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POSTINDUSTRIAL PLAYBOOK ++

MAXWELL FERTIK

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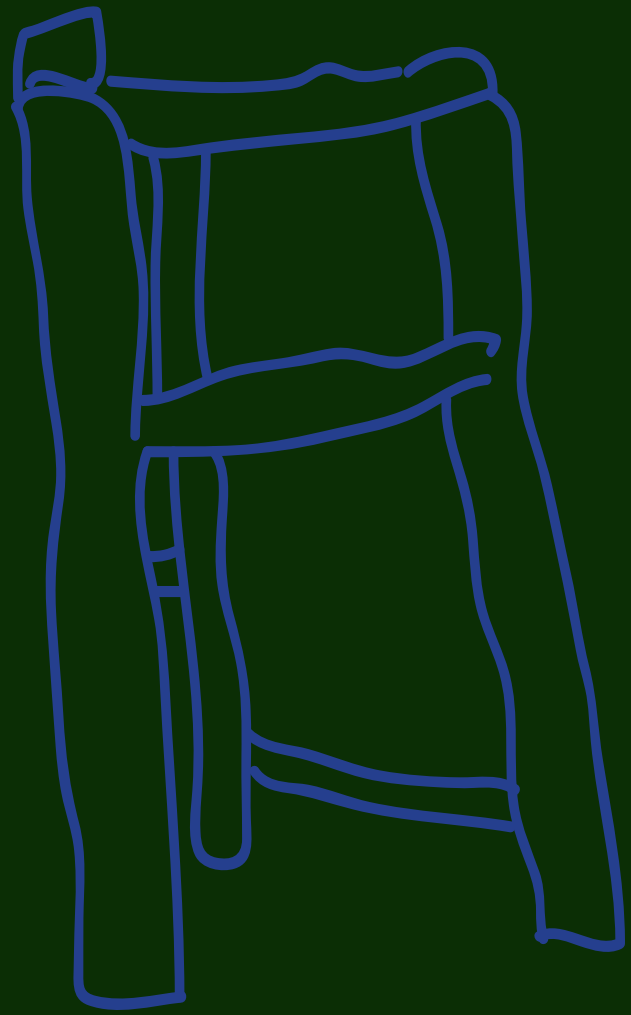


MAXWELL FERTIK

Postindustrial Playbook ++

A thesis presented in partial fulfillment of the requirements for the degree Masters of Industrial Design in the Department of Industrial Design of the Rhode Island School of Design, Providence, Rhode Island

by Maxwell Fertik, 2023

Approved by Master's Examination Committee:

_____

Paolo Cardini, Professor, Industrial Design, Thesis Chair

_____

Benjamin Jurgensen, Critic, Sculpture, Thesis Advisor

_____

Charlotte McCurdy, Assistant Professor, ASU, Industrial Design, Thesis Advisor

++THIS BOOK

This book and exhibition are documentation of a thesis consisting of a series of objects and design research on the relationship of industry and ecosystem. This project is designed to promote the use of abundant over extractive resources and visualize a post-industrial reality. In many ways it is a playbook++. Laying out possible strategies or “plays” for making do with what exists around us in a period of collapse. Itadori, a plant that grows in the most degraded landscapes, commonly known as Japanese knotweed, is the central case study for this project.

At its roots, within the context of the contemporary wasteland of industrial pollution, it addresses the question of *what is invasive vs. native* and *what is design for the end of the world*. It also grapples with and questions the xenophobic and militarized language used around invasive and non-native species. Building examples of this model will allow for a shift toward resilience and resourcefulness within the post-industrial future.

This book does not pretend to be a solution. It is rather a highly contextual provocation to reframe our relationship to the environment. This book will take you down a path from the torrid beginnings of this project, everything from abandoned textiles mills, 1990s psychogeography to the Indeterminacy scores of John Cage. It will spread rapidly much like an invasive rhizome but every so often return to center. At the core of this thesis is degraded landscapes and the ways nature and our minds have mutated accordingly. This book is not just about Knotweed but it will be the window through which we discuss the entanglements of industry and ecology. So be patient, be calm, don’t be afraid to touch the soil...


This ++ symbol that appears
throughout is a representation of
addition and abundance.

TABLE OF CONTENTS

0 INTRODUCTION

05 THIS BOOK
11 ABSTRACT
12 FORWARD
16 INFLUENCES

1 HISTORY

20 KNOTWEED TIMELINE
24 INDUSTRIAL HISTORY

2 WRITINGS

38 ON INDETERMINACY/PRECARITY
42 VIGNETTES
54 ON ABUNDANCE
56 ON EXTRACTION

3 DESIGN

60 STRUCTURES OF REPAIR
68 TABLE
70 SILVERWARE
78 BUNDLES/RAFT

4 ENGAGEMENT

88 MAINE
92 FIELD DAY
100 AFTERWORD

5 IN CONVERSATION

106 MINDY SEU
110 MATTHEW BATTLES
120 LORÉN SPEARS

6 THE EXHIBITION

136 DOCUMENTATION

7 PRECEDENTS CATALOG

152 MAP
154 CATALOG

8 BACK MATTER

170 COLLABORATORS
173 ACKNOWLEDGMENTS
175 FIGURE CITATIONS
179 ANNOTATED BIBLIOGRAPHY

Fig 00.

++ABSTRACT

There is no such thing as an undisrupted ecosystem. Every inch of the planet is impacted by human development and our legacy is in the genetics of the soil and water. The Blackstone River Valley is one such venue for hundreds of years of industrial development and equally, a long history of dumping industrial dyes and chemicals into the rivers and ponds. Today, these once swimmable and drinkable bodies of water exist as disrupted, post-industrial landscapes in need of healing.

Japanese knotweed (Reynoutria japonica)(虎杖), sent to the West as a product of 1800s Orientalist fascination, is an invasive species that thrives in these spaces. Reproduced by rhizomatic cloning, it rapidly takes over polluted/disrupted ecosystems in all but 5 states in the US. It is resilient to almost all methods of extermination and often grows back stronger long after its removal. But despite its invasive tendencies, this plant has potential to be manipulated into something as strong as wood and as malleable as clay. This project seeks to harness this resilience rather than eradicate it by first breaking down the plant to its tough, wood-like essence, then combining it with a plant- based binder to form structures out of the resulting pulp. The completed structure and physical output is a floating island of native wetland plants that absorbs toxins from pond water. The floating platform, made from knotweed stems and filled with its pulp, both functions as a low- tech bioremediation tool and a use for an unruly perennial. But this product is only one part of an ongoing inquiry and is not aimed at simply being a solution but rather engaging design citizens to take this degradation into their own hands. By combining a critical design practice with localized material ways of knowing, this project asks the question, *how might disrupted ecosystems and the question of invasive vs native inform more reparative futures?* Through the lens of Japanese knotweed (Reynoutria japonica) (虎杖), a plant native to East Asia and critically overpopulated in several western nations, this project investigates how this resilience and abundance can be harnessed to craft a more habitable present and future.

FORWARD

This thesis is about abundance and belonging as investigated through invasive species.

Environmental degradation is a threat to American security and a space rife with xenophobia and militaristic language. Hundreds of years of pollution have caused large swaths of invasive species to take over, impossible to manage without the use of more chemical warfare. Japanese knotweed (Reynoutria japonica) (虎杖), sent to the West as a product of 1800s Orientalist fascination, is an invasive species that thrives in disrupted landscapes, now critically overpopulated in several western nations.
This project investigates the xenophobia embedded in our language around plants and how their material abundance can be harnessed to craft more habitable futures.

American Capitalism is built on the assumption that industry can grow infinitely. It thrives on underpaid labor and infinite resources that the Earth was once assumed to provide. Knotweed grows in the same way. Without predators, it can grow endlessly with no competition by shading out any other plants with its massive heart-shaped leaves. It only needs only the tiniest of pieces to replicate, eroding the already weak soil as it goes. But eventually the soil will erode and collapse the parking lot or commercial riverbank. In the same way, the capitalist model will eventually cave in on itself once the speculation it is built on can no longer withstand the growth. This project seeks to subvert this model of growth and imagines a utopia where abundance is utilized without abusing it to build a community that respects natural abundance?

This project consists of a comprehensive series of design experiments that envision this abundant perennial as the central resource of the future. As food, as medicine, as structure too. In the words of Banu Subramaniam, “the point is not only the xenophobia that permeates the terms of invasion biology, as some have argued, but also the way natives and aliens are presented as a biologically and ecologically useful binary.” By focusing deeply on the timeline and movement of one particular species, this project speaks to larger questions of consumption, nativism and resource scarcity in America.

In critique of traditional art and design, this project focuses on using alternative value systems, using the abundant “weeds” around us instead of buying exorbitant amounts of new materials. It does this by manipulating this plant in three ways: powder, pulp and bundle.

But this project seeks to move beyond material studies or biomaterial experiments. The goal is to inject these materials with localized cultural meaning and the anxieties around nation, home and belonging. To be more specific, the first piece is a *floating island made of knotweed bundles* using ratchet straps to bind them together. These tightly bound bundles, making reference to the etymology of symbol for fascism (the symbol for fascism is a bundle with an ax), are the basic element to most of the structures and become a symbol of resilience through basic intervention. Over time, the island will be populated with wetland plants to bioremediate the polluted ponds that made way for the invasives. With use and engagement, this symbol slowly begins to embody a feeling of belonging and alters the way one views the material at hand. *Silverware from knotweed powder* subverts the destructive legacy of Gorham Silver. *A side table from knotweed pulp* subverts abundance to provide function.

Effectively, this project seeks to engage non- artist community members as much as possible. The three groups that it is primarily aimed at are radical community gardening initiatives, invasive plant biologists and hazardous waste specialists. After attending the Annual Maine Invasive Species Meeting (MISM), it became clear that these people were most invested in the project and post-industrial ecologies at large. The project also engages the local Providence, Central Falls, Pawtucket community in cooperative field days in sites of industrial degradation. These allow for community participation in the active work of repair, specifically with harvesting invasive knotweed in the area.

Ultimately, this thesis’ contribution to industrial design is to foster stewardship of the earth and reconsider a radical love for the most unsightly “weeds” of the environment, engaging value systems outside of the traditional market. The work exists as an interactive suite of organic agents, combining familiar industrial and organic symbols. In order to do this, the objects are almost entirely made of invasive species and low tech methods of processing. This thesis involves and will continue to involve the Providence, Central Falls, Pawtucket community to help harvest the plants and through workshops, the local community members will learn how to process the material as well, building the collective narrative.

But let’s begin at the end.

“Silverware” made from invasive plants, a raft that cleans polluted waters and a table that holds the power of a thousand plants.

All of these are highly contextual objects made to criticize land exploitation and promote the use of abundant resources over extractive ones. The project also uses easily available materials to keep the design simple. These three objects respond to the ways industry and ecology of Rhode Island have coalesced and led to mutations in the soil.

But at the center of this project is the notion of invasive vs. native and the question of xenophobic and militarized language around them. Namely, the use of nationalized terminology like “Japanese” or “African” in combination with words like “alien,” “exotic” and “eradicate” show signs of nativism in ecology that makes environmentalists biased against non-native species. The language used around non-native plants reveals underlying xenophobia and develops into ideas of who belongs where and why.
There’s also the question of queer ecology within these rhizomatic species. In its asexual reproduction in toxic soil, sprouting with dominance and growing through concrete have obvious feelings of sexual energy. An essay within the Elvia Wilk book, *Death by Landscape* called *This compost* which posited that compost, made of feces and other waste, was full of rich life that entangled themselves inside and around one another and created a substrate, a bed, for life to emerge. Knotweed and its toxic soil embody this through its survival amid collapse and ability to adapt to the most postindustrial spaces because it is native to rocky, volcanic regions of Japan.

The book begins by looking back on intersecting histories: that of industrial Providence and that of Knotweed arriving in the US. After visiting the former sites of some of the biggest factories of the 20th century, what was striking about these places was how their environment had changed/ adapted since the industries left them. The only remnants of these industries is polluted soil. Design for the End of the World is a hopeful thing, not a bleak ending. How can endings yield new growth? How can the rotting tree become fuel for the mushroom patch? How can the toxic soil act as “free lunch” for invasive knotweed? How will these environments be used in the future when we no longer have enough resources to go around? Who is the real invasive species; is it people? We are biomass, fat and form afterall. We are also responsible for displacing and abandoning these species.

How might we consider an alternative design model that favors abundance over extraction?

How might we address industrial effects on the environment promote respect for things and land?

How might we acknowledge human entanglement with ecosystems and their degradation?

INFLUENCES

CRITICAL DESIGN

++

NATURECULTURE

++

SECURITY

++

INDUSTRIAL WASTE

++

INVASIVE SPECIES

++

SECURITY

++

BELONGING

++

ABUNDANCE

++

FLUXUS

++

LINKS

++

RESOURCES

++

QUEER ECOLOGY

++

SURVIVAL

++

DEGRADATION

++

WASTELANDS

++

SCULPTURE

++

LANDSCAPE ECOLOGY

++

MASS MANUFACTURING

++

CULTURAL ANTHROPOLOGY

++

1

HISTORY

TIMELINE OF KNOTWEED IN THE WEST

1771

Named Reynoutria japonica by Houttuyn (1777), presumably from dried material brought back from Japan by Thunberg

1825

Introduced to soil in Britain by the Horticultural Society of London

1847

Brought to Britain by Philippe Von Siebold from a Volcano in Japan. Awarded a gold medal in 1847 by the Society of Agriculture & Horticulture at Utrecht for the most interesting new omamental plant of the year

1849

First illustration of Knotweed in the West

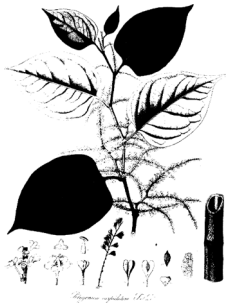


Fig 1.

Fig 0.

1850

A specimen from this plant was donated by Philippe Von Siebold to the Royal Botanic Gardens, Kew

1854

Earliest record of a British nursery offering Japanese Knotweed for sale

1855

F. SACHALINENSIS brought from Sakhalin to St. Petersberg, Russia

William Robinson (1838-1935) one of the most influential of the late Victorian gardeners, who advocated replacing the regimented "carpet-bedding" by a more informal "lay-out" and a more natural setting enhanced by the "new" exotic species then becoming available. His writings and articles about big hardy exotic plants influenced many including Henry Cook

The English Flower Garden (1898) one of Robinsons books that states "there is no better plant for semi-wild places"

Gertrude Jekyll (1843-1932) wrote "A Gardener's Testament" envisaging a woodland-walk flanked by groups of "plants of rather large stature ... bamboos and the great Knotweeds of Japan" recommending use in her English garden plans

1873

Sent by Thomas Hogg to his brother's nursery in New York City and produced "an abundance of rose-colored fruits."

1876

FAILOPIA x BOHEMICA the name given to hybrids between two types documented in Britain

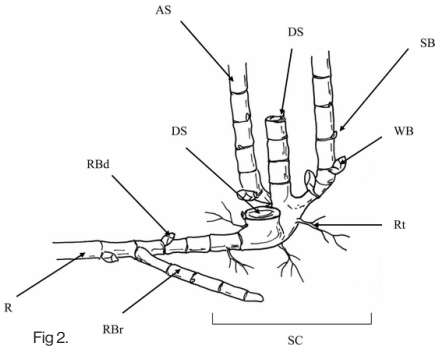


Fig 2.

"Such errors are perhaps inevitable during a period of rapid expansion of the exotic taxa available to gardeners. Difficulties of identification of naturalised alien taxa are to be expected, as there is inevitably a time lag between naturalisa- tion and the incorporation of adequate accounts in the local Floras. Even up to the first edition of Clapham et al. (1952), P. polystachyum and F. sachalinensis were not readily separable."

1901

Tomitaro Makino, considered The Father of Japanese Botany, realizes that Reynoutria japonica of Houttuyn and Polygonum cuspidatum of Siebold and Zuccarini were one and the same; on these grounds he made the new combination Polygonum reynoutria

1904

"Polygonum 'cooki' - new mammoth species, introduced by Surgeon-General Henry Cook, from North America some years ago, who writes that this variety has formed in his garden in Gloucestershire with culms 16 feet high and 5 inches in circumference. It is perfectly hardy and, spreads rapidly, making a splendid plant for the wild garden or woodland drives, etc. We have secured the whole stock of this plant. 7/6d." (Gauntlett's Hardy Plants Worth Growing, Cat. 88 p. 61).

