, billboards, and, of course, flags. I realized then that the American flag image was different from the Subway logo in some meaningful respects. The latter marked the sites of far flung brick-and-mortar institutions that looked and smelled identical. The American logo, on the other hand, was essentially devoid of explicit connection to any particular territory. Instead, it summoned a heroic mythology of benevolent conquest to unite disparate places under a single regulatory regime. Subway existed only inside the store. America could exist anywhere. The flag united steamy Florida with frigid Minnesota and the Alaskan tundra with subtropical Hawaii. An American flag even claims space on the Moon.

The American flag is remarkable because America is neither a place nor a people. America is a mission. Internally, America considers itself a shining example of tolerant democracy, "the greatest democracy on Earth" and "a nation of immigrants." But where most former imperial powers can no longer justify, on the basis of national character, the conquest of foreign territory, deterritorialization has effectively enabled America to continue these lucrative but violent practices in a post-imperial global context. America has more than 800 military bases in 70 countries worldwide, some large enough to be called "Little Americas." The American flag is therefore an ambivalent symbol, equally representing the state's self-described ideals of popular rule and its reprehensible and thoroughly undemocratic domination of non-citizens.

Deterritorialization may be useful as a logic for expansion and domination. But expansion and domination—alongside being firmly antithetical to America's high-minded ideals of liberty and self-governance—impede efforts to address colossal threats like climate change, ecological collapse, and mass extinction that impact idiosyncratic bioregions in unique ways. Such phenomena are forceful reminders of how we are enmeshed with

our landscapes and therefore how place-based adaptability is crucial to our survival. Indeed, our survival will depend on whether we can make substantial changes to our political constellations to account for these entanglements. Can we adapt to meet the challenges of the moment? How might landscapes—and cultures and customs that emerge from them—be reincorporated into a post-domination national character? How might we understand land claims and our responsibilities to land in a post-expansion future, or one marked by dramatic instability?

These are difficult and necessary questions that demand we rethink the nature of politics in the West. They are also questions provoked by Brooke Singer's brilliant *Site Profile Flags*. Simply put, each artwork is created by sewing together strips of fabric colored with dyes made of plants and minerals endemic to a particular site. The result is a flag that is also a place-based color profile. The visual statement is simple, and yet the conceptual statement has immense implications. Rather than centering a mission-oriented ontology, where the state exists, in a sense, in spite of its earthly constraints, these flags propose that we center landscape in our political formulations. In other words, the flags speculate on the possibility of a new bioregional politics.

If we seriously consider Singer's flags as a proposal for a new order, as I believe we should, then they open doors for some very interesting questions about human settlement and governance in a quickly changing world. They demand that we have nuanced knowledge about our environments. As plant and mineral materials vary even within a single bioregion, they question the uniformity of our experiences of landscapes and the rigidity of our definitions. Susceptible to the effects of weather and sunlight, these flags must regularly be remade, a fascinating and useful metaphor for the challenge of self-governance.

I am deeply gratified that Singer's *Site Profile Flag* will wave high on Unison Arts' grounds as part of *Owning Earth*, an outdoor sculptural exhibition I have the great pleasure of curating. It declares the exhibition's alignment with a politics of mutuality and entanglement and of reverence for landscape. Let's follow Singer's lead and reterritorialize our politics!

## Brooke Singer // intro

In the summer of 2020 in New Paltz, NY, I brought eight people together to "talk a book." The coming together was not simultaneous, and later I extended the group to two more via telephone. The one constant was me; I was always present and met with one person at a time. This was dictated by the pandemic. A microscopic organism, the novel coronavirus-2019 or COVID-19, had turned the world upside down and inside out in a matter of months. I had other plans for how this conversation would unfold but, as with everything in 2020, I had to change course and devise a different way forward. It seemed fitting to me that a biological organism, a parasitic symbiont, was powerfully commanding the human world while this book came into being.

Initially "walking and talking" through the grounds of Unison Arts was background research for my installation *Site Profile Flag*, part of the exhibit *Owning Earth* that was to open in fall 2020, then winter 2021 and now slated for summer 2021. Equipped with face masks, face shields, a lavalier mic and sound recording phone app, I met my first interlocuter, Michael Asbill, on July 2, 2020. I had spoken with Michael on the phone the month before and knew where I wanted to start the conversation but that was basically all I let myself prepare.

As soon as we set off, down the path and into the woods, it struck me that the conversations I would have over the summer would be as focal to my work as the flag I was going to produce. I did not propose making a flag and a book, but with each meeting it became clearer to me that was what was happening.

In this book, I have organized the in-person conversations chronologically and bookended them with the two telephone discussions that start and end this text. I want you, my readers, to move with us through land and over time. The path progresses at points but also loops and crosses and retraces a great deal. The form is the content as much as the content obscures the form. I have only edited the text for clarity, removing portions

when deemed too private or off-topic.

The starting point for me is how to read the landscape as an archive. Landscape reading is a practice I was consciously developing while a transplant upstate in summer 2020 and a central topic throughout the text. Along with the how to read landscape, I am interested in related questions like: who is doing the reading, what is being framed or prioritized and what are the organizing tools or methodologies?

I came across the term "deep mapping" shortly before I departed Brooklyn that summer and discuss this form of discursive cartography with several of my co-authors. The concept of deep mapping can be traced back to the art and psychogeography of the Situationists in Paris during the 1960s. The term was popularized by the American author, William Least Heat-Moon, in his book *PrairieEarth: A Deep Map* in 1991. I have loosely followed this form — or taken inspiration from the idea — one that allows us to move across disciplines, zoom in and out along timelines, and toggle between micro and macro scales when considering representation of place.

Lynn Margulis, the biologist and champion of the endosymbiotic theory of evolution, has also influenced me a great deal and her name pops up several times in these conversations. I cherish her unwavering dedication to challenging inherited paradigms despite ridicule, her belief in mutualism over competition as the force for life, her ability to tell stories on behalf of the invisible and microscopic world and her embrace of writing science for all audiences. Margulis' work led me to the biologist Scott Gilbert whose titles like "We are all lichens: How symbiosis research has reconstituted a new realm of individuality" have me leaping for joy. My enthusiasm will, I hope, be contagious via these pages and reach beyond strictly scientific communities through the circulation of this text.

I want to thank all of my collaborators whose words fill these pages and who so graciously agreed to my vague invitation to walk and talk. I am privileged to have such a brilliant and generous group of thinkers and doers converse with me. I also am indebted to Tal Beery who included my work in *Owning Earth* and set this project in motion. My conversations with Tal always leave me with fresh insights and often densely scribbled notes



to savor. I am thankful to Sam Liebert and his vision for Eureka! House, which provided me space and resources to produce this work. I was fortunate to be his professor in graduate school and, within months of his graduation, the tables were turned; while in residence at Eureka! House I learned so much from him and his way of doing. It has been fun and fruitful! Sam has introduced me to many incredible people, including Rachel Meirs (whose drawings grace these pages) and Lilah Friedland (who helped with the debossed cover at Invisible Hand Press).

I will leave you with words by Paolo Freire from his book *We Make the Road by Walking: Conversations on Education and Social Change*. That is similarly a "spoken book" made in conversation with Myles Horton in 1987. Freire spoke/wrote:

Instead of writing a book, we speak the book.... This should give us a duality in the conversation, a certain relaxation, a result of losing seriousness in thinking while talking. The purpose is to have a good conversation, but in the sort of style that makes it easier to read the words. In this book we can capture this movement of conversation. The reader goes and comes with the movement of the conversation.

And so now I invite you to move with us towards Unison, a center for art and learning.

10 conversations

**BS:**

This is the first conversation that I've had for this project over the phone. I've been meeting people at the site, which is Unison Arts Center in New Paltz, and we're walking and talking. We are writing a book as we walk and talk. You are keeping up the doing part while we talk today, being outside and in the field, as I sit in front of a screen and on the phone. That keeps the spirit of how these conversations have gone alive. I like it!

I'll start by sharing how I keep coming across your name after we initially met in California in early 2019. Once you popped up in a video I was watching to prepare for one of my classes. I was looking at the work of the artist collective Simparch and there you were building a compost toilet, I think? And more recently, I was doing research for this project and thinking about the question, "How is the landscape an archive?" And I found this term "deep map" that resonated strongly with the work I am doing and, again, there you are. I found your workshops and *The Ground Rules* book. And then was led to the source, William Lease Heat Moon's *PrairyErth: A Deep Map* which is a gold mine.

I want to hear from you about your experience with the concept of a deep map or



what does "reading a landscape" mean to you?

**NK:**

Well, to start with, I grew up on 500 acres and it was a very diverse landscape. That was a nursery of woody plants and perennial plants. There were large natural areas and we also had a working farm for food production and a lot of animals. From growing up with a lot of land, I have experience determining functionality on a large scale. There are flows of energies within a landscape. And it's not just human flows but flows of weather, landforms, hydrology, soils, existing plant communities and animals. They all kind of come together.

When I got into landscape design almost 30 years ago, I realized I had to pull in a lot of different factors to make the best decisions for the success of a design. When I go to a site, I am not just plopping down what I want or what the client wants, but being really much more sensitive or taking into consideration much more.

I just finished working for somebody where designs were imposed on the landscape and because of that they were running into a lot of issues. Why wasn't it working? Well because it wasn't sited right. Because it's the wrong plant for the situation. Because the soil or the wind patterns... none of those things were coming into consideration in their designs. It was interesting to me that so much wasn't considered or the broader whole, like the soil, the existing plant life, the prevailing winds, the hydrological cycles, the slope, all those things were barely considered.

In landscape reading, I try to emphasize understanding: how these different things interact on a site is important to read before we even get into design or doing anything on the site. Whether it's a mycoremediation installation or a young orchard or a fire circle, first comes observation. It's

not only about where we site things and how things exist, but how our use evolves out from that. And understanding includes looking at waste or the by-products in the system and including that in the process. By looking at full cycles of use in a site, you plan for human use. That way I don't have to walk such a great distance.

**BS:**

It makes total sense. When else do you find this practice of reading a landscape useful outside of your landscape design business?

**NK:**

A lot of the questions are "why are things not working?" or "why is the community being so adversely impacted?". Whatever the issue, you want to understand the broader systems to allow you to intervene better or find the best response. When people say, "I don't know what's wrong," it's like being able to look at what parts of the system are working well and what parts of the system are being challenged to better determine where to put your energy. How do we shift something for the better?

So to be the most effective, one must understand systems in order to understand intervention points. The other reason I use reading of landscape and teach it is because there is no environmental history written about most urban and urbanized places. By urbanized, I mean everything from a small town to small cities and larger cities. When you go someplace, you're not going to get a really integrative sense of what has happened there. And without that, what is required is to engage a very deep process of looking, to try to read and reconstruct an environmental history of a place or a site. We combine the social historical research with real estate records or fire records or historical photographs or documentation, and then bring in all the landscape reading and overlay it too. That is how we can start to talk about

how a site has been used over time.

It takes a while to do deep mapping in order to retell the environmental histories of a site; we could go from soil coring into historical research and then onto oral histories. The different steps get combined to reintroduce the environmental history of a site to people. To me it is more about mental history — not only what you see on site, the natural systems at play, but how people use them over time. So, we can't know everything. We can't connect all the points because there hasn't been written or photographic documentation over time. The historical record hasn't been important in that way, but there are some extrapolations we can make through how we study the soil. What plants are naturally or spontaneously there versus what has been planted? And when you can see evidence of human use, whether it's been recorded or not, in the landscape, if you look closely enough you can parse it out and then reintegrate those pieces into a larger history, a deep map.

**BS:**

It's really layered. When I got my copy of *PrairyErth* and saw it was a thousand pages long, I got a bit overwhelmed. But then I realized it was not the beginning to the end kind of read necessarily. It was not best for me to see it as a linear experience even though it is bound up as a book. And that has been fun for me, all these conversations at the site. I have invited people to join me who have different experiences and knowledge areas to introduce the site. This includes other artists who have worked at the site and the exhibition organizers, the founders of the park, a geographer, two geologists, a wilderness educator and now you. I am curious about their personal history there and how they've seen the site change over time and what their ideas or hopes are for its future. Once I finish a conversation, I ask for a referral and it goes from there. It can just keep going on and on. I'm following these threads one by one but

stepping back now I see the mass. It has become its own form that is dense, and if I continue, probably as overwhelming as the *PrairyErth* book!

**NK:**

You can get lost in the process. And you can't know everything and you don't want to because then you will remain lost in the accumulation of everything. You need to ask: what is the purpose of all of this?

**BS:**

For me it's about rethinking or reorientation. I proposed to make a flag, a bioregional flag as Tal Beery calls it, using foraged materials at the site to represent or mark the place. But once I got the green light, I did not want to simply proceed and make the object; the process was more interesting and held a lot more potential. The experience could be a shopping trip, where I go in and get the materials I need and leave, or I could retool it to be more akin to dating. I come to the space to open up to another's presence and see if I can build a relationship.

I find myself moving between thinking in this way, where goals are less defined or maybe muted, to thinking about policy change, which is a 180 degree turn from there. There is the more theoretical or speculative approach, including pedagogy and learning through teaching. And then there are concrete actions: the pragmatism of let's build this or set up that and see what happens. That is more the learning through doing. When I engage in one kind of practice I often long its opposite, which is kind of annoying. I need to calm that part of my brain and see the bigger picture and not only the particular moment.

**NK:**

I think when we're doing this it's usually towards an end. Depending on my audience, I'm selecting what to commu-



nicate. Certain things come forward for each project. If it is work towards a design then we're going to be looking at certain kinds of things. If it's more about expanding the ideas of how a site has been used, then we need to bring up questions like "what does it mean to inhabit a site?".

That is a social activity, discussion-based. If we're trying to argue for a place as a site of importance, that's something else. So, there is the selection or curation of what we share from everything we've pulled together. We do try to blend things that have some tension, I mean this conceptually for people and that's how we reorient to a place. And I think that's what *PrairyErth* does by representing places with different forms of narratives and different ways of telling. He is reintroducing the reader to Kansas. The joke that is often told is that Kansas is a non-place. But, no, it's a really rich and diverse place. So, he does that through his construction of diverse forms of narrative. And I have always wondered how he knows when to stop? I haven't asked him that and I haven't found that question in any interviews with him.

Again, with this process of landscape reading or deep mapping, we're either solving a problem, like why is this happening? Or we are on a site where there are like six different challenges and we try to unpack what those challenges are by learning what is underlying these challenges. There may be long-term hacks or short-term hacks, and maybe the issue is that we just have to live with a given or what's going on in the world. It's all about taking a deeper look and this is usually towards a goal. And that's how we can make better decisions.

We are so disconnected and most people don't know how to read landscape. They take an online class in botany and they still can't make some basic identifications of trees or plants. So, for me it's essential to try to get people really

embodied, even to the point of their being uncomfortable. I like to invite this embodiment in landscape and dive into the complexity with the tools to navigate and understand it. This often involves science, the powers of embodied observation, listening to anecdotes and personal experiences. And we try to weigh both the so-called objective with the subjective with importance. We try to teach the tools of science and basic observation and ways of marking that. And we teach people to tap into sensory experiences of place to really understand what it means to them. We dip in more emotionally and through our senses. That way people get better at observation because they tend to care more and naturally become more curious. We can measure slopes and walk the area, but unless you're really here or present then what's the point? So we work on a psychospiritual level as well when we're out on site and use a lot of kinds of sensory practices to get people more in their bodies as tools for observation.

**BS:**

When you say people, I am curious who your audience is?

**NK:**

Sometimes an audience is an organization. They are trying to understand something and to really understand they need to do a lot of field visits. They won't necessarily work through things physically, but want to understand the conceptual frameworks of something, as if it is an intellectual exercise, which it is not. My preferred audiences are ones with activist groups, where people are really coalesced. They're not there because of their job, but they're there because they really care about something — groups of neighbors, people in the community that are facing a certain pressure. They're emotionally involved and they also have their own version of mapping a site because they live there and they've been already doing informal observations and hold stories and experienced histories

of the site.

I also work in schools and businesses. But sometimes that is when people look at what I do more theoretically, which is problematic. That is when the adoption of the term deep mapping is thought about as a metaphor as opposed to something one performs. I'm really interested in the performance of this process, not only as a conceptual framework. It is not deep mapping without empirical experience. Today many landscape architects know very little about plants or fungi, soils or water.

Landscape Architects know about building a sidewalk and the specs around ADA [Americans with Disabilities Act] or making a path with packed gravel. They need to know so many regulations that they tend not to know, or have a lot of empirical experience with, the life itself that they're designing for. To get people into an experience of something is hard when there's so much removal. The students or the participants that come are usually people who have already been really involved in other farms or gardens or they are concerned parents of little kids or communities impacted by something very specific and have a strong response to place. So that's the long and short of it. It is about taking it home with you and working with your kids or working with your neighbors, to be more effective in our communities, whether we chose the work or we were chosen.

**BS:**

I know that you split your time between Chicago and land outside of Chicago, I'm not sure where.

**NK:**

I'm in the Driftless, which is an area where there is a lot of diverse topography. The glaciers didn't scrape the land flat there like in the rest of the state. There are ridge tops that

are bare soil, elevation changes and there are rocky outcroppings and big deposits of rich fluvial soils.

**BS:**

That sounds dramatic and I love the name, Driftless. One thing that's interesting to me doing soil work in New York City and more recently in Upstate New York is that divide between the rural and the urban. It's being played out on a really scary national level with our elections coming up. And because of this disconnect there are all kinds of assumptions made about groups that don't really come into contact with each other. Heck, some groups in the cities don't come into contact with each other, but we're in such close proximity. I guess my question is how can these practices or workshops you describe be a way to bridge these divides? I know in your book *Ground Rules* there's mention of environmental and restorative justice. So, there is that too. How can this work be a vehicle for opening up communication and understanding other people as well as



other living beings and systems?

**NK:**

It is rare for urban and rural people to come together. That's been the goal in a couple of gatherings I've been to where urban and rural groups come together. There needs to be translation between these places of habitation for those dialogues to even happen. Basics need to be discussed like why is it important to look at this? Or how would I know that? How a rural person reads landscape is very different from how an urban person reads landscape. For instance, how a person understands scale is dramatically different. When I talk to urban people, no one understands what an acre is. They understand what a square block is in Chicago,



because we have a kind of a military grid where every eight blocks are equal to a mile. We also have standard lot sizes, so if I can I translate spatially for folks, something within their own terms, such as what an acre is in city blocks.

Another way rural and urban people read space differently is scale. Urban people understand a smaller and more intimate scale the way land is parsed out. Rural people are looking at a really large scale and influence. They don't come together very often, but if there's a gathering and

a chance to do landscape readings between urban and rural people, it can be really interesting because there's a completely different understanding of land use, ownership, responsibility, community, scale, time and so on. It's just so different and the languages are so different that there has to be a lot of emphasis on translation, because otherwise the diverse understandings will get lost.

When I do installations on a rural landscape, I encourage urban people to come. There is a need for a lot of patience and translation, but these are the opportunities to come together and learn the different languages as well as different concerns. For example, I was talking to someone about urban contamination and they only work rurally. And she wanted to know what it is and what does it look like? She understands there is pollution, of course, but never considered it more fully. She's somebody who had never looked at urban soils before. And I told her some things, about what urban soil often consists of and the concerns, and she thought it was really super interesting, but had never really considered it before.

**BS:**

I reached out to a farmer in Kansas a few years ago to ask him some questions about his cover crop mix and how he was basically drilling his cover crop seed with the cash crop. He grows sunflowers for oil but it's not a monocrop and there are like a dozen other plant species growing with it. I had to stalk him on Facebook and it took a couple of attempts but once we talked, he was very generous. But his first question was, "why in the world would an urban person like you be interested in talking about soil?". He really had no idea why someone in the city would be interested in soil or know anything about soil or even think about soil. We had a great conversation and I learned a lot from him. There's a lot of dependency between city and urban people. You could call it a symbiotic relationship. The most obvi-

ous exchange is city folk relying on the food and the farmers relying on the income. But it's not a healthy or robust relationship with so much disconnect and loss of visibility. People are always amazed when visiting a working farm to see how much labor it involves. And that a lot of it has to be done by hand not machines. And the precarity of it is totally lost too. I really see the urgency now for that kind of bringing together and bringing these realities to light for both sides that are based in direct experience and communication rather than mediated.

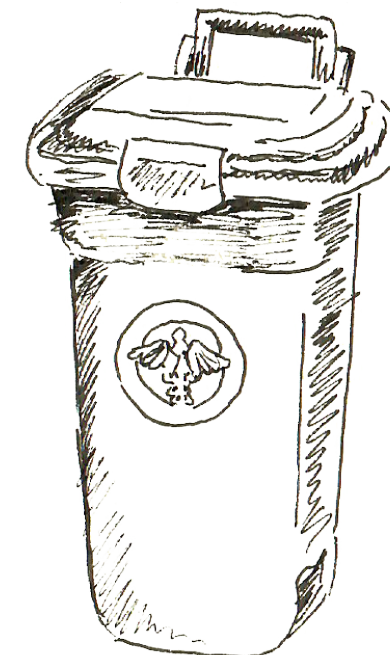
**NK:**

I'm talking to you now, but I also have to be working. There are only so many hours in a day. It is what you're talking about, that constant production, it's really important that you don't monetize everything because it's just what needs to happen at the right time. That's how farming works. Even friends of mine who intellectually know about production say all sorts of crazy things to me about growing and what their expectations are. They ask, "Why are you working so hard?". And my response is "Have you been outside?". Keeping that dialogue open is a hard one. Even the most conscious people don't understand the pressures in these relationships. And so it's really difficult and really important for me to go between the rural and urban. I have to keep that tension real within me and help look for ways to translate. And not only personally in my own life, but with others too who are interested in ideas of regenerative ag or postcapitalism, etc. There is more complexity in navigating those things than most people understand. And it's what keeps the rural and the urban forever separate—like that farmer asking you why should you care about soil.

**BS:**

There are these breaking points, like when COVID hit New York City, and everything shut down and people were not

going outside and the restaurants were closed and the lines were around the block to get into supermarkets. You could not get your groceries delivered because all of those services were booked. And some of the conversation turned to community gardens and resiliency and how we can be self-reliant in these situations. But if you really consider the scale, there is of course a huge gap. These places are really important for community and for education and keeping growing practices alive as well as visible in the city, but we can't rely on them to feed everyone. For me the question becomes looking more seriously at infrastructures or the way we are connecting with rural spaces where our food is coming from and how it's getting here. But I think it came as a shock to some people who were really experiencing food insecurity for the first time. And when you get into these questions then policy becomes foreground. I know you have done advocacy on the local level related to policy and there is your pedagogy and practice or business. Where does one begin and the other pick up or how do you choose where to focus your energies?





**NK:**

Well, I think just getting people who are involved in policy in more open dialogue is really difficult. There are not a lot of people who work in policy who are willing to have those dialogues. I'll ask for them and rarely get them. I think it's possible to find somebody who is open and start from there. But in a large city it's even harder because people can hide from each other more easily as well. There are a lot of excuses right now about why things haven't happened that have been on the table for like six years, things people have been working on for so long. It's like, well, it can't happen now because XYZ. They are just all sorts of excuses to why people aren't picking up the ball and doing things. I think it's really about looking at what are the new ways of communicating and not everybody's open to that, particularly if it will put their position at risk. So it's pretty rare, I think now that we have more of a leverage point for open dialogue. And I feel like in some ways, certain people are more open and other nonprofits are just hiding and trying to avoid the fact that they don't have enough funding to survive. I think it's harder now, but I have talked to a lot of people in the city of Chicago who have a certain level of consciousness and deeper personal interest in doing more for their communities in the city that they live in. But because of bureaucracy, they find themselves limited by what they can do.

