Ruinous Speculation, Tunnel Environments, and the Sustainable Infrastructures of the Border

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"What sort of worlds might we find if we could have a totalizing view of the underground?" This is the premise of Edwin Agudelo's speculative design project *A Practice in Excavating and Envisioning Ambos Nogales*. The project takes the existence and relative obscurity of multiple underground infrastructures across the US-Mexico border as an invitation for speculating on border alternatives. A series of mixed-media models constructed from photographs, sketches, and a cast of Agudelo's own making, *A Practice in Excavating* rethinks the role of border tunnels, sewers, and caves as a sort of common space, available not only for the present but also for the future. The starting point for envisioning alternative underground worlds is the patchwork qualities of both border fences and border tunnels. Border Patrol agents must continually mend broken fences and torn down chain links across the border. Likewise, following the discovery of a trafficking tunnel, Tunnel Task Forces seal off its exits with a few feet of high-bonding concrete yet leave the tunnel's main shaft intact.[1] Agudelo zeroes in on this peculiarity of border tunnel afterlives and proposes that their hollowed out remains hold potential for a new public space. "At stake is [shifting] the U.S.-Mexico border from the typically thought of aboveground condition to one of a subterranean and limitless clandestine nature." He suggests thinking through three underground border systems—sewers, natural caves, and drug tunnels—as a "system of aggregation," or assemblage, that is "capable of being programmed for public access."[2] In *A Practice in Excavating*, this underground assemblage

features no functional distinction between its multiple enabling structures, whether made by human or nonhuman, licit or illicit. What this model suggests is a future common space emergent yet unmoored from contemporary geopolitical distinctions.

To rethink the form and purpose of the US-Mexico borderlands is an objective of utmost importance. The borderlands, including its nonhuman lifeforms and milieus, constitute complex natural and social environments that have in many ways become irreversibly altered by the physical structures built to enact political boundaries.[3] These environments have been "infrastructuralized," Andrea Ballestero's term for singling out legally and technically the function that a natural feature (like aquifers in Ballestero's research) acquires for human life.[4] For decades, US state agents have relied on the desert to act as a weapon against unwanted human migration into the country, building blockages such as walls or fences to push migrants into desolate and dangerous areas to die off while attempting to cross. At the same time, what I have elsewhere called "the racial infrastructures of the border"—including walls, checkpoints, camera towers, and drone weapons—debilitate and destroy the once-thriving ecosystem of the desert, including its animal and plant habitats.[5] *Borders themselves*, as Reece Jones argues, are violent and potentially deadly structures.[6] The project of infrastructuralizing the borderlands consists of mobilizing living environments into the tools and the grounds for the destruction of subaltern lifeworlds. For the border-military industrial complex, that project must continue to expand, as future-thinking border security operations advocate for more violent measures to manage, resist, and otherwise "deal with" the projected 750 million people displaced due to changing climate conditions during the next thirty years.[7]

To argue for more just futures at the borderlands, we must reclaim a sustainable vision from this state-mandated project of securitization. At stake is not a reductionist sense of sustainability nor a return to an idyllic existence before human intervention. Indeed, human-made infrastructures across the borderlands that could support the environment of the region, such as waste disposal systems and public parks, have instead fallen into disrepair because of the single focus on securitization. Finding affirmative forms of future thinking among the current environmental deterioration of the borderlands is what I call *ruinous speculation*. If, as Brian Larkin contends, infrastructures "encode the dreams of individuals and societies" such that social ideals and fantasies can be "transmitted and made emotionally real,"[8] then we must turn our attention away from constructing infrastructures that deplete the environments of the borderlands (e.g., steel-reinforced fences and walls, surveillance towers) and toward maintaining those infrastructures that enable such environments to thrive (e.g., sewage systems, mutual aid networks). The aim of develop-

ing a practice of ruinous speculation is twofold: to resist the infrastructuralizing imperative that turns living environments into tools for reinforcing state divisions and to foment the care for and repair of infrastructures that actually support human and nonhuman lifeworlds across the borderlands.

In order to think through the entanglement of environmental and political issues in the context of the border, I turn to speculative design, or projects that "create spaces for discussion and debate about alternative ways of being."[9] Speculative design is a medium concerned with materiality as a form of world building; its examples can include perspectives on alternative worlds and the physical means to achieve them. Design "has doubtlessly been a central political technology of modernity" as it shapes the material circumstances of daily life.[10] While there remains significant interest in design across industry circles as a solution to current social problems, critical makers have begun to expose the limits of design's most techno-solutionist strands.[11] Following on the critiques presented by Daniela Rosner, Arturo Escobar, and others, I enumerate the limitations of design projects that seek to imagine the future of the border as an extension of present arrangements and suggest where we might turn instead for alternative orientations.

The following three sections elaborate on such matters. First, I explore the conflictual connotations of both "speculation" and "sustainability" by analyzing the limits of contemporary speculative design projects about the border, particularly the lauded *Borderwall as Architecture* initiative, insofar as such projects do not resist an infrastructuralizing imperative. Second, I offer multifaceted close readings of the project *A Practice in Excavating and Envisioning Ambos Nogales*, which focuses on border undergrounds and reclaims an environmental vision from the ruins of border infrastructures. These close readings illustrate *ruinous speculation* as a form of "broken-world thinking,"[12] which suggests that the possibilities for sustainable futures can be found in the failures of the present. Finally, I reinforce how the alternative vision of thinking through tunnels can be implemented in the present by focusing on sewers as transnational infrastructures whose maintenance remains essential for the care of life in the borderlands.

I. Speculation and Sustainability on the US-Mexico Border

The reimagining of border futures proposed in this article brings together critical practices of sustainability and speculation. Admittedly, "sustainability" and "speculation" are fraught terms that often perform ideological obfuscation. In their more reactionary uses, the terms purport to refer to progressive tactics but in fact cover practices that perpetuate various forms of social and environmental exploitation. In this section, I address

the pitfalls of both concepts and trace the alternative intellectual traditions from which I borrow these terms. Informed by the work of scholarly collective Uncertain Commons and by media scholarship that foregrounds how media forms shape environmental thinking, respectively, "affirmative speculation" and "critical sustainability" gesture at critical modes of rethinking the present *and* creative forms of embracing the uncertainty of the future.