1981

The Wildlife and Countryside Act proscribed two land plants, Giant Hogweed and Japanese Knotweed, making it an offense to introduce these species to the wild. This has implications in terms of the redevelopment of sites infested with F. japonica since earth movement and tipping are major factors in spreading the plant further

1950s

Giant Knotweed escapes cultivation around this time and establishes spread in Maine, Massachusetts, Connecticut and Rhode Island

1930s

F. japonica was known in East Cornwall by the picturesque name of "Hancock's Curse", and its presence reputedly reduced the price of a house there by £100

INDUSTRIAL HISTORY

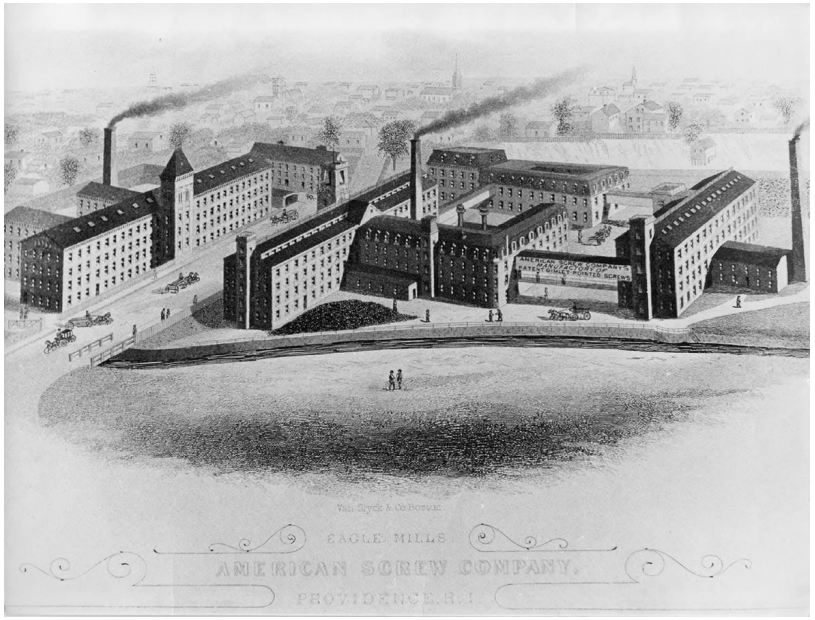


Fig 3.

Providence was once (1890-1900) home to five of the largest factories in the world for tools (Brown & Sharpe), files (Nicholson File), steam engines (Corliss Steam Engine), screws (American Screw) and silver goods (Gorham Silver). Not to mention many other firsts and biggests. Located between two rivers, Woonasquatucket and Moshassuck, the city was zoned for industry and one of the first cities to industrialize in the United States. After the civil war (1861-65), industry boomed as large waves of immigrant labor tripled the city's population by 1900. But by the mid-1900s, the Great Depression and New England Hurricane of 1938 weakened an already struggling industry and many of these major manufacturers moved on and left much of their infrastructure behind.

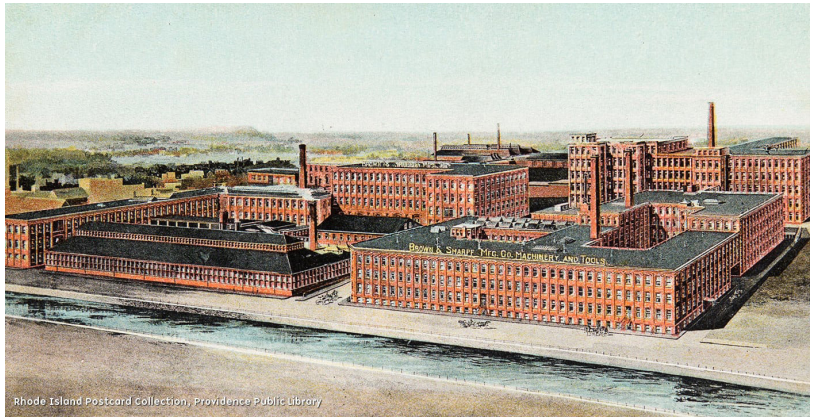


Fig 4.

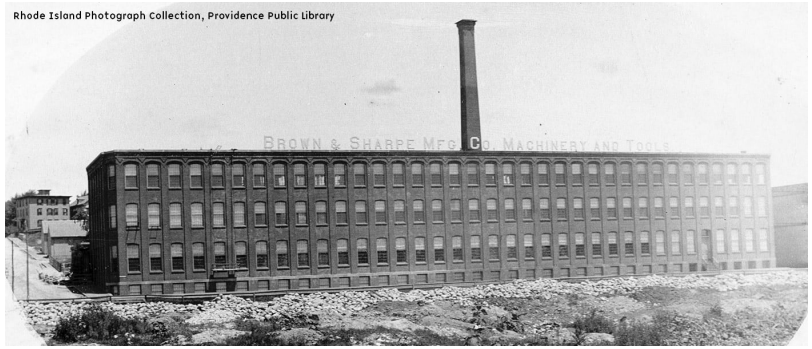
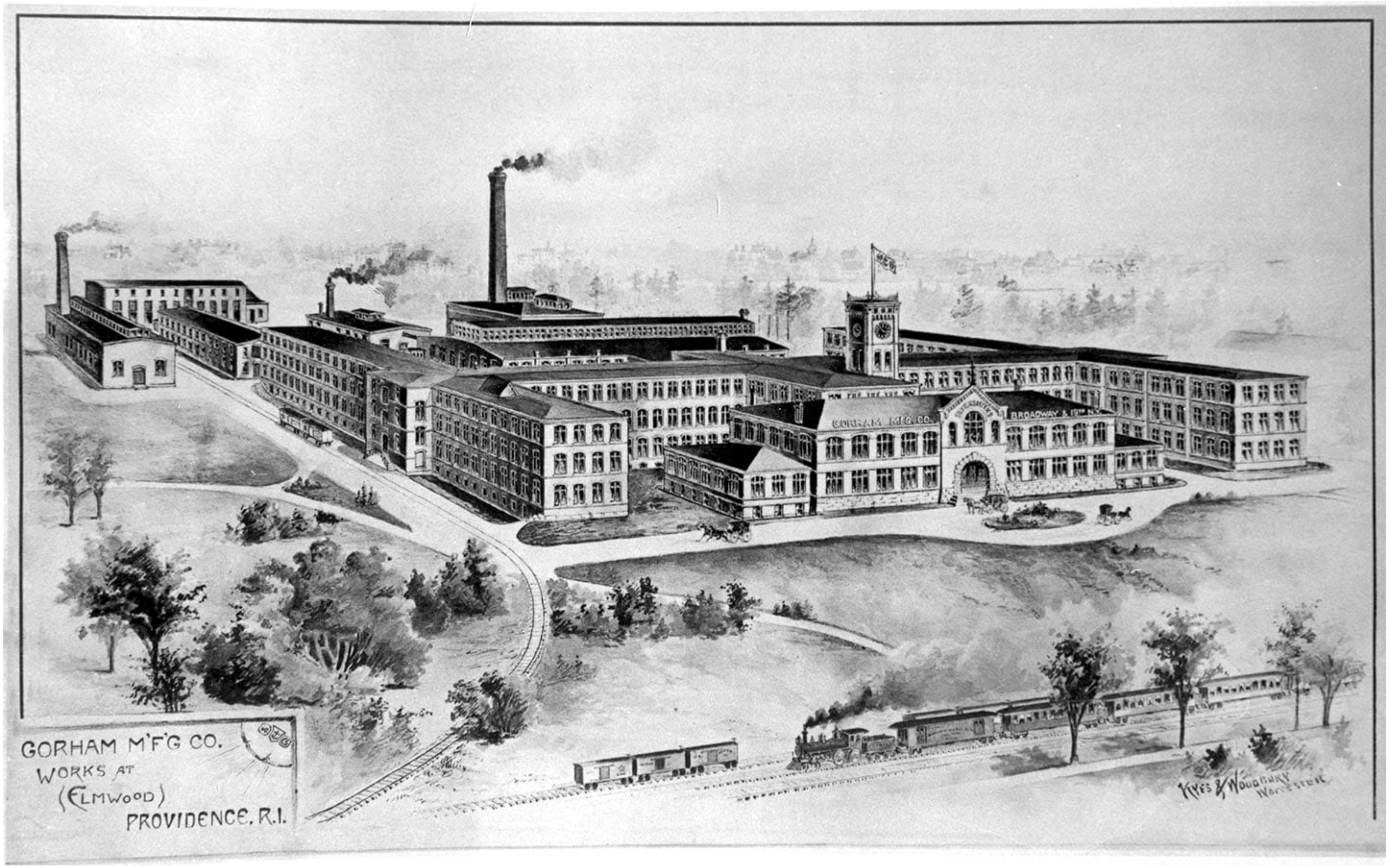


Fig 5.

Gorham Silver, for example, left an incredibly toxic legacy on the Rhode Island environment. Once the largest fine silver manufacturer in the world, today its former home on Mashapaug Pond is practically poisoned with heavy metals and dioxins. While it is currently undergoing an ongoing bioremediation, this pond was once the winter village of the Narragansett peoples who were continually displaced by these industries. Today, we are left with a poisoned body of water that is teeming with toxic algae and will take years of healing and repair to make it swimmable or drinkable again.


GORHAM M'F'G CO.
WORKS AT
(ELMWOOD)
PROVIDENCE. R.I.
GORHAM MFG. CO.
BROADWAY & 19TH ST.
Fig 6.

Today, most of these businesses have shut their doors and the buildings have either been reused or demolished. Pictured is the wreckage of Valley Worsted, the former home of Fort Thunder. Lots of these sites still remain barren and full of rubble and invasive species.

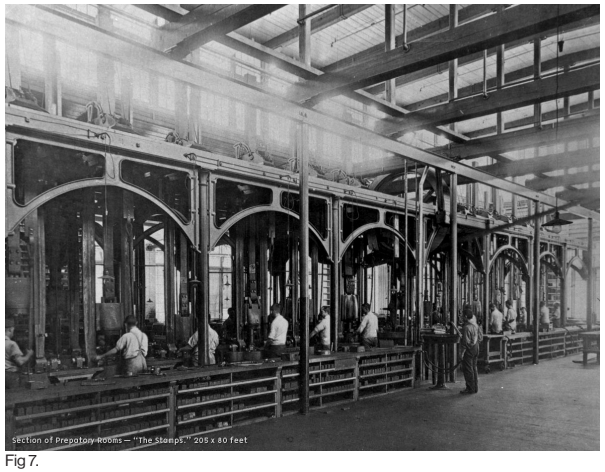


Fig 7.

Fig 8.

Fig 9.

Pictured is Morley Field in March 2023. Pictured on the bottom right are the riots at Eagle Square in 2001, mourning the destruction of the beloved Valley Worsted building that was the home of the Fort Thunder artist collective. The destruction and building of more profitable, but short-lived buildings is yet another example of destruction in the name of “Urban Development.” Valley Worsted Mill was finally demolished in 2002 to build a Shaws (which closed after a year). It is currently PriceRite.

Fig 10.

Fig 11.

But this is where the story intersects with the Knotweed timeline. Around the 1950s, Knotweed was introduced to Rhode Island, likely by accident and likely in one of the many recently vacated industrial lots. The sites of these once magnificent industrial dynamos soon became home to rapid invasive species growth with zero predators and no reason to stop. Its habitat is human-made and we are largely responsible for its introduction and its rapid spread.

Fig 12.

The Knotweed in New England, when tested, is almost entirely a single female perennial that takes over even the most toxic soils. But yet the language around these plants is violent. The language is militarized and xenophobic too. Especially around plants that originated in Japan or parts of Africa, (Japanese Knotweed, Japanese Barberry, African Beetle) the blame and the responsibility is placed on the "alien" plant that is "not from here." Instead of grappling with the structural issues of mismanaging land, polluting ecosystems and weakening the immunity of the soil, we choose to go to war with these plants by attempting to eradicate them and by dumping more chemicals to get rid of them, however futile that might be.

In this chapter, the project addressed the parallel histories of knotweed in the West, the rise and fall of Providence industry and the ways these have coalesced to create the post-industrial forests of knotweed we see today. In many ways this female plant is one of the few things that can subvert capitalist development. It destroys the clean image of infrastructure conquering wild nature.

Fig 13.

In the next chapter, we will discuss some of the influences that led to this way of thinking about knotweed as a powerful entity that evades industrial coercion. It will begin with a longform definition of indeterminacy and precarity which act as bookends to this project. Followed by a series of five vignettes that consider the five elements of this thesis: the soil, human biomass, digital materiality, unruly plants, and the wasteland itself. Last, are two essays on abundance and extraction.

Fig 14.

In England, this plant is heavily regulated and illegal to handle due to fear of spread. It is treated as a threat to national security

Much of the language around it closely resembles to xenophobic rhetoric used on human immigrants.

Instead of addressing the structural issues of rapid development and environmental degradation, policymakers and media choose to blame this "alien plant" for being here...

For example, some real headlines for biological invasions, laid out in Banu Subramaniam's Ghost Stories for Darwin: "Congress threatens wild immigrants" (Weiner 1996), "Alien Threat" (Bright 1998), "US can't handle today's tide of immigrants" (Yeh 1995), fail to specify that the article is about plants and animals but rather present a more generalized fear of outsiders. These closely resemble the bigoted 'Great Replacement Theory' rhetoric that is freely used by far right media and acted upon by extremist American politicians like Greg Abbott and Ron DeSantis. Nonetheless, returning to knotweed specifically, these parallels of attacking the "alien" instead of addressing structural issues of rapid development and environmental degradation is nothing new or surprising.

Fig 16.

2 WRITINGS

ON INDETERMINACY AND PRECARITY

Indeterminacy means uncertainty but also arises when one observes the eventual circularity of a situation; randomness, mutation, trouble

Precarity means lacking predictability but also refers to the widespread condition of the temporary, flexible, contingent, casual instability of post-industrial society; the state of being marked by indeterminacy

These two words began this project and continue to flow throughout the work. By creating a post-industrial playbook and laying out a series of "plays," I address the fact that indeterminacy and precarity will increasingly define the future. *The Mushroom at the End of the World* by Anna Tsing, brought these concepts of indeterminacy and precarity to the forefront of my research. Also *Staying with the Trouble: Making Kin in the Chthulucene* by Donna Haraway guided my thinking around hope and alternatives to capitalism. In many ways, these concepts drive the theoretical forces of the thesis narrative, both referencing the uncertainty and randomness of being-at-the-end-of-the-world. Plants that were once brought to the West as decoration for the wealthiest classes have rapidly taken over and are capitalizing all vacant soil. The connections between humans, biomass, plants, dirt and the digital ecosystem are boundless.

When thinking about indeterminacy, one must consider the possibility of hope. Of course, this word gets thrown around a lot in the abstract but what does it mean in the actual, physical sense? "If we end the story with decay, we abandon all hope (Tsing 2015)" Anna Tsing says in *The Mushroom at the End of the World*, referring to the example of post-decay growth exhibited by the matsutake mushroom. My experience with Knotweed can become a similar indeterminate encounter. By world-making, as Tsing refers to it, and imagining a world where this abundant, invasive plant can become a window into new, potential worlds, this project accounts for indeterminacy and offers an alternative model for design. As a form of analysis, allowing oneself to be open to the post-industrial encounter, the growth that happens after man-made decay and degradation, one might be able to imagine a future of growth in capitalist ruins. For example, the East Side Train Tunnel in Providence, once a symbol of industrialization

Fig 17.

and the importance of the city to a larger New England economy, is now welded shut, covered in spray paint and surrounded by a forest of Knotweed. While some may see this as an eyesore, this alternative model sees potential in this overgrowth, this aftergrowth, this rewilding and a way of working-with this environment in a hopeful manner. It considers the notion of "looking around rather than ahead" and acknowledging the shadow of ruin everywhere we look, in the present. By questioning the value of knotweed and thus all invasive species, this project looks to Donna Haraway as well, existing neither in hope nor in despair but rather "staying with the trouble" (Haraway 2016) and feeling its unyielding power. In other words, by caring for the toxic soil, for invasive plants, for the polluted water, the "trouble" in question, is it possible to foster growth without assuming progress? It also asks, can we manifest hope by "looking around instead of ahead?" (Tsing 2015) In other words, can we look to experimentation over solutions.

