

Towards Feminist
Labs: Provocations
for Collective
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Maya Livio
& Lori Emerson

TOWARDS FEMINIST LABS: PROVOCATIONS FOR COLLECTIVE KNOWLEDGE-MAKING

MAYA LIVIO AND LORI EMERSON

In recent years, the lab as a site of knowledge production has increasingly become commonplace both within and outside of academic institutions, beyond the established lab-based disciplines of the fundamental and applied sciences. The increased prevalence of labs suggests that scholars and practitioners are actively pursuing new models for knowledge production, moving away from ideals of solitary work and towards collaborative, experimental, and interdisciplinary research approaches. However, despite the apparent newness of labs, their dominant lineage stems from a racist, sexist, and colonial past, bringing methods, infrastructures, and underlying assumptions along with it. These handed-down affordances may inform the ways in which lab work is structured, and in turn, shape the kinds of knowledge that labs produce. In this paper, we argue that contemporary labs, as spaces of collective and interdisciplinary thinking and doing, require their own consideration as sites for feminist methodology.

In order to examine lab practices, it is important to first examine their multiple origins. Early proto-lab spaces included sites like monasteries, workshops, and kitchens – spaces which were never called labs but had many of the elements associated with 'labness' such as a source of heat, a central worktable, open and flexible work areas, a library, and a surrounding collection of tools and materials. The most commonly recognized provenance of labs is found in the anatomical theaters and apothecaries of the 16th century, and this century is generally considered the time at which entities properly called 'laboratories' emerged. However, if we include the many sites of experimental work that surfaced later on in the late 17th century, examples of proto-labs should also include – as Steven Shapin points out – a motley assortment of venues, including the private residences of 'gentlemen', 'sites where places of scientific work were coextensive with places of residence'.¹

The fact that places of scientific experimentation migrated further into private homes for a time points again to the importance of kitchens as integral to the history of labs, and is of particular relevance to our essay. Women have, of course, long been relegated to the kitchen as the heart of the domestic sphere and, as Alix Cooper points out, in early modern times 'kitchens and basements or root cellars formed improvised laboratories for women to tinker with and write down medical recipes'.² With the gradual appropriation of the kitchen as a place for 'gentlemanly' experimentation over the span of the 18th and early 19th centuries, women were essentially given the bizarre and contradictory message that they belong in a kitchen, that the kitchen might in fact be a lab, but that a lab is not for them.

1 Steven Shapin, 'The House of Experiment in Seventeenth-Century England', *Isis*, A Special Issue on Artifact and Experiment 79:3 (September 1988): p. 378.

2 Alix Cooper, 'Homes and Households', *The Cambridge History of Science*, Vol. 3: Early Modern Science, Cambridge: Cambridge University Press, 2006, p. 227.

Not surprisingly then, the 19th century ushered in the all-male industrial research laboratory, largely pioneered by Thomas Edison at Menlo Park, New Jersey. A so-called 'invention factory' and the largest private lab in the U.S. in the 1870s, Menlo Park simultaneously built on and departed from the long history of kitchens, apothecaries, theaters, and chemistry labs which we briefly summarize above. As Darren Wershler et al. point out in *THE LAB BOOK*, Edison's lab drew on the spatial, infrastructural, and administrative organization of labs and, with its frenzied embrace of entrepreneurialism and innovation, laid the groundwork for most of the major technology-based labs to come in the 20th century.³ A lab such as the MIT Media Lab, then, is founded upon these archaeological layers. The significance of this particular lineage of labs here is that contemporary interdisciplinary labs are inevitably built on some of these inherited value systems. The project of colonial science itself has deep ties to labs, as Kathryn Yusoff reminds us in *A Billion Black Anthropocenes or None*. Yusoff outlines how, beginning in the mid-1940s, an entire community of Marshallese residing in the Pacific islands were removed from their homeland so that it could be used for nuclear testing. Even though the Marshallese were placed in nearby islands, they were exposed to radioactive ash after the U.S. carried out its largest nuclear detonation, 'Castle Bravo', in 1954. 236 Marshallese were 'treated as test subjects for the effects of radiation', which for Yusoff is comparable to Hortense J. Spillers's description of medical experimentation on sick Black Americans, in that 'the procedures adopted for the captive flesh demarcate a total objectification, as the entire captive community becomes a *living laboratory*'.⁴