Speculation is not value neutral. In late capitalism or post-Fordism, it becomes the dominant form of surplus creation. This kind of speculation is rampant with the rise of global finance and the monetization of risk across all sectors of society. As a practice, it often implies extrapolation and prediction, relying on mathematical models to transform quantitative data into a narrative arc. Despite its overtures to facts and data, financial speculation produces a fiction that contributes to and is affected by the broader cultural milieu.[13] Like the investment in securities pursued by financial sectors, the fear of "unknown unknowns" in national security discourse translates into further risk management initiatives. Securitization, in finance and national security, prioritizes the permanence of present conditions over the possibilities that the future may bring. Speculating on the future becomes tantamount to replicating the present, foreclosing the potential for other forms of being.

Uncertain Commons refers to these forms of speculation as "firmative" by which they mean the containment of risk, "firming" or solidifying the possibilities of the future. The collective advocates instead for *affirmative speculation*, which, they argue, does not foreclose potentialities but affords modes of living that creatively engages with uncertainty. The future must not represent an opportunity for calculating and capturing uncertainty as monetizable risk. Instead, speculating affirmatively means embracing uncertainty as a generative space for imagining and essaying. As a consistently modifying practice acting on shifting, multiscalar worlds, the preferred practices of this form of speculation are intuition, creativity, and play. Affirmative speculation embraces ways of *living in common* insofar as it is open to thinking of social formations different from those currently at hand.

The concept of a US-Mexico border represents a clear example of firmative speculation. For communities native to the borderlands, the border represents an arbitrary division of otherwise highly interconnected societies and lifeworlds.[14] A division stemming from Indigenous dispossession and racial violence, the border as it stands today is neither natural nor necessary,[15] yet firmative forms of future thinking cannot fathom another organization of the space of the borderlands outside of the arbitrary division less than two hundred years old. Critical border studies scholars have long argued that borders persist only because of negotiations

between individuals and institutions performed out of habit and subject to instability and change.[16] Such negotiations include performative acts of securitization designed for mass media consumption[17] as well as relentless acts of violence at the hands of state agents and their increasingly sophisticated technologies of control.[18] The enforcement of divisions enacted by states extends beyond the horizontal surface, as the border security apparatus claims space and weaponizes the air above and the ground below the borderlands.[19] In short, the securitization of the border evidences a deep political, economic, and affective investment from the nation-state in firming its current violent divisions into the future.

Like the conflict between firmative and affirmative speculation, competing notions of sustainability reveal contrasting political projects. In the area of global development, sustainability has long served the interests of the privileged. The more conservative versions of "sustainable development" naturalize practices of capitalist expansion around the globe and focus on imagining how the planet can adapt to such practices. Under the guise of aid relief, the expansionist sustainable development pursued by agents from the Global North privilege forms of life that accommodate resource extraction and profit maximization. Sustainable development becomes merely a justification for exploitative practices and capital expansion in ever-expanding trajectories. Sustainability also finds wide adoption in defense industry circles. For the US Department of Homeland Security (DHS), "sustainable national security" encompasses not only an environmental dimension but also the "military-tactical." Finding renewable energy sources becomes a matter of cutting down on emissions in order to make the military forces and the weapons of security "more lethal."[20]

Sustainability thus cannot be understood as unproblematically benign. Theorists of sustainability must consider not only present and past harms to natural and built environments, but must also assess the implications and unfoldings of carrying such practices into the future. An affirmative version of sustainability should reimagine environmental betterment as a social and political project. In other words, we must understand social conflict and the uneven distribution of resources as the root causes for ecological crises. Policymaking initiatives will remain insufficient, and perhaps even prejudicial, if these root causes are not adequately addressed.[21] Building on feminist critiques of science and Indigenous knowledges about human-environment relations, what is "at stake in the construction of knowledge for sustainability," argues Enrique Leff, "is not a neutral articulation of sciences [or technology or media] but a reconstruction of knowledge from the critical exteriority of the environment."[22] The fundamental questions that need addressing revolve around epistemes, or ways of thinking and knowing. If modern societies are "already thoroughly theoretically driven," as Arturo Escobar argues, then reality "is textually

mediated and produced by all kinds of expert categories, including their unfailing deployment by the media."[23]

Contending with mass media's problematic relation to environmental sustainability, scholars have compellingly turned to the material and representational *forms* of specific media as a way to articulate progressive models of environmental thinking. In her analysis of climate representations in Hollywood studio sets, Jennifer Fay sketches how the aesthetics of anthropogenic weather in these controlled spaces allows us to envision the planetary effects of human-driven climate change.[24] Likewise, Jacob Smith's experimental scholarship reveals how audio-based media can foster an ability to listen and respond to our world with greater ecological awareness.[25] The stakes of formal analysis in these projects are theoretical and practical. In the case of speculative design, formal critique attentive to the material qualities of the medium will also reveal the possibilities for more ecologically minded ways of watching, listening, and sensing. As Janet Walker and Nicole Starosielski argue, media studies should pursue a critical version of sustainability that complicates and destabilizes mainstream media's narrow focus on the spectacularization of environmental catastrophe.[26] In this way, Walker and Starosielski foreground media's capacity for *articulating time differently*, thereby allowing a critical engagement with what Rob Nixon has called "slow violence," or the environmental impact that "occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space."[27] Attending to how media forms rearticulate time and enable different kinds of environmental thinking offers us one avenue toward developing a critical sustainability emergent from the decolonization of science and technology studies.

Building on the premises of affirmative speculation and critical sustainability, I attend to speculative design as one way to illuminate how specific infrastructures mediate the habits, performances, and violent acts that maintain the border and to consider how these might be *re*constructed differently. A media studies approach to the border, like the one I propose here, contends with the material conditions on the ground while, at the same time, interrogating how media forms and technologies support the firmative notion of the border as it currently stands. Affirmative forms of speculating border futures must focus on sustaining those infrastructures that enable the borderlands to thrive while reimagining the infrastructures that abet the violent enactment of divisions and the exploitation of human and nonhuman lives. At stake in a critical sustainability approach lies unearthing the former type of infrastructures amid the ruins of the latter.

