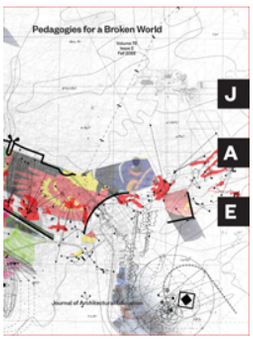

Routledge
Taylor & Francis Group

Journal of Architectural Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rjae20

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To cite this article: Jay Cephas, Igor Marjanović & Ana Miljački (2022) On Trees, Libraries, and Other Forms of Urban Care Work, Journal of Architectural Education, 76:2, 109-117, DOI: 10.1080/10464883.2022.2097503

To link to this article: https://doi.org/10.1080/10464883.2022.2097503

Published online: 07 Oct 2022.

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On Trees, Libraries, and Other Forms of Urban Care Work

In Conversation with Shannon Mattern

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Shannon Mattern is a professor of anthropology at the New School. She has written on archives, libraries, media and tools, media infrastructures, and spatial epistemologies. Our call for this issue of *JAE* was inspired especially by her essay on "Maintenance and Care," published online in *Places Journal* in November 2018. Jay Cephas and Ana Miljački sat down to talk to Professor Mattern on November 8, 2021 over Zoom about a series of topics that are collected in her most recent book, *A City Is Not a Computer: Other Urban Intelligences*, published in the fall of 2021 with Places Books.

Ana Miljački: As may be obvious from our call for *Pedagogies for a Broken World*, we developed the key theme of the issue in conversation with some of your work, especially the essay in *Places Journal* on maintenance and care, which is now also collected in your new book *A City Is Not a Computer: Other Urban Intelligences*, freshly out with Places Books. In that essay, you propose a few things in relation to brokenness. If we were to turn your theoretical work in that article into advice-form, there may be three key pieces of advice that you offer. One: that we should study how worlds are put back together; two: that as we do the first, we don't romanticize the work of care and maintenance, and three: that the study of care is care itself. Of course, we like all three of these, and agree. We wanted to begin by asking you how you arrived at this constellation of interests.

Shannon Mattern: The "Maintenance and Care" article emerged from an endnote that I had included in an article the previous year. I grew up in a hardware store; my dad and his two brothers had a hardware store they inherited from my grandfather. It was one of several in the small town I grew up in. But as the big box stores came in over the years, several of the family shops closed. My family's hardware store was the last one remaining in town—until they ultimately sold it a few years ago. I was invited to give a talk at the Eyeo interactive arts festival in 2018, and the hosts encouraged me to share a presentation I wouldn't be able to share anywhere else. I'd always wanted to write about hardware stores, so I did, for Eyeo—and then I published that piece in *Places* that same year. I included an endnote saying that a study of how hardware stores serve as an important social and physical infrastructure in many towns and cities had a place in this growing discourse on maintenance and care. My editors at *Places* then said "why don't you turn that endnote into an article?"

I have, throughout my career, studied libraries, archives, information architectures, a lot of the invisible infrastructures that allow for us to search for information that lasts, the work required to make knowledge freely available, to make digital resources findable online. There's tons of expertise and labor and skill that goes on behind the scenes to make all that possible. I have written about those spaces and skills and professional investments for twenty years or so, and I hadn't really thought about all of that as an integral part of the maintenance discourse—until the explosion of maintenance theory and maintenance critique and maintenance-based art and design practices over the past several years. So, prompted by the "maintenance turn," I took a revisionist look at some of that work I had been doing for a long time and realized that, yeah, it kind of fits within this maintenance discourse, too.

Miljački: Beyond that article, what forms of brokenness do you find most urgent in your own work? How does it register in your research, teaching or practice?

Mattern: One of the most pressing things I see is an epistemological brokenness, which has always been present, but I think has been made all the more manifest through the Trump years and into the Biden regime. It might not be a novel phenomenon, but now it's hard to deny that people in the United States (and many other countries) actually live in different epistemological universes, where truth means different things to different people. What it means to "do your research" means something very different to QAnon than it does to a journalist or an academic. I think this is one really potent and consequential form of brokenness in the very foundations of epistemology.