While labs bear with them the potential to set a particularly harmful praxis into motion, they are malleable entities and contain potentialities for new world-making practices. Therefore, inspired by boyd and Crawford's 'Six Provocations for Big Data',⁵ we offer here six provocations for feminist lab work – following hooks's call to bring feminist theory 'into the streets' by bringing it 'into the suites' of lab-based knowledge production.⁶ Our provocations are grounded in established feminist methodological concerns, which we have developed and applied towards the collaborative knowledge-work of labs. They are far from comprehensive, and while we do aim for the concrete, are not intended as step-by-step methods, but rather as methodological probes that can be used in the development of site-specific lab protocols. We believe that these protocols must always be situated and collectively established within the community, time, and place in which they are mobilized.

Throughout, we insist on the importance of moving beyond issues of inclusion when making labs more feminist. To be clear, it is urgent for marginalized and underrepresented peoples to be included in lab leadership, membership, and communities. Conversations about how to include these groups in labs and other knowledge-making spaces, commonly echoed in

3 Darren Wershler, Jussi Parikka and Lori Emerson, *THE LAB BOOK: Situated Practices in Media Studies*, unpublished manuscript, in-progress.

4 Kathryn Yusoff, *A Billion Black Anthropocenes or None*, Minneapolis: University of Minnesota Press, 2019, p. 46. Emphasis our own.

5 danah boyd and Kate Crawford, 'Six Provocations for Big Data', A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society, September 2011. Available at SSRN: <https://ssrn.com/abstract=1926431>.

6 bell hooks, *Feminist Theory from Margin to Center*, Boston: South End Press, 1984, p. 110.

movements such as 'women in tech' or 'women in STEM', are unfortunately still critically necessary today. However, we point out that while critiques of 'add women and stir' approaches have been leveraged for quite some time, they seem to continue to dominate popular discourse. Beyond 'adding and stirring', it is necessary to restructure the way labs work, and to consider and address pressing feminist concerns within them, such as those of access, epistemology, care, hierarchy, labor, and the environment.

1. Access is Complex.

Our first provocation deals with the core feminist concern of access, addressing questions such as: Who has access to the financial and spatial/infrastructural resources needed to create a lab in the first place? Who has access to an already-existing lab? Who may access a lab's resources? Who has access to a lab's outputs?

While it might be tempting to simply answer 'everyone should have access' to the above questions, 'everyone' too easily glosses over the realities of privilege, especially in higher education, which determine who can even contemplate the possibility of running a lab. It may be obvious, but also bears underscoring, that marginalized peoples must overcome countless hurdles before they can even find themselves employed by an institution of higher education. They must then position themselves to administrators and granting agencies as having the ability to successfully start a lab by doing work that is clearly legible to those in power, and is particularly legible in terms of requiring a significant investment of space, funding, and materials. Individuals must also demonstrate that they will produce outputs that are legible as 'scholarship' in their home discipline; thus, work that is, for example, collaborative, undertaken with a flat hierarchy, interdisciplinary through and through, open-ended, processual, not easily amenable to peer review, or multimodal will likely not be legible those with the power to fund them, whereas work that is, for example, heavily data or technology-driven, undertaken with a clear hierarchy (such as a principal investigator moving down to numerous subordinate investigators), peer-reviewed, and publishable as a book or journal article almost certainly gives credibility.