One of the most famous speculative design projects about the US-Mexico border is the *Borderwall as Architecture* initiative, which consists of a series of "counterproposals" emerging from research at the Rael San

Fratello studio "presented as a manifesto against the borderwall [*sic*] that divides the U.S. from Mexico."[28] Collectively, these counterproposals present "a conceptional journey" that documents scenarios, both real and imagined, relating to the Mexico-US border. Also called *recuerdos* (the Spanish word for souvenirs), these scenarios include transforming the border wall into a wastewater treatment plant, rethinking border checkpoints as thruway libraries, and fashioning ports of entry as solar farms, among others. Alternatively feasible and outlandish, these *recuerdos* seek to "re-imagine, hyperbolize, or question the wall and its construction, cost, performance and its meaning." In the introduction to the monograph condensing the results of years-long collaborations, Ronald Rael explains that the project is a "protest against the wall" that promotes a reconsideration of said wall through design proposals and "hyperboles of actual scenarios." These proposals, Rael suggests, indicate that "within this enormously expensive and extremely low-tech piece of security infrastructure lie opportunities for the residents of this landscape to intellectually, physically, and culturally transcend the wall through their creativity and resilience."[29]

The most generous reading of this project would assume that it parodies the need for a structure demarcating the border by suggesting wildly implausible solutions.[30] A closer look at the details of specific "counterproposals," however, reveals that the purported aims of the project do not bear out in the implicit politics of its designs.

Consider the idea for a solar panel–powered wastewater treatment plant. On its face, it presents a "more benevolent" alternative to the straight cement wall or steel slats that would compose a border wall. Yet the positioning of these panels in a line formation, retaining the barrier aspect of the wall, perpetuates the structure's negative externalities. Human migrants would have to find more dangerous areas of the border to cross. Likewise, this wastewater treatment plant border would disrupt the hunting and migration patterns of desert animals, which is the main reason that biologists vehemently oppose the wall. Despite its stated intent to generate solar power, a construction of this scale across the desert would impede humans' travel and adversely affect animal survival practices. In short, there is little reason for building solar panels in a linear formation in the middle of the desert other than an assumption that there must be something physical to signify the socially demarcated division.

Furthermore, this counter proposal draws inspiration from the fact that "the New River is considered the most polluted river in the United States." Flowing north from Mexicali, Mexico, and crossing the border at Calexico, California, "New River toxicity is comprised of chemical runoff from farm industry, sewage, contaminants—such as volatile organic compounds, heavy metals, pesticides, which at the border checkpoint far

exceed U.S.-Mexico treaty limits." Pollution in the New River is especially harmful because it flows through the Imperial Valley, which is a major source of winter fruits and vegetables, cotton, and grain for domestic and export markets. Water contamination from industry runoff has long been a serious problem in the border context. In the late 1990s, as Tijuana's sewage treatment plants reached maximum capacity, the Comisión Estatal de Servicios Públicos de Tijuana (Tijuana's Water Authority), proposed treating the city's wastewater to secondary standards—a level that cleans out roughly 85 percent of contaminants—and dump it back into the Tijuana River for discharge into the Pacific Ocean. Officials from the California Water Quality Control Board and the US EPA opposed this vehemently. So the International Boundary and Water Commission struck a deal between the two nations' agencies for a new sewage plant on US soil, which would receive the sewage coming from Tijuana and treat it to EPA standards. The plant took over ten years to meet Clean Water Act standards on a regular basis.[31]

While the counterproposal attempts to tackle this very real border ecological nightmare, the language deployed to promote the wall alternative internalizes the siege mentality that permeates current debates on border security. "While the Secure Fence Act of 2006 was enacted, according to President Bush, to "help protect the American people" from illegal immigration, drug smuggling and terrorism, the new river represents a far more dangerous flow north from Mexico in need of containment." The slippage between security discourse and environmental solutionism betrays the reactionary forms of sustainability implicit in this kind of design thinking. The proposal ends by claiming that "a wastewater treatment wall located in the 2-mile long wasteland that buffers the dense border city of Mexicali from the agricultural Eden of the Imperial Valley would offer a solution to the "illegal entry" of toxins to the U.S."[32]

Without pushing against the rhetoric of invasion, using such language to justify the speculative counterproposal obscures the broader historical and political reasons for the wastewater problems. Following the trade liberalization imposed by NAFTA, the southern border region saw the proliferation of maquiladoras, manufacturing operations that took advantage of the lessened import tariffs in the United States and cheaper labor costs in Mexico. This straightforward story of Global North economic development outsourcing production to the Global South is complicated by the fact that most of the Mexican side of the border is at a higher altitude than the American side. Whenever heavy rains hit the south side of the geopolitical border, millions of gallons of sewage and industrial waste from Mexican factories overflow to the Tijuana River. In some ways, these industrial waste runoffs have long represented a "dark ecology" resulting from the imposition and enforcement of geopolitical

boundaries. The proposal for a wastewater treatment plant as the wall reinforces the idea of "southern invaders" while excusing the northerners for creating the conditions of possibility for such unwanted flows.

Other proposals similarly adopt current exploitation practices without questioning them. The proposal for a beacon signal with built-in water supply, for instance, not only overlooks the Border Patrol's active efforts to get rid of all vital aid to desert crossers but also installs a permanent structure that makes it easier for these agencies to surveil the border region. Human rights activists purposely set up water stations in the desolate desert areas to counteract the state's tactical use of desert conditions to dispose of migrants *and* to prevent CBP agents from finding and destroying these life-saving resources.[33] By conflating the vital resources with a state surveillance beacon, the supposed counterproposal in fact ends up exacerbating current problematic conditions.

Despite its distinct architectural take, *Borderwall as Architecture* embodies many of the issues that critics have identified in other forms of speculative design. Critics of speculative design often point out how it subscribes to the "modernist spirit of technological objects as design leadership," which centers on stylish pieces, encourages consumerism, and privileges a user's cognitive and affective responses.[34] Critical practitioners in particular question the drive toward solutionism in most design methodologies. The "teleological view" of solutionist design principles focuses on incremental problem-solving and displaces value-based discourse grounded in social concerns. For Daniela Rosner, a corrective to the solutionism prevalent in much design thinking is "staying with the trouble," Donna Haraway's formulation for methods that live with and between contradictions and breakdowns.[35] The normative politics of speculative design have implications for what is considered worthy as an object of speculation. Jussi Parikka rightly notes that when speculative design claims "to address an existing lack of imaginaries [it] implies that only specific kinds of situated practices were in the first place accredited as interesting enough to be 'speculative.'"[36] The kinds of situated practices excluded from the realm of the speculative often turn out to be, for instance, those emerging from Indigenous and Global South lifeworlds and those that do not subscribe to technological solutions to social problems.