Also, we see the reliance on black box infrastructures, which is related to this idea of epistemological brokenness. The fact that some of our fundamental infrastructures in society, both technological and social, don't have pronounced ethical standpoints or foundations. When we're laying cable or pipes, how often are we considering what *values* those installations embody? So that, we could say, is almost a form of ideological brokenness—the fact that certain political and ethical questions are not being asked, and ideological questions are not being considered.

And then, of course, we have the physical brokenness of our civic infrastructures, including the more ready-to-hand examples like bridges and dams and roadways and public schools and public transit systems. Those are just a few forms of brokenness that I'm thinking of.

Miljački: What would you say makes the city as computer model appealing? And why did you set out to debunk it?

Mattern: Well, my "city as computer" essay also emerged through a prompt from some editors; they were editing one of those ubiquitous academic "handbooks," you know, five years ago or so. And they wanted me

to write about how the city is an information processing machine. I started writing and ultimately realized that there was something really uncomfortably reductive about that model. So I ended up contributing a piece that was the opposite of what I was prompted to write. I was writing about the deficiencies of equating a city with an information processing machine, while still realizing that there are indeed computational dimensions of how a city functions. Some urban historians connect the rise of urbanization to the rise of accountancy; you need some form of record keeping in order to maintain economic operations and the agricultural infrastructure of a city. But information processing and records management aren't the sole function of a city.

Especially today, as the tech world deploys its hubristic metaphors for everything—proposing that human behavior is predictable, that cities have an operating system, that ecologies are computational models—it is important to debunk some of these metaphors, and the dangerous hubris behind them.

Jay Cephas: That is really interesting. I am finding really compelling the way that you're describing that, and the way that it's written in the book, as potentially situated within this epistemological brokenness that you invoked earlier. Do you see that kind of technical reasoning and the insistence on these technical metaphors' capacity to describe everything as an aspect of that epistemological brokenness, or is it something else unto its own?

Mattern: I would say so. It is funny; I've seen some tech folks discover my "City Is Not a Computer" article since it was published in 2017. Some acknowledge: "Sure, I appreciate the critique, but look at how much tech has advanced since this piece was published! Now we truly can model everything!" As if we filled in all the methodological gaps over the past five years. I think this is a form of not only hubris, but also, as you propose, a form of epistemological brokenness. It's also a broken form of teleology, wherein we assume that all of the universe for all of history has always aspired to be computational. There's just something really sad about that assumption to me. Really: all we've ever wanted is to be computable? But for some people, that's a really liberating and empowering way of thinking about the world. Maybe that works for some folks; it inspires them to apply their tech skills in addressing the world's problems. But in order to have the pluralistic prismatic richness of an inclusive and diverse society, I think we have to supplement that computational frame with other metaphors, too.

Cephas: It makes me wonder if there is a place for that pluralism, if so much of what that 'city is a computer' metaphor does is simplify in such a way that allows presumably some kind of action to happen. So is pluralism just a victim of the larger force of the metaphor? Or is the metaphor specifically about eradicating pluralism?

Mattern: Some techno-evangelical folks would say that if you develop a sufficiently rich algorithm or modeling system, it can actually encompass, predict, and design for pluralism. But then there are so many things that matter in the world that don't readily lend themselves to algorithmic modeling or 'datafication.'

Miljački: We definitely want to talk about "the things that do not compute."

Mattern: Yes. Some folks would say that pluralism can be encompassed within the computational model. But is it a victim? I'm trying to think about your original question now. Yeah, there is a totalizing nature to these types of metaphors that presume to subsume all other metaphors underneath or within them. We can see this thinking embodied in what society values. Consider prevailing presumptions about the purpose of education, the design of systems that privilege and push toward STEM careers, for instance, presuming that these fields have the most useful, applicable, valuable knowledge for the future worlds we're building.

Cephas: I think that, as Ana suggested with the phrase that you use a few times about "things that do not compute," part of it is about the elements that don't fit initially into that totalizing structure, right? Because it sounds like the structure is able to do what it does in part by eliminating things that don't fit neatly into it, and so then I wonder what comes of those things? What comes of things that do not compute?