**BS:**

In New York City, after COVID hit, the first thing on the chopping block was the organic scrap collection program. They just shut it down. And funding for composting operations across the city just froze. The reason the city gave is that it's too expensive, but in reality it's just too expensive not to run. It's clearly not a priority and puts into question all of NYC's resiliency plans, like zero emissions by 2050. Are these just branding? If you're really committed to that goal then municipal composting that has developed

over the past seven years and the incredible partnerships with so many organizations, communities and volunteers would not be so vulnerable; the plug should not be so easy to pull.

**NK:**

Yeah, it's really at a stopping point. I think working on policy now is not where the focus should be. It just seems like the working on community connected to this and place-based solutions make sense. Bureaucracy and nonprofits are trying to protect themselves from dying. And they're not going to be responsive, just offer a lot of excuses. I hear all sorts of people say, "We don't know what's happening." And I want to ask them, "Does that mean that you don't have to respond?"

I'm more interested in what can happen on a personal level and what can happen on a community-based level or an organization of a group of others (cooperatives!), and less interested in the bureaucratic response or institutional response. The way institutions are structured doesn't allow them to take in the learning like an individual or community group can. They're beholden to where and what things are now.

There are lots of things that have been worked on that are coming apart and we have to figure out what we're going to work on and what structures are going to support that work because everything is being restructured right now. I don't know how policy is going to be affected, but I see this as a time for us to build our skills and to define what we're working towards so when bureaucrats are showing up for their job, we can actually start pushing what we want to see happen. There are a lot of people taking on roles that they haven't taken on before, because bureaucracy is either falling apart or being reorganized. I do see a lot of people's voices being strengthened and curiosity is

sparked to ask deeper questions. It's really an opportunity for us to learn more.

**BS:**

I want to ask a question I was going to lead with and didn't. Your talking about taking on roles reminded me of it. I apologize in advance, because I personally hate this question when it's asked of me, but I am curious how you describe your work and what labels you use for yourself?

**NK:**

Well, I should tell you, I don't like being called an artist, although I probably am one. I see there's little utility in that label, because of how the art world has been in the past 40 years. I'm not interested in being associated with the art world. I do see myself as creative both practically and philosophically. I am a facilitator and provocateur. I'm interested in the expansion of ideas. I'm interested in getting to more integrated and more systematically integrated ways of functioning. My larger goals are more social, political and cultural than personal. I really value collaboration, so I call myself a collaborator as well. I work in the field of ecology as a practitioner, a grower and researcher. I'm interested in restoring the function of a landscape, the healthy function of a landscape. I'm interested in it reintroducing land and landscape to people to rebuild connections that have been lost because of economic pressures, cultural pressures and social pressures.

**BS:**

When you were talking I was thinking about a quote I read recently from a scientist about the role of science; the idea is that explaining or defining the climate crisis in terms of science is pretty much done. Now it's a job for social scientists. There is little scientific debate and the debate among scientists is about when and how bad or predicting the scope of things. So, it is really up to social science and

I would add other disciplines to move this forward and mobilize people.

**NK:**

I agree. I feel like communicating ideas and leading people into the experience—so they can have an emotional experience of what is happening in their lives and where they actually are—this is essential. The virus took us there and economic collapse has taken us there. The reawakening to race is taking us there. There are a lot of social things that are impacting us that will help us to get there. And the communications from non-scientists are important. Communication needs to be done through research and in a grounded way. I don't see myself doing what you call street science or DIY science. My background is in anthropology and I am really interested in cultural shifting and how science or empirical experience is understood and how it can affect us. So, I completely agree. I do think that those practitioners need to have a really good grounding in science and experience and not just respond from a theoretical framework to help us get there. And that's why landscape reading is both theory and practice. It uses scientific tools and the tools of bodily observation.

*This conversation took place on the phone on October 2, 2020.*

## Michael Asbill

**MA:**

So, just let me know what you want to talk about and how I can be of help.

**BS:**

This is informal, but I definitely want to get into the discussion that we had on the phone about the trees.

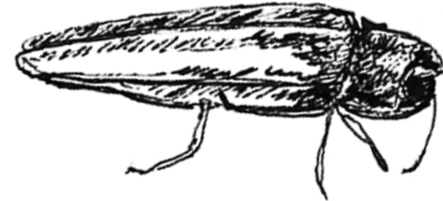
**MA:**

Definitely. I can do that. So, in case you don't already know, I will give you a quick background of Unison. It has been here for over 40 years. The way I see it, Unison came together as a hippy-ish impulse to bring families together, an intentional community. It's kind of fabulous and an idea that returns again and again. I live in an intentional community myself, so I connected to this place a couple of years ago. A lot of the folks who were the members here started to age and weren't coming in and participating at the same level. And if it felt like Unison might close, but a new group emerged to try and steward it into the future. It's funny though the idea was we are this younger group, but we're all in our forties and fifties. I don't know how much it will take or where we are going to take it exactly. But that's kind of the moment we are in right now.

So, with regard to the trees and this space,

let's see. You may not know but a lot of my art work revolves around trees. I was really interested to see how this particular forest was reacting to the infestation of emerald ash borer, because it's such a large population of ash trees in this particular forest. My guess is it was such a large population because of the soil composition. We are standing on clay – all of this ground is clay. Because of that the water just sits on the surface. Ash are shallow rooting trees and they are thirsty trees. It seemed to me that they were really thriving because they root out like this and absorb all that standing moisture. So now without the ash trees when it gets really wet it doesn't go anywhere until it evaporates. It's like a swamp.

I was quite interested in what was going on with the ash trees here and discovering that all of the cedar trees are dying along with it. Of course, the emerald ash borer has been here at least 10 years and these ash trees have been collapsing for quite a while. Maybe one or two have lingering foliage, but for the most part, I think they're all dead here. And my theory is that when the ash died, all the cedar trees kind of drowned. They could not handle all that



standing water.

**BS:**

It was too much water for them.

**MA:**

Yes, too much water. You know, the ash trees were kind of like keeping it at just the right level for the cedar trees to thrive. That's my guess.

**BS:**

All of science is a guess. It seems pretty logical to me.

**MA:**

Once you've spent some time here and you understand a little bit of the composition of the ground, it does seem logical. We had a couple of projects happen where people were digging into the ground and that's when it became really apparent over the entire area that it was just layers and layers of clay that we can't actually get through. We've never dug deep enough to get past that.

**BS:**

What color is the clay?

**MA:**

It is a little hard to see, but here. You can check it out here where it's cracking. It is incredibly sticky. And interestingly, we excavated a couple of pits for a campfire for cooking and around the edge of the pit were these hard chunks of fired clay. It was pretty wild. Some of the cedar trees are holding on, especially where it's higher ground. But they are struggling. Take this cedar, for example. It fell over last winter and finally gave up. There are a couple about this size that collapsed last year. They have been collapsing every year. I was interested in using some of the wood as raw material for projects. If I harvest it then I can make things a

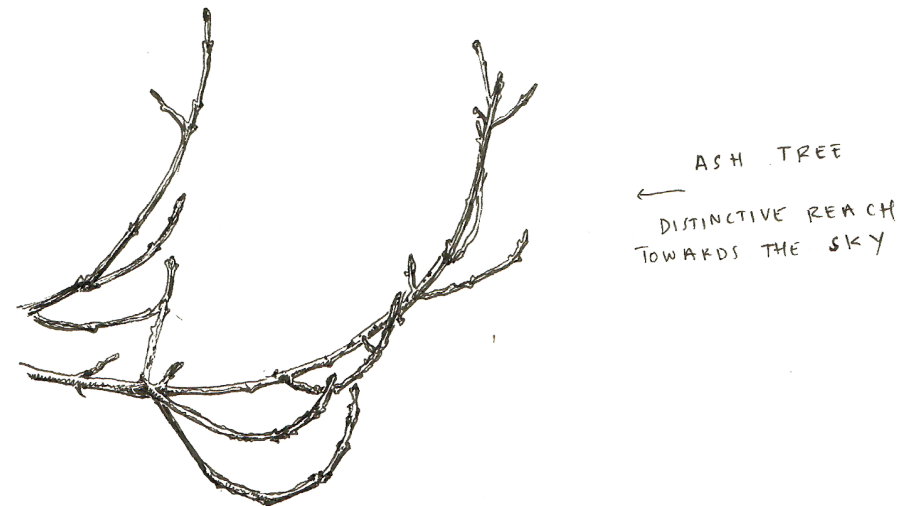
bit safer around here. But then there's part of me that likes to see it here just falling, rotting and leaving it alone.

**BS:**

Did we pass any ash trees? I'm not very good at identifying trees.

**MA:**

We've already passed a few of the ones that are left. These are the large ones. It's hard to take them down without professional help. Look at this ash. You see the flaking of the bark. That's a result of birds, woodpeckers primarily, coming up and hammering away and trying to get to the bugs that are under the bark. And, it is called "blonding." It just leaves piles of all this bark on the ground. When we get closer you can see the actual emerald ash borer's exit





holes.

And I can tell you a little bit more about the life cycle. I had become convinced that as they die, they shed all their small branches and become just largely columnar. And then I realized I missed the point. What actually happens is when they're in the forest and other trees are blowing around like this, it breaks off all the small branches and just leaves the kind of center column. You can see all the dried-out limbs and branches. They are easy to snap when something else is blowing up against them. But out here they remain larger



cedar bark

than the path, which is fascinating. So this is a big ass tree. There is another one right here and I'll show you a few more as we go back into the forest. There are ash trees of different ages. That's the cedar, which are really distinctive, of course, in terms of their bark, this kind of like spectacular way that the trunks form.

**BS:**

It's like ropes.

**MA:**

And it's just beautiful. But you can't see how rich or red the cedar is. But here. See, there's a big gash. We discovered as we started cutting trees, particularly the small ones like these here, that they are all about the same age. From sometime in the 1970s. So, I'm guessing they were cleared with the exception of a few large trees and they all grew up at once.

But you see these little D shaped marks or holes? They're not big. There is a really good one. That's an exit hole. This is where the beetle emerges from the tree after the larva has been feeding. What happens is that in the late spring or early summer, the beetles fly up and lay eggs in the bark. When the eggs start hatching they feed on the nutrients in the tree bark.

You can see just how deeply infected these trees are. Oh my gosh. I mean, it was just such an impact. They go around and cut off the nutrients as they go up and down. So the tree can't feed. They can heal, some of them, but wow.

**BS:**

That's a lot of markings. That would make a nice rubbing.

**MA:**

There's no question. It is just stunning. But that tree really took a hit.

**BS:**

And is it similar to what happened to the chestnut trees?

**MA:**

Well, the blight of the chestnut tree, as I understand it, is not caused by a beetle but a fungus. That is also true with Dutch elm disease. Dutch elm disease caused a crash in the elm population. And again, elm trees can grow to a certain age and then they tend to die from that disease. There is another infestation of something called the woolly adelgid, which is hitting hemlock trees. These are aphid-like insects that came from the other side of the world, just like the emerald ash borer that found its way into this country from China on shipping pallets, landing in Detroit initially.

**BS:**

So, they were part of international trade?

**MA:**

Yeah. What happens with beetles is that they bore into the heart of a tree. After winter they reemerge and transform into an adult beetle. They dig out and fly away. How fascinating is that? And they're just a beautiful green.

**BS:**

Have you seen one with your own eyes or just photographs of them?

**MA:**

I've only seen one. I think it's because I didn't realize what was happening until the infestation had largely passed because I wasn't tracking it. I saw all the ash trees dying

on my property. I didn't put all the pieces together. I just watched all my trees dying. I first noticed after Hurricane Irene in 2011. I started to notice them and then it became evident that all of the ash trees on the perimeter of our property were dying and falling. And it took a little time for that to dawn on me, before I started doing research about it and then I got really concerned.

**BS:**

So once the trees are dead, where do the beetles go? Find another tree to feed off of?

**MA:**

That is what's interesting. It seems like they're abandoning some living trees too. This is good because there are not many trees left to feed on. They just kind of migrate very slowly through. And there seems to be some lingering or some trees that are resistant, but not many. It is largely being talked about as a functional extinction. This means not all the trees are gone, but they are not reaching maturity, like the elm or chestnut. So you cannot actually say extinct, but they're not living their whole lifestyle.

And look here. A baby ash is growing out of this stump. It is a desperate bid to survive! It's just sending out shoots from the nutrients. And there are a few of these around. I don't know if they will develop into full trees or not. I hope so. We'll have to see.

That's a cedar. And then these are actually little ash growing. You see a big ash in the background. This was mostly ash and cedar. This is an oak. And as we move our way back we'll see that there are hickory moving in and have been for quite a few years. They seem to like the edge of the field.

This is kind of exciting. This is actually an elm, but you can see it's stressed. It's got a lot of shoots coming off of the

trunk. It may be coming towards its final years. The elms have pretty much completely died back this year. That is what's happening in this whole section of forest. It's just becoming very sparse. The forest was cleared in the 70s and now it's going back to a clearing.

I am interested in this idea of an observable extinction event, even if it was highly localized, with the potential of being much bigger. They talk about the potential of the extinction of the ash in North America. We don't know if that will happen or not. But I was like there is an observable extinction event in my backyard. I started looking and thinking about how to process that. Some of the effects are beautiful but mostly it's just really sad.

**BS:**

Yes, of course.

**MA:**

So, I started with cutting some of the dead ash down on my property for firewood and learning a lot about the way that sounds. There are a whole bunch of things I learned about the way they fall once they've died. But when I was cutting them down, I was recording the fall. I was taking all that audio and playing it back really, really, really slowly as I was coming to terms with what it means for something to collapse. And that led into other explorations.

For instance, I was taking some of the larger logs from the huge trees that were on the property. There were some that were big and around 120 years old. If I were to pick a section of eight or ten feet and start driving wedges into the ends, the way it would release all the tensions that had built up in the tree throughout its whole life, from blowing in the wind and growing against the hill and was staggering. "Pop, crack, pop!" It was expressing its history through sonic means. And that was really beautiful as well as heartbreak-

ing and sad. And from that exploration I began down the path of "what do I do to preserve them?". I remembered from my archeology classes many years ago of all the kinds of carbon artifacts that exist. And I thought, well, maybe I will carbonize them, also recognizing that a fair amount of carbon was sequestered in the biomass.

I started tinkering with pyrolysis and what I could do in a really efficient way to reduce the carbon that was in them to like 95% actual, black carbon. What does it mean to sequester that? What does that look like? What does it mean to preserve the tree in that way? You see in all of the tree rings, you see everything that it was. So those questions came about and now I am carbonizing everything I come in contact with!

**BS:**

What does the carbonized tree look like?

**MA:**

It looks like a black version of the tree it was. I'm in the process right now of experimenting with carbonizing some whole trees, but before it was just carbonizing chunks and pieces, because the wood insulates. The heat even at high temperatures can't penetrate the wood to a point where it actually releases all of the volatile gases and moisture that were stored inside unless it's in small pieces. So, you pick out a chunk and you see all of the tree rings and holes and the bark. All of it is intact, making it a marker of sorts. I became obsessed; it was all beautiful to me. For anybody else it's like what's in your barbecue. So, that's been a path for me as well as making products out of the wood like baseball bats and axe handles.

**BS:**

The wood then doesn't decompose? Without decomposition it won't turn back into carbon dioxide and the carbon

stays sequestered.

**MA:**

Funny thing is you lose less carbon through pyrolysis—through that type of carbonization process—if you're burning efficiently. You actually cut down on the carbon emissions that would have happened on the forest floor during decomposition. That does not make it a good idea, but it's interesting. You end up with something that lasts 1,000 to 2,000 years.

**BS:**

Right. It's not going anywhere.

**MA:**

And that's why it's thought of so highly. It is kind of a holder of microbes for fertilizing the soil. It is called biochar. But you have to inoculate it. You can't just bury it, because what happens is it just takes all the microbes from the surrounding soil, like a sponge, and just kills the surrounding fertility until it equalizes. So that's all part of the exploration and it's kind of fantastic.

**BS:**

One thing leads to the next. I've been there.

**MA:**

Again, here, you can see the dying trees all around us. These are mostly white ash, by the way. There are also green and black, but not as many of those on this property. I've discovered on my property when they're growing next to the stream or wet areas, they tend to decompose around the roots and collapse away from the root mass. And in the dry areas, they tend to decompose around where the branches meet and then they just fall off from up top.

I haven't seen a whole lot of the trees collapsing here. My

HICKORY



guess is because they go through these intense sort super moist and then super dry phases, perhaps they're being hardened like a Stradivarius violin. You're getting almost treated wood from the kind of radical influx of water and then the complete dehydration.

**BS:**

And this one looks like a telephone pole. You were talking about how straight the ash are. I mean, it just looks like it was machined.

**MA:**

Yes. It does. And that was one of the things I became fascinated with too because on my property, all of the branches were being blown off. They were super, super



straight, which is why they like them for tools and baseball bats and things like that. It's super straight grain. Easy to dry. There's not a lot of knots and stuff, especially down low. You can see some of the knots in that one, but you've got like 10 feet of just straight wood before that.

**BS:**

These two are like a mirror image of each other.

**MA:**

Yes, they are! I mean, it's just sad. It's a heartbreak. Well, I mean, it is what it is. That's some of what I know. Oh, look straight up. Oh my gosh. That's incredible. That was one of the things that I originally found so striking was this column form and the regularity of the bark. That started to really stand in for some sort of fall of civilization. All those collapsed branches. That's a pretty big elm too. It's like two of them.

**BS:**

Their branches start so high up. Is that typical?

**MA:**

That's not unusual. That also tells me that there was a lot of competition for light at one point and you can see how much has been lost below. My guess is that a tree was up to where those branches are now coming out. You can see it with these ash trees here. They grow up to the underside of those branches.

This tree is under a little bit of strain, but then there's part of me that also thinks it's taking advantage of all this new light. I mean, those would be my guesses. And then these are the hickories and they've been growing pretty fast.

**BS:**

These leaves are great. Oh my gosh. They are like banana

leaves or something.

**MA:**

Yes, they really are. They make these amazing nuts. Then at a certain point you have to dodge them because they come down so fast.

**BS:**

Do people eat hickory nuts?

**MA:**

You can. They are super pungent when you try to break open the shell. And here is the hickory shag bark, which is really distinctive and easy to identify.

**BS:**

This is a much nicer day than yesterday. It was so miserably hot in here.

**MA:**

The overcast conditions really help. It's still muggy. And I've been very excited to learn more about your projects or learn some through your presentation. What kind of projects do you have in the works? What are you finding interesting?

**BS:**

Well, you know, I've been doing a lot of work about carbon sinks too, so that's one reason I find what you're doing fascinating. I started a community garden in 2013 in South Williamsburg, Brooklyn, and got really into composting and looking through the microscope to identify different microbes and thinking about soil health. But then got kind of discouraged because there was never enough support or resources. All of the community gardens are always so precarious. The city could come in and take it away at any minute. So, I began thinking about how we could band together and find ways of representing all the ecosystem

services or environmental benefits that we were giving to the city through these spaces as a way to strengthen our position.

At the time my friend James Sotillo, who was dubbed "Compost Tea King" in the area, showed me a field test he was developing with a scientist to identify microbial biomass in the soil really quickly and cheaply. And when I saw this I was like, well, this can be the basis for some sort of participatory science and collective data collection program in urban spaces to gauge soil health. And microbial biomass is also a proxy for carbon sequestration.

A scientist, David Powlson, in the 1980s did a field pilot research test and demonstrated that microbial biomass correlates directly with increases in soil organic carbon, as well as nitrogen. So, we can use these tests as an early indicator that we are on the road to carbon sequestration and then you can actually do some math and calculate how much carbon you are scrubbing from the air and retaining in the soil.

With this in mind, I've been setting up pilot studies in NYC and looking at urban soil, which is often human engineered soil. So, in our pilot beds we have a combination of sediment from a construction site mixed with compost made in the city. The sediment is just pure sand with zero biology. It's kind of like starting with a blank slate. In the pilot studies we've been looking at different planting combinations as well as cultivation techniques and comparing the plots. It's now been a couple of years.

For me one of the most exciting parts is that the project is truly interdisciplinary between soil scientists at CUNY graduate center and artists like me and a range of different kinds of land stewards. And it's been fun. It's been completely wonderful. It's been a huge learning curve,

but like you said, one thing leads to another thing and the whole process is about investigating and observing and learning. How can we change our behavior as land stewards in response to learning more about these natural systems? And science is diving into this black box. There is a lot of information from research that we can use, but there are also a ton of outstanding questions. It's really fun to learn these stories and get involved in trying to answer some of the questions they raise or come up with our own questions as non-professionals.

**MA:**

I get exactly what you're saying. And I'm beginning to feel like everything in the natural system is a black box. I mean, the trees that we have been looking at, for example, are a total black box. I was doing some work over at the Widow Jane Mine, which is part of the Snyder Estate Century House Historical Society in Rosendale. You got to check it out. You can just walk into an old cement mine and it's kind of intense.

But anyway, I was working with a friend and we were taking down some trees and there was an ash right at the opening of the mine. What was really interesting was this tree which was about 120 years old or something like that. And there were big growth rings and then some tiny, tiny rings where it was obvious that the tree was struggling to get by from that point on. And when did our research we found out that the first tiny ring coincided with the year that mine opened.

**BS:**

There are all of these stories being told. Like in your audio work where the trees are speaking to you, right? If we can just sit still for a second and listen.

**MA:**

It feels so true. It feels like there are indicators everywhere. They are just so prevalent.

**BS:**

Yes, that is great. I love that story!

The work I am planning here for the fall really began last summer when I was at the Marble House Project, which is a residency in Dorset, Vermont. On the property there is an old marble quarry. The first marble quarries in the U.S. were in that area. That is where the marble for the New York public library and the Washington Monument came from. I was only there for two weeks but spent that short time trying to read the landscape. And I would create dyes from the representative different parts: the clay at the bank of the creek, the grasses, underbrush and trees. And I was even able to make a dye from that marble. I put a flag together for this site where Marble House exists today.

But here and now, I'm really interested in expanding that further and inviting people like you into this site to read the landscape with me. What are the various ways we can think about the landscape as an archive? And it's not only what we see now, but how to include the past—not only the recent past but much further back or deep time. And what about future plans for this site? Or what do we see happening here that is not devised by humans if we project into the future? Can that all be collapsed into a single space?

**MA:**

Beautiful, fabulous, so interesting. I've been gravitating more and more to working locally and working slow. I don't feel like I can penetrate these meanings so much without just really kind of hunkering down. That is me and my sensibility. And it's interesting for me working with the ash tree, you know, there is something like a 50-mile radius or

a line is drawn which you can't take the wood past. It's like a quarantine because of the emerald ash borer. So I have to show the work within this very small area.

**BS:**

Oh, interesting. I work very locally to NYC. But we don't get rewarded for that professionally.

**MA:**

I'm just sucking that up.

**BS:**

I don't care enough to change my habits, but it's frustrating. And I think there are more and more artists working in this way today than even five years ago. And it makes so much sense.

**MA:**

I've taken to thinking about it as the "vanguard of the region" or maybe the "vanguard of the local." Why is it important in this moment to be working and thinking in that way? I'm not putting that on everybody.

**BS:**

I'm a single mom. I can't be getting on planes all the time. There are so many reasons preventing me from frequent travel along with the fact I just really want to work locally. This imperative to be an international artist is not even questioned in academia. It feels like such a relic.

**MA:**

It is such a model of harm.

**BS:**

Yes, an outdated and unnecessary model of harm. I have so much to say on the topic, but let's not diverge too much! Here we are now in the meadow.