Borderwall as Architecture never fully sheds its underlying premise that there should be something man-made demarcating the border. Without disavowing such a notion, the project can only imagine solutions that replicate the existing structures of resource exploitation and ecological disruption. Similar problems recur in other architectural proposals, such as the one by Miami firm DOMO Architecture + Design that envisions a wall made of recycled shipping containers "topped with flowers as an

alternative to ugly grey concrete."[37] Mark Jarzombek has taken architectural theory to task for being unable to deal with the most pressing social and environmental issues of the current moment, claiming that the discipline can "only barely deal with the problem of global warming." Jarzombek argues that this has to do with the fact that architecture's notion of sustainability has been aligned since the 1980 with management theory.[38] Social justice concerns become relegated to policymaking decisions. Under this assumption, the discipline will continue to privilege building and development over maintenance and repair. Architectural speculations, like much of speculative design, remains moored to the "modernist spirit of technological objects" rather than committing to staying with the trouble.

Beyond the domain of speculative design, similar problems arose in public debates over border wall funding starting in late 2018. Despite the Democratic Party's reluctance to pay for the wall structure itself as a symbolic victory over then President Trump's insistence on a physical barrier, there remained wide consensus across political lines for further investment in "border security," broadly construed. The term included any number of surveillance cameras, sensors, and human patrols, measures that likewise disrupt the ecologies of the border and perpetuate human and animal deaths.[39] Economic and ideological investments in so-called smart wall technologies continue unabated to this day.[40]

Firmative speculative projects such as *Borderwall as Architecture* focus on transforming the design of the border but fail to acknowledge the political underpinnings that make the border an agent for distributing resources and maintaining oppressive hierarchies. Because the infrastructuralizing imperative to turn the borderlands into tools for security is not sufficiently questioned in these projects, sustainability amounts merely to the conservation of current exploitative political and social systems. Though emergent from this same initiative, the outlier *A Practice in Excavating and Envisioning Ambos Nogales* presents an opportunity to examine more affirmative versions of sustainability by avoiding a focus on the existing aboveground border infrastructures in favor of the underground common space. My analysis centered on ruinous speculation illustrates how divergent forms of sustainability emerge from a critical engagement with the politics and materialities of border tunnels.

In its failure to adhere to the firmative speculation maxims of other border design projects, *A Practice in Excavating* opens up a space for affirmative modes of speculation on border futurities and, in doing so, offers more creative and intuitive forms of rethinking the organization of the borderlands. I refer to "failure" here in the sense that Jack Halberstam theorizes, as a kind of critical work that "recognizes that alternatives are embedded already in the dominant."[41] Eschewing the focus on the wall

reveals that alternatives are already present in the caves, sewers, and drug tunnels that Agudelo's project invokes. For Jose Esteban Muñoz, the queer potential of failure lies in a "rejection of pragmatism" and a refusal of social norms.[42] The pragmatism championed by *Borderwall as Architecture*—that a wall should exist at all—remains its most glaring default to normativity. By contrast, the failure of *A Practice in Excavating* to follow on such pragmatism becomes the generative grounds for the critical reading pursued here.

II. Ruinous Speculation and the Potential of the Underground

Hidden underground transnational networks have long figured in practices of state resistance as well as popular reimaginings of public space and social futures. The nineteenth century featured the emergence of literary narratives where the underworld became a site for alternative forms of living and of popular formulations, like the Underground Railroad, where subterranean passages enabled the creation of fugitive flows.[43] The sophistication of these figurative undergrounds provided speculations not only about new worlds but also about new world orders. Throughout the twentieth century, changing geopolitics ushered in new subterranean passages, such as the tunnels under a divided Berlin and the tactical tunnels of the Vietnam War, thereby intensifying the oppositional stance and potential for disruption of "the underground." At the turn of the twenty-first century, with intensifying planetary climate change and rising global inequality, the need for alternative world orders, and the spatial imaginaries to bring such alternatives to life, are all the more pressing.

Throughout the series of underground tunnel formations in the nineteenth and twentieth century, the border being crossed marks a division between an undesirable side where flows escape from and the desirable one across the border where flows escape to. In the case of more contemporary tunnels, this division has collapsed as a result of a series of interconnected processes that have been variously called "late capitalism" or "neoliberalism." Global capital's hold over social organizations around the world means that increasingly there is no alternative economic system or natural environment to escape *to*. Likewise, the intensification of nativist sentiments that have led to the rise of border walls also signal the emergence of a society that, despite some economic advantages, offers no hospitality. This means that tunnels should not be thought of as freeing structures in and of themselves. Where is this better place to which they could take us? The supersession of utopian ideals about a better place "on the other side" presents a reformulation of the role of the underground border tunnel. Tunnels can function not as the medium of transnational flows but as the infrastructure for alternative world formations.

Agudelo's project asks us to conceptualize anew the *infra*-ness of subterranean infrastructures by positing them as the grounds for repairing the borderlands. As such, my reading of this project through the lens of ruinous speculation shares a similar commitment to Steven Jackson's concept of "broken world thinking." For Jackson, the undue attention to innovation means we undervalue the need to constantly repair the vital technologies that maintain the world.[44] Because broken world thinking understands the world as always already breaking and deteriorating, that orientation forces us to trace courses of action not toward the search of the new but in service of mending and remaking the discarded or decaying. Rather than finding new ways to turn the environments of the borderlands into violent state borders, ruinous speculation asks how attending to existing deteriorating infrastructures can foster sustainable environments.