"Precarity once seemed the fate of the less fortunate. Now it seems that all our lives are precarious—even when, for the moment, our pockets are lined. In contrast to the mid-twentieth century, when poets and philosophers of the global north felt caged by too much stability, now many of us, north and south, confront the condition of trouble without end." (Tsing 2015)

As mentioned before, indeterminacy and precarity are intrinsically connected but precarity is a *modality of being* that is *marked by indeterminacy* and indeterminacy is a troublesome condition of our times. This is the way Anna Tsing defines them. Basically, precarity is the state of experiencing indeterminacy, either passively or knowingly but the quote above brings up the feeling of once knowing the stability of mind and environment. Now, even the most fortunate are confronted by the precarious existence of climate change and environmental degradation.

Much of this project searches for a life amid indeterminacy, through the lens of endlessly growing knotweed and contamination. Of course, precarity involves pain and sickness, some extinction of native species and degradation of healthy environments. But it also "calls upon and calls forth deep resourcefulness and imagination" (Allison 2013) as stated in *Precarious Japan* (2013) by Anne Allison. But as Haraway and Tsing so powerfully suggest, precarity exists in the ways people respond, adapt, and refuse these conditions by remaking their existence and changing the individual, local world, both for and beyond human existence. "One can sense," Allison argues, "if one senses optimistically, an emergent potential in attempts to humanly and collectively survive precarity: a new form of commonwealth, a biopolitics from below" (Allison 2013, 18). In essence, to survive and find ways to craftily use what you have around you and rethink the tools and resources that shape your world, one can dig deeply into and survive the precarity of today. By utilizing knotweed and laying out possible methods of engaging with this byproduct of industrialization and of exoticism, I am doing my own precarity research and strategizing on the most local scale.

Introducing the short vignettes of writing that follow, I work through some ideas including: compost, biomass, the internet, feral weeds, and TS Eliot. These essays are about precarity and indeterminacy but in a more material-focused way. They discuss not only the effects humans have had on mutating the natural environment but also the ways we have mutated ourselves and our digital systems to adapt to them. They are exercises and ways of thinking through these concepts outside of theory.

this_compost:_a_response

Hands submerged in the warmth of rotting compost. Feeling fresh. Feeling the heat and steam rise off the pile of banana peels, egg shells and amorphous, shaggy soil is nothing less than a fortunate coincidence. To be present in such a moment of bursting decomposition is an aromatic moment of life and death. A shared experience of isolated nature doing the work it knows how to do best is one that grants the viewer with the ultimate tool. A tool of slowness, and of outcomes that bring about change in gradual, cataclysmic motion, in repetition and in tandem with microbes invisible to the naked eye. A bubbling orchestra of collaborators bringing about their greatest performance day after day, night after night.

These interdependent relationships and wet networks defy our notion of growth and subvert the ever plowing forward of time, growing inward and giving back. The feeling of being arm-deep in rich golden brown compost is nothing more than a visceral vision of disrupting accepted norms of growth without consequences. Consider a perspective shift with filth at the forefront and cleanliness as a strange burden that is based on unnatural goals. Negotiating with the environment, gripping its living, breathing masses of tangled wires, is the feeling of hot compost.

Fig 18.

Fig 18.

Fat and form/exercise and evaporation/ biomass as material soul of an ecosystem

Walking through an online viewing room of Hamburger Bahnhoff, I pan over six refrigerator-sized wedges of animal fat.

Joseph Beuys' Unschlitt (Tallow) (1977) is made of 20 tons and around 30 ft of mutton and beef fat granules. The mutton tallow makes up the majority of the biomass and the beef fat, a tougher material, gives it structure. These wedges were cast from an unused, wedge-shaped space between the pedestrian underpass to the Schlossplatz and the ramp of a university lecture hall. His original plan was to cast the dead space with beeswax, but this project could not be carried out for financial and logistical reasons. Instead, he had the space precisely reconstructed and made a cast of it. He then had the almost 10-meter-long wedge randomly cut into pieces and presented these in the atrium of the Landesmuseum. Recalling pieces of human tissue, the slowly cooling tallow blocks referred back to the inconspicuous, completely pointless cavity on the Schlossplatz. In this way, a dialogue was initiated between the aggregate states of warm/soft and cold/hard, organic/living and solidified/dead, between the chaotic and the crystalline. It also gives biomass to the void.

Once in the gallery space, these pieces begin to slowly melt the more people come and go in and out of the space. In other words, body heat accumulates over time and has a physical effect on the pieces, slowly degrading them over time. Whether or not "social sculpture" means anything to you, even out of context, 20 tonnes of fat will make you ponder your own biomass in the world.

As a 165 pound relatively athletic, cis male person, I have about 20% body fat which means that about 41.25 pounds of my body is fat. Constantly in flux, I ask myself what happens to this fat when I move my body and burn/melt/evaporate this material? Where exactly does it leave my body? One might assume it is through sweat, excrement or urine but in reality, we exhale it. Much like how carbon is released into the atmosphere from a burning tree or piece of synthetic rubber. As I exercise my body, I think about how my fat, my biomass expands and contracts with the environment, as I move and as I breathe. Slowly my body becomes a gaseous, immaterial part of the atmosphere.

Biomass is not merely a solid, tangible element of the universe, it is also the constantly exhaling, belching, gaseous exhaust of our own bodily machinery. You eat, you gain fat, you gain muscle with every pound you burn. You row down the oily, postindustrial Seekonk River and I huff and I puff that fat into the air like the dye and textiles factories of Providence once did. Fat becomes form then it becomes formless. Carbon becomes form then it becomes formless. It is the (im)material soul of the ecosystem.

Joseph Beuys lard forms start to melt as more bodies enter the room. The heat of the bodies warms the room like a badly ventilated gymnasium until the fat eventually melts. Human biomass is a system, adjusting and modulating, burning and consuming until we once again return to our gaseous, atmospheric form. And on and on.

Fig 19.

Link rot/annotation/Footnotes/ decentralized web/wetware

Link rot is the phenomenon of hyperlinks tending over time to cease to point to their originally targeted file, web page, or server due to that resource being relocated to a new address or becoming permanently unavailable. I was first introduced to this concept by Mindy Seu. The notion strikes a chord with me because it, much like a vast majority of the internet, references something organic, something in nature. Much like the sexist and binary gendered terms like male/female in hardware or web, virus, body in software, the digital space is dripping with rotting matter. Just like us, the internet ages, decays and contains pathways, citations and barriers that will only slow down your device and cause it to breathe, heavily. A link is what gives a flat document multitudes of depth beyond the page. It flings the user into cyberspace so fast that a stinking virus might just grab hold. The analogue version of this would be footnotes, instead using a number or asterisk to link the reader to more information. Needless to say, the rotting matter is digital too, and so on.

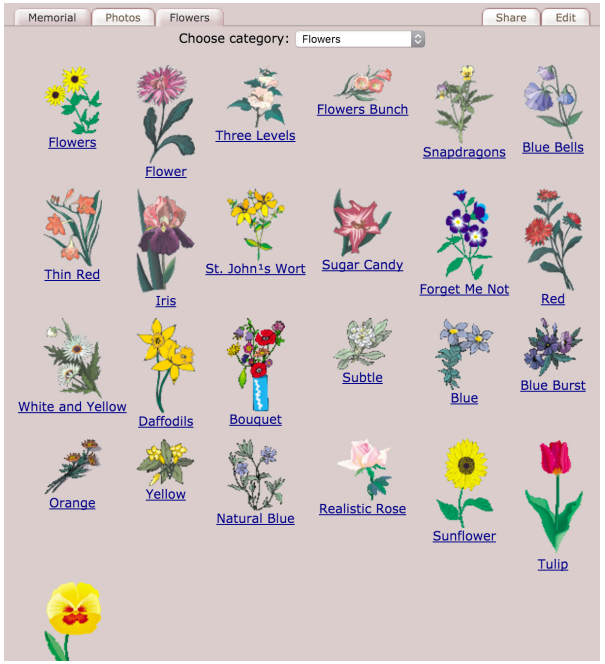


Fig 20.

Fig 21.

Feral weeds and and invasive species culture as a resilience model

Feral tree ideology comes largely from the writing of Matthew Battles, the director of the Arnold Arboretum at Harvard University. Feral denotes the lack of domestication when we think about feral animals. Feral plants, on the other hand, are those we have tried to control for our own purposes and failed to succeed. Somehow these plants, largely labeled “invasives” have slipped through the cracks and evaded eradication, gentrification and domestication. Somehow surviving even the most heavy duty herbicides. How might we look to these as a model for the future?

Fig 22.

<The wasteland> as a model for collapse // psychogeography

The wasteland by T.S. Eliot was the first epic poem I ever read that had a hyperlink for every line of text, sending the reader on a journey to some biblical, mythological or philosophical reference that no high schooler could understand. But now I return to it, awakened by an energetic obsession with the growth that comes out of collapse, the consequences of industry on ecology and the multidimensional journey through time. What if the collective steward of the world developed more inventive ways to endure? What if growth could emerge from the destruction? An evolved, murky survival.

Fig 23.

ON ABUNDANCE

Abundance is the springtime. It is overgrowth, shoots and bursting bulbs. It is the vines and woody brambles that completely overwhelm the urban jungle and hide the rusting Chevrolet in the woods. Abundance is also a satisfied belly and a life of *having enough.* This project often states that it favors a model of "abundance over extraction" and it is important to take the time to explain this a bit. Abundance can mean wealth, richness or indulgence but this could quickly go more into the category of "overabundance." Abundance is intertwined with Knotweed in the way that it completely overpopulates a territory once it takes root. Because it has no natural predators in the US, knotweed grows without end and with no reason to stop, causing erosion in its wake and keeping other plants from getting sunlight. But this abundance is not intrinsic to the plant. However its resilience combined with its very human introduction and spread has led to its present abundance. This is why this project treads lightly on promoting Knotweed. Let it be known that this plant is thoroughly disruptive and most definitely a problem that should not be exacerbated by planting it intentionally. That being said, this project seeks to acknowledge the extent of this problem at the present moment and work with it in a comprehensive and non-militaristic manner.

Deer, although native to North America, have a similar problem. The predators that once hunted them, wolves, cougars, and mountain lions have lost their habitats in the woods due to deforestation and have virtually disappeared from areas like New England. Without predators and with the rise of suburban gardens that feed them consistently, deer have become so overpopulated that cars and hunters are their main predators. They are abundant. One might even suggest a *Got Milk?* campaign around eating venison but due to various FDA health regulations, the sale of venison is very inaccessible or as cheap as one might assume, unless you know a hunter. Even then, the sale of the finished meat is usually illegal.

Fig 24.

Fig 25.

Abundance is both a natural and artificial phenomenon. Knotweed and other invasive species are abundant not only because they happen to have the tools and "learned skills" to survive in the most precarious environments, they were also given the perfect venue to perform. Thus, the abundance or invasiveness is a combination of our own decision to develop and pollute the land and the plant's natural resilience. Nonetheless, the abundance of knotweed is a reality that humans ushered in and it is not going anywhere. Considering this, what if our everyday life revolved around what was abundant instead of what was scarce? What if we found a way to serve knotweed cheaply as a food? As a building material? As a forageable resource that had a multitude of functions depending on the season? Consider a vegetative utopia where knotweed is the new corn, growing everywhere, made into everything but without industrial agriculture, and freely available as long as there are people. Abundant Knotweed is a window into the entanglement between human industry and ecology and could lead to the harnessing of invasive species, something considered problematic and unwanted into something harnessed for good. Design should function accordingly.

Fig 26.

ON EXTRACTION

Extraction is a delicate dance. Taking oil from the sea and overfishing are extraction but so is extracting toxins from a polluted pond, or extracting poison from a wound. Nonetheless, most of industrial history has been based on the assumption of continual growth and continual extraction of resources. Petroleum, which is made into just about everything we encounter, is of course the most prominent example. Pumping the ancient blood from the earth after thousands of years of decay and pressure led this black fluid to the heart of your car. It is the most sought-after and volatile leachate (compost juice) on the planet. Because of its power and effectiveness as a fuel and perceived abundance, we are more reliant on it than almost any other resource.

In 1979, an Exxon study stated that burning petroleum "will cause dramatic environmental effects" in the coming decades. "The potential problem is great and urgent," it concluded. But instead of heeding the evidence, major oil firms buried the findings and manufactured a counter narrative to undermine the growing consensus around climate science. The fossil fuel industry's campaign to create uncertainty paid off for decades and the rest is history. But we aren't here to talk about gas. Extraction is a state of mind.

On one extreme, extraction is theft of abundance. On the other, it is the ongoing removal of man-made toxins from the earth. But in this project, we will call the latter "remediation". Nonetheless, extraction commonly assumes that the earth's resources are for humans to take, consume and dispose of freely as opposed to receiving them graciously as a gift and acknowledging everything natural as something valuable and worked-for. Extraction is taking more than your share. It is taking beyond what is needed and beyond what the living environment can handle. Pollution is the disrespectful return of these damaged goods to the soil and is entangled with extraction. Ultimately, the history of industry is predicated on this mindset that is reliant on a negative environmental impact and an area in need of healing.

Fig 27.

One must lastly be conscious of waste as an abundant resource and investigate novel ways of utilizing it into the transitional space of the postindustrial era. In other words, it is completely unrealistic to posit that all materials will be fully recyclable or regenerative or biodegradable, especially considering the damage that is already done. But the future consciousness of consuming less, creating less waste and looking to the antiques warehouse for lessons in consumption is a valid model of design that needs to gain traction for the sake of survival. Beyond sustainability, the need to work and reframe our relationship to abundant over extractive materials is vital to our long term relationship to the planet. Recognizing that everything our ancestors put into the soil will eventually return to our DNA is only the first step. Bringing that knowledge into practice is the work of the postindustrial future.

3

DESIGN

INDETERMINATE STRUCTURES OF REPAIR (2023)

Fig 28.

Indeterminate Structures of Repair addresses the entanglement of human and nonhuman growth made tangible by invasive species. It also calls for the need to harness this relationship to develop restorative networks in humankind. Combining sculpture and research in design for the end of the world, these forms put forward a novel material from the local flora to provide agency to non-human nature.

The material side of the project began with an experiment of making objects out of knotweed. First, by grinding it to a pulp and then molding it into form. These were largely a response to something that I felt was missing from the biomaterial field. Outside of mycelium, it was difficult to find work that was engaging structural forms with organic materials. this specific element is entitled *Indeterminate Structures of Repair.*

Knotweed, is a displaced species that rapidly takes over riversides and disturbed soils and it is resilient to almost all methods of extermination, often growing back stronger long after its removal. But despite its invasive tendencies, this plant has the potential to be manipulated into something as strong as wood and as malleable as clay. This project set out to harness this resilience rather than eradicate it by first breaking down the plant to its tough, wood-like essence, then combining it with a binder to form structures out of the resulting pulp. The two completed structures, both molded by hand and cast using found bricks and wood, exude an archaic, discarded quality with rough uneven textures and an earthly brutality.

Fig 29.

Fig 30.

Fig 31.

Fig 32.

Fig 33.

Fig 34.

RECIPE

One will first need to find and identify a significant patch of land that is occupied by Japanese knotweed. The leaves are wide and flat and almost heart-shaped. They are almost never alone so once you find one you will find many. The stems look similar to bamboo with clearly delineated nodes.

Harvest by carefully slicing the stem above the ground. Its rhizomes can extend almost 20 ft wide and 10 ft deep so one might want to avoid the task of full removal.

Next, slice the stems into manageable pieces and soak them overnight in water. The next day, one must drain the water and boil the stems for 3 hours with a few pinches of calcium carbonate to help it break down and enough water to cover the stems. Then, after draining the hot water, one must pulverise the stems with a hammer until they are flat and fibrous.

Finally, place the stems in a blender with some water as needed and blend to a fine pulp. One will then drain this water well to find their damp Japanese knotweed pulp. At this point, one can add gum arabica to make paper or add gum arabica and some sodium alginate to make a structural paste that can be moulded or cast as desired. Using a dehydrator and or freeze dryer will vastly speed up the drying process too.

Assemble the parts as you wish using a mixture of knotweed powder and wooden sticks. These pieces will grow into each other with time.

Fig 35.