**MA:**

We are. We're now moving into the meadow, which I'm sure would look just exactly like the forest we were just in if it hadn't been mowed since the 1970s. The forest isn't so different, except it's up a little higher, making this is a lot wetter because of the elevation. Everything flows this way.

*This conversation took place at Unison on July 3, 2020.*



Stuart Bigley

**BS:**

So, where do you want to start?

**SB:**

You're the one doing the interview.

**BS:**

Okay. Well, then I think it makes sense to start at the beginning. What brought you here and what did here look like when you arrived?

**SB:**

Have you met Peter Pitzele?

**BS:**

No.

**SB:**

Have you met Indira?

**BS:**

No.

**SB:**

At some point you will. Peter and Indira used to live in that house back there. They were good friends of mine and I came up to visit from Westport, CT. This property that is now Unison Arts Center was for sale and Peter was concerned that somebody was going to buy it and build condos in the meadow. We tried to dream about what

could happen here. The first idea we had was to build a utopian community. It was back in the 1970s. Peter got a friend of his to buy the property and I moved up here. I was artist in residence and janitor at the time.

**BS:**

That's a good combo!

**SB:**

It has actually worked well for me on a few occasions. Then we started a school for children, the Friends of the Mountain School. And that lasted for a couple of years. And then Peter's marriage ended. Sheila, the woman who had underwritten the property, told Peter that she thought it was a good idea to sell the property. It was like an albatross around his neck. And he asked me to get the property ready for sale. But meanwhile, I had been doing a few projects, was cleaning the place up and had really gotten attached to it. The more I worked on it, the more I realized that if I went someplace else I would like to do the same thing anyway. And I wrote Sheila and told her that when she bought Peter's dream, she got a two for one.

She responded "that's wonderful." I was hoping she would say, "Why don't you take over as director" but she didn't. She said she would sell it to me for what she paid for it, which was a very generous offer at that time. I decided to sell my soul and went into debt and bought it. I had to make it pay for itself and this all evolved from that. As it turned out, I had many artist friends and musician friends. So, I started, started bringing them here to do concerts and workshops, stuff like that. I had done a little bit of that before anyway and this all evolved from that.

**BS:**

Tell me a little bit about the school and like the utopian ideas at the beginning. I'm curious about that.

**SB:**

The school was an elementary school and at its height there were maybe 15 students. This was a barn at the time. It was kind of like the gymnasium of the school. When we moved in it did not have a floor—it was dirt. There were wires hanging from the ceiling to milk cows. The chicken coop we turned into a recording studio. And on this side was a little goat shed. First thing we did was put in a floor and a wood burning stove. That got us going through the first couple of years. The school was art-based. The main teacher was very gifted. I also did a little bit of art teaching. The school basically lasted two years, I think; it was in 76 and 77.

I had a dear friend who was living down in Asheville, North Carolina, and he would come up and visit occasionally. He was working in the office and looks outside. It's the winter and he left and came back. And he says, "Stuart, it could be a sculpture garden!". He was a crazy guy but one of those people who not only would come up with a good idea, but also give some money to make it happen.

So, Steve, you may have seen him, he and a friend of his—both really good woodsmen—they started clearing it out because it was all overgrown. It's actually begun to overgrow a bit back and too much now. We cleared a lot of the brush and took out some dead trees and developed the trails. The meadow was already there. Probably the biggest thing that's happened since then is that hedgerow between the two meadows down the center has grown up a lot. It is now full of tall trees.

**BS:**

Let's walk that way. When I was talking with Michael, he's very interested in the ash trees and the emerald ash borer, the beetle causing the extinction of the ash tree. His theory is that the cedar started to die in this area because of the

ash trees. When they are no longer here, taking up a lot of the standing water due to shallow roots, it causes conditions that are making it hard for the cedar to thrive. It's a kind of domino effect.

**SB:**

He knows more about it than I do. I am aware that they are dying. I have listened to him speak of this. I see a lot of the cedars are leaving us. The poison ivy has done a good job though. I've noticed that!

Oh, over here. This is my piece. We had a raku kiln up on our deck and a couple of buckets were sitting on top of it. Then when we were putting up our solar array, we needed to open up the canopy a little bit to get some more sun. When we cut off the limb, it landed right on top of the kiln and on the buckets that were there. It was dead center. You couldn't have planned it! And what was so funny was afterwards shoots starting growing off the limb. It was a mulberry tree. They lived for a while until the deer came and ate it.

**BS:**

And what's the story of the octagonal house up there?



**SB:**

It's an icosahedron. That is a polyhedron with 20 faces. The house is a Buckminster Fuller design, you know him? I got a call about it probably more than 20 years ago.

This guy says to me "I have this building out by my house. If you want it, it's yours. If you move it is yours." I went over and I looked at it and thought it was beautiful. I contacted a shed moving company and they came over and picked it up and put it there. But then I got another call, maybe two weeks later, and this guy says, "I understand you've got my icosahedron in your backyard!". It turns out that this guy built the icosahedron. He was engaged to the daughter of the man who offered it to me. He broke off the engagement and left so the old man wanted it out. He wanted no memory of him. When the ex-fiancé came to see it, he said it looked good and he let it be.

This whole area here needs to be mowed again, because pretty soon it's going to turn back into the woods. I used to do it every year. You can see what is happening. In another year or so it will be hard to do. This is the first stuff that starts growing and then, you know, eventually you start



getting the poplars and stuff like that.

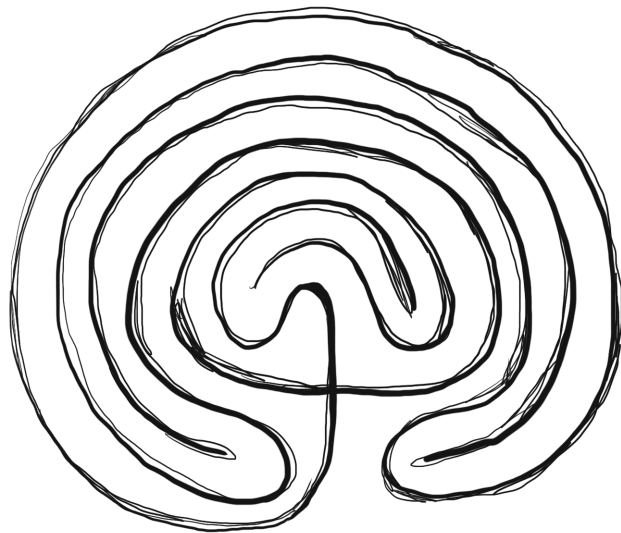
Katie Grove

We used to have a traditional seventh circuit labyrinth here. People would come from all over for that.

**BS:**

Look a monarch butterfly. That is the first that I've seen. It's a little baby. I knew they must be somewhere. You have so much milkweed in the meadow.

*This conversation took place at Unison on July 7, 2020.*



7<sup>th</sup> circuit labyrinth

**BS:**

I want to hear about your practice. I know you do some natural basket weaving and dyeing, which is why Matthew [Friday] introduced us. I would love to hear more.

**KG:**

I guess that the very, very heart of it is nature and the love of the woods and the fields and all of the mother earth. That's where my main inspiration comes from. Mostly basket work these days. I haven't really done a lot of dyes in the past many years. I always say every summer that I'm going to start again, but I just haven't gotten to it. I'm just so into baskets. I'm using vines, barks, roots, leafy stuff. There are so many different things around to use. People come to my classes and it totally changes the way they look at the landscape, which I am sure you know. You see potential or the opportunity to make friends with all these great plants everywhere, right? So that is kind of the heart. To make a living I teach a lot of basket classes, fewer these days with the pandemic. And then in my own work, it's such a mix. I do a lot of paintings, watercolor and then basket-inspired sculptures, all sorts of stuff really. For me, it's about going outside and finding cool things.



**BS:**

For me, I only started dyeing last summer, so I'm new to it. It started when I was inside of a soil profile with some soil scientists. Just seeing the gradations and the colors and being inside of this gash six feet underground was really phenomenal. It was during a convening in Northern CA called "Women in Soils" and one participant was a pigment hunter who looks for rocks and grinds them up. I saw such an array of colors. You never exactly knew what you would get by looking on the outside. Like dyeing with plants actually. It challenged my expectations and goal-oriented self. There is a sense of discovery. And my initial thought was how could I use a color palette to represent the relational nodes in an ecosystem. But then there is this contradiction because in determining the parts that make up the whole I have to engage with this notion of extraction. I have to think of the parts in isolation.

**KG:**

It's almost like you have to let go of the color or the goal of achieving anything.

**BS:**

Yes. Exactly. Does this ever come up in your classes? Do you talk about the ethics of foraging with your students?

**KG:**

We definitely talk a lot about ethics. I try to get across the idea of a relationship. It's building and developing relationships, friendships, and even love of the place around you. The idea of reciprocity and caring for the land is essential. Robin Wall Kimmerer's amazing book *Braiding Sweetgrass* is the Bible of my class in a way! And, I am sharing that idea of honorable harvest and we can talk to the plants! We can use our left and our right brain to ask: "Is there enough of this to harvest? Does this plant want

to be harvested? Am I even in the right mindset to kindly harvest this?"

I don't think that by using nature we are necessarily harming it. It's just all about our intention, you know? Are we grabbing something and using it, or are we stopping to learn about it with our senses, its natural history, and names? I keep looking over at the plants while I talk to you!

**BS:**

You are addressing the right audience then!

**KG:**

Yes. It's important. It's very important.

**BS:**

When I made my first flag last summer, I was living at a place called the Marble House. So to make the flag for the site obviously I would need to make a marble dye.

**KG:**

That's like the anti-dye.

**BS:**

Yes, it's literally bleeding a stone! I like the idea of using unusual materials. Also, as a beginner, I am embracing what I don't know. I did get a very pale grey color from the marble. It had so much texture.

**KG:**

It's the attempt that matters. It's like an index of the place. The act of it is what really matters. I think the minerals and the rocks are a cool place to be. Are you a very scientific dyer or are you more the magic dyer who says "who knows" and you dive into it?

**BS:**

I want to be a scientific dyer.

**KG:**

Me too [laughing]!

**BS:**

I bought this [shows notebook] and am taking copious notes that are intermixed with my "to do" lists. But I get so wrapped up in it and swept away that I forget. And then there are time pressures, "I'm late to pick up my son!" or something. So, there is an aspiration, but really being in it, I hate disrupting that.

**KG:**

Yeah. I'm the same way. I want to be the scientific note-taker and know how to replicate something. I'm never going to be that person, but I like the idea of it.

**BS:**

It's making me think of my friend, who's such a good cook. I wanted her to give me a recipe as part of this guide I was making. And she told me that she does not do that. She in the end kind of made one for me but it was nothing that I could print. It was not for anyone to follow. Parts of it were still in her head. It would have been terribly frustrating to try!

**KG:**

Bakers are really good with recipes. Cooks are bad. I'm the cook, not the baker.

**BS:**

Towards the end of last summer, I broke down and started getting into more of the chemistry. I experimented with different mordants, like alum, to make the colors richer. I like the idea of starting off really scrappy and then being like,



well, that's not exactly what I wanted and then building up from there. What are some of your favorite materials for dye making?

**KG:**

Oh, let's see. Goldenrod, you just can't beat it. The black walnut is so cool. I always like staghorn sumac. That makes a really cool purple-ish grayish lavender color on cotton. And they add a little iron. What else is good? I am going over my brain map of plants. Japanese indigo dye! I actually grew some this year so I'll do that soon. Finally. It's just been a few years. I have a friend that does dyes and she was doing these fern dyes. Really nice greens. And another one that I want to try is phragmites flower bloom. They are an invasive grass that grows on the sides of the

roads. It's the ones where you see the big plume. The flower before it seeds gives a nice color. I've always wanted to try that too.

**BS:**

I made a dye from curly dock last week and used the burgundy seeds from the flower. But then I read you should dig up the roots and use that instead. So I'll have to try that, too.

**KG:**

Yes, the roots are very yellow.

**BS:**

I like to use it because it's considered an invasive species. You find it everywhere around here and that's because each plant produces something like 40,000 seeds! When people say they are going to use beets for dyeing I am like "why!?" They are so good for you and delicious.

**KG:**

I know. And the dye is no good either. It rinses out or fades remarkably. Look for Japanese barberry root. I've never done it, but I've read about it. And when you dig them up they're bright yellow. And they're really invasive. That would be a great one for sure.

**BS:**

So where do you learn about your dyeing? Do you have an idea and then research it or just try it out? What's your process?

**KG:**

Usually, I use books. I do a lot of book learning and then conversations with people. Someone will say "gosh, that's amazing" and I take note. Since it hasn't been a huge part of my practice, the past three or four years, I haven't been

going out experimenting as much. The baskets have taken over my life.

**BS:**

It is time-consuming for sure.

**KG:**

And it takes dedicated space. I was in this tiny little house. My pots would get all messed up because I'd leave them outside and then I moved into a bigger space. Now I finally have the right space to set up a dye studio.

**BS:**

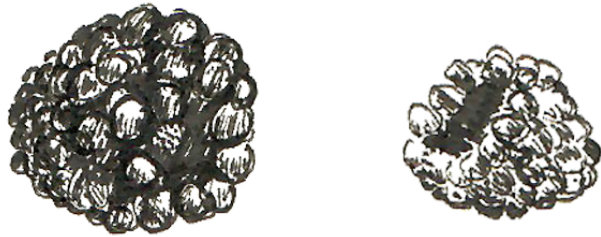
Should we walk a little bit?

**KG:**

Yes. Here, I immediately see jewelweed. Have you tried jewelweed? It's magically amazing. They are ephemeral native plants, but they come up in extreme abundance. There is not a ton of them here. You don't even need flowers, but I don't think they would hurt. It makes an orange color, like a blushing peach. Their under leaf is a little silvery. If they get wet, the water beads up on the top. You just really would not expect a color from it at all, let alone an orange. If used with alum that really helps. So that's a really great one there. And here are the honeysuckle berries you said you used. I never would have tried honeysuckle berries because berries don't seem to leave the most permanent color.

**BS:**

It might not be permanent but I don't wash the flags. Until now I have mostly exhibited them indoors. For Unison I will install outdoors. I am going to look for a dead tree, ash or cedar, with Michael to make the pole. I also don't mind if it degrades. It's not really meant for permanence. Maybe one day I'll worry about that, but not right now.



**KG:**

I think that's perfect. It's really more of a stain than dye. I don't know what kind of ferns these are. Is it okay if I just point out everything I see? Acorns are a great source of tannins. Tannins are a color fixative and a strong brown dye, basically. Unless you add iron, another favorite. If you haven't done any iron it is a really nice additive or is considered a color modifier to use after you've done a dye. It does weaken the fiber a bit and it kind of saddens things, makes them darker. If you had a yellow and you did your yellow dye in an iron pot, then you'd get green. The iron just makes the yellow dye green, or it turns the staghorn sumac from brown to this purple color. If you can get ahold of an iron cauldron that will work and you'll feel like a witch! That's the number one advantage to a cauldron and also you get these great colors. So, acorns plus iron makes a really dark black color. The tannin of the acorns delves into the mineral feeling of the earth tones.

**BS:**

Oh, look, there are berries. Wild raspberries?

**KG:**

Ok, some berry identification. When you pull off the cap, if it's hollow inside then it's a black raspberry and if it is not then it's a blackberry. So, this must be a blackberry. And here is St. John's wort. This is one of my favorite flowers in

the world. It's just the greatest; it's so, so cool. I mostly use it for medicine and making oil. How gorgeous. But if you have an abundance then it is like the most sacred amazing die. If you've ever seen the oil, it's all bright red and beautiful. And if you squash the pedal, it bleeds a red juice. You can make this dye bath, and there are directions in various books, where you use the same dye pot and a variety of mordanted and un-mordanted fabric. And you add them in a certain order and you'll get a red, a green, a yellow, and brown, and another green and another yellow and so on — all from the same bath. You keep switching between mordant and un-mordanted materials until the bath is exhausted. I forget the whole order, but you get the green and the red. St. John's wort is a weed and it's not native, but it has such amazing medicinal properties that I place a very high value on it.

**BS:**

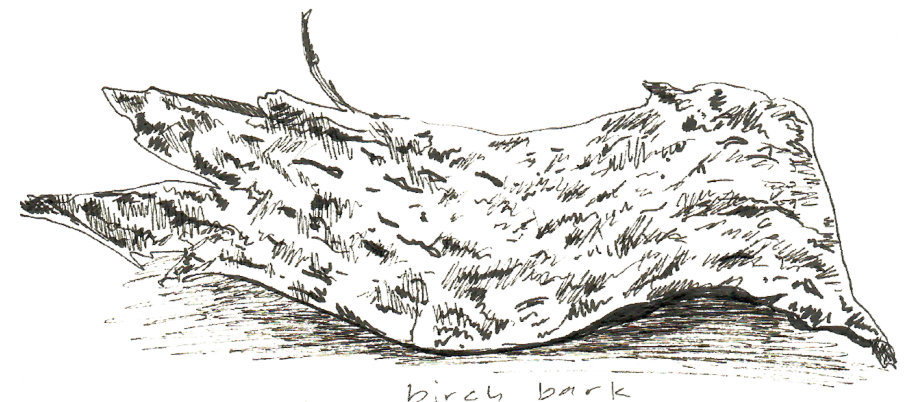
I tried to grow it once in our garden in Brooklyn and we were not successful.

**KG:**

I think the plant does what it wants. Will you use plants on the property for the majority of the dyes?

**BS:**

Yeah. That's the idea. If there's not quite enough here and





I don't want to over harvest and I see it somewhere else in the area, I'm not going to be a purist. But that is the idea.

**KG:**

Well, you certainly have a lot of goldenrod.

**BS:**

And also look here; it's milkweed. I saw one monarch butterfly, which is exciting.

**KG:**

Milkweed is another one I'm trying to grow.

**BS:**

It can be hard. It likes cold stratification.

**KG:**

I have gotten some to grow. There may be some black walnut trees around. I haven't seen any quite yet. You just can't mess up black walnut. It always makes a strong color. I also see lots of great vines, Virginia creeper and grape, all of them are good for basket weaving. These look like staghorn sumacs but I don't see any flowers or fruits, which is kind of curious. This is the time of year for them. And more St. John's wort. You can make like the tiniest dye pot!

Oh, and look at that. It is a birch bark. It's so pretty. That bark is old. What a nice piece and a lovely shape. With fresher birch bark you can make a pink dye. And there is yarrow in there. That will make a yellow dye, as will the Queen's Anne lace.

**BS:**

Here on this bark, you can see the lines made by the emerald ash borer.

**KG:**

That is so sad. I can't imagine there not being any ash trees, but then there will be none. And we will just get used to that reality.

**BS:**

There is hope for the chestnut tree. There's such a big movement to revive them and bring back that species to make it resilient to the fungus. It just means another concerted effort to save a tree species.

**KG:**

Hopefully, we're in a better mindset now where we won't cut down all the ashes and will preserve some that have resilience. Whereas with the chestnuts, people were like "cut them all down before they die!". The chance of resistance was wiped out. I mean, not completely, but mostly. There is a lingering ash tree project that is occurring right now. If you have a healthy ash tree that's not showing signs of infestation you can report it and then they can study it to see why this ash tree is surviving. Even that ash tree, it's obviously dying, but it's not dead yet. It's pretty bad here. I wonder what they are going to do about this?

My partner is a tree guy so I know firsthand how much work and how expensive clearing out so many dead trees can be. I get a lot of my baskets supplies from him, makes for a good partnership! I never know when he's going to call me up and say he is harvesting a tulip tree or something. He's good at identifying trees that are perfect for basket weaving these days!

**BS:**

I love it. This pond is usually a noisy area. But I think the frogs are intimidated by what else is going on [loud cows in the background].

**KG:**

Yes. Now I am inspired to put my dye studio together. I have a place with a large studio space where I can set up permanently. I didn't make art for like a whole year. Things are together enough now that I can just concentrate on art and not put up drywall or something. I want to recommit myself to being an artist. I always will need teaching and I love teaching so much, but it takes a lot of time and energy. And so, I haven't had enough commitment to fine art and I want that in my life.

**BS:**

Going back to school and getting an MFA is a great way to turn the steering wheel, so to speak. I had the same experience in my late twenties. I went back and got an MFA. I had been in New York City doing web design and media-related work, but not art. And it was getting me down, so I turned the steering wheel and went down another path.

**KG:**

Thank you for saying that. I wonder how these cedar branches would dye?

**BS:**

That would be interesting to look into. So, I didn't share with you Michael's theory. The ground here is mostly clay and the water stays up on the surface; it's prone to flooding. The ash trees have very shallow, thirsty roots and took care of that water. The cedars could then thrive in the drier conditions. And then all of a sudden, the ash trees started dying off because of the emerald ash borer, making the cedars vulnerable because there was so much water. So, there's the connection. I love the story.

**KG:**

That really could be true. I might have guessed the opposite because cedars are a first-succession species. They

like a lot of sun and then they get shaded out when everything grows up around them. They die because they're shaded out. You would think that ashes passing away would leave more sunlight for them to grow. That's interesting if the opposite seems to be happening.

I have a friend, Connor Stedman, who is an expert at reading landscapes. Just the coolest. He taught me that if you see cedars in a forest then it used to be a field about 30 or 40 years ago. The cedars come up and then they thrive for a certain amount of time before bigger trees push them out. If you go into a dense forest and see lots of dead cedars you can get an idea of how old the forest is.

**BS:**

The age of this forest I am told is about 50 years. Something to look into more. Did you learn tree identification on your own? What prompted that? Was it basket weaving?

**KG:**

Yes. All of it really. I always caution my students about this wall of green theory. Some of them may come in with a Ph.D. in plant science or whatever, and others, may know zero about trees. I tell them not to be intimidated by the wall of green and just learn one plant at a time and don't be afraid to forget things and relearn them as needed. Use all your resources. I've done just that over the years and still so much to learn always. I'm always studying and I love to have a book out when I'm eating. I'll just flip through field guides. I have a very visual memory.

*This conversation took place at Unison on July 13, 2020.*

## Amanda Heidel

**BS:**

Let's just walk and can you tell me a bit about what you've been doing and explain your relationship to Unison.

**AH:**

I started coming to Unison as a graduate student at SUNY New Paltz about five years ago. I took an extra year in my MFA program because the nature of my thesis, *Mushroom Shed*, took a while to get going and I didn't want to rush it. The intention for the project was for it to grow and evolve with community which needed time, so it took me three years to graduate.

**BS:**

My MFA took me four years.

**AH:**

That makes me feel better, two years is just not enough time. During the summer of 2017, I taught an intro to sculpture course and our last project of the semester was to work on something collaboratively. We ended up building an interactive tea house and installed it for one year at Unison. Later on, I took a course called *Collaborative Constructions*, led by Michael Asbill, and we came up with a proposal to curate a show at Unison based on Linda Weintraub's book, *What's Next?*. As a class, we spent a lot of time on the Unison land

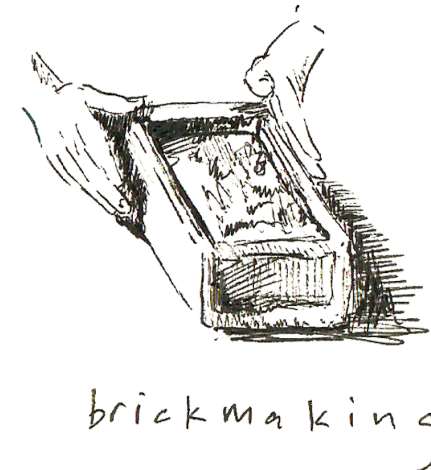
and I developed a connection with it to continue developing work that is place-based using materials found on site. Post graduate school, I participated in the show, "Composed to Decompose" curated by Linda Weintraub and Michael Asbill, which as you can see, some of the work is still in the process of decomposing. My contribution was under a tree.