Scholars researching infrastructures have long urged us to attend to the basic, the boring, the mundane, and all those other "things not understood that stand under our worlds."[45] Examining the physical things that sustain the modern world illuminates how ideologies and power relations take shape in material forms.[46] In this vein, I propose that underground tunnels allow us to *think infrastructurally* about the formation of the border as both a space and a set of social relations. If the border is always iteratively made and remade through a series of negotiations, then thinking infrastructurally about the border means unearthing those practices, structures, and things that support the narrow understanding of the borderlands as a place for nation-state divisions. Underground structures reveal much about which ideologies are dominant in the formation of the border and about who has power to exert such ideologies in the physical space. As AbdouMaliq Simone argues, "Infrastructure exerts a force . . . [in] the way it attracts people, draws them in, coalesces and expends their capacities."[47] Turning toward, or turning away from, specific border infrastructures shapes people's conceptions about that space and defines the possible fields of action. Following on the insights of critical infrastructure scholars, I contend that attending to underground tunnel structures exposes the need to rearticulate the space of the border as an environment in need of maintenance and care.

Consider a vital yet often overlooked set of border tunnels: sewers. Crumbling sewer infrastructure across the borderlands has been a well-documented problem since the early 1990s, and it resurfaces whenever a spectacular pipe break results in sewage spillage above the ground.[48] Border residents, including local politicians, attest to the hazardous effects of depending on polluted water, yet few people outside of the border region are aware of this issue, let alone consider it a crisis.

The need for extensive physical repairs and changes to existing infrastructure is not a mystery. Experts have long detailed the range of

actionable solutions, including fixing weak points in the International Outfall Interceptor (IOI), which carries at least ten million gallons of sewage per day from Mexico to the Nogales International Wastewater Treatment Plant in Rio Rico; reforming the role of the International Boundary and Water Commission (IBWC); and reinstating funding to the North American Development Bank (NADBank).[49] The main issue, then, is the entrenched "state-thinking" that privileges security over sustainability, leaves bureaucratic inefficiencies unchecked, and leads to an international impasse where the United States blames Mexico for the infrastructural problems and Mexico excuses itself by claiming it does not have the resources to fix them. Solutions to this issue require not only significant forms of investment but also a *regional* commitment to infrastructure maintenance and repair.

"The State is the Sewer," as Dominique Laporte succinctly puts it.[50] Historians and other scholars have long argued that the development of urban sewer networks parallels, and is informed by, modern forms of state power. Sewers are key elements in the study of state power because they infrastructurally link the citizenry to the state without any sense of direct intervention. "The construction of sewers," notes Gay Hawkins, was "the creation of an infrastructure for the subterranean management of threats to life."[51] Practices of waste management on the border region are likewise caught up in larger political assemblages, but the qualification of what that "threat to life" is in the case of the US-Mexico sewers remains under contention. The default to securitization already impedes the collaboration needed to properly mend and maintain sewers across the borderlands.

If border tunnels already provide alternative transnational routes for the movement of goods, people, and ideas, *A Practice in Excavating* suggests that they may also act as what John Durham Peters terms "world-enabling infrastructures." That is, in fostering transnational connections beyond current geopolitical formations, tunnels become "not [only] passive vessels for content, but [also] ontological shifters," transforming the very terms of the debate around the issue of public space.[52] This project illustrates why, and how, the struggle over the definition and control of an underground common space includes attending to immediate and long-lasting concerns as well as managing the conflicts that emerge from competing temporalities.

A Practice in Excavating represents the border underground as a multimedia model (fig. 1). The aboveground world is made up of collages of Agudelo's own photographs of the border and from sketches of silhouettes: a border officer holding a gun, a truck, people walking, a border fence with graffiti. The underground world consists of photographs of a physical model created by Agudelo himself. Connecting wooden sticks and metal rods in disparate organizations, covering them in plaster, then wrapping

Figure 1. Still from *A Practice in Excavating and Envisioning Ambos Nogales* depicting the border aboveground in photographs and sketches and imagining the border underground as a series of openings through a mesh of wood, cloth, and metal.

these in cloth, the artist built casts for different sections of the border he sought to represent. He then cut the casts in half, revealing a tangle of cloth, metal, and wood. These sections of the cast are placed atop a cement block and photographed. The photographs of these tangles are placed in the same image as the collages, creating a contrast between the two-dimensional aboveground world and the disarrayed, three-dimensional underground. The distinguishable figures for the aboveground world also stand in opposition to the entangled mesh of the underground.

In analyzing *A Practice in Excavating*, I find a project of *ruinous speculation*. Ruination, according to Ann Stoler, refers to "an act perpetrated, a condition to which one is subject, and a cause of loss."[53] Rather than focusing on the object of ruins, ruination highlights the processual force of imperial destruction brought forth by capital forces. Ruination encapsulates the feeling of dwelling amid various forms of environmental decay, depletion, and exhaustion. Rahul Mukherjee further expands this term to include the "lived worlds of people who are inhabiting ruins-in-the-making." Focusing on the *mediation* of ruins means considering in tandem the media infrastructures that index obsolescence (e.g., old cell towers, broken phones, incompatible software) as well as the images, ideas, and values that these objects transmit. The materiality of the media

object stands not only as a vessel with which to render the state of worldly ruin but also a ruin-in-the-making itself. Studying ruins from the perspective of mediation moors infrastructural precarity to an interrogation of power relations. Mukherjee finds in media archaeology a method for excavating the lifeworlds of ruins-in-the-making. "Ruination is finally, and quite literally, a political project" of distributing waste, segregating livelihoods, and demarcating productive spaces from forgotten sites.[54]

Influenced by both media archaeological and speculative design approaches, I understand *A Practice in Excavating and Envisioning Ambos Nogales* as a media artifact because it "tells worlds" in material and representational ways. The project's dual nature of mediation inheres in its title: excavating in the sense of archaeological uncovering of material relations and envisioning in the sense of giving shape to the insights uncovered from such archaeology.

This project's contrasts in materiality gesture at distinct ontologies between the purported and clearly demarcated divisions of the present geopolitical order and the nebulous future order of the tunnel world. The mixed-media nature of these models adds a material texture that speaks to the representational impossibility of this space and time. It also alludes to the multiplicity of tunnels. While the mesh in *A Practice in Excavating* is evidently tunnel-like, it speaks to the web of rudimentary, interconnected, and sophisticated tunnels—the different types of drug tunnels—that shape the border's porous underground. Finally, the project is a *frontera*— a hybrid liminal space that conflates natural and human-made, licit and illicit systems—dissipating geopolitical markers in favor of rendering the borderlands as a distinct region.

