Repair

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We are surrounded by broken things and environments:[1] designed objects, spaces and systems in need of repair. Repair is a commonsense but partial answer to overconsumption and landfill crisis. It is conservative yet progressive. But as a concept and a material reality, repair can also overwhelm. With increasing technological complexity, and decreasing time, resources, and skill, the ethical and logistical questions around repair abound: What shall we care for, why, and how?[2] Where to begin? In this context, we begin with design: linking the value of repair to design is central to developing an ethics of care in the environmental humanities. In doing so, we acknowledge that design, in its current form, is deeply complicit in environmental destruction.

Dominant definitions of design since European modernism have tended to emphasize the creative capacity of humans to make something *new* by manipulating material resources, organizing information, or delineating space. To be fair, critical design history has worked hard to add complexity to this understanding of design, extending analysis far beyond the new product to incorporate a plethora of practices and account for production, consumption, use, and social meaning.[3] Mainstream social understandings of design, however, still tend to gravitate toward the fresh, crisp assurance afforded by the latest new thing. The most celebrated professional designers tend to be those who envision new products. Other material practices, such as repair (as well as disassembly and maintenance) are not generally considered design, even though such practices shape the form, operation, appearance, and perceptions of the material world we occupy (fig. 1).[4] The recent popularity of "design thinking" brought design and business together, further entrenching design's status as providing a soothing surface sheen.

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1. Muir, "Broken."
2. van Dooren, "Care."
3. Lees-Maffei, "The Production-Consumption-Mediation Paradigm."
4. Fry, *Design Futuring*, 3.

Figure 1. Spare parts in a roadside stall, Surabaya, Indonesia, 2017.

Design has historically operated in the service of the powerful, ever concealing the ugliness of global capitalist exploitation. In this context, repair has often been understood as the unfashionable antithesis to design: repair is seen as making do rather than innovating; repair happens in the face of austerity. By limiting the kinds of people who call themselves designers,[5] design closes itself off from the consequences of its actions over time: it takes no responsibility for the messy, destructive, and unequal futures that it has contributed to producing.

Repair is evidently everywhere in the history of design, from premodern practices to industrial craft, from the Japanese *kintsugi* tradition of gold ceramics repair to the Roman architectural tradition of *spoila* involving the repurposing of building stone. In response to the limitations of mainstream commercial design culture, feminist scholars are rereading and rewriting design histories.[6] Likewise, the necessary decolonization of design is already in motion (both in theory and practice).[7] Indigenous and other non-Western notions of use, ownership, and care are already expanding the definition of design.[8] As part of that expansion, the study of repair as a design practice needs to be

5. Rosner, *Critical Fabulations*, 25.

6. Rosner, *Critical Fabulations*; Reed, "Women, Work, and Revolution"; Rothschild, *Design and Feminism.*

7. Escobar, *Designs for the Pluriverse*; Tristan Schultz et al., "What Is at Stake with Decolonizing Design? 81–101; Schultz, "Design's Role in Transitioning to Futures of Cultures of Repair."

8. For examples of indigenous design in Australia, see www.firstnationsfashiondesign.com/, oldwaysnew .com, relativecreative.com.au/design-lab/, and Gothe, "Communicating Fire."

invigorated to make clear its crucial significance in the context of impending environ-mental and social disasters.[9] In order to revalue repair in this essay, we decouple design and innovation by thinking through two possible relationships between repair and de-sign: *repair as design* and *designing for repair*.[10] These dual trajectories position repair as more than a reactive response to something broken. Rather, repair is the expression of care, and therefore a way of making ethical decisions about design within complex and traumatized ecological systems.

Repair as Design

Emerging voices have questioned the focus on all that is new in design and technology—challenging the uncritical enthusiasm of innovation-speak. One alternative offered by Andrew Russell, Jessica Meyerson, and Lee Vinsel, for instance, is a pivot toward *mainte-nance*, in all its forms. Unwittingly at first, Russell, Meyerson, and Vinsel spearheaded a movement—*The Maintainers*—of thinkers and practitioners motivated by "the mundane work that keeps our society going," resulting in a "more accurate and grounded under-standing of human life with technology."[11]

Such movements built upon decades of feminist political work making visible unrecognized labor. In 1969, maintenance artist Mierle Laderman Ukeles wrote *Mainte-nance Art Manifesto 1969! Proposal for an Exhibition "CARE,"* in which she included acts of repair such as "mend the fence" and "seal it again—it leaks," along with "change the baby's diaper" in a long list of indispensable yet unrecognized chores that are dismissed as "women's work."[12] Ukeles helped make visible the diversity of repair and mainte-nance. Repair as design happens at different scales in different places. The design of some products—such as bicycles—are progressively repair focused. Other industries, such as consumer electronics, are decidedly anti-repair, but they nonetheless inspire countercultures, hackers, and small industries of out-of-warranty repair. iFixit, for in-stance, is a company selling parts and publishing free online repair guides in multiple languages.[13] Repair cafés all over the world focus on community-level transformation, creating spaces for people to learn skills, use tools, and become repairer/designers.[14] Re-pair is not limited to cosmopolitan contexts, as evidenced by diverse and widespread re-pair cultures in the Global South.[15] Likewise, Aboriginal designers from Yuendumu,

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9. We follow a number of significant scholars in valuing repair, including but not limited to Jackson, "Re-thinking Repair"; Graham and Thrift, "Out of Order"; Mattern, "Maintenance and Care"; Houston et al., "Letter from the Editors"; Strebel, Bovet, and Sormani, *Repair Work Ethnographies*; and Isenhour and Reno, "On Materi-ality and Meaning."