**BS:**

It sounds like it already decomposed and is no longer there?

**AH:**

You might be able to see some remnants of the bricks I made under the tree. I made a series of bricks that were made up of bagel paper from bagels sourced locally that were headed to the landfill, along with cardboard, local



clay, and reishi and oyster mushroom mycelium. Each material was layered, then bundled together with a paper strap, and sealed with beeswax. The bricks were laid out in mycelial patterns (the mushrooms underground root system) and composed to decompose with nutrients to nurture the Earth.

**BS:**

It got devoured by the mycelium.

**AH:**

Yes, that was my intention. I thought the mushrooms might fruit and it is possible they might have, and I just missed it.

**BS:**

What does bagel paper look like?

**AH:**

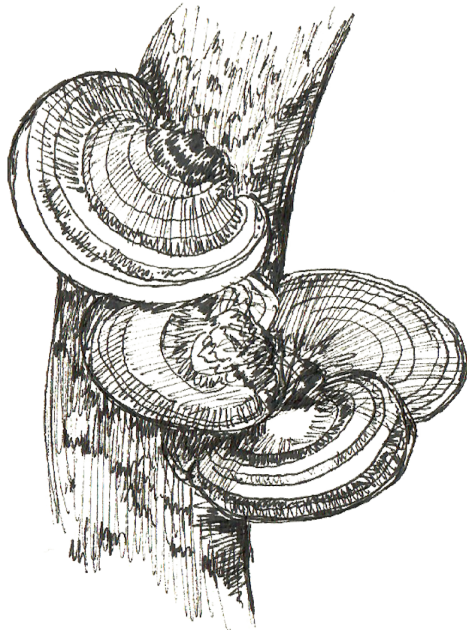
A lot like stoned wheat thins or a big cracker.

**BS:**

And is your mushroom shed here?

**AH:**

No. *Mushroom Shed* is located in the heart of New Paltz on Huguenot Street, a historical landmark. It is connected



reishi

to the Reformed Church of New Paltz community garden bordering the Rail Trail. As the project developed and the location began to be determined, the opportunity to build and form the project on a historical street brought with it rules and regulations that I did not consider originally.

**BS:**

There are strict building codes.

**AH:**

Yes, building codes, and a direct reference to the history of the street. I went on several tours of the street and none of the tour guides ever mentioned one structure that was a kind of hidden in the back behind the museum shop. Eventually I asked, "what's that one over there?" and the tour guide said, "Oh, that was the community smokehouse." And I thought, that's it! The community smokehouse, built in the 1700s on this street, was once a shared space for the community to smoke their meats. So, we designed *Mushroom Shed* as a representation of the community smokehouse. It has some differences, such as the slope of the roof because we wanted to be able to utilize the roof for water catchment. Due to other rules and regulations of the historical street, the project was not allowed to be permanent or temporary, so *Mushroom Shed* is a 10-year project.

**BS:**

Ok. Ten years is not temporary but it's not permanent either. Good to know.

**AH:**

Yes, they considered 10 years to be semi-permanent. The location couldn't have been better. It is nestled in the town, so there is high foot traffic and lots of land surrounding the shed which we are utilizing to create an outdoor mushroom cultivation demonstration garden. Our internal *Mushroom Shed* group is made up a group of six people collabo-



ratively working on finishing the construction and leading the execution of the community mushroom garden.

Over the past year, we have expanded our research to include Korean Natural Farming to look at the role fungi play in soil health. These experiments are also amongst the community mushroom garden to be utilized in collaboration with local businesses for a compost project. And then the structure itself, the interior of the shed, will be transformed into a library of resources and a rotating exhibition space that will be mirrored digitally on our website with seasonal and rotational interactive resources for learning. For example, soil samples, Korean Natural Farming inputs, mushroom growth, books, physical objects, and tools such as inoculation supplies which people can take out on loan similar to a library. Before COVID, we were hosting free events with 40-50 people, but it was completely unsustainable. We grew fast and did not have a solid foundation to grow from, so it became stressful on our internal group. Because of this, we were struggling as a group to keep up and the events did not allow for enough time for us to finish the shed construction.

The workshops were incredible, and we will continue them once it is safe to gather again, but for now, our focus is on building a strong foundation to grow from. This time has allowed us to reevaluate and discover how we want to move forward. How can we continue to serve a large population and provide free programming? How can we engage local schools to utilize our space and help them develop curriculum that facilitates learning about food systems? The point is for the project to function on its own, as an organism.

**BS:**

So, you are asking what's the business model, really. I'm at the point with some of my own work where I am wondering

how can I be as creative with the business model as I am with the content. It's easy to do a one-off project where you don't have to worry about that, but when you are talking about longevity or 10 years, that is another thing. If you are not going to follow the art model of applying to any and every grant, where you will have to convince funders that what you are doing is art, then you need to find a patron



OYSTER MUSHROOMS

with deep pockets or tap into the capitalist economy where you are producing goods or services without feeling like it's degrading the spirit of the work and in direct conflict with the concept.

**AH:**

Exactly, that has been our focus. As I mentioned, the impetus for the project was my thesis and I set a lot in motion, but it was always intended for it to grow far beyond me and to a larger group effort that morphs and shapes with the people involved. This intention and the relationships needed to evolve; it takes time to nurture. Our plan is to

apply for grants and utilize what we have around us. For instance, Alisa Javits, runs Sugar Shack Mushrooms, and grows out all of our mushroom spawn for the projects and workshops. But of course, there are always other expenses and grants will not cover all of them.

**BS:**

And our time is a huge expense. The amount of time these projects take and the research involved adds up to a lot. We are driven by curiosity and our love for it, so it does not seem burdensome, but I have a son to take care of and car payments and so on it. It is a balancing act, always. I think it's naive or a privilege to think otherwise. And that is hard to confront. I don't have answers, by any means.

To go back to something you mentioned earlier, Korean Natural Farming. It is funny you bring it up because I was just introduced to that a few months ago and have going down the rabbit hole online. I have been thinking about fungi and how it relates to soil health as part of a project called *Carbon Sponge* that has been ongoing for a couple years now. I'm working with a team to understand better the ability for urban soils to sequester carbon. Urban soils are different than what you have here. They are highly engineered or manipulated; you do not have native soil in the city.

One of the tools we are using measures microbial biomass and recently added a new feature to calculate the the ratio of bacteria to fungi in that microbial biomass. We know soils dominated by fungi are able to sequester more carbon so Korean Natural Farming or inoculating with native mycelium makes sense, but what does that look like in the city? The process of making your own mycelium inoculant really excites me. Like natural dyeing, you become a bit of a mad scientist or experimental cook.

**AH:**

Totally. That's what I love about it so much. I love fermentation and taking what's around me and repurposing it. That is what Korean Natural Farming is all about.

**BS:**

And all of those steps. I mean there are too many steps, but I was thinking that this wooded area back here would be a really interesting place to set down a cage of fermented rice.

**AH:**

That would be a great spot to capture IMO [indigenous microorganisms]. Our next workshop at the shed is IMO in preparation for developing a compost test with local businesses. They will be bringing their scraps to the shed so that we can monitor utilizing the IMO to break down the organic matter. You should come to the workshop!

**BS:**

I will be there!

**AH:**

I will send you location details. It's all outside so we can stay six feet from each other. You will see that it is situated on a large area of open land which allows for lots of possibilities for expanding the project.

**BS:**

Oh, I love that. You're so lucky.

**AH:**

As most good things do, it took so much to get it there. Throughout the beginning stages of the project, we looked at many other places, but this was ideal because of its location to the town.

**BS:**

It's fairly urban, right? So, it's not like here. It's in the center of town. I love that.

**AH:**

Yes, and right off of the Rail Trail.

**BS:**

How did you learn about natural farming?

**AH:**

A farmer, Joe Lorusso, had moved to New Paltz last summer. He studied with Korean Natural Farming expert, Master Cho, in Hawaii for many years. If I remember correctly, he became interested in Korean Natural Farming because of his efforts to grow cannabis sustainably.

**BS:**

Oh yeah. There's so much innovation in the marijuana community.

**AH:**

I am curious about that. So, Joe came to one of our earlier second-Tuesday-of-the-month *Mushroom Shed* meetings, which we started in an effort to build regularity with the community. He heard about what we were doing and thought we might be a group that would be interested in learning Korean Natural Farming. A few weeks later, he held three, day-long workshops and taught us many aspects of Korean Natural Farming, its importance, and how we can implement these processes into what we were already doing. And then, he moved to North Carolina! It was such a gift because he taught us so much and really expanded our research.

**BS:**

I find it curious because at the start of the conversation

you told me it is your first-time gardening.

**AH:**

It is! I realized recently that I was educating myself on things and creating spaces for learning, but I wasn't practicing it myself, mainly because I have never had the space to. Of course, I was experimenting and utilizing the space I had available, but it wasn't until the *Mushroom Shed* and having now moved to a property where I can garden, that I have been able to truly practice these processes. I think, I really wanted to create a space for learning in groups for myself. And I guess that's what artists do- they create the space for things to happen.

**BS:**

It is a different entry point into growing food and gardening than most people. My story is similar. I was part of an art project in Madrid about food rescue. This was a collaboration and we addressed food waste because the Spanish artists on the team were worried about people eating out of the garbage during an economic downturn. So that was our focus. After the exhibit there was extra money from the commission and the Spanish curators asked us what the project would look like in Brooklyn. And I thought, that's a great question. So, with my partner at the time, Ricardo Miranda, we started this food rescue project, which felt weird in Brooklyn. There already was City Harvest, a massive and fantastic operation that rescues food from all over the city. And then there's Food Not Bombs. That space is not exactly spoken for, because there's always room, but it's tended to. What felt less formulated and more in need of a conversation was composting. What about the inedible food? Food scraps are garbage and not considered the resource they are. It was 2013 and the city hadn't launched their municipal composting program yet. The project in Brooklyn became about composting. From there I helped start a community garden for composting and then learned

soil microscopy with Elaine Ingham. I had never planted anything in my life before all of this, but suddenly I was president of a new community garden. There was so much administrative work and organizing that I didn't get to do as much hands-on stuff as I would have liked. But yes, I helped create a new space. That feels great. It is a different kind of learning and experience.

**AH:**

I can relate. There is a lot of necessary administrative work that goes into it and it is hard to do everything. Over the past few years, I have been able to fit in some hands-on experience that I am just now digging deeper in. As a graduate student eager to learn more about mushroom cultivation, I reached out to the biology department at the university. I sent an email to a mycologist in the department, Hon Ho, asking if I could work with him to learn how to grow mushrooms on waste materials collected from local businesses. He gave me access to the lab for a year and taught me how to clone mushrooms and grow out spawn. Utilizing waste materials, such as the bagels, coffee grounds, and spent beer grains, brought its own set of challenges and I had some trouble with contamination and getting the mushrooms to fruit. This was the foundation of my experience with mushroom cultivation.

Of course, with the logistical aspects of the project including meetings, zoning permits, etc., I often had to turn my focus to administrative efforts. Over the past year, I have reignited the hands-on mushroom learning through a program at Cornell called, Community Mushroom Educator, that has been enormously helpful in learning how to grow mushrooms, which I am integrating into the garden at home.

**BS:**

Does your *Mushroom Shed* contain all of these interests? I

can see it being a curiosity shop of all these things under one roof.

**AH:**

It will eventually! It will integrate many things from IMO (indigenous microorganism) samples to natural dyes.

**BS:**

How beautiful is this lichen? I've been starting to research that a little bit, how to use lichen for dyes.

**AH:**

I've heard you can use ammonia to extract a purple dye. I attended a lecture by Dorothy Smullen, a mycologist from New Jersey who has spent a lot of time learning the natural colors that can be achieved from fungi and plants. She suggested putting the lichen in a jar with the ammonia and to shake it every day for three weeks until you see purple emerge.

**BS:**

I want to learn more about the chemistry of all of this. It's so fascinating how these colors are produced. You can just follow steps, but then I am like "what actually is happening?".

**AH:**

I am always asking why and how. Have you tried St. John's wort? This year I am growing it in the garden both for its medicinal benefits and dye color. It was difficult to cultivate so I am amazed it is now thriving!

**BS:**

I have had a hard time growing it too. Here is curly dock. I did make a dye from the flowers but want to try the roots next. I immediately went for those burgundy colored seeds but then I read that the roots give more color. Out here I am



constantly learning the lesson of patience. I may have all of these objectives or ideas and they don't ever, or hardly ever, turn out as you expect.

**AH:**

My partner is someone who draws something out and executes it exactly. My process has always been to enter with an idea and allow for the process to unfold and change.

**BS:**

I'm much more like your partner but not always. As I'm working I'm constantly thinking about letting go or keeping at it. The tension is palpable.

**AH:**

It's really curious to me too, because I do see value in his process and have started to integrate it into my own, bringing a new-found structure to my work. For instance, with natural dyes, you achieve the best results when following a specific recipe. Overall, I've found that it is important to check in with myself throughout a process. It feels good for me to allow things to unfold the way it wants to and to be present enough to reel it back in and restructure as needed. It's a process of paying attention, which is hard sometimes because there are many distractions.

**BS:**

I've been out of grad school for many years now and maybe while in school you think you are doing that because it's the time for it but I have found I am always figuring out my practice and realigning. Or at least that's my experience!

**AH:**

Yes, exactly! This was where my piece was, and it's all gone. I wonder if you could make a dye out of some barks?

**BS:**

I was reading about making dye from red cedar on the west coast. I am not sure what the differences are between those cedars and the ones you find here.

**AH:**

I noticed a lot of cedar here.

**BS:**

Yes, cedar and ash. I have to tell you Michael's story about the relationship between the ash and the cedar. I've told everyone who has come here to walk and talk with me. It is beginning to be a game of telephone, except I am the one retelling it each time!

The theory goes that the soil here is mostly clay and therefore the water sits on top since it only very slowly penetrates. The ash tree roots don't go deep and took care of a lot of that water so it wasn't too wet for the cedars and the cedars were able to survive. But once the ash fell with the emerald ash borer, it got too swampy for the cedar trees. The relationship was a domino effect. Katie was also talking about forest succession and how cedar trees are usually the first trees as you're moving from a meadow to more of a forest ecology. Then when taller, bigger trees come and shade them out, they die. So, maybe there's some of that going on too.

**AH:**

That seems like a possibility!

**BS:**

These are ways to think about the landscape that are new to me.

**AH:**

It is another example of the interconnectivity of all things!

**BS:**

There is not any cultivation back here besides the mowing of the paths. So I've learned. And these areas Stuart said should be mowed soon because it is getting very tall and woody and will become part of the forest and no longer a meadow if left much longer. There is a lot of milkweed in here.

**AH:**

Milkweed provides a strong fiber. It is used in papermaking and textiles, and great at attracting monarch butterflies. The plants in my garden are in their first year, so I look forward to watching them blossom next year.

**BS:**

What else is in your dye garden?

**AH:**

This is my first time creating a medicinal textile garden and I look forward to expanding next year. So far I have tulsi, or holy basil, for tea and a green dye, St. John's wort I use for skin care and you can yield a variety of colors through different mordants, mint for tea and a green dye, Japanese indigo, milkweed, and kenaf which I am planning to spin into a fiber to weave for clothing.

I wonder what ferns contain in order for them to produce dye. How are they different from say garlic mustard?

**BS:**

Yeah. I don't know. And here is the sumac. But these trees do not have the fruit, the red gorgeous flower, that you see now everywhere. But these are barren, which might be telling us something.

**AH:**

I've made a dye with sumac. If you use an iron mordant,

you get this beautiful gray. A really beautiful, deep gray. I have also just read that the leaves can be utilized as a mordant.

**BS:**

Yes. And then without the iron it's more the color of that flower.

**AH:**

I like the idea of coming to a place and then using what's there to inform your process.

**BS:**

Right. It makes sense.

**AH:**

Yes, it feels more reciprocal.

**BS:**

These woods are part of Unison. We could put a trap back in these woods to gather mycelium. Wouldn't that be interesting? The way I understand natural farming is if you were building a farm or garden here, you would want to bring the local mycelium into play rather than purchasing something generic.

**AH:**

Yes. Encourage all the microorganisms that are already here, and the plants will thrive. I've seen from what we've planted in IMO plants taking off. It is incredible!

**BS:**

I hear that all the time. And there's science to back that up too. I recall it's something around 20 to 30% more biomass for a plant that has been inoculated. I'm curious what's happening in the soil too. How much healthier is that soil which is reflected in plant growth but also the soil's ability

to retain carbon and nutrients. What is happening in the whole system above and below ground when you cultivate something like mycelium.

**AH:**

Fungi are miraculous. It seems that we have only scratched the surface of understanding their impact.

**BS:**

When I learned the fact that mycelium exchanges nutrients and water on every bit of their surface area, not just the tips like plant roots, you realize how powerful they are. Think of them as super roots.

**AH:**

They are super roots. Right below our feet there is a giant network of mycelium nurturing all of the life below that will never produce a mushroom above ground.

**BS:**

Yes, the wood wide web they call it! There's a new book called *Entangled Life: How Fungi Make our World* by Merlin Sheldrake that describes it really wonderfully. It is so well written and engaging. It is completely for generalists and I'm finding more and more younger scientists are up for collaborating and sharing across disciplines. Scientists now seem to really understand the importance of building an audience outside their specific expertise and niche. Twenty years ago, when I was in graduate school and collaborating with scientists, it was more of a situation where you had to knock on 10 doors before you got one that opened. And when it did you felt like they were doing you a big favor.

**AH:**

I think things are definitely changing. Scientists are now more open to sharing and getting this information to be-

come mainstream. Of course, there are still some who are not of this mindset that I have come across. Most of the scientists that I have been working with have been incredibly encouraging and generous with their knowledge.

**BS:**

Well, it's the way their discipline is structured. And "publish or perish" is real. I find my science collaborators are highly creative, but then they have to put it into this framework that often dilutes that creativity or makes it a lot less apparent.

**AH:**

That is a great point.

**BS:**

All those questions, or hypotheses to use scientific language, are incredibly creative. And then how you design an experiment to address those questions is again a creative endeavor. There's so much problem solving involved in every step. I'm working with an agroecologist, a person who is really well versed in the field and learning about the laboratory. And then some of the scientists are more focused on the lab and not as familiar with agricultural practices or knowledge. And then there's me, who's does a bit of everything but has no formal training. And when we have to make decisions as a group, which way of knowing or doing prevails?

The first season we pulled a lot of the plants up to look at their roots but here we're talking about carbon sequestration and that's the exactly the thing we know we shouldn't be doing. But it was important data for one of the scientists. So, there are these conflicts that need to be talked about. Those moments are so interesting to me that hold a lot of tension and are not easily resolved.

**AH:**

I find that tension interesting too.

**BS:**

And I think more and more scientists see art as a great PR mechanism or a way to get science out there into the world but it's not part of the work they are supposed to do or get rewarded for. For artists, half of the work we do is about public engagement or how we exhibit. Even if you are more of a traditional artist in a gallery, you're still thinking about your audience a lot.

**AH:**

Yes, our innate ways of working in these disciplines make for important collaborations.

*This conversation took place at Unison on July 16, 2020.*

MAKING OF THE UNISON FLAG

**Specimen:**

curly dock  
sumac  
St. John's wort  
wild carrot  
fern  
clay  
ash bark  
cedar bark  
hickory bark  
rust  
lichen

**Materials:**

stock pots  
saucepan  
buckets  
colander  
Mason jars  
plastic tubs  
scissors  
knife  
ladle  
water  
fire  
sun  
linen  
canvas  
towels  
sponges  
clothes line  
clothespins  
index cards  
notebook  
marker  
tape  
pen  
timer  
gloves  
hair tie  
mask  
alum  
copper  
iron  
wheat bran  
sodium carbonate  
calcium carbonate



















**BS:**

Tell me a bit about your work and interests.

**SED:**

I have background in physical geography. That's how I really started doing research. It was in physical geography and now there is a critical physical geography group that's formed and I'm part of that. Rebecca Lave at Indiana University is really a big force behind it. There's no institutional backing for any of this, but there are dozens of people who are interested in this kind of work: mixing physical geography with social justice. There are still very few of us, but there are more than when Rebecca Lave and I were doing our doctorates.

**BS:**

I want to make sure I have this right. When you say critical geography that is the mixing of the hard sciences or the natural sciences with critical theory and social justice? When I think of geographers, or the academic geographers that I know, they would include David Harvey and Ruth Wilson Gilmore.

**SED:**

Oh yeah.

**BS:**

I can't name any physical geographers but

I know it's a field.

**SED:**

Exactly. I'm not surprised. I mean if one were to have a background in geology, one might've heard of some of these folks. Like Jim Knox, he is a river landform expert. He was one of my professors and a huge name. There is a bunch of them, but they are not well known outside the field like David Harvey is.

**BS:**

I know several artists who are geographers or working in what is called critical geography. This has been happening over the last 10 years or so.

**SED:**

I am glad it is finally taking off. Ruthie [Ruth Wilson Gilmore] had an MFA background before she started in geography. When I was doing my postgrad at Rutgers, there was one student, a friend of mine, who was mixing environmental justice, Superfund sites and an artistic representation of the problem. It was so far off, like two decades, I do not remember much about it now. Also, there are counter maps that straddle the line.

Like the Beehive Collective, for instance. I don't know if you're familiar with them? They do all these maps that don't look like maps at first, but if you look at them closely it is a spatial representation of like exploitation of farmers in South America, for example. They might not look like a map, but they are very spatially oriented. They are just amazing drawings in black and white. I still have one of their posters. I think they were active in the late nineties. So, there's that background that I know of. There was the representation of landscape work in art history coming out of England at that time too. I remember reading Cosgrove; he comes to mind. The power relations aspect was simply

not there and that turned me off. But there was a lot of potential and I think it got picked up later by some of the younger folks. I sort of absorbed that work as a grad student at the time.

**BS:**

I would love to hear more about what is occupying your time and keeping you busy at the moment. I know you have a current NSF funded project that you are working on, so maybe start there.

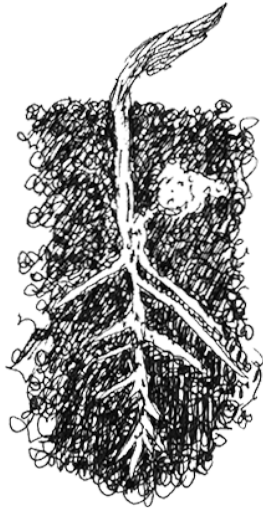
**SED:**

With that project I am trying to see how much of the heavy metal contamination of food is coming from airborne deposition compared to the soil. What contamination is from the air and what comes from what gardeners are putting in the soil, what comes with imported soil? That is what I've been trying to assess ever since I did some work in Rome with another grant years ago. It just dawned on me that you've got some cases in which you have a substantial amount of contaminant in the vegetables but nothing detected in the soil. So, where's that coming from? Are they irrigating with wastewater? Are they using pesticides?

I didn't get enough funds to do the work initially and was in a couple of squats, by the way. That's another part of my life. Squatting is one of the most important aspects of activism. Squatting is appropriating the means to produce. I was trying to help out my mates there and found out that there were a whole bunch of things one had to worry about, including what's in the soil where the vegetables are being grown. I was testing all sorts of stuff, but it was not a big enough sample size; it was just a preliminary result and stayed preliminary until I got this grant.