Mattern: This is in part why I wanted to start the book with the dashboard chapter, because I think it offers a strong crystallization of a lot of these questions, these epistemological, methodological questions, political questions. It's a material artifact that allows us to ask these questions regarding what's not on the screen. What doesn't lend itself to 'datafication'? What can we not represent in a flowchart or a heat map of some sort? Because certain values and variables don't fit within the purview of measurement, of control engineering, of data visualization; they're just bracketed out, because they aren't actionable. I'm teaching a class this semester where we're doing an ethnography with a not-for-profit, and we're thinking about the language of "impact," and what kinds of things funders recognize as indices of impact. If it is quantifiable, it demonstrates impact. The long-term benefits of various social programs, the things

that are a slow burn, or that evolve over generations, or through the evolution of an entire lifetime, on a deep-time scale, don't readily lend themselves to measurement with the instruments and the modes of visualization that we have in our toolbox today. So, yes, those are the types of things that tend to get bracketed out.

My colleague Ann Stoler has written about the history of the colonial archive, and in that context, when things don't fit within the classification system, they represent an embarrassing lack of totalization, which in turn shows the leakiness of the state's control mechanism. All the stuff that leaks through the cracks of the classification system ends up being unsearchable, unfindable, and inaccessible. So you "classify" it to hide the mess.

Miljački: To build on that a little bit, could we talk about "critical mud," which seems related to your concept of "feral archives" as well as embodied and ambient knowledge. Could you highlight for us the competing forms of knowledge that one finds in the city and that are not easily computable?

Mattern: Sure. We can draw here on rich discussions around multi-species ecologies and epistemologies, Indigenous ways of knowing, embodied ways of knowing. Let's apply this to maintenance. Technical knowledge, computational tools can certainly help with the work of diagnosing problems and determining where action is needed most pressingly, but there are also so many forms of embodied knowledge and performative knowledge that exist in the world of maintenance, repair and care, that don't really lend themselves to computation. There is also intergenerational knowledge, types of community-based knowledges that are passed through oral histories, through rituals and ceremonies, through observation and being in the presence of the elders of a community. These don't really lend themselves to computational modeling either.

Miljački: It seems that in the book, you also contrast the city dashboard with the library as infrastructure that could play a central role in what you call practices and theories of digital urbanism. So maybe we can come back to the library now as the site in which, maybe not all of this knowledge that you listed for us, but some of it, and certainly some that is not easily computable, lives and finds itself.

Mattern: So I'm not necessarily proposing the library as *opposed* to the dashboard; it just represents an alternative way of thinking. Yes, there are dashboards in a library. The catalog is a dashboard. The library management system (LMS) is a dashboard for circulation, all the things that can be measured and tracked in a library system. How does a library justify its existence to city administrators? Through the number of people who come through the door, the number of books that circulate, the number of downloads of materials, the number of public programs—again, all things that can be quantified. So there is definitely a dashboard mentality within the library as well. But I've studied libraries for twenty years and I think the library embodies multiple metaphors, multiple epistemologies simultaneously. It absolutely embraces the computational. Yes, a library is a great place for people to learn new digital skills, to "skill up" for the digital economy. Libraries have digital entrepreneurial programs, makerspaces, all those types of things. A few years ago I worked with the Metropolitan New York Library Council and the three library systems in the city to help develop a pedagogy for digital privacy, for librarians to then share with their patrons. So yes, the library functions within a computational world.

But it also represents different ways of knowing. Even just looking at the breadth of a print collection, the fact that some really engaged local community librarians make collection development a political and aesthetic practice, where you really know what people care about, what they're making in your community. You care about the politics of how publishing happens, you emphasize things like small presses, locally produced materials. These are different kinds of sensibilities that don't necessarily lend themselves to an "acquisition" algorithm that might exist in one of those library management systems. Lots of libraries also host oral history projects and provide programming that supplement the embodied knowledge of the community. There are several branches in Brooklyn, for instance, that host programming that celebrates the local knowledge embedded in food communities—recipe sharing, cooking demonstrations with people in the neighborhood—and then you connect those activities with the materials you have within your print and digital collections. The Greenpoint Library and Environmental Education Center engages with Indigenous knowledges and oral histories related to environmental injustice in the community, which involves embodied multi-generational, performance-based ways of knowing that you wouldn't find in a more traditional commercial database for instance.