10. Other design writing on repair engages with similar concepts, such as Oropallo, "The Fixing I"; Gill and Lopes, "On Wearing"; Willis, "Renew, Repair, Research"; Tonkinwise, "Is Design Finished?"; and Schultz, "De-sign's Role in Transitioning."

11. Russell, Meyerson, and Vinsel, "About Us."

12. Laderman Ukeles, "Maintenance Art Manifesto," 382.

13. See iFixit's *Repair Manifesto* for another example of repair articulated as politics.

14. Rosner, "Making Citizens, Reassembling Devices."

15. For example, Corwin, "Nothing Is Useless in Nature."

Central Australia, inspired the television program *Bush Mechanics*, documenting desert repair culture.[16] These resourceful acts of reparation, mending, reassembling and maintenance constitute a progressive form of design: a form of design fit for the age of the Anthropocene.

Designing for Repair

While we understand design as an extensive social practice, rather than a specific point in a production process, designing *for* repair focuses on the decisions made at the initial stages of invention, to ensure that objects, spaces and systems are long-lived and repairable. Rather than considering design as a cog in the wheel of consumerism,[17] this shift implies that design keeps designing, all too evident in the legacies of plastic packaging clogging waterways, and the automotive dependence encouraged by ongoing motorway development.

Designing for repair means planning for change over time: designing to allow objects, codes and systems to be opened, disassembled, or altered. These decisions can be material, for example, when designing a child's toy, including a screw-affixed removable panel for the battery, rather than hermetically sealing the casing. Designing for repair includes considerations of durability, longevity and material affordances.[18] Designing for repair means keeping knowledge exchanges open. In this way, repair is linked to other open knowledge movements: Electronic Frontier Foundation,[19] Open Design,[20] Creative Commons, and the Free and Open Source Software movement. Much of the current debate over repair, particularly in the United States, relates to the right to repair, demanding policy changes that protect consumers from product software that makes them wholly reliant on the original manufacturer for maintenance and repair.[21]

Revaluing and Redirecting Design

Understanding repair as design, and designing for repair, means letting go of the aspirations for sleek, seamless, and human-centered forms. It means embracing bricolage and remix as we design for uncertainty and complexity in more-than-human systems. It

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16. Meakins, "Some Australian Indigenous Languages You Should Know."
17. Thorpe, "Design's Role in Sustainable Consumption."
18. Chapman, "Meaningful Suff."
19. Doctorow, "It's Repair Day."
20. van Abel et al., "Repairing."
21. Tech corporations such as Apple protect their devices' TPMs (technological protection measures), which penalize users for using independent repairers, requiring a return to the original manufacturer (often at great expense). Replacement and discard are therefore encouraged, and repair actively prevented. See, for example, Vinsel, "Fighting for the Right to Repair Our Stuff"; Wiseman, "Do Australian Farmers Need a Right to Repair?" Also, *Make Magazine* designed a special tool "small enough to fit on your key chain, the MAKE Warranty Voider is the perfect companion for mobile fixing, hacking and MacGyvering" (makezine.com/2009/06/19/in-the-maker-shed-make-warranty-voi/).

means designing sometimes unfashionably, often cautiously, with a view to intergenerational equity and the multispecies "earth-repair" that might reframe the relationship between ecology and economy.[22] It means prioritizing mending over marketing. It means challenging the relationship of designer (in a studio or office) to a worker (in a workshop or factory) in order to value the labor that goes into repairing the world.[23] It may mean choosing not to design anything at all.

Understanding repair and design as interlinked helps share knowledge between the environmental humanities and design studies, pushing to transform the way design is conceived, managed and practiced. As an expression of care, repair must involve an ongoing critical engagement with the terms of its own production and practice.[24] Design cannot only engage with an ethics of mutual care—but it *must* by acknowledging repair as a design practice that is diverse enough to redirect, and by including repair as a criterion for making decisions about what and how we design. Of course, even hopeful repair practices cannot, alone, fix the environmental crises we are in, nor can design solve the wicked problems of climate change. Rather, repair brings design more deeply (through theory) and more slowly[25] (through practice) into critical conversations about more-than-human ecosystems, and about design's culpability in environmental degradation.

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22. Gibson, Rose, and Fincher, *Manifesto for Living in the Anthropocene*.
23. Strebel, Bovet, and Sormani, *Repair Work Ethnographies*; Hamilton "Labour."
24. van Dooren, "Care," 292.
25. Rose, "Slowly."

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