So now I'm working on it for community gardens. I'm really





interested in community gardens because, practically speaking, many more people are affected compared to a home garden. You bring a lot of kids in there for educational purposes. I was already doing work in Brooklyn but went to Budapest and then with the pandemic I was stuck for months. I finally got a flight back but, in the meantime, I was disconnected from Brooklyn altogether.

I'm still trying to assess who's still alive. I've been worried a lot about the gardeners there. The NSF grant is actually allowing me to reconnect with some of the folks that I've lost track of.

**BS:**

I am community gardener. I helped start a garden in South Williamsburg, Brooklyn, in 2013. It's called La Casita Verde. Our community garden is actually doing great. You can't have visitors right now or volunteers, but the members are able to garden and are gardening more than ever. It is a kind of therapy and something really positive to do right now. There is a renewed interest in food security. So, what I've witnessed is there is more activity and involvement by the members than ever before. And there is an even more

pressing need to communicate, some members are more vulnerable than others, and there are new rules we need to follow. But at least at my garden, it's been such a bonding moment and an explosion in activity in a really positive way.

Also, with the municipal composting being shut down by the city, there's a recommitment to composting that at least we can continue and maybe even ramp up a little bit. Community gardens cannot fill the huge gap left suddenly by the city and people are pissed. The city just pulled the plug on composting and it was one of the first things they cut.

**SED:**

Yeah, I was rather disappointed. I'm doing the work in East New York, Brooklyn, and things there are thriving. I was really pleasantly surprised because I thought it was very important to keep that up. And it's similar to what I saw in Budapest. It was mostly elderly folks who are responsible for the gardening.

They immediately reorganized and said: "We're going to keep doing this. We're not going to stop" In fact, it's really important. They made a schedule and people go to the garden individually. It is really hard, but at the same time it is an inchoate aspect of the bonding that goes on.

**BS:**

Let's maybe walk and talk a little.

**SED:**

I didn't even tell you about the other stuff that I'm involved in, but I guess maybe that will come out as we move along.

**BS:**

We'll take a walk and see what comes up. This here is curly

dock, which I used for my first dye.

That was Stuart I was talking to when you arrived. He's a painter and has a lot of old linen lying around which he's giving to me to use. I am dyeing with plants but have also excavated some clay to make dyes too. It's through this work I am getting to know the site little by little. Stuart was one of the founders in the 1970s. They first started a school, a kind of progressive art focused school. And then later they turned it into an art space with the sculpture garden. And there are a lot of music events I hear, at least during non-pandemic time.

**SED:**

Yeah. I've been here many times. We've brought our child here on occasion. We have enjoyed it a lot.

**BS:**

This here is curly dock and has this gorgeous burgundy



seed and blossom. The thing I like about dyeing is you are attracted to the colors and think "I'm going to make a dye from that." But it always is a surprise; you never know what color will come out. It turns out that with curly dock the roots are better for making the dye rather than the color-

ful blossom part. I did get a pretty nice color from it, but now I need to try the roots and compare. There is a lot of it here and plenty to harvest. There is some Saint John's wort here, not as much, but I was able to make a range of colors from it like mustard and olive green. It's really exciting to see these things reveal themselves and learn about how to tease out the color.

This project began after experiencing being inside a soil profile, a trench about 6 feet underground. I found it pretty transformative. It was in northern California on a ranch in the foothills of the Sierra Nevadas. I was interested not only in the experience but the different layers that make up the profile. As humans we see them as separate and through diagrams extenuate the distinctions, but it's as misleading as it is helpful in many ways. And my instinct was to find the connections that undo the prolife and that includes expanding the profile to above ground and including the plant that connects these two spaces along with other things like the air and water. So, for me these flags I am making are expanded profiles of the site and its many parts that exist in interlocking or symbiotic relationship.

**SED:**

That's a great idea because having a more holistic view is key. I've seen too much in the biophysical sciences in which everything is compartmentalized. People just like seemingly have no clue what's going on with things that are directly related to what they're studying. They just don't see it.

**BS:**

From an outsider it is weird that soil scientists and plant scientists don't talk to each other. They are entirely separate departments.

**SED:**

It is difficult even to talk to each other institutionally because we're in separate programs and there are different expectations as to what is supposed to be our subject of study. I tried to collaborate for example, to collaborate with a forest ecologist here. But we haven't gotten further than having one shared student who did some soil work in one of the local parks under our supervision. Aside from that, we simply haven't had the chance to crossover much from our respective departments because we're so loaded with other kinds of department-related work. That's another thing that is not necessarily the subject matter we are talking about today, but precisely it is that sort of stuff that also separates us, even though people will say college-wide campus work is how faculty meet.

At least in the U.S. there are combined societies that are supposed to get people talking across disciplines like agronomy and soil science. The separation of agronomy, crop science and soil science has always been bizarre to me. It drives me bonkers because it was obvious it is such a narrow view of crops, they excluded maybe like half the smallholders in the world, you know? All those plants are not crops? They are not crops because you don't make a lot of money from them? What you're doing is fantastic for that reason. Hopefully you can make evident to people how interrelated all these different aspects of an ecosystem are and you can't really study them separately.

**BS:**

Do you know this article by Scott Gilbert called "A Symbiotic View of Life; We have Never been Individuals"? I found his work via studying Lynn Margulis and her evolutionary theory based on symbiosis. He ends his article with the sentence "We are all lichen." It is so poetic and convincing at once. These newer scientific theories of evolution speak to this holistic view.

And speaking of poetry, I love the title of your recent article: "Grow Better Soils Knowledge, not Bigger Crops." We talk about growing soil at La Casita Verde, especially at the start.

**SED:**

Oh yeah. I wrote for the journal *Capitalism Nature Socialism*. That is something I have been toying with since the 1990s but have not gotten around to writing. It explores how to develop a dialectical materialist view that is not reduced to the horrific stuff that came out of the Stalinist period and apply it to biophysical sciences, like soil. It was indirectly inspired by Lynn Margulis, but more directly by Richard Levins and his classic work *The Dialectical Biologist*. I read it back in my early postgraduate days and it took me a while. That's a culmination of that trajectory I embarked upon in the mid-1990s. I was reading about the early Maoist period in the fifties and sixties and how agronomy was evolving then. These team leaders who would be sent out in the countryside or were part or villages themselves, had an unfortunate narrow view of dialectics that they were taught. And, to put it rather mildly, it went wrong in a lot of respects in how they viewed plant life.

We don't have to take that approach with dialectics. We should be cognizant of it and then build from that, because it should not all be jettisoned as some people would like to do. Instead of looking at soils as a medium to grow better crops how can we look at soils in a non-instrumentalist way but in a way that actually takes into consideration a whole bunch of "us" as well as a whole bunch of other organisms. And the ways that soil has developed, with or without us. That is what motivated me to write that one.

**BS:**

I am interested in your view of deep maps, if you are familiar with the term, or more generally what does mapmaking

mean to you as a geographer. To go back to Ruth Gilmore Wilson, she had a beautiful line in a recent Intercept interview. She said "As a geographer, I don't make maps. I describe places and how they form." That idea really stuck with me and resonated with what I'm thinking about here.

**SED:**

I've always had a difficult time describing what geography is or what geography is doing! So that definition is a much more eloquent way of saying what I usually say. What does a map mean to someone like me? It's closely aligned with what Ruthie is saying in the Intercept podcast.

For me, it's a way to represent parts of the world. That one part, that's one aspect. To bring out parts of the earth surface, if you like, depending on what is important to show. I'm not a map maker per se, I'm not a cartographer, although I do make maps. But mapping for me is really just a way of representing a place. One of the more difficult aspects of mapmaking is to get out of the habits that are instilled upon people like me through the training of the map as an authoritative way of showing the rest of the world what is on the surface instead of making sure that it's understood as provisional. Maps are always a provisional enterprise. They are just one way of representing what one sees.

I view maps as something that always has to delimit something as well. There have to be constraints, because otherwise it's an issue of management. As you are saying with deep maps, if you explode a view and don't reduce it then things can quickly become unmanageable. And I like that. There are two aspects for me. One is it's inspiring because it's just amazing. So awesome. One could actually map this little place and never be able to end mapping it. But what do I want to find out? For what? Then the question becomes how do I choose to represent things in a par-

ticular way? And why am I focusing on certain things? That could be useful for other things. I always have to find that balance. What I am emphasizing has to be clear to myself and to others.

And that's what I try to go through in the classroom, by the way. Too often people have a representation or a map of something and I say "is that what you need to know about this place?". And, actually, what is in front of them is the last thing you need to know about the place, depending on what your questions are, depending on what you're interested in exploring. If a map becomes a way of choking the exploration then it's a bad map. I guess I could put it that way.

It's like paintings, you know. You go to a museum, you see a painting. It's like this de-contextualized piece. I can't connect to it. I mean, even if I read the little blurb, it's like, it means nothing to me. I need to know what the artist wanted me to see, or maybe compare what I'm seeing with what was intended. Something that I can dialogue with. If a map is not looked at as something that is dialogical, then I think it is potentially dangerous. It cuts off the ability to converse about what is being displayed. But it's hard to achieve that because let's say you look at a roadmap. It is a roadmap; it is for roads. That is the authoritative map for roads. That is the authoritative map for the authorities, but not necessarily for the rest of us. There are so many other ways you can get around besides these roads!

Exploding the map and showing others ways is important to me. But at the same time, how or where do I need to restrain it? What is the particular question I am asking?

**BS:**

Yes, because the deluge of information can be overwhelming and then the dialogue you're talking about is impossi-

ble to have.

**SED:**

If I want to have a dialogue, I need to have a little bit of focus as well. But, if I'm doing an oral history then, you know, we should go like meander about every which way. But at the end of the day, it's like, what I'm trying to find out and what for? That's the issue. If I were really into it, which I have to say I am and I'm not. Cartography is just a tool. That spatial representation can be very useful instead of like numbers. But when I draw, that's like a different realm, it's a different universe there. I find something out through that process. But it comes down to lack of time. I have to choose.

**BS:**

One thing you said earlier grabbed me; it is this idea of mapping the earth's surface. Both of us are really interested in soil and there's so much unknown about soil. When I started diving into soil science research and trying to find answers to my very specific questions, I got really frustrated because I couldn't find answers. And I think it was Perl [Sara Perl Egendorf] who pointed out to me the obvious that there's a lot that science doesn't know. And as an artist coming to science I have found that some of my questions are the same questions that scientists are now asking or debating at the moment. This was frustrating at first but then I realized it is pretty cool. The soil matrix is so complex and invisible, under that surface, I wonder what kind of mapping techniques could be used to kind of open up that black box and make it more visible or relatable to both researchers and general public alike.

**SED:**

I don't have the background to even begin to know how to do it. It is a bit of a frustration for me as well because it is a scale of analysis problem. I came across this last

November when mapping out even a small garden space. There are ways in which you can represent what's underneath the surface, but there are at least two problems practically speaking that I always find. One is, yes, I can turn everything upside down in order to map it out, but then basically I'm destroying the place. I'm not going to do that obviously. The other approach is to probe here and there, and then I can do what a lot of physical geographers and geologists have done for ages. You kind of pretend a three-dimensional view in which you show the profile and then show the surface on another in the same drawing.



But in an urban space, or urban community garden, within even two or three meters, there's a huge variety. You've had so much material that is mixed up and over short periods of time that you don't have in places like this. Over even like a hectare, how does one represent that diversity underground? It is an extreme challenge because the variability is so great over short distances.

If you do something like me, representing an urban garden, I am only looking at the top 20 centimeters of soil and how much lead is present. Where in the garden is the lead? For that purpose, it's not so important to have that kind of 3D view. You can say imagine the top 20 centimeters and that's all you need for this exercise. But if I really wanted to know about the variability of those urban soils in that specific space, even the scale of analysis of an urban community garden would have to be segmented into spots and



then reconnected. I can't imagine how to see that space with all that diversity in a single map. It would be overwhelming to put in a single map because I would expect there'll be so much variability over like short distances.

**BS:**

And you are just talking about lead but there are so many related and important factors too like the soil type and the microorganisms and the structure and pH and the list goes on.

**SED:**

[Laughs] I didn't even want to go there because, because, yes, there are so many factors and ones that vary over time as well. Every year they are going to be different. Every month, there are differences. The microbial populations you have to consider when they're dormant and then the sheer number of species. If I do the sampling for my study in November, and I go back in August, I have a very different site. Maybe the soil structure stays the same but it depends if you bring in soil from elsewhere or amend with compost.

**BS:**

With my *Carbon Sponge* work this summer we have five groups conducting beta tests with a kit. I was just looking over the data with the one community garden group and trying to get a grasp on why their microbial biomass numbers are going down. You would think this time of summer they would go up. I asked if perhaps someone applied compost before their first reading. Maybe they harvested between the readings? But he did not know because it is a volunteer-led garden and things are a bit haphazard, even though this is one of the best run community gardens I have seen. It's primarily a place where people enjoy themselves. We do the best we can with this testing but the culture of the place to a great extent will dictate what

is possible.

**SED:**

Yeah, I did not think about it that way. That makes me even more interested in interviewing gardeners. The thing about science or the natural sciences is that it is such a handicap that it is viewed as if we know it all. It's just an impediment. And, also, it can lend itself to be listened to. If I'm teaching in the social sciences, I see how students treat the material as a matter of opinion. And I am sorry but it is not. The poverty rates are not a matter of opinion. Colonialism is not matter of opinion.

I have an easier time teaching physical geography than I do with world geography because world geography is just up for grabs. I was astounded at the attitude of some of the students, especially the white male students. I was teaching about slavery and one student comes back to me and says "You know, Africans chose to come to this country." And I think, did you actually read?

But in physical geography, it's a different world. It can be easy to abuse that authoritativeness as well. And that is not helpful because it means that as soon as anything comes up and is questionable in the physical sciences, then it's hoax. That's the other side. It is a double-edged sword for a lot of scientists.

*This conversation took place at Unison on July 21, 2020.*

## Peter Pitzele

**PP:**

Tell me about your project and where I fit in.

**BS:**

Yeah, OK. I started this work last summer at a place called Marble House Project in Vermont. I live in Brooklyn where I have been doing a lot of urban gardening and composting and, also, I collaborate with soil scientists. My work is engaged with thinking about cultivation practices and soils as a means to mitigate climate change. If you want to put a label on it I guess you could say it's a mix of activism and interdisciplinary collaboration between art and science. I do not always make room or time for my own individual, artistic exploration, but last summer at this residency I was able to reconnect with a more intuitive process.

The winter before I had been really impressed by being in a soil pit or this ravine that soil scientists use to study soil and its different layers and structure. It was a transformative experience for me, being inside the earth like that, but also I was challenged by the way soil science, and science more generally, create separations through classification. I wanted to expand the profile to include the more total ecosystem, both below ground and above ground, and represent the interconnectedness or symbiotic relationships.

I turned to making flags to signify the systems at play in a specific place. The first one I made was for Marble House and I proposed one for Unison. Since I had never been here before, I was organizing workshops to bring people together to think through this idea of place and find ways to identify the parts of systems that constitute Unison. But, of course, with the pandemic, that's not exactly possible so I've been taking these walks with people through the grounds and having one-on-one conversations instead. Some people I have met are very familiar with Unison, like yourself and Stuart. Others, like Saed, are not. I actually didn't know about the origins of Unison and the school, all of that was new to me before speaking with Michael and then Stuart. I learned that Sarah Warren, who teaches with me at SUNY Purchase, was one of the students here at a very young age. And Stuart mentioned that you would be the person to talk to about that early history.

**PP:**

Yeah. I'm down there at the base level of the soil pit!

**BS:**

Right! I would love to hear more about those days.

**PP:**

Sarah's mother, Carol, made a number of quilted pieces for the school. I think one is still hanging in this building—I'll show it to you. Do you know how to get in?

**BS:**

I do not.

**PP:**

I think I can get us in. Carol Warren made these quilted pieces when we started the school and they might give you a visual idea.

**BS:**

OK!

**PP:**

Let's see if I remember the code. Is that it? I don't think so. No, hold on. Let me call Susan. [Calls Susan and gets code.] So, this was Unison when I moved up here in 1975 [sound of door opening]. This was a cow barn. Let's try to find that quilt. Where is it? This was our one-room schoolhouse and Stuart's home. I laid this floor with Stuart. This was where it all started. And, and the name of the school was Friends of the Mountain School.

I don't know where that quilt is. I've seen it hanging somewhere. Maybe it is in the office and that's locked.

But to make use of your metaphor, I think about tells. Do you know what a tell is?

**BS:**

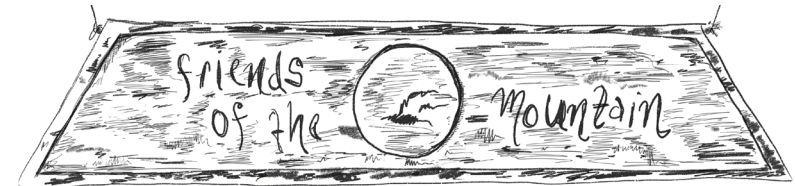
No.

**PP:**

A tell is an archaeological dig, which is excavated layer by layer. And each layer has a narrative that is a historical narrative. And in some ways that is a kind of archaeological, but also narrative, image for what you're doing with soil. Right? The earliest layer was the mother of my children and we were disciples of an Indian teacher. And we moved up here after a year of being part of his community. We bought this little piece of property and then this larger piece of property came up for sale. And some friends joined to help us start what was Friends of the Mountain School and then became Unison Learning Community, which was its earliest incarnation. And things went South for me in terms of my marriage and I eventually left, but have come back in the past couple of years and reconnect-

ed with Unison.

You know, Unison, its formation, came out of a spiritual phase in my life where I was stepping back from my career and all this stuff. I was an academic then. Stuart



and I were both members of this group that had the same teacher. I had always wanted to start a school for children. There is a sign hanging, I believe it's still up. Did you see the Friends of the Mountain School sign? Let me see if I can find that! We had it tucked away somewhere and I think we brought it out here. Yeah, here it is. It was a brief experiment. I mean the school only lasted two years and two summers. It was a very idealistic undertaking.

**BS:**

What were some of the ideals?

**PP:**

Friends of the Mountain tells you something. We had a very strong sense of the mountain and presiding over us here and being connected to the spirit of that mountain. It was a school for very small children. We taught them to sign language. We did things with artists and had a more standard curriculum of, you know, ABCs and that kind of stuff for early childhood learning. But the core of it was community and understanding that a school is a way of forming community. From this little school, and its students and parents, Unison grew. And things happened. It became Unison Arts. Stuart really moved it forward as an

expression of arts. And I don't know where it is now. The way the world has changed, I think we need a place where the contemplative and the arts meet. I was just talking to Stuart about this. I think people really need places of peace. The churches and the synagogues don't have this quality of being friends of the mountain.

It seems to me that Unison could be a real gem. I don't care for the outdoor sculpture—the art—to me, it's okay, but it offers me personally nothing. I'm an artist and I like art. I mean, I make art. I can appreciate it, but I don't think that it is the right time for that kind of art anymore. How many places can you think of? I mean, you know the world differently from the way I do, but how many places can you think of where the contemplative experience and the arts are brought together? I can't. I offhand can't think of a place that, you know, where you could have a meditation room. You could have chanting or dancing. You could have places for contemplation and sitting. You could have views and reflections. You could have earth, air, water, fire. I don't know any place where you could go on a kind of mini-retreat and spend a day, you know, in a variety of little stations.

**BS:**

I think of Rothko's work and his chapel, that's the first thing that came to my mind. That's very specific to one artist.

**PP:**

Yeah. And it's very enclosed. I mean, you know, I dig him. He certainly is an artist that I know and love. I think that the Japanese understood this. That sense of the rock garden and the pool and a sense of order that isn't fussy but deeply connected to a sense of harmony.

**BS:**

Forest bathing, isn't that from a Japanese tradition? This term is kind of trending right now.

**PP:**

What does it signify?

**BS:**

Well, it's a form of guided meditation, a kind of cleansing that is done in the forest using all of your senses. And I believe it's of Japanese origin and maybe a fairly recent phenomenon.

**PP:**

Yeah. This vision I'm sharing with you is not exactly where you wanted to go with this conversation probably! But it comes out of both my own contemplative life and also my sense of where we're headed globally. On a scale of one to 10, I'm a 10 in terms of the changes that climate change will exact on the world. That means I don't really believe in sustainability. I don't believe that we're going to be able to create a global culture that we can maintain. And I wonder about what the world needs most. This [pandemic] is a preview of coming attractions. It is a rehearsal.

And what I'm seeing is that people are being thrown back on themselves in a way that they can't escape. If you have reserves, that will really serve you. And if you don't, you're going to feel really desperate. And, so the question is how to support people in finding the ground for being able to deal resiliently or adequately with radical change. And I think Unison right now is in a real transition moment, not just because of the coronavirus, but because Unison has sort of run out of activities that worked for a demographic that is no longer here. The Hudson Valley is changing. I mean Brooklyn has moved to the Hudson Valley.

**BS:**

And that has really accelerated within the last few months.

**PP:**

Yeah, absolutely. But it was definitely happening before. And, so, you know, you have sort of a whole new demographic economically, socially, and culturally. And it is a demographic that has no conception of how to live in this environment. So, having a zone where you can kind of land and begin to set your metabolism at a pace that is the pace of here, a transitional zone, I think that is important. That is what I'm prepared to talk about if anyone will listen.

**BS:**

What you are saying is this will become a little Brooklyn, or whatever city people are fleeing from, and people will replicate what they know instead of relearning or starting new habits, which is what is necessary.

**PP:**

That's nicely put. And I think that people are so very dependent on the internet and, in the world that I foresee, there's a great deal of internet fragility. And there will be a great withdrawal that is going to happen around devices. It is the most potent drug I've ever seen because it involves the body in all of these little operations, you know. It's like all right here [motions to his hands]. It's all very, very virtual, and solipsistic. The people whom I have been paying attention to, as well as myself, we're trying to phase out and withdraw from those addictions and to learn about the nourishment that's here in this co-relation of the human and more than human, or other than human, environment.

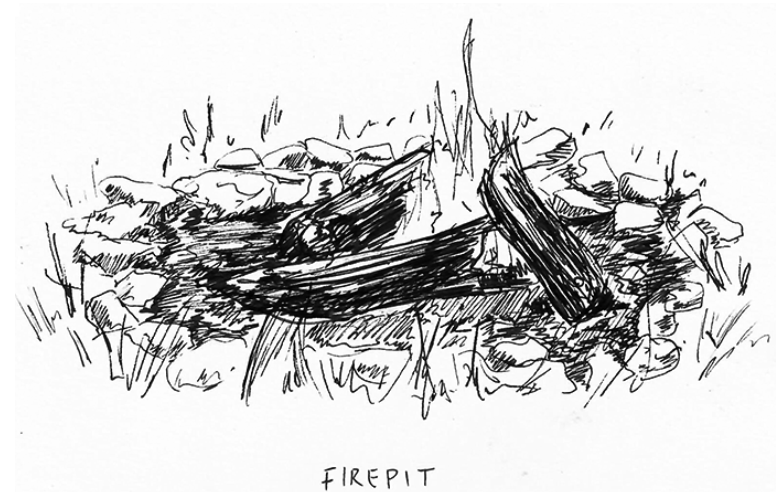
**BS:**

It's really compelling. I helped start a community garden in Brooklyn about seven years ago. And we have a pre-school

nearby that often visits. And there is an awe and light when the kids come. The excitement when they see where strawberries come from, for instance. Or when they see a worm in a compost bin. It's such pure wonder and joy. It's really infectious. I love it. And these are hard-core city kids.