Miljački: Is it that the key difference between the dashboard and the library, even if not diametrically opposed, might be in the way in which they receive support and maintenance? The dashboard seems to be supported by, maybe, venture capital, whereas the library as infrastructure doesn't get the love that the cockpit of the city does.

Mattern: I wrote this article about the dashboard in 2015, and when I went back to refresh and reframe it for the book, I found that a lot of the case studies that I included in that original article were dead, or many of the widgets were showing a 404 error; they just couldn't retrieve the data anymore. So we see here the ephemerality of a lot of digital tools. Partly because of this fetishization of innovation, cities regularly develop new dashboards. The old ones are "sunsetted," and the new ones come into being to supplant them. Libraries tend to be much more, you might say, hardy or robust infrastructures, because they're instantiated as physical sites in the city, but they require, obviously, significant maintenance investments themselves. In New York City, for instance, we do this dance with city government every year; the mayor proposes a budget that underfunds libraries, the libraries launch a public campaign to encourage people to write to their city council people to express their need for the libraries, then they revise the budget. We go through this every year.

I don't think there's a lot of understanding of library funding—how they're minimally supported by the federal government, some by the state, but mostly by local sources, and it is always a very precarious situation. They have to continually fight for support, justifying their existence from year to year when budgeting happens. I'll just note one more thing; you probably have read articles about far-right folks taking over the school boards and the library boards in their communities because these have historically not been elections that many community members pay close attention to. But when you have a lot of folks joining a library board specifically to defund it, that's a really dangerous situation, and we actually see that happening in some libraries and school districts around the country right now.

Cephas: The role of libraries sounds even more critical, not just for these attributes that you've noted that don't lend themselves to computational modeling—the intuition, the affect, the embodied knowledge—but the role of the library in maintaining that knowledge, and especially in relationship to its precarity, becomes even more critical. I'm wondering to what extent, not so much the library itself, but perhaps the knowledge that it's able to contain and transmit reflects these "just epistemologies," or do they stand as some salve to that original epistemological brokenness? Or are they just in the stream of different potential ways of different types of epistemologies?

Mattern: I think that libraries do embody multiple epistemologies, many of which have different politics too. Who would argue that a print collection is a wonderful thing? Yet those stacks of books, which we so often fetishize, are classified in accordance with a system that represents colonialist, sexist, white supremacist values. So we see brokenness in the infrastructure that makes possible this potentially beautiful thing. Same thing with digital resources: we see a consolidation of commercial providers (like Elsevier and Taylor & Francis), with their multibillion-dollar profits, who are controlling access to information. Plus there's the whole rentiership model, which means that individual libraries don't own the materials anymore. They're renting them from these large global corporations who can decide at any time to discontinue access to any particular material. Libraries also commonly rely on commercial service providers for internet access.

So yes, the library is a commons, a community resource, but the infrastructures through which that operates do not work on similar principles. On the other side of the interface, you still have to depend on corporate players in the technological stack. But this is where we can apply some type of a salve, to use your term, which I really like—where you can be more conscious. Emily Drabinski is an activist librarian here in New York City. She has advocated for using broken classification systems as a pedagogical opportunity to talk about the "critical mud": who's left out? Who's framed as aberrant, or broken, within the classification? And what do those exceptions reveal about the brokenness of the system itself? Artists are also great at transforming systemic snafus into learning opportunities. Artist Kameelah Janan Rasheed often works with libraries, and a lot of her projects work to highlight the gaps in the knowledge, to uncover the forms of knowledge that aren't there.

Libraries can build tools, too—what Ruha Benjamin calls abolitionists tools, liberatory tools. I (and I'm not alone in this) argue that libraries—if they were well funded, staffed, and valued as they should be—could be an ideal hub for the development of public interest technologies and civic tech and community infrastructures. Various library labs demonstrate the potential for these public institutions to develop collection management and discovery tools that prioritize privacy and discovery over the monetization of users' data. But to provide such tools and services at scale, to serve a whole city or country, requires a lot more resources than libraries have historically been given. I'd much rather have a robust library system providing internet service to its community than, say, Google Fiber. An empowered library is ideologically and conceptually possible. It's just not political-economically and materially possible.