KNOTWEED TABLE (2023)

Fig 36.

Fig 37.

Fig 38.

Fig 39.

This project was made in collaboration with Sam Aguirre (MFA FD 24). We created a small table out of knotweed pulp mixed with paper and cotton pulp. This object, designed with inspiration coming from industrial, concrete infrastructure, embodies similar values to the *Indeterminate Structures of Repair* but with an added element of function. This table is made out of the organic post-industrial byproduct and biodegrades back into the earth once its usage is done.

KNOTWEED “SILVERWARE” (2023)

Fig 40.

This cutlery is meant as a response to the environmental impacts of Gorham Manufacturing Company, nearly 50 years after they shut their doors. While producing fine silverware for the wealthiest families, locally and abroad, Gorham dumped toxic solvents and polishing agents into Mashapaug Pond. Today this area, once fishable/swimmable, is completely overrun by invasive species and toxic algae that thrive in this disrupted environments. As the ecosystem begins to recover, this project questions, how might we work with this “new wild” instead of trying to eradicate it? How might we use the tools of function to subvert the model of growth?

Silver is in the DNA of Providence soil. Even if it is microscopic, the effects of the fine silver industry of Providence left traces locally. Gorham Silver Manufacturing Co., at its peak was the largest fine silverware manufacturer in the world. The complex was complex was a 37-acre industrial site that included over 30 buildings located between Mashapaug Pond and Adelaide Avenue in the Reservoir Triangle neighborhood of Providence. The complex was in continuous operation from its opening in 1890 until 1986. The Smithsonian archives of American art show the Gorham foundry over 700 times in its inventory of American sculpture. Today, the area has been hastily redeveloped with a high school and shopping plaza while the soil and water continue to leach trichloroethylene (TCE) and perchloroethylene (PCE), into the groundwater. These chemicals were used to clean metal and machine parts.

Nonetheless, silver is not only a symbol of immense wealth but equally, environmental degradation. While masterful in its contribution to decorative arts, everything silver represents today is that of contamination and disregard for natural systems. Not to mention the environmental racism toward the Narragansett Tribe who once called Mashapaug Pond their home and for thousands of years, worked to steward this land.

These pieces were cast using knotweed powder and sodium alginate and then dehydrated. They were then coated with a copper paint and electroplated in Providence, giving them an actual silver coating. Ideally this silver would be smelted and derived from the actual metal particles found in the pond sediment and in the contaminated knotweed but time and technology would not allow.

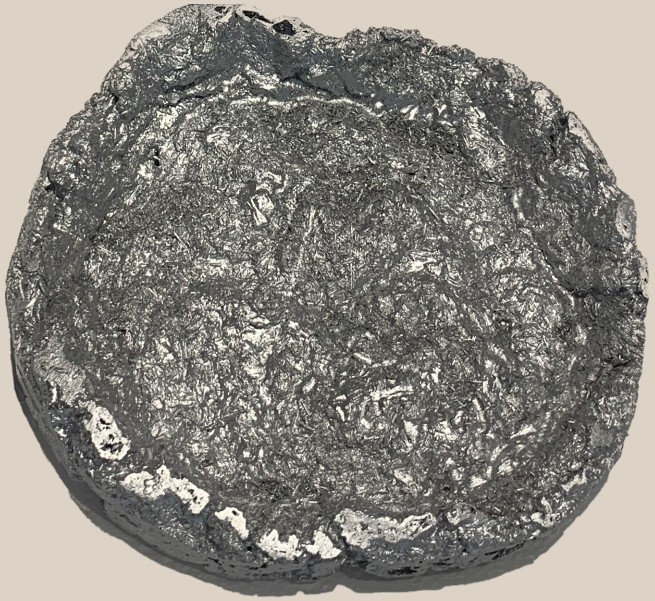


Fig 41.

Fig 42.

Fig 43.

Fig 44.

FLOATING ISLAND PROJECT (2023, ONGOING)

Fig 45.

Using the pollution of Gorham Silver on Mashapaug Pond as a case study, this raft will use a byproduct of their pollution and use it instead to regenerate the environment. In essence, this project will develop a floating island of wetland species as a way of containing but also harnessing this abundant resource. It will have a discursive function, making reference to botanical gardens as the main reason we have an invasive species, and bundles as a symbol of fascism. But it also plays a productive role of providing a bed for plants to grow and extract toxins that have resulted from chemical waste. In this way, the goal is to craft a postindustrial cycle of abundance rather than extraction.

In collaboration with Augie Lehrecke (FD 18), Matt Muller (FD 18) (Both Pneuhaus), Alex Ionescu (NCSS 18), Hope Leeson (Critic, NCSS), and Holly Ewald (New Urban Arts / Brown) we are creating a floating island for the *Art on the Trails* exhibition in Southborough, MA. This piece also defines the least labor intensive method of utilizing knotweed. Each bundle was harvested from either Mashapaug Pond, Morley Field in Pawtucket or East Side Train Tunnel Valley. At its roots, this is an Island of invasive ecosystem in middle of a polluted pond.

Fig 46.

Fig 47.

RECIPE

Lots and lots of knotweed, preferably dried

Some kind of rope, preferable a natural kind like coir or hemp to create tight bundles

Trim the ends down to a workable size with a jigsaw, bandsaw or handsaw

Plug each end of the knotweed stems with paper or paper pulp

Purchase beeswax from a local apiary

Melt the beeswax down and dip each bundle until a thick layer coats the ends of each stem

Fig 48.

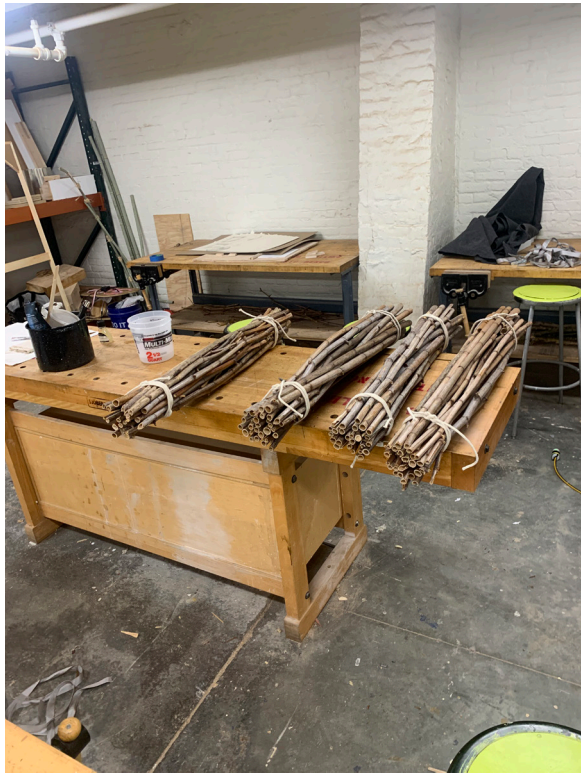


Fig 49.

Fig 50.

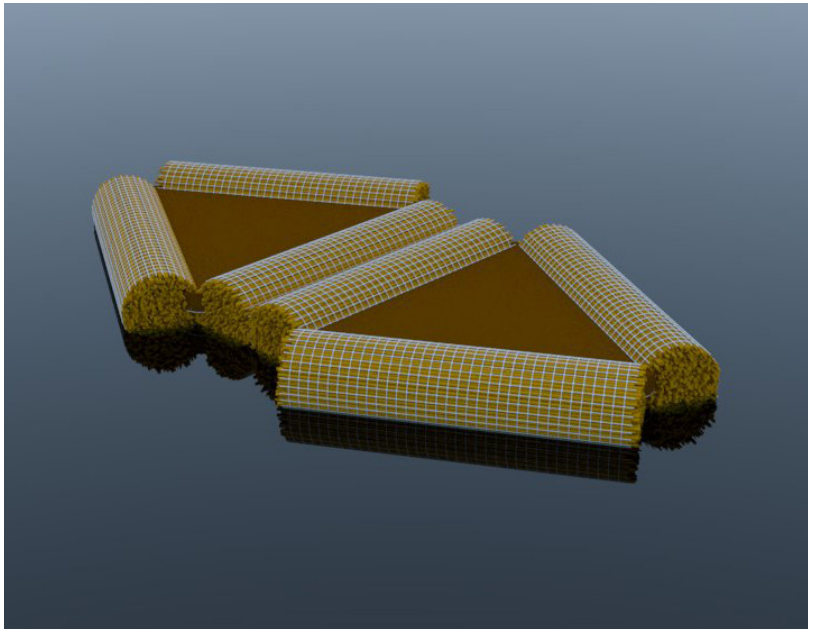


Fig 51. Render of future raft courtesy of Augie Lehrecke

4

ENGAGEMENT

ARTIST TALK // WORKSHOP
UMAINE SCULPTURE
MARCH 2023

Fig 52.

Fig 53.

MISN: THE ANNUAL MAINE INVASIVE SPECIES NETWORK MEETING MARCH 2023

Pictured is an Invasive species conference in Maine where people from different fields can interface more with others who were interested in Knotweed for various reasons. They also took part in discussions of xenophobic rhetoric and militarism embedded in invasive language

This narrowed the audience of this project to:

+ radical community gardening initiatives
+ invasive plant biologists
+ and hazardous waste specialists

Fig 54.

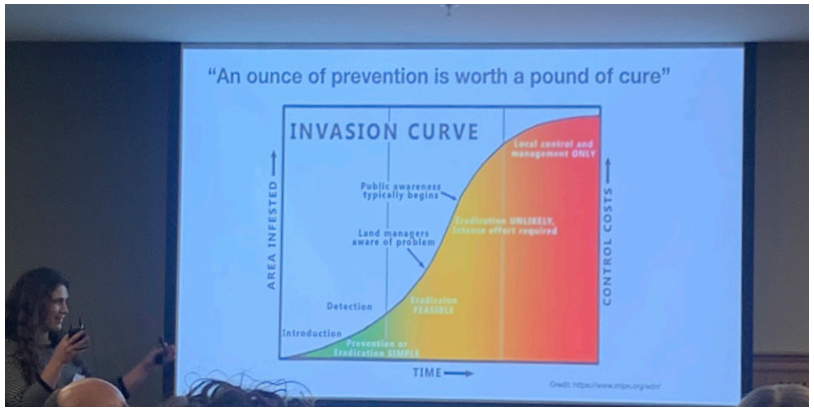


Fig 55.

COOPERATIVE KNOTWEED FIELD DAY
PROVIDENCE, RI
APRIL 2023

On April 22nd, Earth Day, a Cooperative Knotweed Field day was organized to engage the Providence/Pawtucket/Central Falls community in the knotweed project and to facilitate a larger conversation around this invasive plant. This was a collaborative endeavor where people from the community met together in the Gano Park community garden to meet and to discuss the dangers of spreading knotweed. The conversation then pivoted as I shared some of the objects I had created using knotweed. Then we walked into the woods, or the valley where the East Side Train tunnel used to run through. Today this heavily disrupted area is entirely filled with knotweed and far beyond potential for comprehensive eradication. Instead, this project proposed a reframing of this plant as a viable and dynamic resource that can be utilized in several ways. The group began by clipping as much of the dead knotweed stalks they could find and piling them on a tarp to bring up the hill. The group was then instructed on how to make bundles from these that could later be turned into a raft, a partition or even a building material. This field day was meant to engage the community with invasive species in a new way but also consider alternative outcomes beyond eradication.

Fig 56.

Fig 57.

Fig 58.

Fig 59.

Fig 60.

Fig 61.

In an age when industrial systems are breaking down ...

++

Collapse is becoming the norm ...

How will artists and designers respond to the end of the world?

++

Who will write the playbook?

AFTERWORD

This project envisions an alternative mode of design based on abundance over extraction and a utopia of radical care for even the most hated weeds. Japanese Knotweed was my example but there could be thousands more in a thousand other disrupted landscapes.

Some other possible plays or strategies for utilizing this plant:

A grilled vegetable
++
A beer
++
A wine
++
A shelter
++
A buoy
++
An ice cream
++
A medication for lyme disease
++
A supplement for anxiety
++
A pain reliever
++
A paper
++
A repair putty
++
An insulation
++
A plywood
++
A wood composite
++
A tile
++
A bee home
++
An ointment
++
A textile
++
A mesh
++
A tea
++
A trap
++
A pickle
++
A substrate
++
An anti-aging serum
++

This project tells the story of knotweed and its introduction to postindustrial Providence but such a story can be told in so many other places. These are just three ++plays I have made to consider postindustrial resilience but this project challenges designers to consider the disrupted landscape as a man made space that is abundant with possibilities. In the end we are faced with a series of challenges and a series of questions with not a lot of answers. And this thesis is not about answers. It's not about solutions either. You won't find those here. What this thesis strives to do is to question what is invasive vs native, who and what belongs and why we have come up with these ideas that only lead to alienation. By talking, writing and making about Japanese knotweed, this project hopes to bring more clarity to its origin story and reframe it in a less xenophobic manner. By recognizing that the reason for its spread is entirely reflective of capitalist development and repeated mismanagement, hopefully this tells a more honest story about all "non-native" things and the ways we discuss them. It is about the soil too, and our choice to industrialize a whole region, introduce a species with no competition and wait for a future of mismanagement and collapse.

In retrospect, this project brought to the surface questions about the end of the world. Through the lens of this history and ecosystem, this project was broken down into three material forms, a powder, a pulp and a stalk. Each design provided unique insights about what was possible with each process and how each method could be embedded with cultural dialogue. The powder, which the silverware is made of, allowed for casting and even layering new materials onto the surface. The pulp, which the structures and table are made of, allowed for molding and creating a strong composite with many applications. And the stems, used for the raft, allowed for a non-plastic flotation alternative that could also be used as a barrier or platform for lightweight structures. All of these experiments, paired with the writing and creation of this book, ultimately go back to design for the end of the world, and how we will use what is around us to survive in the future. This resilient plant in this postindustrial city tells us so many stories beyond its thriving nodes. It can teach us so much about resilience, displacement and belonging.

I hope this thesis brings you hope, resonance and kinship.

"These livelihoods make worlds too – and they show us how to look around rather than ahead." - Anna Tsing (2015, 22)

Fig 62.

5

IN CONVERSATION

(MICRO/MACRO) MYTHOLOGIES: A CONVERSATION WITH MINDY SEU

Max Fertik: Hello! And I wanted to just ask you a handful of questions and hear your perspective on some of the concepts I'm thinking about in my thesis. Starting off, and I may have mentioned this before but I've been looking a lot at *The Wasteland*, the T.S. Eliot epic poem, thinking about how in the present and future, most humans will also exist in a form of postindustrial wasteland. And I wonder, as a designer, educator and scholar of the internet, what does this mean to you? What does it mean to look directly at the wasteland, both digital and physical and the space in between?

Mindy Seu: Just to clarify a few points, I'm curious how you actually think of the wasteland or that in-between space. Do you have some parameters for what that means for you?

MF: Yeah, I mean, I kind of see the in-between space as the space that we actually get to interact with. The natural world, the postindustrial space, construction and polluted sites, both physical and digital sites. Dead webpages. I think about the past as well as the present that I can interact with through this space. So to me, this in-between is the space where we get to forage and actually gather what we have access to, like knotweed and eventually make material out of it.

So I guess that in-between space is what one can actually get their hands on. As opposed to what's beyond our control, and the outcome of what we create as settlers on this land. the legacy we already have on the earth and internet for the future. SO that's what I mean by the in-between.

MS: I'm assuming you've read *Mushroom at the End of the World*? (I have, yes.) Okay, great. Cause that seems right on point with what you're speaking about. So actually, during the D+M talk one of the questions was about *macromythologies* versus *micromythologies* and how these are sometimes strategies for revisionist histories or collective histories.

And towards the end we kind of came to a synthesis that perhaps a *macromythology* is some sort of theory. Some sort of uniting principle, whereas a *micromythology* might be singular examples of practice and how all of these things can come together to build into that *macromythology*. So that feels similar to what you're describing about this in-between space.

I also think about Anna Tsing's ideas about *scalability* Or Adrienne Marie Brown's idea of fractals. Or even the *Undercommons* by Fred Moten and Stefano Harney. All of these things are able to thrive regardless of what other hegemony is on top of this because you're able to find like-minded people who are grouped together. In contrast to some other force that can exist in any climate. There are other ways that this can get more difficult, less resource allocation and things along that nature. *But I think for the most part this idea of figuring out the primary principles of a local community, those principles will always be distinct from any other local community.*

So figuring out what those principles are and then scaling up from there, allowing for mutation, that's the *fractalism* concept. I think this is where it gets interesting, and this is opposed to the *scalability* that we're familiar with now, which is *the same unit multiplied at scale proportionally,* which doesn't allow for this in-between space. Does that answer your question?