In terms of who has access to an already-existing lab and its resources, again, it might be tempting to answer 'everyone is welcome to use a lab'. However, 'everyone' can too easily appear neutral, while the term is in fact still deeply embedded in ableist, gendered, colonial and racial assumptions about who counts as a someone, especially a someone of value. We explore these sorts of epistemic assumptions in our second provocation below, but for now we can assert that, when it comes to answering the question of access to a lab, we believe in the productivity of continually questioning, answering, and questioning again who gets to enter a lab, who gets to use its materials, and who gets to produce work considered 'of value'. Such probes can be broken down further into questions including, but not limited to: Is the entrance to the space, as well as the interior, and signage accessible to people with disabilities? Are there clear instructions about how to use the equipment, or are there unwritten/unspoken assumptions about expertise that will determine who will or will not use it? What kinds of opportunities are there for people to receive training on how to use the equipment? If all the equipment is not immediately available in the lab, is there an up-to-date and easily discovered inventory?

Finally, with regards to who has access to a lab's outputs, once more we advocate for a practice of continual questioning. Such questions include, but are not limited to: Is the output produced in accordance with accessibility standards? Is it open-source (including open-hardware, open-data, etc), and if not, why? Is the output written in clear and accessible language, and/or supplemented with images, infographics, audio, video, or other materials to accommodate multiple audiences and learning styles?

It should go without saying that while continually questioning, answering, and questioning again who has access to a lab and its materials is necessary, the questions and answers in and of themselves will not change the demographic of who is accessing the lab. Going out into communities around the lab to find out who might have an interest in participating, and what particular practices need to change to better welcome those potential participants, is also required. That is, lab members need to make sure that in thinking through lab access they don't simply capitulate to an iterative process that only takes into account who and what is already known.

2. Epistemic Assumptions Run Deep.

Our second provocation deals with the epistemic underpinnings of labs. As we have already indicated, the history of labs is inseparable from the history of science, with the anatomical theatre, apothecary, and Edison's lab serving as a few early examples. We have also noted that science is a project with colonial origins. As Tuhiwai Smith notes, scientific classification systems were developed largely as mechanisms for organizing the knowledge generated by (and appropriated from) expeditions to the 'new world': 'New colonies were the laboratories of western science'.⁷ Making this history explicit is the first step to demonstrating how contemporary labs may, advertently or inadvertently, be bound to knowledge and value systems adopted from empirical science. Writing alternative histories of labs back in, by documenting the shift of kitchens between lab and not lab for instance, is also a valuable concurrent exercise. Together, these kinds of correctives can help to illuminate how marginalized knowledges have been excluded in the scientific codification of knowledge within labs, and more generally.

As Geri L. Dickson reminds us, 'scientific knowledge does not represent the totality of knowledge', and historical approaches are incomplete if labs do not think through their inherited assumptions and reorient themselves where necessary.⁸ The work again begins with the inclusion of diverse persons and perspectives within lab leadership, membership, and the communities the lab interfaces with. Lab communities include the local community in which a lab is situated, the communities who will be impacted by a lab's work, and communities that the lab researches, where applicable – all of which must be considered a vital part of a lab's knowledge base. Reaching out to community representatives, building long-term

7 Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples*, London: Zed Books, 2012, p. 68.

8 Geri L. Dickson, 'Metaphors of Menopause: The Metalanguage of Menopause Research', in Alison Jaggar (ed.) *Just Methods: An Interdisciplinary Feminist Reader*, 2nd edition, Boulder: Paradigm Publishers, 2014, p.157.

relationships with them (as opposed to one-time 'outreach' events), sharing lab outputs with them in an accessible fashion, and being open to their feedback (as a form of peer review) are therefore significant strategies for feminist lab-making. Some methods for working with a lab's communities can be adapted from Patricia Maguire's 'Feminist Participatory Research', which, via Tandon, 'begins with the premise that knowledge has become the single most important basis of power and control'. Maguire continues:

Ordinary people are rarely considered knowledgeable, in the scientific sense, or capable of knowing their own reality. They are excluded from the increasingly more specialized research industry, barred by requirements of the 'scientific method', and by intimidating concepts and jargon, money, time, skills, and experience.⁹

Maguire's list of how non-specialists are excluded from knowledge-making practices can be reversed into a set of counter-methods for labs, again tying back to access – for example, by making language, tools, and skills accessible for participation of community members and other non-experts.