Miljački: I love that answer. I also am reminded, again, that, we shouldn't romanticize things, as you describe

the multi-layered-ness of the library. I certainly am prone to romanticize the library as an institution. But also, somewhere in your writing, you described the way in which certain librarians were taking on roles in the space of social services, including figuring out how to provide Narcan. This trend in enlarging the scope of librarians' work is what I connected to your characterization of libraries as other, otherwise, or other worlds. Maybe we can pivot this a little bit to a word that you use in the book a lot that we found interesting: "Grafting." Grafting seems to be both about maintenance and about exploitation. It seems operative and important in the book in various ways. You describe the book itself as a grafting of things. But you also tell us that our new technologies are grafted onto rotten roots. It seems like the word and the verb are doing a lot of work for you.

Mattern: I am so glad you've already identified how the word graft is a metaphor, it allows for grafted layers of application itself. Several years ago, I was invited to write a tiny catalog essay, maybe 1200 words or so, for a gallery at the University of Toronto. They published a series of broadsides to accompany an exhibition about Environmental Humanities. I was assigned the term of grafting, and I hadn't really thought much about it before. Even writing a short, pithy piece about it was really fruitful. I watched all of these YouTube videos about how to graft, looked at the cultural history of grafting. Simultaneously, someone responding to my "City Is Not a Computer" article reminded me about Christopher Alexander's "A City Is Not a Tree." I revisited my article while thinking about the tree as a metaphor for knowledge. Just a couple of months ago, I published a piece in *Places* called "Tree-Thinking," which was inspired by the grafting metaphor. I wanted to think about how trees have shaped our thinking, in so many productive, and maybe reductive, ways throughout history. But grafting in particular allowed me to engage with the Alexander piece, to see where trees are and aren't productive things to think with and through. And we can add trees and grafts to our whole repertoire of urban metaphors: cities as machines, cities and ecologies, cities as computers.

But I also think about the fact that the book is a remixing and refreshing of some existing material, combined with some new writing that I did specifically for the book. I thought that grafting seemed an appropriate metaphor for my mode of operation, my method, for the project. As I point out in the book, grafting is both an art and a mechanical operation; it's engineering and poetry at the same time. Writing is a bit like that. Researching is grafting. Urban planning grafting. All of these practices require both pattern and spontaneity, program and poetry. They can rely on computational tools, and supplement them with the analog, the affective, the serendipitous. Grafting seems to embody those different sensibilities and ways of knowing—and it's a great concept to put in dialogue with Alexander. "Grafting" was a helpful way to think about both the methods and arguments of the book.

Miljački: You write about arboreal intelligence. Trees provide ambient information on the city. They provide shade, there is Google trees... Trees could help us think about different forms and dispositions of knowledge.

Mattern: I signed the contract for the book shortly before the pandemic, and like many people engaged in February 2020 in once seemingly important work, I wondered: does the world even need this anymore? Do I care about this anymore? In spring and summer of 2020 I was outside a lot. I walked around Manhattan a billion times, and trees were my most constant companions. I saw their seasonal rhythms in a way that I probably hadn't noticed before. I wanted them to be a part of the book because they were such a big part of the book's coming into being.

Shade feels like something that's so accidental or incidental. Then you realize, no; particularly in urban environments, it's engineered. There are political and design decisions being made here that determine who has access to shade. Shade is one of those infrastructures that is unequally distributed, just as the trees that provide shade can be. Trees are an integral part of political discussions about climate change and about environmental justice. Trees seem to be a convenient solution to a big problem.

In terms of trees as epistemological models: we have this long history of using trees as ways of organizing knowledge—everything from the bifurcated diagrams we use in classification, Linnaean classification, to the whole tree of knowledge. Of course, so many maps of intelligence have been rendered in the form of a tree, with a presumption that there's a root, some ur-science or spiritual or cosmological force out of which all other knowledge, the branches, erupts. Those are historical ways that trees have shaped our thinking. But then trees are also—and I think it's not coincidental—they are fundamental structures in computational intelligence; we have things like decision trees and random forests, and some of the same historical ways of parsing out knowledge that informed analog thinking are still fundamental to the way that computers are thinking on our behalf today.