MF: Yeah. It's super complex and it's also a loaded question. I think there's value in what you said especially in terms of these hyperlocal examples.

That's sort of what I am grappling with in terms of framing a thesis and being like, how can I do a design thesis without considering the local scale? And considering what is around me, especially since I'm from Rhode Island too, I have an intimate connection with this space.

So I guess my next point would be, what does it mean, as designers, to consider *belonging* as a part of this conundrum? I know you've worked a lot on the term *gathering* but I'm thinking a lot about how *belonging* has to do with ecology. Because so much of when we talk about invasive species, and even use the word invasive, it's almost derogatory. And especially the use of regionalized terms, like Japanese or like African, these terms are often associated with things that we see as a problem that we need to manage or eradicate from the environment. I'm interested in how you think about these questions of *belonging* in terms of humans in an ecosystem? What belongs in a space? What is a weed and what is something that belongs?

MS: I mean, to kind of approach this from a different angle, I think that this is a primary reason why I try to define what *gathering* means for a community that you already belong to. I think because I was adjacent to architecture schools and also came from a proper design, graphic design background.

We're often thinking about how to do work for other people and it's kind of this *drop-in model* or it's an *anthropological approach* where you kind of go to someplace, observe and assume that information can be taken as some sort of data to inform something else. So it often feels extractive in that way. So again, a roundabout way of coming back to this idea of *belonging*. If you are actually invested in a community and doing the, almost like an *oath of maintenance* or an *oath of commitment*, then it feels less likely to have these extractive potentials because then you would be extracting from the community that you belong to.

And perhaps this goes the same way for that term *invasive species*. If we're considering something to not belong, then there's a lot of ways to think about why that might be. Is it because of the original source, is it because it's impacting things surrounding it in a negative way? Generally, it seems like a sort of otherness, but other times because it wasn't from the same ecology, there is tension in making it fit and it does tend to affect that environment in unexpected ways.

MF: I mean, there's definitely a cause and effect and negative connotations with disruptive plants for valid reasons. Often they are killing native species that have

been there for many, many years. But in the end, these are organisms are doing the only thing they know how to do: grow and multiply.

I think in a lot of ways there's no solution and there shouldn't be. And I think what you were saying about design and going into a community and being like "I'm a designer and I'm going to solve this problem" I'm very much trying to think about design in a different way as much as possible. Because just like you said, that way is very extractive and it's using care and help as a resource. And not seeking to truly help in a comprehensive way.

And I've learned that eradication is more solution-based design because it keeps coming back. Sometimes 10 times stronger no matter how many herbicides we lay on this already toxic soil. So in the same way as localized design, I wonder how can we work with, and work together with the ecology instead of just seeking a monolithic solution?

MS: Yes. Yeah. I think that it requires a sort of adaptability, right? We think about mutation, if these invasive species are requiring a sort of mutation of that specific ecology. Sometimes these things are good. Even if there's a sort of tension in figuring out how those things connect. So yeah, it's funny thinking about it as a metaphor because then you can really point to the pros and cons and you can kind of shape the argument as you want.

But thinking about concrete examples then maybe it feels more decisive. Yeah, I am curious to hear more about this knotweed though, what are you making of it? using it to make?

MF: Yeah, I mean that's been a long process but I've been having fun with material studies trying to subvert some industrial practices with the knotweed. For example, I was thinking how invasive plants have an industrial quality to them. Not only because they're the product of toxic soil where nothing else can grow, But they're also naturally mass produced at incredible rates.

So I've been making a biocomposite out of it because I think if I can create a plastic alternative then it will draw attention. I am then making some flatware out of this material. I've also experimented with making a raft out of the raw stems and beeswax.
But I think by focusing on this hyper-specific thing in order to talk about something a lot larger is better than doing it the other way around, like starting with something really big and then trying to break it into smaller pieces.

MS: Well, I think that's why *Mushroom at the End of the World* is a nice framework in a way because she's talking about the matsutake mushroom and then she uses it as a metaphor to talk about all the problems of late capitalism. And this idea of invasiveness or foraging et cetera is in some ways doing the same, you're talking about a,hyper-specific organism or plant. I wonder for you then what the larger metaphor is or what the larger commentary or criticism is and that might take time...

MF: Yeah, I think it's similar to what Anna Tsing is saying a lot.

Exposing the things that are already within our DNA and within our collective DNA and geological DNA in a lot of ways too, like what's already there and just exposing those things. Stefan Helmrick wrote a piece about extremophiles, or microbacteria, that live at the bottom of the ocean. That's essentially like an alien.

Which made me think about how we might find a sense of empathy for this alien species that we might have a lot in common with. It might be microscopic, but it's still a being. So I guess the commentary is like, we may have no connection with this thing necessarily, and we may have a negative connotation with things we cant see or comprehend, but I wonder, how can we build more care into the environment and into our local ecology?

MS: I think it's also that we, as humans, need to learn that we should care for things, even if we don't connect to them by the very nature of living on this earth together or having some other, there are a lot of ties that we could create, but I think the problem with making people care or feeling like they have to care about something is you can't change what people feel proximity towards or feel connection towards.

So, I wonder if there's a way to actually shift this idea of care overall that doesn't relate to connection, but just connects to us being part of a similar ecosystem and not being so human first. Seems very difficult, but maybe worthwhile.

MF: Well, thank you so much for chatting. I really appreciate it.

MS: Yeah, of course. Thank you for being in touch. Take care.

Mindy Seu (b. 1991, California) is a designer/educator/technologist who has revolutionized the critical design community and radically expanded the feminist discourse of digital space and the Internet. She currently teaches at Yale and Rutgers and most recently published a print version of her Cyberfeminist Index.

FERAL PLANTS + STRIP MALL ECOLOGIES: A CONVERSATION WITH MATTHEW BATTLES

Maxwell Fertik: I was interested in this resilience of knotweed and its takeover of polluted land. Blackstone river valley is incredibly polluted. So i was curious, as a writer, maker, editor of ecological matter, how do you think of the word invasive? And what does it mean to manage, govern or attempt to control something so uncontrollable?

Matthew Battles: These are such great questions that have fascinated me for quite some time. And the work that went into my talk at Umea ended up in my book called Tree, which is all about The Tree of Heaven, which is famously treated as a noxious species, that was the species that got me started and paying attention to the language and material practices. The National Resources Defense Council shared an image of a guy hanging out the side of a helicopter. And he had a gun in his hand and the caption was "Using paintball pellets filled with herbicide to control invasive trees in Hawaii" and the imagery was so Apocalypse Now! It's fascinating the ways we deal with eradication of invasive species can organize this kind of civic action to pull mustard greens or plantain. It's often the first step regular people take into the field. I think it's all quite fascinating but also quite problematic. You know, somebody who is a really important resource for me is actually someone who is a longtime researcher, plant scientist here at the Arnold Arboretum is Peter Del Tredici. I don't know if you've seen his work. he wrote a book called *wild urban plants in the Northeast*. It was just like a field guide to all of these plants that live in urban Environments. But he is not alone in doing this, but he's among the plant scientists who's kind of argued for this shift towards an urban ecology, that it really embraces the possibilities of these what we call invasive species in the urban context in particular, representing a distinct cosmopolitan biome. He talks about the cosmopolitan plant communities of our cities, which is a phrase I really love.

And points to how. You know, they're often doing a lot of good work in cities. I mean, they're fighting over remediating pollution and they're providing cover for all kinds of other organisms.
You know, some other invasive species work that I did, involved cooking. We were working with a chef who was using honey from urban bees managed by an urban beekeeping company here in Boston, and *we found that something like, like nearly half of the plant DNA represented in that honey came from Japanese knotweed*. All of those knotweed flowers in August that are whipping in the wind as you drive around are capable of supporting an incredible kind of, you know, a metaculture, an urban metaculture world, you know, almost on their own.

So, a friend of mine and I, who is an alumnus of the GSD, worked on A project called *Future Food*. Keith Hartwig and I, but we did a number of projects that explore. The culinary possibilities of introduced species, including knotweed. Keith was a very skilled brewer. And so we made a beer that was flavored with knotweed among a number of other projects including some installation work with knotweed where we brought a knotweed rhizome into a gallery.

And you know, we really spent a lot of time playing with knotweed in particular. And subsequent work in that project included some sort of mutual aid food security work in East Boston with Easty Farm, which is a community garden kind of environmental activist organization in East Boston using both introduced species and Harnessing food waste from from food banks around the Boston area to with working with a chef to develop recipes for turning all of that into food that people could use in the context of Covid early the early months of Covid.

Yeah, so knotweed, Tree of heaven, black locus, which is a curious case of a native invasive, it's a tree that's treated as an invasive, even though it "belongs" here, whatever that means.
Yeah. You know, the whole question of invasiveness is, has, has been preoccupying me for, for a while now.

MF: Yeah. I, it's, it's, this is really great to hear. I, I mean, I, I hadn't, I wasn't familiar with the food project. And, it seems like there was an exhibition quality to it as well.
As well as a community mutual aid aspect, which are like all things that I would like to ingrain into the thesis in some way. Especially in terms of the exhibition side. Also, something I wanted to note. I didn't, didn't realize that you made a beer out of it too. I was thinking, making wine outta knotweed once the shoots come up in the spring.
So I'll have to keep updated on that cuz I would be very excited to see. Well, first of all, I wanted to ask what it tastes like?

MB: You know, it was, it was, it was quite nice. We actually also did a knotweed ice cream later. We worked with Toscanini ice cream in Cambridge on that. But the guy who owns that Gus Francatore who's a crazy character who made us some Japanese knotweed ice cream. And, and these turned out to be good. And just on the technical side, it was like racked on the knotweed, which meant we had harvested the shoots. And we were fortunate to have identified a place the Cambridge Reservoir has all of this you know, forest land around it and an urban park around it. And there's real control of the use of pesticides and herbicides around the reservoir, and they're very careful about the pollution.

So it seemed like it was a safe place to work with. And so when the beer was brewed and while it was basically in its second fermentation, to sort of carbonate it, the knotweed was introduced and I mean it was based on a kind of sour beer model and it gave it that kind of sourness, but it was quite a fresh, light sourness. It was really quite nice. I was really surprised. I expected to be kind of like, Okay. But it was really good. Yeah. So, the thing that we ran into once we were sort of, and the first, the first sort of event that we did with invasive species, culinary explorations was very under the radar.
You know, we just invited Friends and friends of friends and you know, it was very unofficial. We had a subsequent event that was part of a Harvard thing, and they really put us through the ringer as far as food safety goes for good reason, right? But like, that's an issue with culinary projects that, you know, if there's any, you know, if there's a funder or any kind of institutional support, often they're gonna be difficult about that.

MF: But another thing, another thing that you said to the first question was like, about belonging, which kind of leads me into the next thing. I've really been interested in this invasive question because it ends up bringing into sociological questions of what belongs and what doesn't. Of course we talk about that in terms of people all the time. And especially regarding marginalized people who are told they don't belong in a space.

And when I think about knotweed, I'm like, how do we Understand that genuinely for landscape architects and gardeners it is a nuisance and a problem. But Also be able to understand that eradicating it is not the answer necessarily, And many others, and like kudzu, it comes back 10 times stronger. So once we realize that eradication is not the end-all solution, how do we think about other ways to utilize this thing? I think that's quite important to ask.

MB: And you know, a couple of things that strike me about that. I mean, first of all, I think that projects that do involve a substantial participatory element are exciting around this, to get people engaged in both, Working with, but in the first instance, just recognizing these, you know, companion plants that follow us wherever we go in the world.

And then make part of the ubiquitous green fringe of the urban ecosystem and wake people up to see them and to appreciate them. You know, your question about How to acknowledge the problematic aspects is an important one.

And at the same time, I think you know, one answer to that, or at least you know, a response to that question is to ask people to consider the frames in which those problems emerge. Are they really intrinsic to the species, to the organism and its habitus, its etymology? Or are they actually the frameworks in which we situate ourselves?

You know, the fact that gardeners have a hard time with knotweed, maybe tells us something about the bourgeois condition of gardening in our society. And these are people who have access to private property within which to express themselves.

And in that context, it's really significant in the United Kingdom where people feel like their whole allotments and back gardens are taken over by knotweed. And they cut it back and it comes back stronger.

These are real challenges people deal with, but they're also challenges that come from the fact that we live in a society where, you know, people strive to invest their entire stake in society through a small plot of private property.

And so, if we organized our cities differently, could they be organized in ways that are more companionable with these cosmopolitan species? What alternative forms do these species with their peculiar ways of flourishing suggest, right? What might a neighborhood or a housing development look like that took these peculiar ways of plant flourishing into account?

it's a lot of fun to think speculatively about, like, I don't think we've begun to tap the playful material possibilities of some of these organisms.

You know, like, I mean, Knotweed is certainly in this category, I think of phragmites, which is the common reed, like on Amtrak from New York to DC you cross the river and you're in the Meadowlands and it's just this incredible monoculture, you know, it looks like corn and soybeans in the Midwest, but it's kind completely self-organized.

And I know that in Northern Europe, there are companies that are starting to harvest common reeds for use as a building material. I mean, it's traditionally been used in Northern Europe for roof thatching for thousands of years. But you know, I think it's interesting to think about ways in which the perfusion of these plants could be turned to advantage.

I have to be struck by, you know, one thing that I haven't thought of before, but purely on the material side. Knotweed is kind of mucinous. Right. Especially when it's a shoot. when you pull them, if you work with them, they're sticky.

And so papyrus reeds in Ancient Egypt and Mesopotamia were used to make paper, like material for writing, kind of the first paper simply by pounding the stalk. You know, until their fibers sort of meshed together and the sage stuck them together, and when they dried, they were writing surfaces. I just wonder what kind of material knotweed might make when similar techniques are applied?

MF: Yeah, I was, I was able to actually do, make some paper out of knotweed this summer. It came out pretty nice. But onto the next question, I'm interested in how these things mutate and like how we think about mutation and I'm curious to hear more about this feral idea in nature, because I think you're the first person who I've heard say that about green life, about flora.

MB: Right, right, Yeah. And you know, so the feral, I got interested in the feral a little more than 10 years ago now. And it wasn't at first with respect to plants. It was about animals but it struck me as a semiotic category rather than just the kind of fuzzy notion of whether feral is wild or feral is ungovernable or something like that. But, you know, so as a term that has its place in a paradigm of the wild on the one hand and the domesticated on the other, there are tame creatures that are captive. And then there is feral.

And it is this creature that's sort of often explicitly in the context of human forms of life and, and yet a form of life that's achieving some kind of freedom or autonomy or is flourishing in some sense. And aside from the plants, dogs. I've read a billion dogs on the planet, give or take, 750 million of them don't live as pets, right?

They live as what we call strays. This is the way the dog is in the world. This is how the dog has formed its relationship with the world and separated itself from the wolf and the coyote and the fox and other canines.

The categories of the horticultural world: the wild, the domesticated and plants

"intact in ecosystems." This concept of a plant that has these qualities that make it companionable with human forms of life in a particularly kind of rich or flexible way feels to me like.

It's a more capacious way to think about these organisms in the first 10 senses. But it also indexes other qualities that I think matter in the world we live in now. What would domestication look like for us? It looks a lot like having a Twitter account and if it's a verified Twitter account, you're super domesticated. You know, they're all the ways in which surveillance capitalism domesticates us, the ways in which we exceed the demands of the expectations of, you know, technocapitalism in the 21st century.

These can be, I think, analogized pretty richly with domestication you know, with animal or plant domestication which is all about the preferential selection of certain traits of organisms. And the use of rewards caused those traits to be magnified or to flourish, right?

And the suppression of animals and how domesticated animals tend to have smaller brains by volume than their wild counterparts. They have literally traded off to us a lot of theirtraits that they needed to survive in the wild.

And they've traded that for comfort, for safety, for often flourishing proliferation and very much the same is true for plants, although it's much harder to see with plants because plants are invisible to us most of the time.