**PP:**

It's like you're using both hands, you know, they are becoming ambidextrous. I think it's great to think that Brooklyn kids are not so far down the rabbit hole that they are in wonder in a garden. I think absolutely the right word is wonder. And, you know, it is the sense that this is a medicinal environment. It is medicine. Absolutely.



**BS:**

And quite literally too! I foraged some St. John's wort here to make a dye. That has very powerful healing properties.

**PP:**

One of the most interesting things that has happened to me here at Unison recently was meeting a young woman who was in the MFA program at New Paltz who built a little tea house in the meadow with solar power to heat the wa-



ter. And she was making a tea out of meadow flowers. Her name is Amanda Heidel.

**BS:**

I met Amanda here. She did a walk with me last week. She's great.

**PP:**

She is so far ahead of the curve. If she can just last long enough for the world to catch up to what she has to offer.

This space here with the fire pit and seating, I put all this together. I wanted to have a place where people could gather, sit around a fire, and tell stories, and sing.

**BS:**

Space is so important, both in terms of the space to think but also to come together. Most often the design of a space is not shared. At La Casita Verde, my community garden, we worked with a friend who is a carpenter and skilled enough that we could talk about what we wanted for a community shed and he was able to build it and we assisted. Two of the sides of the shed totally open up so in warm weather it is an indoor-outdoor space. In the colder months, we can come together as a group and meet there. We store seeds and books. And then the space is active 12 months out of the year, which is important. It's not a derelict space; it's a space for people built by people. I have learned this from teaching. I walk into a classroom on the first day and think, "I do not want to teach in this room, let alone be in this room." It takes so much energy to work against the design of a space. Space sets the tone. The people who use the space need to design the space. It rarely happens that way.

**PP:**

It makes me think of McLuhan's "the medium is the mes-

sage." What you're really saying is the environment is the message.

**BS:**

Yeah. I guess so.

**PP:**

I hear what you are saying. I hated teaching outside because I couldn't compete with this... [motions to the outdoors] nor could I restrain myself from drifting. If I was responsible for some sort of curriculum, I wouldn't go outside because it was just impossible, but it speaks to your point exactly. When you go outside, you are in the classroom. And it's just a matter of picking up what there is to learn.

What is happening here now is individualized art. It's like a gallery outside or a gallery without walls. The space that you made and Amanda's *Mushroom Shed* are artworks that are about gathering. And it is an invitation for something to happen rather than names on a wall or something.

These are participatory environments. The trick is that it doesn't channel you, but invites you into an exploration that has some intent. It's not clear that the intent has to be didactic, but the intent can be to expose you to shade, to columns of trees, to perspectives, to views, to the soil, to rock, to fire, and so on. And maybe that is the big loop back to Friends of the Mountain is to create this environment as an educator, as a school, with a particular kind of curriculum. That is the curriculum of noticing and learning what's here and being. You said earlier that you need a



teacher. And I think what one needs are several teachers, or a group of teachers, who offer different perspectives out of a common understanding of what it is that you're trying to cultivate.

**BS:**

I have been listening to Robin Wall Kimmerer read her book *Braiding Sweetgrass*. Her books are so popular right now. She is a teacher to many. She has such a poetic, beautiful voice, and I mean that literally too!

**PP:**

She got me to buy a microscope. Her book *Gathering Moss* was just inspiring. I have been up on the mountain a lot, looking at moss. Unbelievable. I've never seen the moss happier and the lichen too.

**BS:**

I'm interested in making a lichen dye. It's all over the fallen wood, soon to be firewood, around here. It's stunning.

**PP:**

Oh, man. What's interesting is how few mushrooms there are. Last year at this time, or even earlier in the spring, there were loads of mushrooms. But this year they are saying, "No, we're just going to take our time and put all that energy into the mycelium, not our fruit."

**BS:**

I love how Kimmerer writes about this idea of learning from the plants. What do the plants have to say to us and how can we better listen? We see plants in a very utilitarian kind of exchange instead of as teachers. How can we learn from them? I am not sure but I'm thinking about that a lot.

**PP:**

Do you know the work of Stephen Harold Buhner? Like Kimmerer, he is a scientist but also a kind of earth shaman. He has woven the two together. He is all about plant intelligence. You will like his work. Also, read David Abram's *The Spell of the Sensuous*.

**BS:**

Yes, I am actually reading that now.

**PP:**

It's thrilling and his sequel *Becoming Animal* is amazing. What he does in *Spell of the Sensuous* is address all these factors that have alienated us from the natural world. And then *Becoming Animal* is really a move beyond to look at animal intelligence and our place within the world.

I'm curious how you see the uses of art here. What is the relationship of art-making to the kind of contemplative environment that I'm imagining? Because to me, the art is very conceptual. And in that way, oddly unrelated to the natural world; there may be natural decomposing things, but they are not situated in any way in relation to one another or this environment. And to me, that's a problem.

**BS:**

Yes, I can see that. They are still very individual in terms of many different projects made by one person or a team. I think your vision is more about cohesion. But even if a project is working conceptually it could also be a platform, a convening, or instigate action. There are a lot of different approaches actually, it is hard to generalize.

But I think there is overlap in terms of not thinking like a gallery or a showcase but more of a community-building enterprise or a community center. What are community centers? They are a lot of different things. And as the com-

munity changes, the center responds to reflect that. It's not a senior center or trying to target one specific population. It's really about thinking about bringing all people in and filling some basic needs. What is a 21st-century community center for a place like New Paltz?

**PP:**

Yeah. I like it. You know, I'm reminded of that phrase: if you build it, they will come. Many places are built with a particular audience in mind: kids, elders, Jews, what have you. I sort of think if we created this place in the vision of what I was trying to talk to you about then a community would arise in response to it.

*This conversation took place at Unison on July 21, 2020.*

Steven Schimmrich

**BS:**

You already know some things about the project I am working on here. It really comes out of my love for the soil, an interest of mine for nearly a decade now. More recently I was in a soil profile and it was somewhat of a transformative experience. I have always been interested in ways in which we as humans categorize things, make order. And how these distinctions are somewhat arbitrary. How we classify things is a way to understand them but it also deters our understanding or distorts our view.

I am inviting many people here to talk with me to gather different perspectives and in a way to create an exploded view, a means to open up this place in time. This concept of a deep map is to hold differences together as a productive force, rather than trying to reduce it to one coherent thing. I have yet to talk to a geologist and I am eager to address timescales. I have talked with the founders of Unison about the history of this place, which dates back to the 1970s, but have not addressed a larger timescale. For me, it's really hard to think past the scale of centuries. It is difficult to grasp a millennium but, of course, geologists work in scales of millions even billions of years.

**SS:**

Yes, I am a geologist. I'm more interest-

ed in the rocks rather than the soil. I pretty much ignore soil for the most part. There are geologists who are really into soil. It's just not my thing. I'm more interested in the geologic history. I just published a book on the geology of the Hudson Valley where I talk about the geology from basically Manhattan up to the north of Albany. That grew out of a summer course I do where every day we go to a different site. This includes northern Manhattan, the Hudson Highlands, the Palisades Sill, Thacher State Park, and Minnewaska. Unfortunately, it got canceled this summer because of COVID. But, I put together a manuscript that grew out of my lecture notes for the course and it's available to purchase online.

And that's my interest, local geology and the geologic evolution of this area and then tying all kinds of things together. There's a quote by John Mueller that everything is tied into everything else. You can look at natural cement mining in Rosendale that grew out of a specific set of geologic circumstances where this rock makes this beautiful natural cement that built New York City in the 1800s. Bricks from the Hudson Valley were from glacial lake clays. And there were hundreds of brick-making companies in the Hudson Valley due to this. You go down to New York City and you see these brick buildings and that's from upstate here, from Haverstraw and up toward Albany. Then there is bluestone from the Catskills shipped down the Hudson River to the city to pave sidewalks. And iron ore from the Hudson Highlands was used during the Revolutionary War to make cannons and all kinds of things.

And then the environmental movement really grew up in the Hudson Valley with Pete Seeger and Clearwater addressing contamination issues. There are a lot of those human-interest stories that originate from here in the Hudson River Valley as well.

**BS:**

The first flag I made was in Dorset, Vermont, at a place called the Marble House Project. It is very near where Danby marble was excavated, the first marbles quarries in the U.S. That marble was used to build the New York Public Library and part of the Washington Monument. I think the pillars of the Supreme Court were also made from this marble. I ground up marble I found on the property—which has two abandoned quarries that are now swimming holes—and made a marble dye for that flag. I'm not sure anyone has ever done that before.

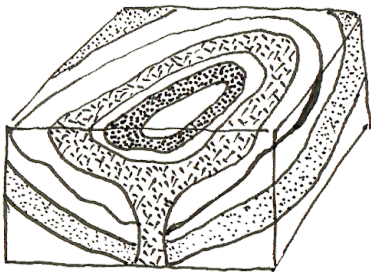
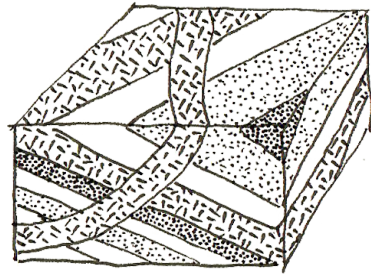
**SS:**

Yeah. I like your idea of integrating all those things. In terms of science, I tell students when I teach geology that I'm going to teach them to look at the rocks. You see those rocks, you drive past them every day on the road, but you don't pay any attention to them. They're just these gray rocks, but when you get up and actually put your nose on them, you start to see different features that tell you about the past. You can actually learn from them.

And, and so when I walk around, I see geology. When a forester walks through here, they see all the trees. When an ornithologist comes, they hear the birds and note that's a woodpecker. You learn to see depending on your field and sometimes it's blinders too. But it all does tie together in a lot of ways; the rocks influenced the soil composition, which influences the flora, which influences the climate and the fauna as well.

**BS:**

What's the story about the Palisades? A geologist once told me that it's very important and now I can't remember why.



*igneous intrusion*

**SS:**

The Palisade Sill is an igneous intrusion. That means it was magma molten rock that came up from deeper below. And then it spread out horizontally, which is what geologists call a sill. If it's vertical, they call it a dike. The molten rock cuts through the surrounding rock and it cools and solidifies. In this case, it was able to spread out sideways, but due to the rifting of Pangea, which was Africa pulling apart from North America at the time, there was a lot of volcanic activity about 180 million years ago. The Washington Mountains in New Jersey were the result of these ancient lava flows, for example. And in the Newark lowlands there were lakes and swamps and you have dino-

saur tracks in there. This was all 180 million years ago.

When you see rocks just lying around, you have to wonder sometimes if they were carted here or not. These are pieces of the Shawangunk conglomerate, which is what makes the ridge behind us, the Mohonk and Minnewaska and all the way into Pennsylvania. So big blocks like this, and the bigger they are, the more likely they were here originally. And, in these cases, they're glacial erratics. They were dropped here during the last ice age because this area was covered by a mile thick sheet of ice. And as the ice moved forward, it picked up rocks.

And then at the peak about 18,000 years ago, it started melting again. And these rocks just sort of deposited and they were entrained in the ice. You can go hiking on the ridge and find huge boulders on tops of cliffs. They weren't put there by anyone. They were dropped by the glaciers.

**BS:**

This ground is all clay. I was wondering if that's typical around here.

**SS:**

This area looks low. It could have been more of a wetland than it is today. And in that case, you typically would get some clays. Maybe it was a small lake. The soil type varies a lot from place to place. A lot of the soil here is what is called glacial till, and like the rock, it is what was dumped by the glacier. You find different sizes of stuff in here from cobblestones down to clay. But sometimes you find pieces of metamorphic rock and that's not from Ulster County but from further away like from the Adirondacks and carried down by glaciers. And there is metamorphic rock here, but it's about 15,000 feet below you.



**BS:**

And the glacier till in the area is what makes it good farming land.

**SS:**

Yeah. That's why you have those nice black soils in the upper Midwest where they grow a lot of corn and soybeans. But if you have ever seen the soil maps of Ulster County that are put out by the cooperative extension you can see the whole of Ulster County and all the different soil types.

There are hundreds and hundreds of different names of soil types. And in just a small area, you will find like 10 different kinds of soil types.

**BS:**

I'm just used to the 12 classifications when you do a basic soil jar test.

**SS:**

They get much more specific than that and usually name the soil types after towns.

**BS:**

It's interesting now that I am walking here with you I realize there are not many rocks.

**SS:**

No, just a few scattered small ones. One of the things you find walking anywhere in the woods is these old stone walls. And I don't know how recent this is, but it is typical of what you find elsewhere. And it's because the soil here was glacial till and was full of rocks. The farmers back in the day, they carted the rocks off the least distance they could to the edge of the field. And they made these dry stack stone walls, which you find everywhere. And it's interesting when you go hiking now in state parks and



preserves the number of stone walls delineating what were once fields and farmed. And when you see these old pictures of the area from the 1800s, there were much fewer trees than there are today. People cut down most of the trees. A lot of the forests we see today are relatively young. They are not old-growth forest except in a few areas.

**BS:**

Most of the trees were cut down by the colonists for ship making or export...

**SS:**

Or firewood and to clear for farming.

**BS:**

Last night I was reading a book about the environmental

history of New England by William Cronon and learned about the formation of the dunes in Truro, Massachusetts, in Cape Cod. The colonialists brought cattle over and the grasses along the shore which were holding down the sand got destroyed. And those huge dunes were a result of the wind whipping up all that bare sand. I had never heard that before.

**SS:**

Yeah, I hadn't heard that either, but now those dunes are such a permanent feature.

**BS:**

Yes, and now it's a feature and we think of those dunes as a natural occurrence when it was really environmental damage. This kind of thing really gets me excited. What excites your students? I know every student is different, but what do you find with this generation in terms of their interest in geology or reading rocks?

**SS:**

Well, I teach courses for majors and then non-science courses for people who just need to take a natural science requirement. I get a lot of "I took this course because my advisor told me to take it." I do try to make things relatable. I talk about earth science in general, which is for non-majors, and talk about things like how wells work or septic tanks work and then just the environmental issues, especially ones with local importance.

I always try to tie things into the local stuff because at a community college they are all local students. They're not coming from somewhere else really. And I think trying to tie things into their own experiences in the local area is key to getting them interested. And some people you just can't get interested, but at a community college, it's funny because we have students that then go on to a pretty

prestigious four-year college when they graduate like we have engineering students that go to RPI. And then we have students who are barely literate.

I mean, as long as you have the check or signed for financial aid, you can come. It's open admission. So that's one of the challenges of teaching at a community college. The State University of New York, which we are part of, judges the success of a college, all two and four-year colleges, by graduation rates. When you are open admission, you can't compare us to a college with an SAT cutoff or where students can flunk out. We try to retain all the students.

And then students who answer the question of "Why are you here?" with something like "Oh, my parents told me I better go to college." It's hard to reach everyone, but I think trying to make it relevant to their lives is a start and not just learning definitions of igneous rock types. That's for majors. You have to learn all the nomenclature and, like any science, it's full of terminology.

But we are also trying to teach them what science is and how it works and what pseudo-science is. It's important to understand the process of science. And I think that's what I try to get students turned on to and by getting them out and looking at rocks and looking at features they learn the process of science through doing. I mean, especially in the Hudson Valley, there is so much opportunity for amazing fieldwork. It's not as nice as out West where everything is open and there is not as much private property. But there is a lot here and there's a lot that's protected, like Mohonk and Minnewaska and the Hudson Highlands, Harriman State Park. I probably wouldn't bring a field trip here because there are no rocks, but I do like Minnewaska which is close by, for example.

**BS:**

What is Minnewaska known for?

**SS:**

Minnewaska is best known for the Shawangunk conglomerate which is the most dominating feature, at least in the winter when there are no leaves on the trees, you see it right there. The ridge was carved by glaciers and the lakes were scooped out by glaciers. The bedrock is polished and it has scratches in it called glacial striations, which indicate the direction the glacier moved. As the glacier moved across the bedrock, it just scratched and grooved the bedrock.

There are faults in the rock and these aren't faults like you think of in California and with earthquakes, but these were faults that formed 400 million years ago during mountain building that occurred here. They haven't moved in a very long time. These cliffs that you've undoubtedly seen and those the traps where the rock slopes down, it



m a s t o d o n

goes into the Clove Valley and then comes up the other side and over another ridge and then down into the Rondout Valley. So those rocks are actually folded. And then you can go into the whole geologic history of how that form and when that formed.

**BS:**

When you talk about glacial till was that the most recent ice age or what they call the little ice age?

**SS:**

No, this was not the little ice age that was just unseasonably cold among other things. The Earth has had ice ages throughout its history, going back over 2 billion years. So there have been multiple ice ages on earth. The most recent ice age was called the Pleistocene ice age. It was about 2 million years ago to about 12,000 years ago. Even that had at least four major pulses of glaciers coming down and covering this area and then melting away and the climate got as warm as it is today in the periods called interglacials. The most recent advance of ice was called the Wisconsin advance. And that's the one that ended 12,000 years ago. It peaked about 18,000 years ago with that mile-thick ice and about 12,000 years ago New York was ice-free basically.

They dug up a mastodon near Poughkeepsie in Hyde Park, about 20 years ago now, but it dated 11,500 years old. At that time there were these spruce forests and swamps, and this poor mastodon fell through the ice apparently in a bog and got trapped in the mud and drowned.

He was almost entirely intact in what was a little lake in someone's backyard. They went to enlarge it with a backhoe and they started pulling up these huge bones. You can find it at the Museum of the Earth in Ithaca.

**BS:**

In one of the gardens, I have built with my collaborators the soil we used is human-engineered. It is a combination of glacial sediment with New York City-made compost. I love to show it to people and share how one material was formed about 20,000 years ago and it's sandy and caramel in color, and the other is a dark brown color which is compost made by the Department of Sanitation, within the last year. It's amazing to look at these two different materials and understand the vast time difference of their formations.

**SS:**

Do you know John Rayburn at SUNY New Paltz? He teaches geology there and one of his main projects is sampling glacial lake clays, all the way up to Northern New York. And these clays have layers. There are seasonal layers, winter and summer because the lake gets frozen over in the winter and there are fewer organics coming in. You can actually identify that. And he can match them up from place to place as well. There is a computer program that measures the thickness of the changes and the sequences. Basically, he can read the timing of the deglaciation of the Hudson Valley since the last ice age, because those lakes only opened up when the glaciers have melted away from that area.

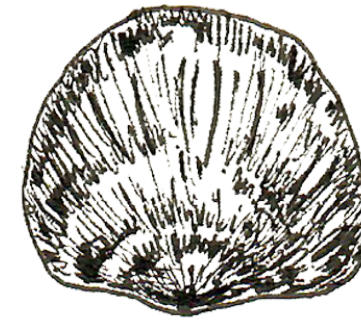
**BS:**

It is like reading the rings of a tree.

**SS:**

Yes, exactly.

Not a lot of rocks here but I can visualize what's under our feet and below the soil, which has varying thickness obviously throughout the area, but it is a shale. And it's called the Martinsburg shale by geologists that actually stretch-



brachiopod

es quite a distance south of us as well. And it represents a marine basin in places. There is a quarry on the road to the Mohonk Mountain House, it's a shale quarry. You can actually go there and find little shells. They're called brachiopods. They look like clams or something, but they're not related at all. They're a whole different phylum of life, you know, but they were very common, back in the geologic past. They were much more common than today.

So most of the shelled fossils you find are brachiopods and they indicate a marine environment. From the types of fossils, you can tell it was kind of a restricted environment, meaning not a lot of circulation, somewhat anoxic in places where there was not a lot of oxygen down at the bottom. And it turns out that 450 million years ago this place where we are was underwater. To the west was the shoreline of North America and it was smaller than it is today. It didn't have New England yet, basically. And this was a fairly deep basin and the edge of North America.

That tectonic plate was subducting or sliding down a trench to the east and above that trench was a chain of volcanic islands erupting. And we know they were erupting because, within that shale, you can find layers of volcanic ash that you can radioactively date.

Some of these ashes can be traced for hundreds of miles. As a matter of fact, one of them was a huge eruption, much larger than anything we've seen in modern days. We call it the Millbrig ash. You can find it in Scandinavia too, but Scandinavia was then called Baltica. It was a micro-continent that was much closer to us during the eruption. There was a chain of volcanic islands off the coast, a lot like the Aleutians islands off of Alaska. That is where the Pacific Ocean plate slides under the North America plate under the Bering Sea. There were big earthquakes here and influxes of sediment coming down into this deeper basin from those earthquakes. And we see that today as these deep marine shales and then big layers of sandstone. You get what is called graded bedding because the coarser particles are on the bottom. Sediment comes down and first the heaviest settles and then the lightest. This happens during the turbidity currents or submarine landslides, which are quick events.

When you go over the bridge to Poughkeepsie from here, as you pay the toll, you go down those big rock outcrops. They're all tilted, and you see shale and a layer of sandstone. Then again shale and a layer of sandstone. That is repeated over and over again from turbidity currents from this deep marine basin. Eventually, that volcanic island collided with us and you can actually find remnants of that over in Connecticut and Massachusetts. It crumpled up this area and pushed it above sea level again, and it formed what was called the Taconic mountains. There were no land plants or life at that time. Maybe a few mosses and lichens and things. So erosion was much greater then and all these braided rivers and streams coming down off the mountains, which were the highest to the east of us. The rivers came down off these mountains to form these floodplains with lots of gravel and sand. That's the Shawangunk conglomerate that white rock. You see up on the ridge that formed the braided channels of sandstones. If

you go up there you see things called cross-beds, which indicate flowing current, as well as channels of heavier gravels that represent old stream channels. And that was about 420 million years ago. And they formed on top of that shale that was down below until the collision happened. And with the collision, they got all folded and faulted. And in some cases, they got stacked basically. And so right here, if you drill down, you'll get like 12,000 feet of shale before you get to what's called the basement rock.

And that basement rock is an igneous and metamorphic rock. That's 1.3 to 1.1 billion years old. That's the original crust of New York. I went out of order chronologically, but a billion years ago there was a collision of a piece of crust called Amazonia, which is now part of South America with North America. And it was a collision like India with the rest of Asia today that thrust up the Himalayan mountains. This collision thrust up what was called the Grenville Mountains, which were once as high as the Himalayas. That mountain belt is gone today. If you assume like 1/10th of a millimeter of erosion every hundred years and multiply it by hundreds of millions of years, it takes about 500 million years to wear away a mountain belt the size of the Himalayas. The Himalayas were obviously formed a lot more recently. They are just a couple of tens of millions of years old.

**BS:**

How do you make that relatable to your students? I am feeling like one of your students right now and can't wrap my head around these timescales.

**SS:**

In the classroom, I would discuss geologic time. At some point, the majors do have to memorize it because geologists don't talk in terms of tens or hundreds of millions of years. We have names for all these time periods. For



instance, the shale is the Ordovician period in age and the conglomerate Silurian period in age. So, it becomes a kind of shorthand. But in terms of the geologic timescale, if you imagine all of the Earth's history, four and a half billion years, compressed down into one year, until about November, there's nothing much going on in terms of life. If on January first the earth formed, it isn't until maybe mid-March when you start seeing the first evidence of bacteria.

And then for a couple of billion years, that's all that is on earth. Just bacteria and in water only at first. Biologists wouldn't call them bacteria. They call them archaea, which is another domain of life. And sometimes they're called extremophiles because they can live in all kinds of extreme environments. Biologists think that was the first life on earth. When you go to Yellowstone National Park and they tell you there are bacteria living in boiling water that is an example of an extremophile. There are bacteria in glacial ice. They have found bacteria in rocks miles below the surface of the earth using drill holes. Most of them don't want oxygen. It's a poison gas to them. They don't use oxygen. Some of them get their energy from methane or other chemicals.