What's more, trees are archives of data themselves; they can essentially hold within their material bodies thousands of years of environmental history.

The tree ring itself as a readable archive. Consider also the fact that trees have played an integral role in the social history of human beings; we gather around trees to talk and learn and deliberate and make decisions. Trees are communication hubs; people will tack up—on either live trees or utility poles—notices of important events that are happening in a town. Trees are rallying points, and they're substrates for knowledge to be shared and produced in a community. In short, I wanted to look at trees as symbolic, computational, and physical infrastructures for thinking.

Cephas: It is really interesting how trees can serve as such a broad resource, physically in the city as well as conceptually. Coming from architecture in thinking about this topic—I am interested in where you think architecture fits (if it does) within all of this, within all of these ideas, and I'm thinking of it perhaps analogously to the way you were talking about trees and grafting, and the way that trees can be conceptually related to something highly structured, but also organic, and very much not structured at the same time. What's the role of architecture in your thinking through these different ideas?

Mattern: I think that some of these ways of thinking can be useful for architecture. I think most architects are aware that they engage in computational and organic modes of thinking. These questions might be particularly pertinent to people working on tech-forward projects—especially those working with firms like KPF (who does a lot of the smart city developments, for instance) or Sidewalk Labs. Folks at these firms play a role in determining how technologies are responsibly integrated into projects, whether things like maintenance are considered from the get-go, from the conceptual stages of design. I think my work on libraries and civic knowledge institutions is also highly pertinent to architecture. I realize that libraries are a very popular studio project in architecture schools; they're very benevolent institutions, and lots of design educators like to build studios around libraries. There might be something to learn there about the ethical center to the building, the fact that the ethical raison d'être of the building shapes the program and the style and the building materials, which are themselves often framed as pedagogical tools. Libraries often become thinking tools, object lessons in resilience and context and material learning. Some of these same considerations could be applied to other building types, and expanded to the urban scale as well.

Cephas: I was really struck by the metaphor of the tree, and thinking about what possibilities are there for architecture to think similarly, potentially. I was thinking that particularly, Shannon, when you were talking about the library as something that should not be romanticized, and as not being the wholesale solution to the set of issues we were talking about before. It seemed to be really rooted in these ideas of these different forms of knowledge, and different ways of engaging that happened to happen in the library, also, coupled with the fact that it's publicly funded. I'm trying to think to what extent might architecture potentially occupy a similar space? I don't know that it does, but broadly speaking, beyond libraries, could architecture operate similarly to the ways we are talking about trees and grafting?

Miljački: Conceptualization of architecture in terms of trees and grafting strikes me as really useful in this historical moment as we challenge and rethink what constitutes expertise in architecture. I find particularly useful the question of maintenance and assign your article to incoming masters students in architecture, because I think issues of maintenance and care need to be foregrounded for architects as primary concerns as they/we think about design, not an afterthought.

Mattern: One of the things I would add, just after hearing both of you share your thoughts, is that I think some of the things that we talked about with regard to the book could also be useful for thinking about community engagement. It's something I have written about recently in relation to Sidewalk Labs' processes of community engagement. What does it mean to translate community engagement, fieldwork methods, into data that then inform a design? Who's left out when we rely on digital modes of participation? How might we use a mix of digital and analog tools to help community members convey their investment in and aspirations for a new development in their neighborhood? And could different modes of community knowledge be grafted onto other data sources to inform design?

Miljački: What kind of concern is maintenance? Can we characterize it in relationship to time, future, history? What kind of an orientation does it bring to the material we look at through this question?

Mattern: This might be a cop-out, but—yes to all of these things. Maintenance makes us think about temporality, about the lifespan of materials. What is the afterlife of a building? Its component materials? What are the biographies and genealogies of the materials that I'm drawing from? We can think about supply chains, but also about the deep time that produced the petroleum-based materials you might be using, or the trees that you're harvesting for your engineered wood? I do think maintenance could cultivate a multiscalar way of thinking about the temporality of design. It's also obviously an ethical consideration.