That's a well attested phenomenon, sociologically but also plants. Hybridize and shift in their habits and their forms of life in often very subtle ways that are along a continuum rather than discrete states. The way which is often the case with animals, plants can mutate.

They can have point mutations where part of the mutates, you know, a branch or, or, or a trunk of a tree will manifest differently from the other part of the tree. You know, hybridization happens between plants in a very feral and fruitful way. Plants reproduce vegetatively from cuttings as well as from seed, right?

So all of these techniques that plants have for adaptively flourishing in the world feel to me like a catalog of qualities that are fun and potentially productive to think with and about. Human forms of life in the 21st century that are more sustainable in terms of climate and biodiversity but also maybe more liberating particularly at the margins and in the context of precarity.

What does it mean to begin to think in these ways about how we might organize our communities? If we're thinking in terms of, you know, not only. You know, sort of, you know, kind of straightforward, bourgeois sexual reproduction, talking about plants right now, but also the vegetative. What does it mean to sprout, to propagate, to graft? These are often just metaphors or analogies, but they can be very productive, I think.

So that's the kind of thing that I'm thinking of in the context of plants. Also

acknowledging that this is a system, it's a symbiotic system. As with the dog, in the case of plants, there's a whole complex of veracious plants that have probably been following human agriculture around the planet from the very start that flourish in the context.

Compacted depleted soils, if we saw them in the context of a volcanic island rising out of the ocean, these invasives are the first plants that colonize those places that inhabit them and begin to make them ready for other organisms, right? And we can celebrate those qualities in that context.

But when it's in our cities, they disturb us in many different ways.

MF: Yeah, I think that's super fruitful. And it's curious because when we think about a lot of these invasives that came into Boston or came into the UK especially that were brought in to be domesticated and they just evaded that very quickly.
And It makes me think of a dog that you try to adopt and they just refuse to be trained or something. I think it's kind of discursive in a way that certain plants are able to do this and I'm like figuring out ways to model that and think about how that could be used as something that we can learn from in terms of humanity.

MB: You know, I'm thinking about this because your comment made me think about other instances of what we might call feral horticulture like where and so thinking about slave gardens in the Atlantic world, in the context of colonialism about how Enslaved peoples brought plants from Africa to the new world.

They adapted new world plants to new uses and created this kind of flourishing, you know cryptic horticulture that developed into soul food and Caribbean food. So many Celebrated foodways today come out of this very moving kind of resistant practice of bringing plants to places where they didn't belong in a kind of ecological or official sense.

And so I think that's also a whole set of techniques to think about in these terms. You know, what does it mean for us to think about the kind of climate refugee context of 21st century life and what role plants that are foreign. These plants will tend to adapt to these shifting conditions.

How can we learn from that? How can we work with that rather than against it or alongside it rather than merely appropriating?

MF: Right. Yeah. And I think, yeah, I think this idea of like a climate refugee, I think is super relevant. And just the fact that it can grow through concrete is such a visceral symbol.

But yeah. I don't, I don't wanna take up too much more of your time, but I, I just have like one kind of wrapping up question.

Looking outwards into the future. Of course I've been like playing around with objects and playing around with like how these can be made, but I've ultimately been finding a lot more recent like success in just writing about these things and

thinking about how this could be a model for resilience and being a designer as a curator as opposed to you know, a designer as like a someone who is creating a solution of some kind. So I'm, in terms of ongoing change, I guess, like how can we start to see degraded landscapes as these kinds of future models for adaptability and ways of us being able to mutate ourselves to be better able to deal with the future in different ways.

MB: Yeah. I mean, I think those are terrific provocations that, you know, getting back to thinking about how you know, this design brief can start with the plant life that you're dealing with rather than with the normative tradition of land use and ask, what can we do to create the world in which these plants want to live?

You know, more broadly or more generally, a few other thoughts come to mind. First of all, I'm thinking of a recent essay by Robin Wall Kimmerer which might have been in Orion Magazine, where she, she talks about the use of the common plantain as a plant species that, while introduced, has also become one that indigenous folks are quite comfortable incorporating into knowledge practices and as a useful plant.

And I think that attention to, and holding space for and supporting the actually mobile, flexible forms of indigenous knowledge and practice in the living world today as survival strategies for the 21st century. They tend to meet these plants where they are rather than deciding which plants are right and which plants are wrong.
You know, acknowledge them as, as a community of living relations of the plant world. I think there are probably more examples of that kind of work that are salutary and deserve to be empowered and promoted.

I'm talking to a horticulturist who's doing this kind of meadow making practice. That involves native species for the most part, but native species kind of always are living at the margins. They're very proliferative. You find them in sort of ditches like goldenrod and astor are the dominant species that are native species, but if you scrape the lawn off of a traffic circle the Goldenrod and Astor are gonna flourish there. And rather than relying on the nursery trade, relying on the capacity of these plants to show up and to be part of a horticultural practice, and inviting people to come and know these plants, come to value them, and come into relation with them.

I also think of this urban forestry practice. Can't see the book right now called the Miyawaki method and it's based on and inspired by the work of Japanese botanists who developed this kind of intensive, community driven urban forestry to reclaim empty lots to make a place for intensively grown forests.

The species are locally adapted species, often native, but they are not super rigorous on that front. But just a way of looking at the urban fabric and saying, "oh, there could be a small forest there in this empty lot, or where this strip mall used to be. But then also thinking about, you know, what it means for the community to come into relation with that space and inviting people to be a part of it. Propagating and caring for, and coming into relation with it. So those are some, you know,

examples of some kinds of strategies or techniques or projects that come to mind.

MF: That's super important. I think bringing in either through exhibition or through community building or gathering. But I really appreciate all these really great insights and I feel like these topics are just so loaded with new things that come out every time we talk. So, I really appreciate the time and care.

MB: Totally, totally. Yeah. Well, obviously I'm happy to talk about this stuff, it gets me going. It's good to talk and good luck with the thesis, you know, keep me up to date just as you know, if you're, you know, as you turn towards finishing, let me know how it's going. I'll be curious to see!

MF: Yes definitely, I'll be sure to keep in touch. Nice to meet you Matthew. Have a great evening.

MB: You too. Take care, Max.

Matthew Battles (born 1968) is a writer, artist, and editor of Harvard's Arnold Arboretum magazine, Arnoldia. He is also the former associate director of metaLAB at Harvard University. Battles is the author or co-author of six books, including TREE (2017) which deals with feral nature and its human entanglements

Fig 63.

Fig 64.

Fig 65.

Fig 66.

RESILIENCE IN DISRUPTED LANDSCAPES: A CONVERSATION WITH LORÉN SPEARS

Maxwell Fertik: So for this project I am looking into degraded landscapes in Rhode Island and how invasive species, specifically Japanese knotweed, in Rhode Island can be sort of a window into colonial histories and decolonial histories and they way we call certain things invasive and some native.

Lorén Spears: Well I'll start with that. The way that we think about an indigenous ideology is we are the land. The land is us and what we do to the land, we do to ourselves. So when you think of it in that way, everything related to who we are as a people is connected to this land. And, when I use the word land, I use it in its entirety, land, waters,, the gifts, the blessings of the land, meaning the plants and animal life.

Everything is connected. So from a museum perspective, we do a lot of work around this and we take people out on the landscape, everything. We used to call them nature tours, but we tend to call them TEK tours today.

Which stands for traditional ecological knowledge, because that's what we're sharing, right? Even when we called it a nature tour, we were still sharing traditional ecological knowledge and pointing out the belongings within the museum, what you just referred to as artifacts.
If we're looking at the birch bark canoe in the museum, we're out on the TEK tour and looking at a birch tree. But then we're also talking about the birch for the birch bark container. The birch bark canoe, the birch sap that you can harvest and drink the chaga that you can make into a tea. Birch, polypore, mushroom, and its properties.

So it's looking at things holistically. So, um, when you think of RISD and you think of the arts, everything has gifts and blessings and can be arts, but it doesn't have to be one thing. So in a Western way of thinking, something's one thing usually, you know, in an indigenous way of thinking, It can be many things.

So if you can look at bull rush, for example, right? Most people see bull rush. It looks like grass in the water, the edge of the water, they pay no attention to it. But that bull rush can be food. You can eat the shoots, the roots and the seeds. You can harvest that plant. Weave it into mats and bags and baskets for things that you need for your home.

And traditional coverings for your traditional home. But it's no different than if you wanted a cordage mat for your sunroom, right? You could make one and put it down on the floor, or you could use it for your traditional covering for your Long House. And insulate your home while making it beautiful.
Then you could go to the bullrush, to the cattails and do another mat. Eat the foods, the shoots and other parts of it. And you could line your baby diapers with it if you so choose. a little more work than a pamper for sure. But, still something that our ancestors would do to absorb.

Line your cradle board for softening like a mattress. There's lots of uses for these things. So when we think of land use, um, and the landscape as a whole, we think of it as a gift from the creator and the gifts of that land come in many forms. Some of those forms are edible, some of them are medicinal.

Lots of medicines come from this too. And I talk about medicines in layers. You know, there's wellness medicines. if you take the purple cone flour, SIA, Medicinal, but it's mild. You know, you can drink eina tea and you're not, you really can't really overdose on that.

You can't overdose on mint tea, right? So there's wellness teas and then categories that are kind of in that wellness zone where they help you, you know, kind of like ginger root, you know, if you eat ginger, it helps them settles your stomach, but it's not gonna necessarily cause you a lot of grief if you have it every day.

Then there's the next levels of medicinals where you have to be more judicious about how much you take. Um, and, and, and you have to treat it like a medicine. And then there's others that are even more extreme. Mullein for example, you can use that for bronchial issues and drink that as a tea.

But you really need to know what you're doing. You cannot start drinking mullein tea, every day, all day, because then you would hurt yourself.

And then there's some teas and medicines that come from powerful roots that you really need to know what you're doing. So there's these different levels. The most common are things like tobacco and sweet grass and cedar.

So there's edible, medicinal, spiritual, things that are used in ceremonies.

But nonetheless, the point is that some things are used in ceremonies specifically, but I always like to remind people everything is in ceremony because when you harvest, you give thanks and that's part of the ceremony. When you harvest, you leave something behind and give thanks for, for the life and the gift of that plant or animal.

There are also plants harvested for technology. You might be harvesting cedar for ceremony or you might be harvesting it for weaving and cordage, engineering your home.

So there are lots of layers to what you're doing and different things take different technologies. And we talk about that as well. Conquest and colonization interrupted some of these things by creating fishing weirs.

You know, the rivers were dammed up and the herring and salmon weren't spawning upstream to use those fishing weirs. Two people seem to think they own the coastline and the waterways. So you can't make the fencing weir that you might have done in the past to direct the bluefish when they're running, for example.

That is technology we know and understand, but maybe aren't using on a regular basis today. Um, so those are things that are impacted by the changes. In our world, due to conquest and colonization and urbanization and industrialization, all the -ations that there are, even gentrification today, that is still displacing indigenous people from their homelands and from access to waterways and to those same resources.

MF: Yeah, that makes me think of some of your work. I read earlier this week about Mashapaug Pond as the last naturally occurring fresh body of water. And a lot of these bodies of water in Rhode Island are so polluted to the point that it has completely changed the nature of life in those ponds. Specifically, there's a body of water around Roger Williams Park that used to be right where Gorham Silver used to be and some, I'm curious your thoughts on how industry grapples with these questions as a form of reckoning with this past destruction? How has this destruction of the land affected the indigenous community as well in the region?

LS: Well, let me think about it, I'll go back to Mashapaug Pond first and use that as the center point.

You could extrapolate this out across all the land, but when you think about Mashapaug Pond, it was one of our historic villages, of this region of what we now call Rhode Island, It was under the territory and umbrella of the Narragansett Nation. And there were tributary tribes that were nearby like the Niantic that were in the southwest corner, Nipmuck in the northwest corner and, uh, Wampanoag in the northeast corner.

But when you think about that, we were living much more in balance with our ecosystem and had these strategies for managing the forest and fire burning and harvesting. You know, it's one of the things that we talked about during a recent round table discussion with tribal leaders and a couple of us were there from the Tomaquag Museum.

And one of the things that we talked about is that access to resources has been diminished because of the vast growth of population in this country and the commodification of land and resources, which has been ongoing since the beginning. So if you go through time a little bit ...
The first introduction to Europeans to this space and place. That begins to change the land because there's a clash on the way in which you use the land. Right? The way that you're in relationship with the land. Indigenous people had a relationship with these places and spaces. The Europeans that came here were thinking about the land in a way of commerce and commodification for income and wealth.

If you were a landowner, you were wealthy, in a Eurocentric way. We were wealthy because we were communally living on this land, creating support systems of harvest and give back, harvest and give back. And that you did it in balance. We are always taught this.

Take, basically, the first and the last. Make sure there's something for the next generation of whatever plant that is there, not just wipe the whole thing out.

So when you think about that, we had so many clashes of ideology that were happening on top of each other. Introduction of new species, hogs, cattle and other domestic animals.

I mean there's very early documentation about the destruction of the under story of the forest. The clam beds that were being destroyed by the hogs and they were digging up the clams.

There's a word that I'm trying not to use anymore in my vernacular, and that's the word wild.

Like when we talk about out in the wild, there's this notion that historically when Europeans first came here in the 1600s, that the land was wild and free for the taking. And there was this notion that it wasn't being utilized. But the reality is indigenous people from Coast to coast were utilizing the land, but they were living more in balance with the land they were moving around to.

And when I say moving, I don't mean nomadically necessarily. But moving villages so that lands could regenerate. They were moving gardens so that they could reestablish themselves and give nutrients to the ground. They were burning forest understories so that things could regenerate. There was a lot of work around maintenance and care for the land and as I said, back to the original teaching, if you are the land, then you need to care for it because what you do to the land, you do to yourself.

There are actual laws on the books. The one I'm most familiar with off the top of my head was out of Newport, where it was against the law to harvest tree bark. And you know, a lot of times I'll say this to kids on a tour and they'll be like, "well, you shouldn't harvest bark because it kills the tree."

Right? Because that's what they've been taught today. Right. But they don't think about what it means when it's a law that blocks you from harvesting bark? What does that stop a whole community of people from doing? It stops you. If I just use Poplar as one example, the bark was used to cover our homes.

The actual trunk of the tree after the bark was removed was to be a dugout canoe. So now you've gotten rid of our homes. You've gotten rid of our transportation. Bark was used to make a quiver. Bark was used to make cord. The inner bark was used for medicines.

All of those things now are being stripped. So we've talked about medicine, we've talked about materials for tools, quivers and baskets and bags, cordage. Quickly, like in five seconds I've come up with a bunch of things that's just from that one tree. If you are not allowed to take the bark, you now lose all of those things that we just said.

And it's complex because that's across all kinds of trees. And, and you know, like I tell young people, it's not like we were just stripping bark. We were utilizing the

whole tree. When you took the tree, you used it all and as multiple ways as you could because you're giving thanks for the life of that tree for your life.

And so to have respect and reciprocity, you use all of it that you can. And so that was really important. And all that changes things when, when the ideology, rules and laws around the relationship with a plant changes, it makes life very difficult if it's against the law to harvest bark.

There's lots of things that you lose, lots of resources that you lose from lots of different kinds of trees. And so that's a really strong example of that impact. And so when places like Mashapaug Pond, where it would've been maybe a winter village for our ancestors of the Narragansett Nation, when people move in and those first things are happening they were bad enough. The introduction of domestic animals that were maybe putting things in the water that were toxic or, you know, an abundance of runoff that was causing algae blooms, that was already bad enough. But then when you add in European style waste, that's an added problem.

So there was this layering of negative impacts on these waterways in what is now considered Providence today. Those urban centers that are now urban today, they started it as pristine places and slowly over time were getting impact after impact. So some of it is the cutting of trees and causing runoff and things since there are no protections for that. It's heating up the water.

There's this impact of European lifestyles too, waste removal systems that are different from indigenous uses of those waterways. Then when you start getting into. Industrialization, then it really changes cuz they start damming those rivers and changing the way those waterways move all together.

And then as things like the industrial mills are put in place, all those toxins get put into the water and into those river systems that, at the time, they thought would just disappear into Neverland. But we all know that each thing, whether it was the paper mills or the cloth mills, all those dyes and toxins and things that were all just put into the water that started changing, killing off plants and killing off animals, but also changing the water structure. The ways in which the water flowed. Due to the dams and things like that. And of course, if you go into something like Gorham Silver, I mean, that's in the soil. That's in the water, it's toxic.