You mentioned Lynn Margulis earlier. I think she was instrumental in developing this whole concept of endosymbiosis. Some of them started living within each other, basically as organelles and the bacteria and the archaea forming prokaryotes. These are bacteria that don't have a nucleus. And then you have the eukaryotes, which do have a nucleus, and they have organelles like all plants and animal cells today. And that led to sexual reproduction, which is not just splitting in half as a clone but the mixing of genetic information. And then that was a huge advance like 2 billion years ago. Well, there's a lot of argument as to exactly when that happened, but one to 2 billion years ago. It's a pretty big range. Then about 600 million years ago,

some of these eukaryotes started sticking together, probably as sponges and things. That is primitive multicellular life, the first animals and plants.

If you compress all of the geologic time into a year, those earliest animals we're talking about arriving in like November and then dinosaurs don't appear until almost mid-December. Humans come onto the scene at the last minute before, you know, the end of the year. It's just hard to visualize that immensity of time, deep time as a famous author, John McPhee, named it. You don't really think about it, but when you do it's crazy. It's the same with astronomy too. You look at the images of galaxies from the Hubble Space Telescope. They take a tiny bit of the sky and you see thousands of galaxies and you think each of them has a hundred billion stars and then I feel like nothing. What's the point?

**BS:**

These ways of thinking about our place on the earth, it can really make us feel completely insignificant.

**SS:**

Yeah. And the perspective that 99% of species on earth are now extinct. Most things have a certain span on earth and then they disappear. There are several mass extinction events in earth history all caused by the climatic change of one sort or another. But it's spread out. They are not overnight in the geologic record. This one we are experiencing now will look more like an immediate, overnight extinction event that we are hastening along.

**BS:**

It's more like a sudden disaster rather than an evolutionary change.

**SS:**

And that's another thing I talk about. Some people grew up believing the Earth's only a few thousand years old and have trouble with evolution. I tell students you don't have to believe what I tell you but you have to know it. And, also, it's about how we know things. When I say, "Ulster County was covered by ocean water" I don't want them to be afraid to say, "how the hell do you know that?" Because there are reasons that we say things. You can actually go out and verify for yourself if you want. Not in every case, I guess. You can't buy these multimillion-dollar instruments to do an analysis of some stuff. But geology is just observing.

**BS:**

I was talking to a professor yesterday who teaches both natural science and social science. And he said in the social sciences, everything is up for grabs and no one believes anything. There's push back on anything and everything. And then in his natural science classes, the kids are taking furious notes and don't question anything. But you just a moment ago were mentioning there are students who don't believe in your classes.

**SS:**

Right. And I think it's more and more. In the age of the internet, we are seeing more of the flat earth nonsense. That was settled 2,500 years ago by the ancient Greeks. I think it's also the current day valuing of opinion over expertise. You know my 10-minute research on the internet is better than your Ph.D. and 30 years of research. It is similar to the way doctors always complain about Dr. Google.

*This conversation took place at Unison on July 22, 2020.*

**LM:**

It's a beautiful morning here at Unison.

**BS:**

I see you have your binoculars.

**LM:**

I do. Whenever I'm going on a nature walk, I try to remember to bring them not because I'm looking for something in particular necessarily, but if I don't bring them, there's usually something I wish I could have taken a closer look at. I'm kind of coming at it this morning from that angle. It's not just that I'm a geologist, but I'm a person who likes being outdoors and noticing different things in nature. And we're going on a ramble.

**BS:**

That's exactly what I've imagined too. Let's start with a little bit of your background and what your interests are.

**LM:**

Sure. I've been in the area since fall 2013. That's when I started teaching at SUNY New Paltz in their



Geology Department. I grew up in Pennsylvania, in kind of a rural area in the middle of the state. In some ways a similar landscape to this. There certainly are some very familiar plants and animals and other things here that I grew up enjoying outdoors. I was kind of drawn to geology because it brings together a lot of other sciences and a lot of other things I'm interested in like resource use and how people live on the landscape. For somebody who is interested in a lot of things and has trouble deciding what she wants to study, it was great because it allowed me to interweave all of those different aspects.

At New Paltz I mostly teach intro or intermediary classes. And that's actually great because it's given me an opportunity to kind of have a wide overview: to introduce students to science and to help them make some of those connections and to look at things in a very integrated way. So, you spoke with Steve, he told you he's a rocks guy and in a lot of ways I'm kind of a rocks gal. That's what I focused on in grad school, but more and more, and especially in the role I'm in now, I really see myself as a systems person. I think that's really a lot of what geology brings as a perspective; it is looking into relationships between things and all the different parts of not only the physical earth, but the biological earth. And, of course, we're part of that.

Geology is also looking at changes through deep time and looking at this sort of integrated approach, holistic

approach. A lot of what I noticed when I wandered out here the other day was not just the rocks, but also looking at the weather and the atmosphere and the flow of water. They're all related. And I think we can sometimes think of these as different spheres: the solid earth and then the water and the air above it. But in a lot of ways, we're also looking at the connections between spheres that cross vertically and sideways and diagonally and all of that. And I always had a strong interest in landscape and land use, just from an aesthetic perspective. That drew me into geology as opposed to other sciences—the beauty aspect of it, the enjoying being outdoors, the textures, the colors of rocks and minerals and of the landscape all around us.

I've had a long interest in agriculture having grown up in an agricultural community that also has an industrial history. And that is similar to here. As a kid, I was surrounded by the remnants of extractive industry. In that case, it was mostly iron mining and here there are a lot of remains of the cement industry and brick yards and things like that. I've always found that interesting too. How we use the resources of the Earth, how we think or do not think about their impact on us and our impact on the ecosystem. Those are some of the things that weave together to inform my approach: how I look at science or how I look at a landscape. I've just grown up spending a lot of time walking in the woods or the fields with my Mom and Dad as they were pointing out birds or flowers or things like that. And just kind of learning to notice and enjoy the outdoors.

**BS:**

I love that you bring up beauty and it's something I've been thinking about. Beauty is something that I've used in my artwork as a way to engage people. It can be an introduction that then opens up to a more conceptual or research-based world that really drives my practice. Have you read Robin Wall Kimmerer's *Braiding Sweetgrass*?

**LM:**

Her name is familiar, but no I have not.

**BS:**

I bring it up because in one essay she writes about the beauty of the goldenrod and the asters, the purple and the gold, in the fields together. And, in her freshman year



of college, she meets her botany professor for the first time and he asks her "why are you studying botany?" She mentions the beauty of these goldenrod and asters. To her dismay, he replies, "Well, I think you should be an art major. We don't study beauty in botany." Thankfully this did not deter her and through her studies and by ignoring her professor, she eventually learns the scientific reasons that these two flowers grow in combination. It has everything

to do with survival. She writes that if he had been a better teacher, he would have encouraged this exploration rather than sending her to another discipline.

I do think that some of these dichotomies or stark divisions are becoming outdated. It's something I struggle with—bringing science into my art practice. I have also gotten similar reactions like that's way too pragmatic or where is the poetry or why is this art.

These are holistic needs for our own intellectual inquiries, our needs as human beings. The discipline of art is actually incredibly flexible and that is what has sustained me. It sounds similar for you with the discipline of geology. And I talked to a geographer out here the other day who explained his discipline as being undisciplined. Our experiences are all related.

**LM:**

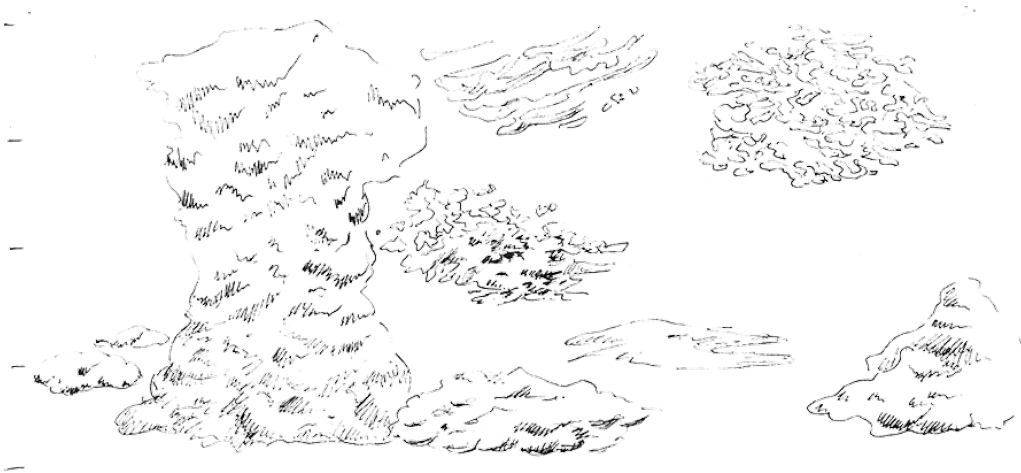
I think, at a personal level, anything that is worth doing becomes really difficult. It becomes either extremely intellectually challenging and kind of stretches the limits of your brain or it becomes really emotionally challenging dealing with the implications, be it climate change or habitat destruction or racism or whatever you're engaging with. You need to have something that kind of keeps your spirit going through the tough work. You need to honor whatever it is you're doing that feeds your spirit. And for me, a lot of that is the beauty and being able to pause in that.

**BS:**

Let's start our walk and see what we see. And hear some of what you discovered last time you were here.

**LM:**

Well, I just took a short walk and actually this piece of art is one of the first things that caught my eye. For the recording, this is *Wings #2* by Alex Uribe. It looks to me like



it's made of local bluestone and that's been quarried in West Hurley and a variety of other communities throughout the region. And it's used as flagstone all over the place. It was historically what was sent to New York City to make sidewalks and other things. And then you see it in people's patios and stuff today. But it actually is kind of a piece of local industry. I obviously don't know looking exactly at this particular rock that it absolutely came from here, but it very likely could have. And the other thing I kind of love about it as a piece of artwork is that he's using something really solid and heavy and inflexible, the stone, to represent this idea of flight and wings.

It reminds me of an exercise that I assign my weather students. I usually ask my weather and environment students to collect some cloud observations of their own, but then also to find artwork that depicts clouds. I ask them to classify the clouds or describe them scientifically but also to try to talk about what the clouds are communicating in an artistic sense too. What is the artist trying to get at conceptually, aesthetically? And there's one series done by an artist named Rob Good, who I think is in the UK, that's all cloud shapes that are carved out of marble. And it's similarly to this. It is a contrast between something which is so ephemeral and diaphanous but rendered in a hard, per-

manent media. This is art, trying to capture a permanent glimpse of something that's always in change.

**BS:**

I share a cloud work with my students by Karolina Sobec-ka called *Thinking Like a Cloud*. She built a cloud collector device that she sends up into the air to harvest cloud water. Clouds condense on the mesh wings of this artwork and when she brings it back down, she enlists volunteers to drink the gathered liquid. They are literally becoming part of the cloud. She asks her participants to keep a journal to record their experience. I love that work so much.

**LM:**

Yes, interesting.

Look here, we have a lot of boulders scattered around. Let's talk about some of them. In general, there are a couple of different ways they could have gotten down here. Oh, wait a minute that might have been a pileated woodpecker that flew across there. Ok, so the boulders may have just tumbled down from the slope of the cliff up there. That might be the case with this one because it looks like it hasn't gone very far and it's pretty angular. It's definitely made out of the same material—you've probably been up there along the ridge line and seen people rock climbing on material like this. It's great because it's all knobby with all these little cobbles in it. A bunch of these have presumably been dropped here by the glaciers back in the last ice age. I imagine Steve may have talked a little bit about that too. We've got kind of a cool word for big rocks that are out of place that have been left behind by the glaciers—they're called erratic. It just basically means they're out of place. And the erratics that we see here, arranged in a landscape like this.

I wonder if humans put them here like this or at least shift-



ed them a little bit to their current location after the glacier moved them? But glaciers are the reason why they're sitting here in the middle of basically a big flat area. There aren't many things that can move rocks this size: a backhoe or ice. They can't be pushed around by wind or water. So that tells you the ice must've been here over 22,000 years ago during the last glacial maximum and it was about a mile thick above our heads which I still find hard to picture quite honestly.

**BS:**

Absolutely. I love how the lichen is colonizing this rock.

**LM:**

I don't know much about lichen but I do know that it's a symbiosis between two very different types of organisms. It's a fungus combined either with a cyanobacteria or algae, and there are many, many different combinations. They often do have this kind of fractal pattern of how they grow, which is cool. And as they colonize the rock, they will actually break down the rock. And so this is part of a stage of weathering.

This rock is very, very difficult to break down. I'm not sure the lichen actually are going to be able to break down the rock very fast because it's made almost entirely of quartz, which is both extremely hard and doesn't fracture easily. And it's not very chemically reactive, which is why this can exist in the landscape for a long, long time.

And if you go up on the ridge and into Minnewaska State Park you will actually see scratch marks left in this rock by the glacier and a mirror-like polish on the surface of this rock. And in 22,000 years they haven't been obliterated by weathering processes. They are still visible on a bright day. If the sun's hitting the rock just right, you can almost be blinded by the mirror polish. So, it's very, very hard for this to break down, but the lichens are doing their level best.

The lichens are finding in the little nooks and crannies just enough water and maybe dust that gets trapped in there that give them just enough nutrition so they can grow, even though they're not extracting a lot from this particular rock material. If you see a couple of lichen and zoom in, you will see an entire community of others; there are a bunch of them that are almost the same color as the rock.

And they've created just enough incipient soil that we've got some moss growing here too. Moss requires a little more than the lichen does. That's probably because it doesn't dry out as much. And one of the things that I've heard about lichens is that many of them can become extremely old.

There was a particular kind of lichen that we used to see a lot of on our trail. My Mom was interested in natural dyeing and this particular lichen is used in dyeing, but she never wanted to collect it because she said it grows really slowly. And she had heard that this particular lichen could grow for a couple centuries. And as a kid, I thought that this lichen might've been around when George Washington was



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alive. And in my head, this became the George Washington lichen. I would probably recognize it if I saw it. But it seems to only like a particular set of conditions that are not very common. I don't know how old any of these are, but they could potentially be decades old.

**BS:**

I'm curious to try lichen dyeing but you do have this ethical question of how to collect the specimens. I have found plenty of them on downed trees that will likely be firewood. So that's a better place to harvest it than from a rock like this.

**LM:**

Right. If you know that the log is going to be used for something else, you might as well take the lichens. I would certainly say if you see bits of lichen that have fallen off on the ground, that's OK too.

This plant here is called chicory. You can use the roots for coffee. And I actually was thinking of it when you mentioned the aster and goldenrod combination because that was one that always appealed to me as a color combination: chicory and day lilies. It is a kind of gray purple blue of one and that golden orange of the other.

**BS:**

A friend of mine who grew up near Syracuse told me how funny he finds it that day lilies are sold at the corner bodega as a precious commodity because for him day lilies are the flowers that grow free on the side of the road. I never thought of them like that before.

**LM:**

One thing I noticed about these woods is that they're relatively young. The trees are not terribly big. Another way you can kind of pick that out is you can see succession

at work. I don't know a ton about this. I'm not an ecologist by training, but cedars are usually a tree that comes in early. When you've got open ground that's being reforested, cedars come in. They like a lot of sunlight. And now that they're starting to be overshadowed by other trees that are come up around them and are casting shade on them, they're actually starting to die. They were kind of the pioneers in here and you can see they are now on their way out.

**BS:**

I've heard what you just said about the cedars from others but I also heard from Michael Asbill, who was the one who recommended I talk to you, his theory, which I think is very interesting. He has ash trees on his own property and they were attacked by the emerald ash borer. He thinks this beetle also took down the ash trees here. The ash roots are shallow and when the population was healthy, it took care of a lot of the standing water that was due to the clay soil. And then when they were gone, the cedars couldn't handle the flooding issue. And so then the cedars started to die off too. Who knows? Maybe it's a combination of being overshadowed and the water issue.

**LM:**

That's interesting. I'm not sure what the timing is on the arrival of the emerald ash bore. These cedars have actually been here quite a while. And it seems like I've only been hearing about the emerald ash bore relatively recently as being a major problem. We can look at the soil a little bit where some of these sculptures have come out and take a peek.

**BS:**

I took a little bit of clay from here. You can see my hole.

**LM:**

Perfect. Yes, it is very, very compacted and cloddy. This looks a lot darker in color than what I was seeing out there in the field. That is not very surprising because the forest has been here for a little while and this has more organic material. A lot of the soil around here does not drain very well. It tends to get really kind of compacted like this. And even on relatively high ground like this you get flooding because it doesn't drain well, particularly through the bedrock that's below it. And this is mostly clay that's also been lithified, crystallized into a rock, making it even harder to penetrate.

Soil is actually kind of at the forefront of a lot of interdisciplinary science that's going on in Earth science right now, which I can't say I'm personally part of, but it is falling under this heading of the critical zone. The idea being that soil is this place where you have a meeting of not only rocks and minerals, but also liquid, water, air, other gases, and living things. And they're all meeting in this really complex intimate interaction. It is not only scientifically fascinating, but it's also where our food comes from. It is critical in a lot of ways, critical to our survival. I like that terminology, the critical zone. It is a good example of what I was talking about before, the interpenetration of these different spheres and vertical integration.

We tend to think of the plants on top and rocks at the bottom and in between we have water, soil and air, but actually everything is integrated within the soil. The roots are extracting nutrition out of the soil and bringing that up to the surface and also bringing enormous amounts of water up to the surface and essentially evaporating it into the atmosphere. The trees are like giant pumps, like millions of little wells.

**BS:**

Returning back to our discussion about disciplines, it's been fascinating for me working with scientists to understand firsthand how there are plant scientists and rock scientists and soil scientists. This soil matrix you describe involves a lot of different experts coming together. But what I am finding is that because the elements are studied separately in different departments and in different labs, there are silos of information cut off from one another in awkward and even damaging ways.

**LM:**

It really does look like it's mostly clay and silt and not much sand in here, which is more or less what I had expected. But you do see a lot of big chunks of pebbles and even larger rocks that haven't broken down. And most of these nondescript little brown things, I'm guessing are pieces of limestone, because there's a lot of that around here. It would not have had to be brought very far by glaciers. You're going to be hard pressed to find fossils in it or really be able to drill down to exactly what it is and how old it is and where precisely it came from. But just based on the way it is weathering, that would be my guess as to what it is.

I should have brought an acid bottle with me. I could have done a fizz test to confirm. Did Steve do that with you? If you put diluted hydrochloric acid on limestone or dolostone rock, it'll actually react with the carbonate minerals and it will release CO<sub>2</sub> gas. So, it's a very quick way to figure out if you've got those very common minerals present in the field. You can just put a drop on your rock and it fizzes. Then you know what you've got. It's also kind of cool because you're basically thinking about these long cycles, kind of like the hydrologic cycle, it's part of the carbon cycle. You're releasing CO<sub>2</sub> out of this rock that was trapped maybe 400 or 350 million years ago when it was formed.



FROG ON A LILY PAD

The carbon was part of the air, you know, way back when we didn't even have creatures on land.

**BS:**

When Steve and I were talking about deep time, I asked him how to wrap your head around these kind of timescales. I think it's very hard with the climate crisis to wrap your head around what's going on, the sheer scale of it. Like what the heck is a 5.1 billion metric tons of CO<sub>2</sub>? These numbers are meaningless and we have to embody them to care or understand the effects of our actions. For these reasons, I am quite interested in how we can think in metaphors or plan exercises to help us better fathom those scales. Steve uses the calendar year with his students to help them grasp geologic or deep time. For instance, bacteria appears mid-March, the dinosaurs came in mid-December, and humans appear right before midnight on the last day of the year. As humans we have to realize how little time we have spent on this planet and this is just one planet in the universe. How many other universes are there?

**LM:**

I do a similar exercise with my students. I have them stretch out a tape measure actually, and make a spatial scale. We happen to have a 50-meter tape measure and

we've got about 4.5 billion years of earth history. That means one meter represents every hundred million years. You see how long the Precambrian is before we even really have a very continuous record, of rocks or events, let alone much evidence of life. And then we animals show up, complex animals, shortly before five and a half billion years ago. And that's only five meters out of our 45 meters stretch. And then you get down to the ice age in humans!

I have the students put tags along the tape measure, showing where some of these events are, and it's a good icebreaker thing for the first day. We get to know each other's names as well. And then somebody has the last tag, which is human history and the first cave paintings, at 50,000 years ago or something. And you know, that's less than half a millimeter. You barely even see it. So, they are trying to put the marker on this tiny sliver. And that includes everything from cave paintings through, you know, Kanye West.

Here is a frog pond. This frog kind of made me jump!

**BS:**

Here is another one on a lily pad.

**LM:**

These are leopard frogs, I think, but I'm not quite sure. It's interesting that they actually have to line this pond with plastic or it would drain through the soil. Despite the fact that we're relatively high up, you often do find natural ponds in this soil just because it's fairly impermeable, but this one isn't very deep. It wouldn't take much for it to disappear if you didn't have a liner.

If the drillers left well logs, you could really go deep and find out what's really under here. I mean, we have a general sense. It probably is a fairly thick package of this—soil

derived from glacial till, and then the bedrock is going to be that same shale that you see as you're climbing up the ridge to the cliffs. You know when you take that hairpin bend on Route 44, you see the shale. There's a nice wide place that you can pull over and look at that rock fairly easily.

And it's the same rock, basically all the way from there, out past Highland, through this whole side of the Hudson River. You may be able to notice actually in some of those outcrops that the rock is folded back on itself. It's not flat. The rocks that make up the cliff are close to horizontal. They're not perfectly flat either. If you were to be able to kind of follow it for a while, you'd see that it's crumpled. That same crumpled shale is under here. That shale is from the end of the Ordovician. And it was deposited as part of a big mountain building event called the Taconic Orogeny. Steve might've talked about this. You had a collision between the edge of North America and a chain of land masses off shore. Where they meet you get a big trench, just like there's a big trench off of the Andes today.

In that deep trench, all of this shale was accumulating, material was shed from that mountain building process. And then as the whole thing continued, it actually got crumpled and uplifted. And it went from being very deep in the ocean to exposed at the surface and eroded away to make a flatish surface on which the conglomerate was deposited.

The conglomerate is in the late Silurian, there is about a 30 or 40-million-year time gap between those two rocks. The surface, where they meet, is where the missing time is. That missing time represents when the rock was being crumpled and lifted up and eroded away. And that's another thing that I think is kind of cool about geology. A lot of what we're figuring out when we're telling the story has to

do with what the gaps are telling us-- what is not there and what we can infer from what is not there.

That shale is very, very impermeable. It is not an easy rock to extract water from. There may be some fractures through it, especially because it has been crumpled and deformed in that way. Whereas some of the groundwater flow is being concentrated and possibly a well could tap into that. I am kind of curious how deep the wells in this area tend to be. The water table itself can't be more than about a hundred feet down tops, but you might need to get quite a way below that before you actually hit an area where you have sufficient flow rate.

**BS:**

Is that the shale rock they are fracking in Pennsylvania?

**LM:**

Actually, it's a very similar shale but it's slightly younger. That was formed during the analogous phase of the next mountain building event. That's the Marcellus shale. And then there are equivalents of this shale that are found further in Western New York called the Utica shale that potentially could be targets for fracking as well. The gas companies won't tell you that if they want to get your land rights. They will say they want to drill for the Marcellus shale but if they get the mineral rights, then potentially they can go after both. There is a moratorium on it. That is indefinite. That could potentially be revisited. Although probably won't.