It's an ontological consideration, too. Consider different cultures' understanding of what it means to maintain or preserve a building: do we have to maintain the original materials? Can we rebuild with new materials, if the ethos or the spirit of the place is the same? When do we allow for graceful degradation? When is sanctioned decay actually the most appropriate response? What if, maybe, that crumbling bridge or dam isn't part of a better, more biodiverse world? Maybe we don't maintain it; maybe we destroy it instead. It's thinking about the scales of maintenance—which is also thinking about the objects and subjects of maintenance. Are you maintaining an individual building, a piece of infrastructure, or a community? Are you maintaining an ecology? Sometimes these different kinds of considerations reveal competing interests. With maintenance, we see how the physical world is cross-temporal and -scalar.

Miljački: That didn't sound like a cop-out. Maybe we could end with the idea that you began with and that we began with in the interview: epistemic pluralism. In the introduction to the book, you qualify the way you use "We" in the book, which I appreciate, I feel like I'm newly struggling with this question. You were saying it was not a universalizing We but a hopeful one, "an invitation to difference rather than a claim of universality." Then you end the book with epistemic pluralism. I was hoping you could define this term for us, or tell us what it might take to cultivate it, or qualify it as a personal hope.

Mattern: I'm hoping that some of the case studies that I offer in the book serve as examples of how to enact or practice epistemic pluralism. Something like the dashboard seems to be universalizing and totalizing; we all agree that these are things that matter about the entity that we're tracking on a dashboard. But there have been some interesting speculative projects, people who are making parodic, playful, or absurd dashboards for things that don't lend themselves to 'dashboardification.' They remind us that, actually, there are things that matter that escape this mode of representation. There are lots of speculative practices that can demonstrate such epistemic pluralism.

The library, as we have just discussed, can also embody this epistemic pluralism. Maintenance, as we were just discussing, does too. Maintenance requires so many different forms of knowledge: from the embodied knowledge of the skilled laborer to the artificial intelligence that might be monitoring a larger system, helping individual laborers determine where something needs to be fixed within a larger supply chain. We realize that in order to have a functional system, all of these different actors, with their complementary intelligences operating at different scales, have to be integrated. I am hoping that my different chapters provide some examples of where that epistemic pluralism might be, how it's necessary, and what's at stake when it isn't facilitated.

Cephas: I wanted to comment on something you said, Shannon, about when we allow for decay, which seems to be such a critical issue, because it involves intentionality, right? Things are decaying around us all the time, unfortunately. I was wondering how much you're thinking about intentionality and different actions, essentially. To what degree is our notion of intentionality important for how we're determining the outcomes of things?

Mattern: Maybe we could think about intentional decay in relation not only to our built world, but also to the world of data preservation, which encompasses everyone from Google to the NSA to the Library of Congress. Do we intend to preserve everything—every book, every TikTok video, every tweet, every 3D file—because cheap, infinite storage purportedly makes it possible? Yes, we could keep building data centers, yes, we could build in a perpetual maintenance system to sustain them, but we have to think about the energy costs, or the scale of the labor that is required to catalog this material, set access policies, and make it findable. Archivists have been having really interesting conversations about when we might allow for a graceful degradation. When do we allow certain media to decline? How much effort do we put into maintaining that media art project from the 1970s for which the electronic parts aren't even made anymore? Do we have to preserve all virtual worlds? Do we preserve all of that, and at high fidelity? What, again, are the labor and energy costs required for doing so? Caitlin DeSilvey has written a lovely book, *Curated Decay: Heritage Beyond Saving*, where she addresses the *intention* to allow things to decline in cultural heritage preservation. There are interesting resonances between DeSilvey's book and what archivists and museum curators are talking about. Decay can happen through mindless neglect, but it can also be an intentionally sanctioned or incited process.

Miljački: To me, this form of intentional decay, albeit a version that is politically motivated and violent, also connects in a programmatic way to Achille Mbembe's concept of necropolitics. We can certainly talk about neglect, decisions, and intentionality in the U.S. context, especially when it comes to public housing and a white supremacist worldview in which neglect is used to specific ends.

Mattern: I think that is a really important consideration. Neglect is not just a matter of forgetting. It can be an intentional practice too.

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