The materiality of design invites an exploration of issues of scale and temporality in tandem. The scalar difference between the photocollage of the aboveground and the cast of the underground visually render the shift in emphasis that Agudelo proposes. The border fences and other security forces are still there, but they are minimized. Conceptually, the photocollage recedes in order to foreground the tunnels as the area for speculation— but it is significant that these figures are still present. *A Practice in Excavating* does not pretend to ignore the present conditions of border lifeworlds; it suspends these and offers new worlds at the same time. The barely legible traces of the border agents, fences, and vehicles gesture at the potentially disappearing traces of current bordering conditions. Even if the speculative futurities embodied by the tunnel worlds come to fruition, these would not undo the destruction that current bordering practices have perpetuated on the region's ecologies. The aspiration that these practices above will soon become a memory is also a reminder of the endurance of the material effects wrought by their violence.

Time itself is stratified in material traces. The use of different com-

ponents for each of the layers in *A Practice in Excavating* allows for an examination of temporality beyond the straightforward demarcation of present and future. While the top layer of the sketch figures and photo-collages gestures at ephemerality, the bottom layer of cement upon which the tunnel cast is set signals more permanent sediments. Spatially, such sediments could mean the geological strata that human bioturbation is unlikely to reach. Temporally, this cement block represents the limits to future thinking. It is a reminder that even open-ended speculation should focus on short- and middle-term futures since these serve as the conditions of possibility for the long term.

The cast that represents the tunnel world deserves special attention (fig. 2). In its shape, process of creation, and material composition, the tunnel cast provides multiple avenues for ruinous speculation. First is the use of a cast to create portions of the underground, a feature that Agudelo does not elaborate on. Before it is cut up into sections, the shape of the cast resembles the body of a small person without a head. It is a maimed body. As Jasbir Puar argues, maiming is a way to extract value from populations that would otherwise be disposable. The "right to maim," as she terms it, articulates a sovereign form of power that will not allow disenfranchised populations to die as long as their debilitated existence still carries value for the oppressors.

By physically marking populations as disposable but not disposed, maiming becomes a "sanctioned tactic of settler colonial rule, justified in protectionist terms."[55] Borders are the spatiotemporal figurations that enact such biopolitical strategies. Puar's analysis focuses on the violent tactics of the Israeli Defense Forces to debilitate the Palestinian population, yet this practice of maiming also occurs at the US-Mexico border and across border zones around the world. Examples include US Border Patrol agent Lonnie Swartz killing a sixteen-year-old Mexican boy in 2012 by shooting at him through the border fence and the repeated instances of Border Patrol firing tear gas at Central American refugees attempting to approach the border.[56] These resonances are far from coincidental. The American government repeatedly relies on Israeli military contractors to develop and implement the architecture of securitization across the US-Mexico border.[57] As critical geography scholar Reece Jones argues, violent borders share similar infrastructures and maiming practices.[58]

Transposing this biopolitical framework onto the "body" of the underground world of *A Practice in Excavating* reveals the potentials of ruinous speculation. The insistence on marking national borders at the expense of regional lifeworlds perpetuates the process of debilitation for the flora, fauna, and select human populations that inhabit the border region. Such insistence is tied to attempts at capacitating the national nativist sentiments elsewhere in the nation-state. Throughout the disputes

Figure 2: The cast used to create the mesh of the underground in *A Practice in Excavating* also represents a maimed body, signaling how the violence of current border practices transforms the borderlands into spaces of ruin.

in early 2019 over funding for a border wall, it came as no surprise that support of such a measure did not come from people living in the border region.[59] Ecological wearing down occurs here at a regional level, but it is also clear that within the region, already disenfranchised populations feel the burden of such debilitation processes the most. By using the cast as the material from which to build an alternative future, this speculative project suggests that capacitating the ruined worlds of the border is tantamount to envisioning the viability (and livability) of the underground.

What forms of livable life can emerge to counter the processes of debilitation that border reinforcement facilitates? The mesh derived from the pieces of the cast provides material to speculate with because of its composition (fig. 3). The mesh gestures at inchoate forms contained within such entanglements. It suggests the impossibility of knowing in advance what tunnel futures would look and feel like. Meshlike formations stand in contrast to the calculations that firmative speculation would demand. Instead, the future is a *literal mess*: it remains unknowable yet emergent from material traces that we can apprehend in the present. In their analysis of the etymological roots of speculation, Uncertain Commons ascertains that the Sanskrit root verb *spas* derives not only into words that invoke observing and contemplating but also into terms that suggest undertaking, stringing together, and touching. In the process of advocating for an affirmative mode of speculation, these etymological links "turn

Figure 3: A close-up of the broken-up cast from *A Practice in Excavating* offering a detailed look at the mesh representing the underground.

us toward not only speculation as thought but also speculation as a *pressing toward an apprehension of the unknown*."[60] The mesh of the underground world suggests that the future unknowns cannot be merely forecasted, as in made visible. They must also be made tangible.

The rethinking of public space proposed by *A Practice in Excavating* proves suggestive because it links a ruinous landscape to a field of potential. Certainly, the public space envisioned in this project is at present unlivable. Even sophisticated trafficking tunnels that feature ventilation systems and electric lighting depend on aboveground sources of energy to function. Sealing these off with concrete severs their viability, leaving an empty shell in lieu of a functional shaft. Materializing an alternative public space in these underground recesses, as Agudelo suggests, would require finding a means of providing energy from within the tunnel world. *Still, the potential for alternative publicness remains in infrastructural form.* The "sophisticatedness" of sophisticated tunnels lies partly in their resilience to natural and artificial contingencies, in their ability to withstand for long periods. Geologists have recently argued that "this form of anthropogenic modification arguably has the highest long-term preservation potential of anything made by humans."[61] In geological time, tunneling may become the most long-lasting human invention. The potential of these resilient infrastructures becomes a powerful rejoinder to the reac-

tionary, and inherently futile, impulse of building border fences, surveillance towers, and walls.