**BS:**

What are you finding your students are interested in? Why are they studying science?



**LM:**

Certainly, climate change is a big one. I don't have to work very hard to get them interested in that. One thing I also try to spend a bit of time talking about is pollution and its impact and human vulnerability to natural disasters along with the environmental racism aspects of that. If people don't already know about that, environmental justice tends to get them pretty energized.

And, look, here's a little imprint of a fossil in this rock. Actually, this rock has a whole lot of fossils in it, all these little round things. Those are internal molds of brachiopods. Brachiopods are still with us, but they're rather limited. They were a much, much more abundant marine invertebrate back in the Paleozoic when these rocks would have been forming. And this is definitely a limestone and it's probably the new Scotland formation. And you can see some of that up near Rosendale and Kingston. So, it probably hasn't come very far.

This is a really, really big brachiopod. It's flatter and looks more like a clam as opposed to some of these rounder guys. They lived in shallow warm ocean settings. This was kind of a tropical tidal, flat reef lagoon type of environment. It was formed in between those two mountain building events that I talked about.

**BS:**

This fossil and rock are from then?

**LM:**

Yes, this rock. If you come in here, you can see these little patterns with bumps and depressions. They radiate outward. Now I've not touched it and because of COVID, you probably don't want to stick your face down there and look at it. But this impression is of an extinct kind of coral.

That's kind of neat. This rock is just chock full of fossils that might even be in the order nautilus. I'm not positive because we're only seeing part of it. It could just be another big brachiopod. Not precisely nautilus but nautiloid; the two are related. They had a kind of a long conical shell. They were squid-like creature with tentacles living in a chamber.

**BS:**

When you say ocean, it means that the ocean was this far west?

**LM:**

Yes, because at this point in time, shortly before the mountain building event that added the land that became the Berkshire, the Taconic Mountains, Massachusetts and all that, this was the edge, close to the edge of the continent. This land was forming and the sea level was higher. It was very warm. This is early Devonian about 350 million years ago.

**BS:**

My God. Yeah! I am touching deep time!

**LM:**

It's kind of crazy, right? You can look at a rock and you see there was an ocean here. And it was warm and tropical. And if you were really good with your fossils, you'd be able to identify some of these and get a little more precise, although this is pretty weathered. And all of these rocks right here look really nicely rounded and I suspect they spent some time churning around in the bottom of the glacier, bumping into each other.

Also, this is kind of wonderful to see succession at work. You can see the difference between the areas they're continuing to mow and the areas that have been mowed but not recently and are turning into a wildflower meadow. And

then at the edge of the field where these trees are coming up are areas that are not mowed.

**BS:**

What you are doing, reading the landscape like an archive, is something I am learning. It's not about appreciating the beauty or the potential of something but reading.

**LM:**

Geologists like to talk about layers of rock being like pages in a book because they literally are often stacked just like that. And you can flip through the pages as you go down into the earth. And you're going further back in time. Some pages have fossils on them.

This I think is a kind of milkweed. It's a very different pod. It's not as fat as the milkweeds that we associate with the monarch butterflies. And there's some of that around here too.

I've seen so many more monarchs this year than last year, which is reassuring because I was getting pretty worried about them last year. And I probably still should be. And I love this sculpture that's using the base of this glacial erratic, more of that conglomerate. It's number 13. And I wonder how long it's been here because the lichen and has certainly colonized the rock that was added on the top.

It's heating up more here in the meadow than in the woods. And that contributes to an interesting phenomenon where you get these rising air currents, where the land is heated unevenly. And then you get places where you basically get these updrafts. I just saw a vulture a minute ago, and it's gone already. They love riding these thermals up and you see that a lot out here in this valley. They kind of travel along the ridge. That's also one way that the ridge serves as a good corridor for migrating hawks and other

birds.

**BS:**

So here are some of the marble sculptures.

**LM:**

This is a rock that would have started out being not dissimilar from the one we looked at with the fossils in it. It would have been a form of limestone, probably one that's pretty much pure calcite. And if you think about where limestone forms, it usually formed in a sort of warm tropical ocean where you would get large amounts of it. It can also form in caves as dripstones or hot springs, but most of it is formed in the shallow ocean. And sometimes you get sand and mud getting mixed in with that. And so that will give it some color and some impurities. And then it turns into a marble, basically it gets compressed and heated buried under layers of other rock and it re-crystallizes. The calcite, which is the main mineral in the marble, will just kind of rearrange itself and make new crystals. It won't actually melt and turn into magma and then form back again. But it re-crystallizes. You tend to lose a lot of the layering or the fossils of the original texture. You get this very uniform and sugary type of texture and it's lovely to touch. And because it's uniform and symmetrical in all directions, because the calcite is a very soft mineral, it's perfect for carving. And it is pretty.

This is cool how the artist has actually used the way that rock naturally splits as a feature. These surfaces have been polished. Somebody basically took sandpaper and made it gleam. And here they've just left it, probably allowed the rock to fracture, maybe from where this block was quarried. And these would have been the holes from the quarrying process. This is very characteristic the way that the natural rock surface is often split with this sort of fan-like structure. And this is sometimes called rooster

tail fractures for obvious reasons. Another aspect of rocks is the mechanics of them. That includes what makes them strong or brittle, how do they break or bend or deform.

Oh, I found another interesting rock. This was obviously left by the glacier because it's not from anywhere around here. You can sort of see this almost tiger stripe pattern to it. If you were to look at it close up, it would have a crystal texture, like marble. But these crystals, rather than having a very uniform pattern and in three dimensions, look like a layering. There are flat crystals that are kind of stacked on top of each other and it's giving a planar fabric to the rock. This is a metamorphic rock, like the marble, and this would have started out as some kind of a shale or claystone or maybe granite. It's a little hard to tell. We have a lot of weathering here on the surface, but when you have these plate-like minerals that are lined up like that, that tells you that the rock was formed by being compressed and squeezed. It was being heated, causing the recrystallization to happen. Probably the closest place up the glacier that we can find things like that would be in the Adirondacks. This probably traveled quite a long way. The other stuff here, I think, hasn't come very far.

It's relatively flat up here, but there is kind of a ridge, a very subtle hill that extends more or less along that property line. And that's actually a drainage divide. What that means is that water on that side of it is going to flow more or less towards the Wallkill River. And on the other side, it's going to have to take a little bit more of a circuitous route because it's flowing this way. And it will make its way ultimately into the Kleine Kill and into the Roundout Creek, just shy of where the Rail Trail crosses on the trestle in Rosendale. That makes this an interesting little dividing point, where the water will go in one of two directions. It's pretty subtle, but if you look at a topographic map, it'll show up. I was curious about it and when I went home I did

access terrain view on Google maps.

One last thing when you're talking about the soil, the presence of limestone pebbles and clay can be really helpful to buffer acid rain, which is still a thing. It's not nearly as big a thing as it used to be because the Clean Air Act has made a huge difference.

Some of these clays—and especially the limestone—actually break down in the presence of the acid. And as they do that, they will absorb the acid. So that is what is called buffering. And that maybe something you've heard of as well. Acid rain is still part of the story, even though we don't tend to talk about it quite as much.

The weather and wind patterns also are part of the story. You may have noticed on the map, there used to be a little airfield here. If you look at a satellite view in Google Earth, you'll see Airport Road and you'll actually still be able to make out the strip just south of here in that meadow.. And the airstrip, as they all are, had to be oriented with the prevailing wind direction for stability reasons. Planes need to take off and land into the wind. If you have a big airport and you have a couple of different wind directions, you might actually have several sets of runways. But here they just have one, because it's a tiny airport. You can infer that the wind direction is almost perpendicular to the ridge. And it is also not surprising—that is the wind direction you would expect in the mid-latitudes.

And you've probably noticed on the weather map that most of the time our weather is coming from the west or maybe from the northwest. And that's exactly what the orientation of this airstrip is confirming. I've started teaching this weather class that I inherited from my colleague who retired and I didn't really know much of anything about the weather before I had to start teaching this class. Now I've

started to notice some more weather-related things. It is fun to read the weather in our built environment.

*This conversation took place at Unison on July 27, 2020.*

Connor Stedman

**BS:**

To start, would you briefly explain your work to me?

**CS:**

Sure. I'll do my best. Broadly speaking, I'm working on questions of human survival into the deep future on the planet given climate change. And within that arena, more specifically, I work on agriculture and food systems. What does a deeply climate-informed agricultural system look like? A lot of the work I do to these ends is through working with individual farm businesses to evolve how they're doing production and think about land use. But I also work in the field of environmental markets and climate policy. I have another side to my work which is as an educator that is very focused on place and the work of encountering where we are and the implications of who we are. That is a through-line that runs across all my work. I'm also a Ph.D. student right now at the University of Vermont in an experimental program for transdisciplinary leadership. I'm getting to explore the intersection between a number of these things from a

practice perspective. So that is a bit of a snapshot.

**BS:**

That is fascinating. I've never heard of a program like that and it's awesome that one exists. I noticed online when I was doing research that you have the title of wilderness educator. Can you explain what that means?

**CS:**

I think it is in some ways an artifact because I actually like to engage with people around what we mean and imagine by wilderness and what is the backstory of that idea. It's actually a very troubled backstory. That's not the way that I actually think of land or practice with the land. But I work with people to understand how we become intimate with place, the place where we find ourselves. And, sometimes that is very practical, like how do we maintain our body's homeostasis when it's raining at night when we're outdoors? How do we live outdoors with success and comfort and in relationship to the beings around us? That can sometimes look like survival skills, but there's a deeper thing there about the question of what does it mean to be where we are. There is an overarching idea there that the modern world—basically through colonialism and our economic system—got superimposed over something else. And that something else is still here with this superimposition on top of it. We can see this when we step away from some of the aspects of the modern world. There are religious practices that do this routinely, like in the Jewish tradition there is Sukkot that just wrapped up. People actually live outdoors for a week ritually. It is making a deliberate return to being in closer contact with the pre-modern world.

**BS:**

That's really interesting. When I met with Katie at Unison, she mentioned your name when we were talking about

the cedar trees. One of the first conversations I had about this site was with an artist, Michael Asbill, even before I set foot on the sculpture park. He was telling me about the ash trees and the clay soil. His theory is that the dying off of the ash due to the invasion of the emerald ash borer led to the demise of the cedars too. The site has heavy clay and compacted soil, and the ash roots, which are not very deep, were able to absorb a lot of that water sitting on the surface. But then as the ash died off it was like a domino effect. The cedars started to drown because there was so much water and they couldn't cope with that. This is Michael's theory and his sense of what is happening to the park that he has been working in for a couple of years now.

His property is not far away and has seen the ash population die-off. When I retold the story to Katie, and I have retold this story now to all the people I have subsequently met in researching this project, she mentioned you and how she has learned that cedars are an indication of a young forest— these are the first trees that will populate agricultural lands or fields that have been left alone. This is an early stage of succession. I am less concerned with who is right. Maybe both are right in different ways. But I'm interested in these stories that we tell through our experience of place and being in a place.

**CS:**

I'm interested in the stories too, but what's really interesting to me is the fact that there actually is a living system that is totally independent of the stories we're telling! Regardless of our poetics, there are these hugely complex living systems and interactions going on that are not about people. They might be influenced by people, they might be affected by people like through the introduction of the ash borer and climate change and all the land disturbances that have happened. But there's this kind of encounter with the nonhuman that I really want to invite people to



keep coming back to. We often believe that the way that we imagine the world is central. If you look at the longer scope of time, we're really very recent and uninvited guests here. I find that valuable in this process—that kind of humbling ourselves and recognition that there is much we still don't understand well.

**BS:**

These stories probably tell more about us than the ecosystem and the world we live in.

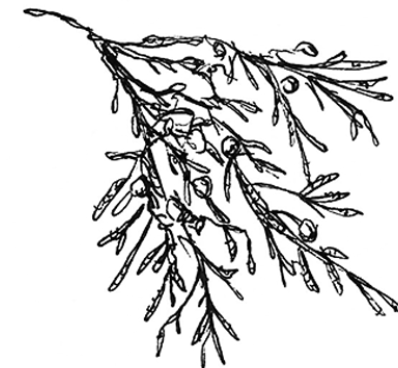
**CS:**

Sometimes, yes! One thing I like to do is present this idea of landscape forensics. In forensics at a crime scene, you try to piece together what happened from the available evidence. You can do the same with land history, just like crime scene investigators. They have a whole body of context that informs how they interpret what they're seeing. There is a lot of context that has to inform the way we're tracking a landscape back in time. A big part of that context is the people of a place and what was driving their lives and decisions. How was it shaped?

The backstory of the Catskills and the lower Hudson Valley



is that it was a commodity export farming region for an international market during the first half of the 19th century. Just like we think today about palm oil plantations and the destruction of the orangutans' habitat or sugar cane plantations that employed slavery or all these really extractive forms of farming and land use elsewhere in the world that was happening here between around 1810 and 1870 in Merino wool. We think of sheep as very benign animals. Well, they are in a lot of ways, but the overstocking, overgrazing, and permanent pastoring that was used during that era was almost a monoculture of Merino wool production in a lot of these neighborhoods and towns. Essentially all of the stone walls that you see in the forest in this area come from that period of time. They were sheep enclosures.



And there was not only a huge loss of habitat, a huge loss of living communities from the conversion of so much land to pasture, but there also was a huge loss of topsoil from erosion because of the overstocking of those animals. It was a really significant land degradation event that played out over about a half-century. This is not true of the Shawangunks; they have a different history. But the Wallkill Valley and much of the Catskills at lower elevations and the lands along the Hudson River are now post-disturbance forest after that period of resource extraction.

And, so, the presence of the junipers stems from that time because the junipers were being dispersed by birds through their droppings with berries they ate. That was one of the plants that would establish into the disturbed soils in those overgrazed pastures. And then, because their young stems are really spiny, they would resist being browsed or eaten by the sheep as they grew. You would get juniper woodlands growing up on these really beat up pastures and it would contribute to the pasture being less and less usable for grazing. So that is a little bit of backstory on the presence of those trees in the landscape.

**BS:**

You call them junipers. Cedar is more a generalist or common name and juniper is more accurate?

**CS:**

Their scientific name is *Juniperus virginiana*. And the reason I call them juniper is because they are very different trees than say the Northern white cedar or the Atlantic white cedar. They're actually much more similar to the Western Rocky Mountain juniper than they are to the other sort of Northeastern cedars. I like to keep that straight in my mind.

**BS:**

A lot of what I've been doing at Unison and thinking about as an artist is how to read a landscape and how to think of a landscape as an archive rather than thinking of it as a place to freeze for representation because of its beauty or a site for some sort of action or development or simply as a resource to extract and remove. These are some of the default ways humans think about place or land. Reading a landscape is what you do as a profession, so for someone like me who wants to learn, do you have any recommendations?

**CS:**

I think a place to start is getting really curious about where we are and remembering. I think one of the challenges we have is that a lot of so-called place-based education is very focused on the current-day experience. It is focused on the sense of the place—like the way the seasons are unique experiences of a place right now. But this moment is such a small snapshot in time. And a lot of these places have significant histories of displacement and diaspora among people. The people who are here sometimes are here because of the displacement of other people or they are here in diaspora from other places.

Also, sometimes in place-based education, we can become very focused on where we are and not on what we are surrounded by. The systems of living things, including humans, and geology or the non-living things are constantly interacting. Everything is influenced by its surroundings. So, getting curious about where we are, and also what surrounds us, and how we're affected by what's around us and also about the backstory and who is not visible here right now. All of this is a major part of the story.

What is invisible is definitely significant in the Hudson Valley with so much displacement and diasporic waves of people coming here from other places. How did native people respond to colonization, for example, and how did the enslaved African people respond to slavery? There has been a lot of movement of people both by choice and sometimes not by choice. That to me is a big part of reading the landscape. We need to cultivate a lot of curiosity about these stories and remember that we're not seeing the full picture when we look around right now in the present day.

**BS:**

Like with your forensics example, there is an analytical

side of the brain that is required to do this work. But also, what you're talking about requires us to exercise our imaginations. To envision that which is no longer visible, but nonetheless had a great impact and is part of the story, stretches us to see a world that does not immediately present itself. I walked through Unison with two geologists and this idea of the expanse of time also takes imagination to wrap your mind around. I can think in like a hundred-year timeframe since I'm approaching 50, that is not too hard, but once you start talking about millennia or millions and billions of years, that's really difficult.

**CS:**

To really be in a relationship with the full story of the so-called Hudson Valley, we have to stretch to that timeframe because the Hudson Highlands, which are south of the Wallkill Valley, are made of rock material created between 700 million and a billion years ago. Yet the mountain range itself is not that old. It has gone through a lot of different changes, being subsumed and re-uplifted and changed and altered during that time. I agree about having to stretch our imagination. The conversation we need is between our imagination and our analytical brain.

**BS:**

Yeah. That's well said. I'm really aware of this divide between the rural and the urban and it is essential to bridge that right now considering the deep divisions in our country. What are the ways you're doing that in your own practice?

**CS:**

That's an enormous question. One place to start with that question is the fact that for at least 350 years the Hudson Valley has essentially been an economic colony of New York City. Everything that happens economically in the Hudson Valley is in an intensely locked relationship with New York

City, and New York City is obviously a globally significant crossroad of goods, money, people, and the interactions between all those things. I think in a lot of ways you can't really talk about the Hudson Valley without talking about NYC. So then there's the question of what can the relationship be between a city and its foodshed, between a city and its watershed, between a city and what surrounds it. And that to me is a much longer and deeper conversation and has a lot of interesting precedent for around the world. There are some things we've never tried in the U.S. because resource extraction has been the only focus. Go back further in time to urban communities in Europe and Asia and Africa and see what their relationships have been to their surrounding lands, that is interesting to me. We can learn from that.

**BS:**

Yeah. Maybe that's the premise for my next project! Usually, one project rolls out of another. You're not aware of how many ways you've touched on my previous conversations at Unison. This really ties in nicely. Thank you.

*This conversation took place on the phone on October 16, 2020.*



## biographies

### Michael Asbill

weaves arts advocacy, community engagement, environmentalism, and curatorial endeavor into his installation and public art practice. His work has been experienced in venues such as Sporobole and Galerie Zybdone (Sherbrooke, QC), Flux Factory (Long Island City, NY). As a core collaborator with Habitat for Artists, Michael contributed to eco and social engagement projects for Smack Mellon (Brooklyn, NY), Arts Brookfield (New York, NY), Washington DC's Commission on the Arts and Humanities, and the Corcoran Museum (Washington, DC). He has received numerous grants, awards, commissions, and honors. Michael is the founder and director of CHRCH Project Space (Rosendale, NY), a residency for the development of pioneering, community-based, participatory artworks. Michael is a visiting lecturer in the sculpture program at the State University of New York in New Paltz.

### Tal Beery

is an artist, activist, and educator from New York City. He is co-founder and co-director of Arts and Ecology, a multidisciplinary institute committed to research, art, and education on radical environmental themes. Beery's personal and collaborative works have been exhibited in museums and galleries in the United States, Poland, and Germany. As a core member of Occupy Museums and a founding member of Debtfair, he has helped organize large-scale and more intimate interventions to call out economic and social injustices propagated by institutions of art and culture. He currently serves as core faculty at School of Apocalypse, a radical learning community that examines the connections between creative expansion and notions

of survival. Beery's written work and interviews on art and social change have been published in numerous publications including Spike Art, Temporary Art Review, and Revolt.

### Stuart Bigly

is an artist based in New York's beautiful Hudson Valley. He has been making and showing his artwork for over 40 years. During this time he also co-founded and ran the Unison Arts Center in New Paltz, NY. His artwork includes paintings, drawings and photographs.

### Salvatore Engel-Dimauro

is Professor at the Geography Department of SUNY New Paltz. Research interests include critical physical geography, gender and environment, socialist histories and movements, soil degradation, urban soils, and trace element contamination. He is chief editor for the journal *Capitalism Nature Socialism*.

### Katie Grove

is a Hudson Valley artist who is driven by the desire to observe nature closely and share what she discovers. Her mixed-media sculptures, drawings, and etchings highlight the unseen and intricate details of the natural world. From meticulous drawings of the hundreds of pieces in a bird's nest, to woven sculptures, which ask the viewer to look closer, her work has a strong sense of exploration and storytelling. She takes the perspective of a naturalist and an artist, creating pieces that aim to be both scientifically accurate and imaginative. Katie has a BFA in Printmaking from SUNY New Paltz. She exhibits her artwork regionally and teaches workshops on art techniques using natural materials, including basketry and plant dyes.

### Amanda Heidel

is an artist living in Kingston, NY who works with fungi, plants, and animal fibers to make food, sculptures, textiles,

events, and community projects. Her work examines the mushroom lifecycle as a model for community engagement and collaborative structures. She is currently sowing a textile garden at Women's Studio Workshop and nurturing a vibrant community project, *Mushroom Shed*, in New Paltz, NY.

#### **Nance Klehm**

has been an ecological systems designer, consultant, and agroecological grower for more than three decades. Her approach is centered on instigating change by activating already existent communities, and her work demonstrates her lifelong commitment to redefining the way human populations coexist with plant, animal and fungal systems on this planet. Nance is internationally respected for her work on land politics and soil health. Her work has received extensive national and international media coverage and has been mentioned in over 30 books. She is the author of *The Soil Keepers: Interviews with practitioners on the ground beneath our feet* (2019) and *The Ground Rules: a manual to reconnect soil and soul* (2016). She currently splits her time between Little Village, a densely packed, diverse urban neighborhood in Chicago, and fifty acres in the Driftless Region, where she cultivates and forages medicinal and edible plants, keeps bees and a fruit orchard, raises native quail, and grows for a seed bank.

#### **Rachel Meirs**

is a musician and artist based in Brooklyn, New York.

#### **Laurel Mutti**

is an enthusiastic educator committed to hands-on learning and a broadly trained geologist with diverse interdisciplinary interests and extensive field experience. She loves her work at SUNY New Paltz, where she is an adjunct to the Geology department (and recently Physics). She is a trustee at the Century House Historical Society in Rosendale,

NY. Her other areas of serious exploration include sustainable agriculture, folk music, ecology, and languages.

#### **Peter Pitzele**

resides in New Paltz, NY, and was a co-founder of the Friends of the Mountain School that preceded Unison in the early 1970s. He speaks for the field hearth. He curated a place at Unison for the contemplation of fire, the solitary and communal conversations and stories of those for whom some time outdoors in the presence of a natural fire holds appeal.

#### **Steven Schimrich**

is the author of *Geology of the Hudson Valley: A Billion Years of History* and a professor of geology and Earth sciences at SUNY Ulster County Community College in Stone Ridge, New York.

#### **Brooke Singer**

engages technoscience as an artist, educator, nonspecialist and collaborator. Her work lives on and off line in the form of websites, workshops, photographs, maps, installations, public art and performances that often involves participation in pursuit of social change. She is Associate Professor of New Media at Purchase College, State University of New York, a former fellow at Eyebeam Art + Technology Center (2010-11), co-founder of the art, technology and activist group Preemptive Media (2002-2008) and co-founder of La Casita Verde (2013-). She is in the collections of the Whitney Museum of American Art, Microsoft and Melva Bucksbaum and Raymond Learsy.

#### **Connor Stedman**

is an ecological design, farm business planner, and climate change educator based between the Connecticut and Hudson river valleys. Connor has spent over a decade supporting businesses and communities to implement



industry-leading carbon farming and climate adaptation systems, and to reimagine how they can affect and be guided by land and place. He is lead faculty at the Omega Institute for Sustainable Living and a professional affiliate instructor with the University of Vermont's Leadership for Sustainability graduate program.