I mean, the project with Holly Ewald from New Urban Arts, she started on that project because the city came up with a call for an artist to make signage. And it's because there were a lot of immigrants moving in that didn't understand the language and were literally fishing on the pond. But you know, in our country today, there are lots of people who fish that are catch and release fishermen. It's just the sport of fishing. I find that a little bit abhorrent personally. Because I feel like if you're gonna catch a fish, you should eat a fish , but not from Mashapaug pond.

So what was happening was immigrants were coming in and they were actually eating things from the pond, which is unhealthy because they were incredibly polluted, right? But they don't know that because they didn't understand this American thing of catch and release fishing. And so they had to put up these signs

and Holly, along with students, created these signs in multiple languages that told you that the water wasn't healthy.

Our history of that place, indigenous people were here prior to European contact, but also survived here through each wave of colonization, industrialization, urbanization and gentrification. All of those things that are taking place and displace them from these spaces and places.

And, and so through some of the projects we're capturing those stories, the stories of our ancestors that have lived there, prior to European contract, all the way through the displacement that people all different ethnicities felt as they put in those industrial parks to move people away from the pond because it was so polluted.

So I think that it's really important. And one of the things that we talk about a lot is that, um, everything's connected, right? So when you were mentioning the ponds in Roger Williams Park, they're connected. Those waterways are connected to Mashapaug Pond by underwater tributaries. They eventually go into all those parks and then eventually into the river and then out to the Bay. So when we talk to young people and you're talking about the pollution that's happening at Mashapaug, that's polluting those tributaries and ponds in the park and then eventually putting that water in the bay.

And when you think about the different times that different parts of the bay are closed, not that it's all to do with Mashapaug pond. Lots of these pollutants get in there from storm runoff from the urban environment since there's no place for it to leach into and it picks up all the toxins from the roads too.

All of that is connected. So when we think about it as indigenous people, we're also thinking about the dispossession that we've had over and over and over again of our homelands. We continue to see that. I can take that right in the rural sense too.

The pandemic added to dispossession for indigenous people because of all places in the State, and really in the region are getting exponentially more costly and that's displacing indigenous people from rural towns to suburban to urban towns, and then sometimes out of the state altogether.

MF: Thank you so much. There's just, there's so much to unpack in there. it makes me think I, yeah. When, when we think about these questions and the, these like tip of the iceberg things like algae blooms, and invasive species, the dispossession is just the tip of the iceberg.

These plants that grow after everything else. after everything else has been contaminated or Degraded in some way. I'm very interested in seeing things you witness above the surface but there's so much underneath it. Like you were saying, how everything is connected.

It's not just in the pond, but it's also in the soil and it's eventually in the ocean and it's eventually, you know, in us in some way. And I think it comes from a time when

colonists were just kind of developing land left and right, and there were no consequences necessarily.

Bringing these questions back to the surface and kind of materializing them in different ways, is something that I'm hoping to do with this project. But as a final question, looking into the future, I wanted to kind of ask about this resilience that we see in ecology, and in the Narragansett people as well and how indigenous communities have been able to survive through so many different, repeated traumas, I wanted to ask, how might we look to this as a model for the future and consider ongoing change beyond solutions in this next period of the anthropocene?

LS: Let me go back before I get to the last question. I wanted to mention something about invasive species. One of the things that, you know, we often talk about with Phragmites and how they invade the space of the cattails, for example, how they displace them and the cattails have all these usages both edible and technological and so forth.

We don't see the same benefit from the Phragmites as we do from the cattails for, for resources. But it's interesting. I love Robin Wall Kimmerer, I'm sure you've read *Braiding Sweetgrass* but one of the things that stuck out with me in particular, is, she speaks our language. You know, we come from the same perspective.

But one of the things that she talked about with invasive species vs native species or indigenous species was the question of becoming naturalized. And I liked that because we talked about how on our TEK walks, we talk about things like dandelions, for example, and how we eat the leaves and make a tea and do different things with this plant, and how some of them have been around for so long that they've been incorporated into your traditional knowledge and ways of being. And so I kind of took from her conversation around that to be "immigrated here" but then "became part of our community" and "became a benefit to our community" in a positive, productive way, that didn't necessarily destroy habitat or opportunity for other things, right? I also love the way Wisteria looks. But I'm always telling people never to plant it because we always talk about the first person that has it in their yard...

The first person that plants the Wisteria in their yard, right? They are a tremendously great gardener. They take care of it, they do all this work, and it's love.

And then I go, and then they move and the next person comes in and has not a clue how it needs to be managed. They're not gardeners of the same level, so they don't know how to manage it. And all of a sudden, Wisteria is down the canopy, down the street and into everybody else's yard and then beyond, right?

And that's the same thing with Bamboo. There may be wonderful uses for bamboo, but when we don't have koalas here eating the bamboo, what happens is people put up a line of bamboo and it's all lovely until they move away, and then the next person doesn't know anything about bamboo and it's all over the neighborhood.

So those are sort of my comments about invasives that sometimes make it detrimental. We have invasive animals as well that are taking over the place. The indigenous rabbit that's from this area, the Northeast Cottontail, or something like that.

But, you know, those kinds of things. There are things that are taking over, some that are extraordinarily detrimental and are really taking over the habitat, the homes, locations and things like that.

But back to your talk about resilience and ecology and our community as indigenous people and what "survives" over time. When I think about the resilience of our people, we have been steadfast. And our ancestors were remarkable at surviving persistent conquest, which included displacement, enslavement, forced assimilation, germ warfare as well as overt warfare. I mean, they survived all of those things. Navigating these changing systems once King Phillips war happened and power shifted prior to King Philip's War. During that war, for this space, what is now known as New England, they used every strategy to eradicate indigenous people here to conquer this space and to lay claim to the resources so that they could grow their own economy.

When it was in the 1600s when we were dealing with King Phillips war, in the beginnings of conquest and colonization, it was the agency of our people, the strength, resilience, perseverance and adaptability. And of course the strategizing to ensure sustainability because we wouldn't be here if there wasn't for that.

And whether it's, you know, making decisions, you know, whether that was during the 1700s fighting in the Revolutionary War. Because they thought that if they're trying to throw off the yoke of tyranny from Great Britain, maybe if we join them, we will also get our rights.

But that didn't work out very great, but we did it nonetheless. And you know, served in that capacity. And, it's been documented many times about the importance of that service, right in the creation of this country and. The decisions that were made in order to ensure the success of future generations of our community.

And that went onward to the continued fight for rights. There were people and there's documentation of us constantly writing to government officials, trying to ensure the rights of our people, political figures as well. People that were just lay people just doing what needed to be done to have their voice heard in different forums.

But there's still a constant barrage on our rights and identity and belonging to this place. There's a constant threat of displacement and usurpation of the land, no matter how much they have. They keep taking more even in the 21st century. But there's this constant work, you know?

Whether that's legislation that happens, some of it on the national level that's impacting us, but that people in our home community are working toward. Whether it's you know, the Indian Reorganization Act of 1934 or American Indian Citizenship

Act, I think of more if my memory serves, the American Indian Movement and the American Indian Civil Rights Act, the Indian Child Welfare Act and Land Claim Settlement Act of our tribal nation and federal recognition, you know, land Claim Settlement Act was in 1978, as was the Indian child Welfare, as was on the national level, as was.

The Indian Religious Freedom Act, which was also 1978, then our federal recognition in 1983. But we continue to fight for rights. Sometimes little things, like a few years ago through our indigenous empowerment program here at Tomaquag Museum, we actually testified to ensure that tribal IDs could be used to vote. This was maybe eight years ago now. But we did that so that tribal IDs could be used and now when you go to the polls, you see it as one of the choices. But before we did this, it was nebulous and people weren't sure.

Recently some tribal activists, including some of our staff here at the museum, were advocating for rights in the town of Narragansett to be able to walk on the beach without a fee. You know, which is so commodified. You can't even go to the beach. We're not even talking about parking your car. We're talking about walking on a beach.

But it took a lot to win, a lot of people testified at the town council and it. I don't know how many people took advantage of that but I know I went there at least once just out of principle just to make sure it was done right. And I know there were others that walked across that beach.

As the first people of this land, we should be able to go on any beach that's here. I mean, it's absurd that we can't. But you know, we've also had meetings, with the powers that be to ensure access to salt ponds for Quahogging.

And we've talked a lot about how they're is starting to be water dispossession along with land dispossession as people are starting to do all this aqua farming and how that's starting to infringe on indigenous rights and access to waterways. So these are the things that we work towards in this idea of our own resilience and agency and survival

We continue these fights for justice because we wanna ensure that these rights are there for our next generations. You know I'm a grandmother. My grandson is four, and I want my great-grandchildren to still be able to hunt, fish, gather, grow, do agriculture in a traditional way and have the rights to do so.

And not to have those opportunities, to be able to speak our language, to be able to, practice our own, traditional religious beliefs, spiritual beliefs. That's really important. They're currently attacking Indian Child Welfare right now. If they're attacking Indian Child Welfare, could they attack the Indian Religious Freedom Act too? Could they walk back civil liberties related to indigenous people through the Civil Rights Acts?

All of those things are really important so we continue to work to ensure that they're there for the next generations to come. We often say "Seven generations."

I can't go back in time and say exactly why that was selected, but the way that I've always interpreted it and what has always been expressed to me from my family members is that seven generations that come was related to the idea that, like my grandmother, she lived to a hundred. But in her lifetime if you go from her to her children, her grandchildren, her great grandchildren, her great great grandchildren, which she lived to see, there's still two more generations out from that. So if you're doing things in your lifetime to impact seven generations, that goes two beyond what you can live, right? And so that's really impactful. It's that you're leaving the world better not only for the next generation, but you're creating that opportunity for the next seven. So everything that we do is supposed to be for those next generations. And I certainly try my hardest to ensure that, in the work they do here at Tomaquag, I'm trying to make sure it's here for the next generations we're creating a really strong foundation.

So in many ways that is the most important model for the future.

MF: Well Thank you so much, Lorén

LS: Thank you too, take care.

Lorén Spears (Narragansett/Niantic) is an educator, essayist, artist, and two-term Tribal Councilwoman of the Narragansett Tribe. Spears has taught for over two decades, including 12 years in the Newport Public School system and is the Executive Director and curator of the Tomaquag Indian Memorial Museum. She has also done significant work on the Indigenous history of Mashapaug Pond.

Fig 67.

6

THE EXHIBITION

all exhibition photos by Qingxian Xu and Maxwell Fertik

MAXWELL FERTIK


different scales, (silverware, table an
discussing the xenophobic language
invasive species, this project investig
resilience and local resourcefulness
a post-industrial future.


Fungi in Flux
MATERIALITY & TRANSFORMING LOCAL WASTE
MYCELIUM DESIGN & PRODUCTS
AN ALTERNATE APPROACH TO PROTOTYPING
POSTINDUSTRIAL PLAYBOOK ++
There is no such thing as an undisrupted ecosystem. Every inch of the planet is impacted by industrial development and its chemical legacy has mutated the soil and water. As a response, this thesis is designed to promote abundant over extractive resources and visualize a post-industrial reality. It consists of a series of objects, writing and design research on the relationship of industry and ecosystem.
In many ways it is a playbook++, laying out
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amid collapse.
weed (Reynoutria japonica)
grows in the most degraded
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FREEDO
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TO PICK IT


AN ALTERNATE APPROACH TO PROTOTYPING
METHODS TO BIO-FABRICATE FUTURE OBJECTS
POSTINDUSTRIAL
PLAYBOOK ++
SYSTEM

7

PRECEDENTS


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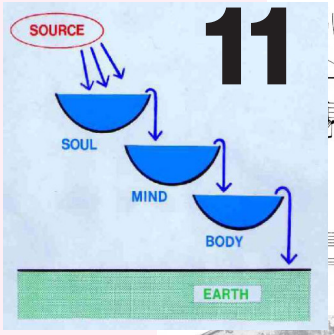

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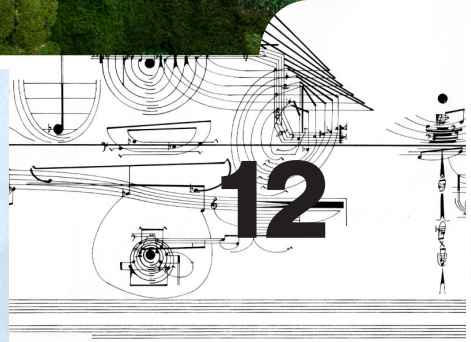
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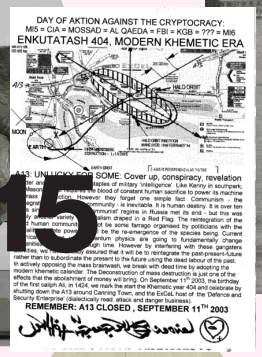

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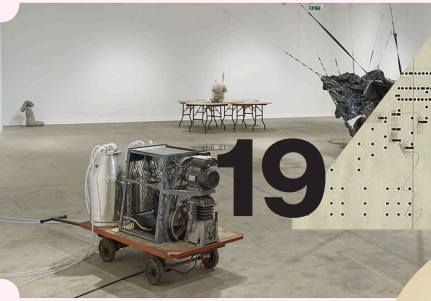
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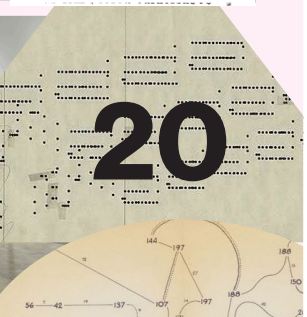
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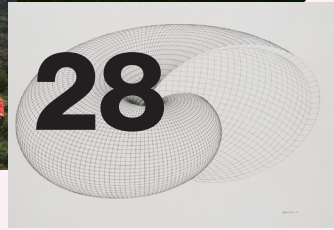
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1

Daniel Lie Children of the End at Casa Triângulo / São Paulo, Brazil in 2018, multimedia

2

Laura Coombs, "Unstable Signs," 2021. 3-D rendering, 6417 pixels x 4813 pixels. Courtesy the artist as mentioned by Mindy Seu in cyber feminist index

3

Hope Village Cotton Mill in Hope, RI. I spent two weeks during my thesis fall housesitting in this tiny town within Scituate. Formerly one of the largest textiles mills in the nation now lies in disrepair and abandonmultimedia

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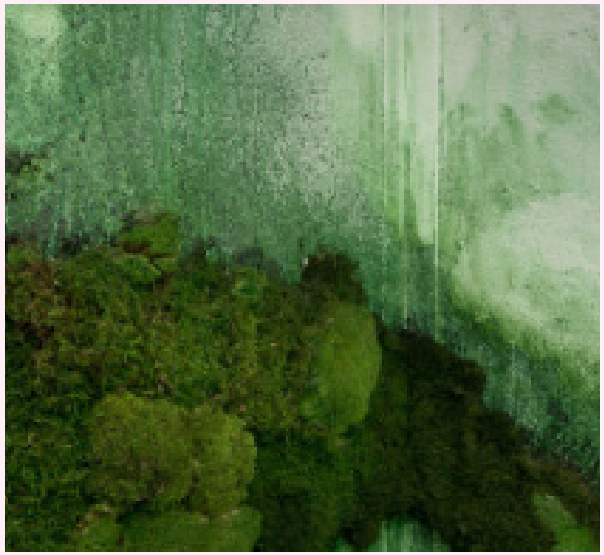

Jenna Sutela, Sporulating Paragraph, 2017. Courtesy of the artist and Momentum 9 Photo: Istvan Virag Copyright: Punkt Ø/Momentum 9, used in e-flux article

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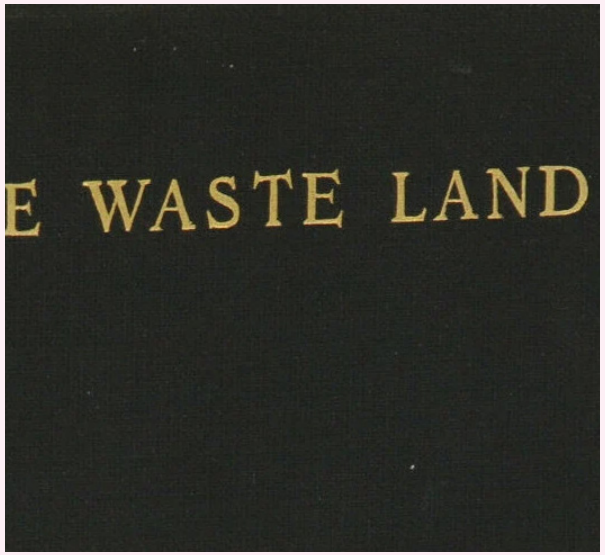

The Wasteland by T.S. Eliot, the first epic poem I read that had more hyperlinks than text, every line of the poem had a reference to something from mythology or religion.