Because *A Practice in Excavating* fosters links between material forms, underground space, and speculative futurities, I suggest that, in this project, border tunnels represent a site akin to what Anna Tsing calls the "latent commons," emerging formations that are both barely noticeable and underdeveloped. The key contribution of Tsing's formulation lies in the fact that the commons are not (necessarily) good for everyone because every collaboration includes some and leaves out others. Latent commons are not utopic; they exist in the "here and now, amidst the trouble." The purpose of tracing these commons is to "aim for 'good enough' worlds, where 'good enough' is always imperfect and under revision."[62] These commons transform the ruinous state of contemporary organizations into the grounds for thinking other configurations in the future, but such future configurations remain contingent and continuously permutable.

Like Tsing's latent commons, *A Practice in Excavating* eschews teleology while alerting to the ethical dimensions left in its wake. Sustainability emerges not as the perpetuation of current practices in less maligned forms but as the encounter of conflicting processes animated by natural and social forces. Ruinous speculation suggests that to build a future in common means to negotiate diverse interests driving their own economic, ecological, and technological processes with their own timings. The latent commons found in *A Practice in Excavating* gestures at a future world below, rather than beyond, the current geopolitical formations and architectural structures.

The speculative reimaginings presented in this project also mobilize the figure of the tunnel to make claims about the relativity of borders and their potential imminent dissolution. In this regard, the project further suggests that tunnels may provide apertures not only to present epistemological and geopolitical struggles but also to those struggles to come. Tunneling futures hold the capacity to engender and shape alternatives for contemporary geopolitical orderings. If capitalism has securitized, quantified, and parceled out the future—in other words, foreclosed it—then underground border tunnels provide a literal and figurative opening to reevaluate the terms of our engagement with the uncertainty of what is to come. These vertical structures undermine spatial and temporal (i.e., linear time) *horizontal orientations* and, in doing so, unearth radical potentialities within the ruinous infrastructure of the present. Tunnels animate new lifeworlds in the here and now, amid the trouble.

III. Remediating Tunnels: A Conclusion and a Beginning

"What sort of worlds might we find if we could have a totalizing view of the underground?" By now, my analysis of *A Practice in Excavating* as ruinous speculation suggests a starting point to think through the question posed by Agudelo. By way of conclusion, let us return to the case of border sewers as an example of how such an aspiration can begin to take shape. Sewers illustrate how the insights derived from the preceding speculative analysis—sustainability as open-ended creative engagement and the importance of "good enough" worlds—inform the development of short-term solutions. Sewage networks offer a concrete infrastructure that requires maintenance and repair today to ensure the sustainability of the borderlands in the future.

The tunnel sewage systems explored here extend modern forms of state control to the transnational arena, but they are complicated by an unavoidable, distinctly regional dimension. The state-based practices of border enforcement and securitization remain incompatible with the region-wide approaches needed to tackle environmental issues such as sewage disposal. The widespread use of sewers by narcotraffickers and the framing of trafficking as a national security issue will likely only complicate the integration of these cross-scale differentials. In this regard, lack of intervention in border sewer infrastructure is not unlike other clashes between the interests of state militarization and environmental sustainability, such as the passing of laws that allow the suspension of the Clean Water and Clean Air Acts whenever the DHS deems it a national security imperative.[63] At the heart of all these examples is the struggle between "immunizing the nation" on one hand and "preserving border ecologies" on the other—a struggle between two distinct conceptions of life.

In the nineteenth century, urban planning relied on an "organic" understanding of the sewer lines, pipes, and tunnels. Pipes were supposed to be neutral and anonymous, supplying the private space of the home with public intervention in a nonintrusive way. They were organic because they were "natural," blended into the background. Additionally, these sewer lines were organic because they were ideologically and materially coupled to the "vital economy" of the body politic—in other words, to maintaining the health of citizens and the cleanliness of the city. This underground tunnel environment was intrinsic to the "life" of the state and therefore needed to be regulated like the population itself. [64]

The regulation of a particular form of life remains a central feature in the securitization of sewer networks across the US-Mexico border. The DHS refers to the practice of shutting down any kind of trafficking tunnel as "remediating tunnels." Implied is the assumption that ameliorating the condition of the tunnels means filling them with concrete and

sealing off entrances and exits, without considering whether such sealing off impedes using the tunnels for other, more vital purposes. As Alenda Chang succinctly explains, "Environmental remediation aims to remove without return. The desired goal is an absence, rather than a presence."[65] Remediating tunnels in the DHS manner suggests that the problem being solved, the absence sought, is trafficking. The security paradigm emphasizes protecting the vulnerabilities of these vital systems so as to avoid contraventions to state sovereignty but not necessarily to foment a better functioning of the vital systems themselves. The remediation of tunnels as currently exercised by DHS focuses on the livelihood of state control without regard to the lives of those who depend on the waste disposal system.

The issues fueling this lopsided focus concern different temporal and spatial scales. Spatially, the nation-based practices of border enforcement and securitization remain incompatible with the region-wide approaches needed to tackle environmental issues such as sewage disposal. The development of a security apparatus to maintain the vitality of the geopolitical state increasingly contrasts with the vitality of the region where this apparatus is most forcibly enacted. Likewise, the different temporal registers between "security" issues and environmental ones means that the former always draws more attention. While issues of national security carry a sense of urgency (and therefore immediacy), plans for the betterment of ecological problems take decades-long cooperation.[66] The imbalance of powers between the interested parties is also a factor. The underfunded agencies on the Mexican side of the border may be more concerned with treating the ecological crises before the geopolitical ones, but the military industries on the US side favor the opposite approach.

Mapping, mending, and caring for these infrastructures, I argue, are better alternatives to think through the sustainability of the border. Herein lies the value of "open-ended" speculation: it is not about a lack of concrete action but about allowing plans of action to emerge through avenues that existing paradigms cannot account for. The ruinous tunnels of the sewer systems evidence the limited use of state-based paradigms for border futures. Their figurative mesh signals both the nebulous present, where incomplete information prevents better care for these vital infrastructures, and the speculative future, where attending to regional problems requires the dissolution of present divisions. As Jenna M. Loyd argues, political movements for the abolition of borders must contend with the "troubled categories" inherited from nation-state thinking and must seek alternative "scales or sites of organizing."[67] The first step to a ruinous speculation is to resist the infrastructuralizing imperative of most speculative border design projects, which continue to assume that the living environments of the borderlands can be turned into tools for the benefit

of the nation-state. The second step is to foment the care for and repair of existing infrastructures, such as sewers, that can viably support human and nonhuman lifeworlds across the borderlands. In the long term, this turn toward care also implies attending to the material composition of community through collective practices that make everyday life possible.[68] As Anna Tsing reminds us, not all "good-enough" worlds are the same. Choices need to be made about which border futurities we want and how to make them happen, starting today.

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Notes

1. Woodhouse, "Nogales is Still Tunnel Capital."
2. Agudelo, *Practice in Excavating and Envisioning Ambos Nogales*.
3. Borderlands, for Oscar Martínez, encompass the "transnational settlement" unified by common daily activities, shared natural resources and environmental features, and labor markets that overlap the political boundary (*Border People*, 40–41). Gloria Anzaldúa describes "to live in the Borderlands" as a rich, conflictual experience on social, political, and environmental registers that exceeds the physical demarcation of a dividing line between the United States and Mexico (*Borderlands/ La Frontera*, 194–95). Therefore, throughout this article, I refer to the "borderlands" (or *la frontera*) to signal a regional setting with distinct environments and specific human and nonhuman lifeworlds. I use "border" to mean the figurative and material construct supported by the nation-state to demarcate geopolitical divisions.
4. Ballestero, "Underground as Infrastructure?"
5. Llamas-Rodriguez, "First-Person Shooters, Tunnel Warfare, and the Racial Infrastructures of the US-Mexico Border."
6. Jones, *Violent Borders*, 9.
7. Miller, *Storming the Wall*, 22.
8. Larkin, "Poetics and Politics of Infrastructure," 333.
9. Dunne and Raby, *Speculative Everything*, 2.
10. Escobar, *Designs for the Pluriverse*, 32.
11. Rosner, *Critical Fabulations*.
12. Jackson, "Rethinking Repair," 221.
13. Bahng, *Migrant Futures*, 4.
14. See, for instance, Guidotti-Hernández, *Unspeakable Violence*; and Aldama, *Disrupting Savagism*.
15. Saldaña-Portillo, *Indian Given*.
16. Mezzadra and Neilson, *Border as Method*; and Vila, *Border Identifications*.
17. Andreas, *Border Games*, 11.
18. Jones, *Violent Borders*, 32–37.
19. Weizman, "Introduction to the Politics of Verticality"; and Elden, "Secure the Volume."

20. Miller, *Storming the Wall*, 47–48.

21. Blythe et al., "Dark Side of Transformation," 1206–23.

22. Leff, "Political Ecology," 39–40.

23. Escobar, *Designs for the Pluriverse*, 109.

24. Fay, *Inhospitable World*.

25. Smith, *ESC*.

26. Walker and Starosielski, *Sustainable Media*, 7.

27. Nixon, *Slow Violence and the Environmentalism of the Poor*, 2.

28. Rael, *Borderwall as Architecture*, 5.

29. Rael, *Borderwall as Architecture*, 4–5.

30. This is the interpretation that Judith Torrea suggests in the review of the project for MoMA. See Torrea, "Borderwall as Architecture."

31. Liddick, "Sewer Runs through It."

32. Rael, *Borderwall as Architecture*, 60.

33. See Krohn, "Geographer. Humanitarian. Felon?"

34. Tonkinwise, "How We Intend to Future," 169–87.

35. Rosner, *Critical Fabulations*, 14.

36. Parikka, "Inventing Pasts and Futures," 219.

37. Cooke, "This Alternative US-Mexico Border Wall Is Made from Recycled Shipping Containers."

38. Jarzombek, "School of Architectural Scandals."

39. See Ghaffary, "'Smarter' Wall"; and Borquaye, "'Smart Wall' Relies on Invasive and Ineffective Experimental Technology."

40. See Weissert and Miller, "Mexico Agrees to Invest $1.5B in 'Smart' Border Technology."

41. Halberstam, *Queer Art of Failure*, 88.

42. Muñoz, *Cruising Utopia*, 26.

43. Williams, *Notes on the Underground*, 11; Cohen, "Depths of Astonishment," 1–25.

44. Jackson, "Rethinking Repair," 221.

45. Peters, *Marvelous Clouds*, 33.

46. Parks and Starosielski, introduction, 17.

47. Simone, "Infrastructure."

48. Dibble, "Tijuana Sewage Spills."

49. For every $1, Mexico contributes $2, and another $3 comes from other public and private sources. Yet despite the growing need to finance wastewater treatment and clean water projects, the US Treasury Department requested zero new funding for the bank in 2018, citing budget constraints (Vanderpool, "Festering Sanitation Crisis at Our Border").

50. Laporte, *History of Shit*, 57.

51. Hawkins, *Ethics of Waste*, 52.

52. Peters, *Marvelous Clouds*, 25.

53. Stoler, *Imperial Debris*, 95.

54. Mukherjee, "Anticipating Ruinations," 302.

55. Puar, *Right to Maim*, xviii.

56. Phillips, "U.S. Border Agent Who Repeatedly Shot Mexican Teen"; and Herrera, "Border Patrol Fires Tear Gas at Migrants."

57. Parrish, "U.S. Border Patrol and an Israeli Military Contractor."

58. See Jones, *Border Walls*.

59. Groetzinger, "Texas Border Sheriffs."

60. Uncertain Commons, *Speculate This!*, 7.

61. Zalasiewicz, Waters, and Williams, "Human Bioturbation and the Subterranean Landscape," 7.

62. Tsing, *The Mushroom at the End of the World*, 255.

63. Consider also that conservationists worry about the continuous deforestation around the US border with western Canada as a result of the increased imposition of surveillance technologies in this area. See Sadowski-Smith, "U.S. Border Ecologies," 144–57.

64. Osborne, "Security and Vitality," 99–122.

65. Chang, "Environmental Remediation."

66. Because of this long-term commitment, ecological projects are also victim to the whims of changing federal governments. Consider that the Border 2020 plan, instituted in 2012, was meant as a transnational cooperative initiative spearheaded by local chapters of federal organizations but suffered significant cutbacks when Scott Pruitt became the head of the EPA and sought to massively scale down the agency's projects (Kaufman, "Scott Pruitt's First Year Set the EPA Back").

67. Loyd, "Prison Abolitionist Perspectives on No Borders," 104.

68. See Boyce, Launius, and Aguirre, "Drawing the Line."

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