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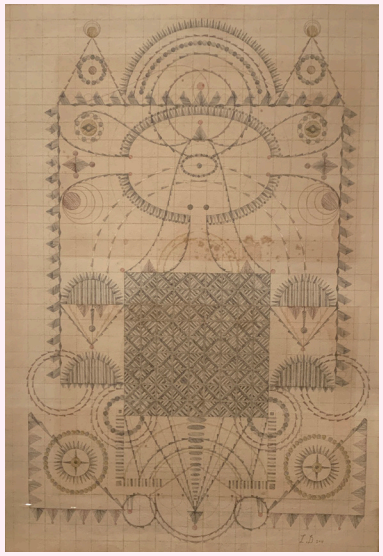

Louis Despont, untitled, 2015, graphite and colored pencil on antique ledgerbook pages, a piece in the RISD Museum

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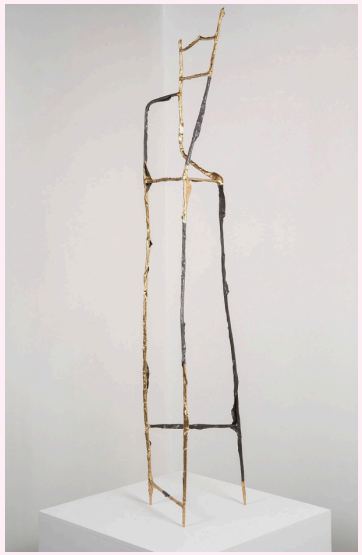


Michelle Lopez, House of Cards, 2018, lead, steel, hand twisted steel rope

8

An 1889 orthographic map of Hope, Jackson, Fiskeville and Arkright, Rhode Island. These towns all were integral to the early industrial development of the state as well as the slave trade. Arkwright Manufacturing was owned by James DeWolf, the second richest man in the US in the 1820s and one of the most prominant slave traders in history, trading slaves long after it was outlawed in Rhode Island. These areas and histories are inherently tied to postindustrial ruin in local ecosystems both in human and nonhuman contexts.

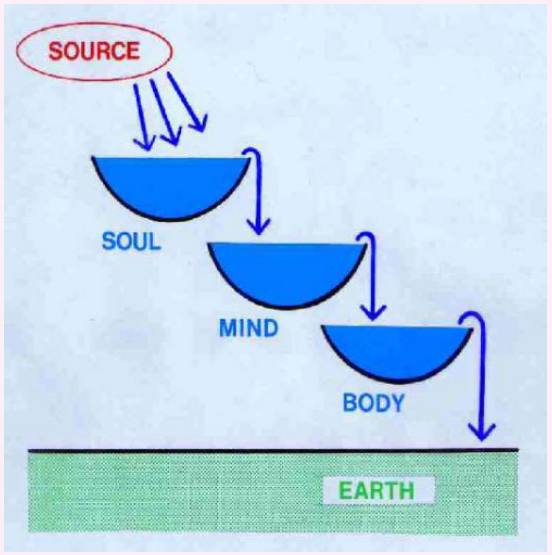
9

Arnoldia, the literary journal of the Arnold Arboretum at Harvard, cataloguing the plants that have the ability to grow through concrete, like Japanese Knotweed ...

10

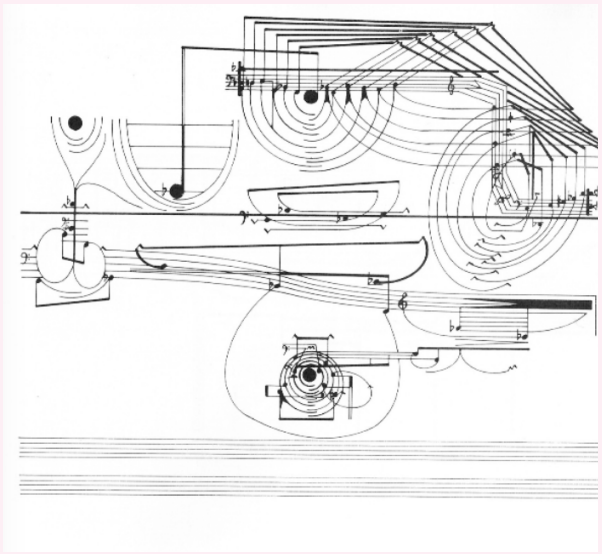
The westside piers of NYC in the 70s and 80s, a symbol of queer existence amid postindustrial collapse, a place well documented by Alvin Baltrop and worked on by Gordon Matta-Clark.

11



An interesting chart that is pretty meaningless that I found on the internet

12



Sheet music for Cornelius Cardrew's "Treatise" who focused on writing indeterminacy after assisting John Cage

13

How to Wrap Five Eggs by Hideyuki Oka discusses the beautiful progression of traditional Japanese packaging before mass production. The package is the art itself.

14

The raw, mythological sculpture of Reuban Nakian is progressively inspiring to me and perfectly embodies the feeling of mass.

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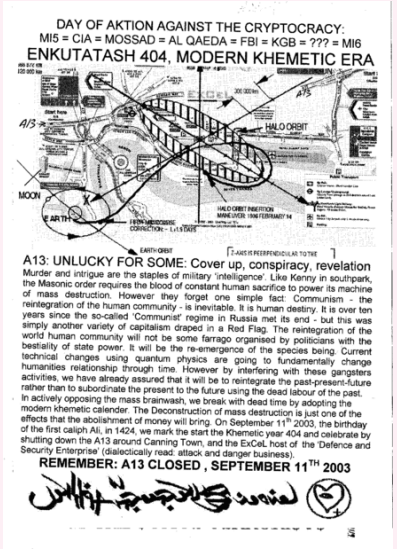

A strange conspiritorial artifact of London Psychogeographical Association. propaganda. The Situationists based their ideals on Psychogeography which is the exploration of urban environments that emphasizes interpersonal connections to places and arbitrary routes. They experience cities on foot.

16

Gordon Matta-Clark,Conical Intersect, 1975, black-and-white photograph, 42 x 42". © Estate of Gordon Matta-Clark.

17

Gina Hsu and Nagaaki Shaw, 'straw stool' by gembodies strength of the fragile,

18

FOS, One Language Traveler, 2011, Nils Staerk Gallery

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Yu Ji, Jaded Ribs, 2019–21, Courtesy: the artist and Chisenhale Gallery, London

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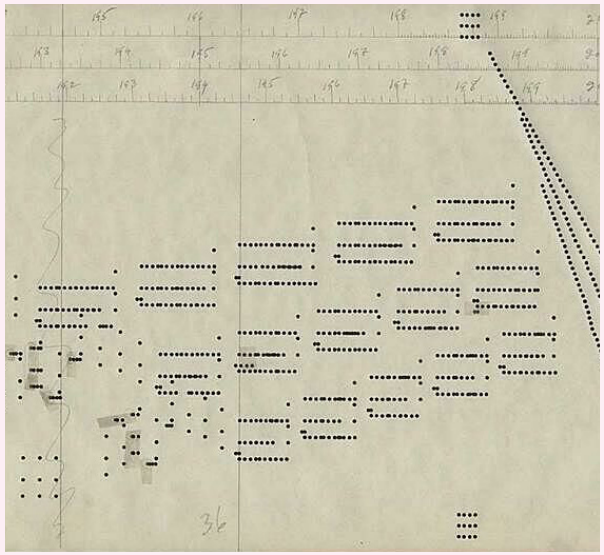

Conlon Nancarrow, The ending of Study 49c. Score courtesy of the Paul Sacher Foundation, a score for player piano

21

Japanese Knotweed, Reytronica Japonica, an incredibly resilient displaced species that can grow through concrete and thrives in postindustrial and distrupted landscapes.

22

Daniel Lie, Death center for the living Performeum/ Vienna Festwochen Viena, Áustria, 2017

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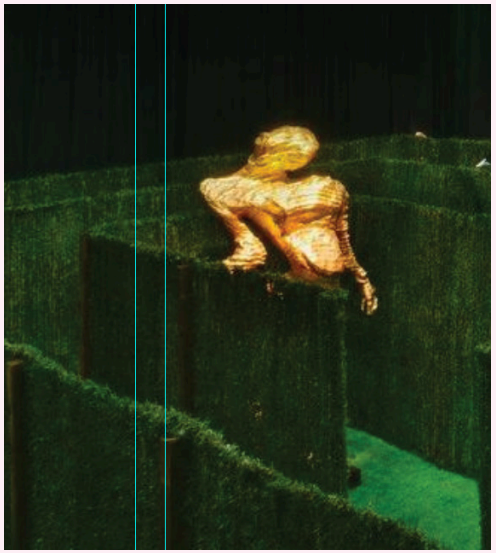
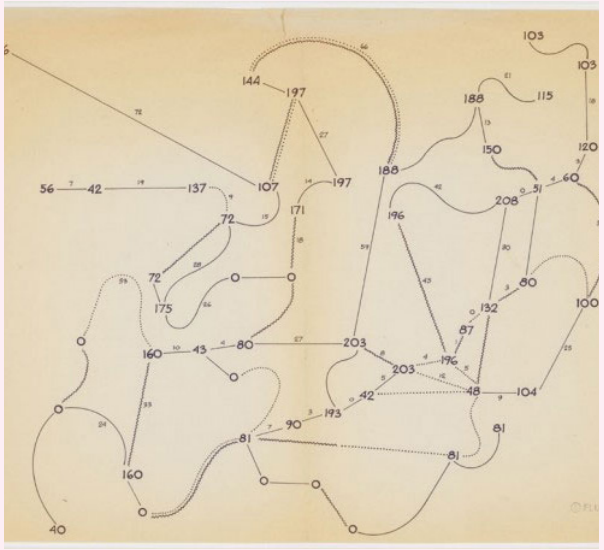


Installation view, Jon Rafman, 2015 at Zabludowicz Collection, London.

24

Courtesy Cal Flyn, Islands of Abandonment: Life in the Posthuman Landscape

25



Toshi Ichiyanagi, Music for Electric Metronome, 1960

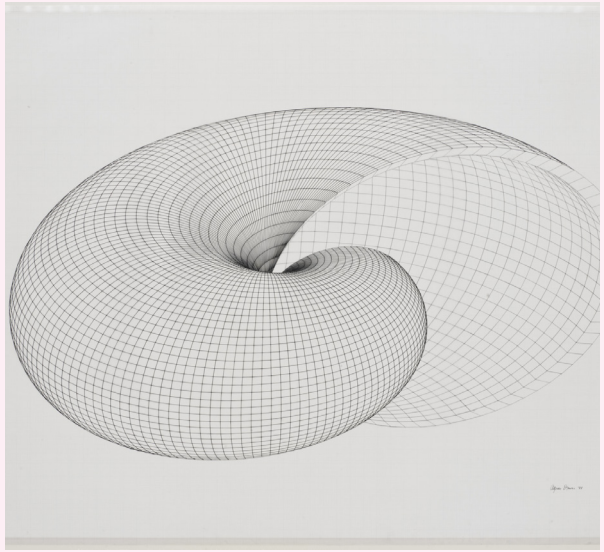
26

Royal Mills, West Warwick, RI, Exterior view, looking west down the Pawtuxet River, South branch.

27

Futurefarmers, Wind Theater, Lofoten, Norway, 2019

28



Agnes Denes, Snail Pyramid – Study for Self-Contained, Self-Supporting City Dwelling – A Future Habitat, 1988

8

BACK MATTER

COLLABORATIONS

CHARLOTTE MCCURDY

++

PAOLO CARDINI

++

TOM WEIS

++

ALEX IONESCU

++

MINDY SEU

++

CHARLIE CANNON

++

JEN LIESE

++

BEN JURGENSEN

++

HILLEL OLEARY

++

HOPE LEESON

++

MATTHEW BATTLES

++

TAYLOR BALDWIN

++

AYA MARUYAMA

++

LORÉN SPEARS

++

EMILY CORNELL DU HOUX

++

ELIZABETH LEEPER

++

KHIPRA NICHOLS

++

GREG ONDO

++

DEEPIKA NANDAN

++

TESS FEIGENBAUM

++

HOLLY EWALD

++

LESLEY BAKER

++

SEAN TAYLOR

++

J HOGUE

++

MATT MULLER

++

AUGIE LEHRECKE

++

NATIVE PLANT TRUST OF MASS

++

MAINE INVASIVE SPECIES NETWORK

Fig 68.

ACKNOWLEDGMENTS

I want to thank my parents - Lisa and Scott, for being supportive unconditionally

Erika - my inspiration and confidant for helping me every step of the way

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figure 9-10: Famously post industrial site of Morley Field in Pawtucket, teeming with Knotweed on the edges of the site. credit: Maxwell Fertik

figure 11-12: Demolition of Valley Worsted and the subsequent mourning of the building by Fort Thunder community and friends. ArtInRuins & public sources. “Property: Valley Worsted Mills,” ArtInRuins. com, updated May 2, 2020, https://artinruins.com/property/ eagle-square/. Accessed March 9, 2023

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figure 14: The ruins of Gorham in the early 2000s before the construction of Alvarez High School. ArtInRuins & public sources. “Property: Gorham Manufacturing Company,” ArtInRuins.com, updated September 3, 2020, https://artinruins.com/property/gor- ham-manufacturing-co/. Accessed March 9, 2023.

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figure 28: Taken in studio during the pulp-making process for Venice Design Biennial, part of a timelapse video credit: self

figure 29: Taken (again) in summer 2022 in Mt. Hope, knotweed in hand. credit: self

figure 30: “Indeterminate structures of repair”, August 2022, credit: self

figure 31-34: Process of “Indeterminate structures of repair”, pictured is the slicing, the draining of the pulp, the molding of the form, the assembling of pieces. August 2022, credit: self

figure 35: “Indeterminate structures of repair II”, August 2022, credit: self

figure 36: knotweed pulp, January 2023, credit: self

figure 37-39: “knotweed pulp table,” January 2023, credit: Sam Aguirre and Maxwell Fertik

figure 40-41: “knotweed silverware version 2,” February 2023, credit: self

figure 42-43: silverware mold making process, February-May 2023, credit: self

figure 44: “knotweed silverware version 3,” electroplated, February 2023, credit: self

figure 45: “knotweed raft,” March 2023, credit: self

figure 46: “Ice pond Southborough, MA” March 2023, credit: Alexandra Ionescu

figure 47: “knotweed raft,” March 2023, credit: self

figure 48-49: The beeswax and bundling stations in the studio. March 2023, credit: self

figure 50: “knotweed raft,” taken in Fletcher. April 2023, credit: self

figure 51: A Render by Augie of the next iteration of floating island for summer. April 2023, credit: Augie Lehrecke

figure 52-53: A day in Maine spent with UMaine Sculpture cohort, knotweed composite and bundling workshop. Orono, ME. March 2023, credit: self

figure 54-55: A day in Maine spent at the MISN: Annual Invasive species network meeting. Second photo taken with permission of person. Orono, ME. March 2023, credit: self

figure 56: Knotweed field day in the valley of the East Side Train tunnel. Truly a knotweed forest of dead and growing knotweed. May 2023, credit: Gavin Zeitz

figure 57-59: Carrying the first of four loads with Bill and Spencer. May 2023, credit: Arvind Bhallamudi

figure 60-61: Truly in the weeds with friends and strangers and the final pile of harvested knotweed. May 2023, credit: Arvind Bhallamudi

figure 62: The original forest of knotweed in Mount Hope a year later, this was the place where Erika first pointed it out, it was bulldozed and now it is back stronger. May 2023, credit: self

figure 63-64: Two images from Apocalypse Now referenced in the interview with Matthew Battles. Perry, Kevin EG. “Francis Ford Coppola: ‘Apocalypse Now Is Not an Anti-War Film.’” The Guardian, 2019, https://www.theguardian.com/film/2019/aug/09/francis-ford-coppola-apocalypse-now-is-not-an-anti-war-film. Accessed 2023.

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