Other forms of knowledge production which are of particular importance in lab settings are embodied knowledges and skills. Knowledges such as tool making and repair, craft, and other bodily doings cut across a range of lab disciplines, from makerspaces to biolabs. How are these knowledges included as part of the lab's knowledge base? How are they documented and acknowledged? At the same time, technical skills are sometimes treated as *more* valuable, particularly in technology-centered spaces. 'Soft skills' such as communication, organization, management, writing, mediation, and knowledge-synthesis must also be taken into consideration. How are these valued as part of the knowledge work of a lab?

Finally, situating a lab's research is critical for feminist work. This includes reflexivity about a lab's position and perspectives, transparency about funding and research stakeholders, as well as efforts to complicate notions of objectivity whenever possible. Feminist researchers have repeatedly demonstrated the impossibility of a neutral 'view from nowhere', as even the most mundane research activities are knotted in subjectivity. Feminist labs should therefore work towards, as Haraway argues, 'partiality and not universality [as] the condition of being heard to make rational knowledge claims'.¹⁰

3. Labs are Laborious.

In this provocation, we shift from considering who counts as a knower to who counts as a laborer in a lab. What labor counts? How is labor equitably acknowledged and compensated? How are attributions handled? How is rest ensured?

9 Patricia Maguire, 'Feminist Participatory Research', in Alison Jaggar (ed.) *Just Methods: An Interdisciplinary Feminist Reader*, 2nd edition, Boulder: Paradigm Publishers, 2014, p. 420.

10 Donna Haraway, 'Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective', *Feminist Studies* 14, no. 3 (1988): p. 350.

The etymological root of 'laboratory' is the latin 'laborum' and 'laboratorium', for labor and place of labor, indicating the degree to which embodied labor has historically been at the heart of any lab work.¹¹ However, too often labs continue to be structured hierarchically in such a way that those performing the embodied labor of experimentation and testing are given titles such as 'technician', 'intern', or 'research assistant', compensated with lower (or no) pay, and left unattributed on lab outputs or listed at the end of a long list of authors while those perceived to be performing the intellectual direction of the lab are placed at the top, with all of its attendant privileges. A lab driven by feminist ethics must aim to acknowledge the labor of all of its workers. This may include not only those laborers carrying out duties more directly tied to research, but also those working in service of the lab and performing less legible labor such as the cleaning staff, administrative staff, and marketing staff.

In terms of author attribution, some labs may choose to address unjust hierarchical assumptions by opting for a mostly flat model. To take just one example, they might choose to place an asterisk next to all or some author names, indicating that those authors contributed equally. These models are excellent in some cases. However, as Liboiron et al. point out, non-hierarchical attribution can make it difficult for lab members to accrue publication value when seeking employment in academic institutions. We are particularly taken with the methods the authors put forward from their own lab – the explicitly feminist, anti-colonial Civic Laboratory for Environmental Action Research (CLEAR), methods based in 'a situated and context dependent process that assumes decisions about author order will be different for every paper'.¹² The authors concretely outline methods for consensus-building that take into consideration equity across the complex social, economic, and political locations of lab laborers. We believe that such a system could be used not only for author attribution, but for devising job titles that work to complicate hierarchies, and that suddenly make visible the entire range of laboring that takes place in a lab.

Finally, appropriate attribution of labor must be paired with equally appropriate compensation, as well as with boundaries for how much each lab member can be expected to work. Drawing on Liboiron et al.'s guidelines for attribution, we believe that the creation of clear divisions between work time and rest time should also be made via a process driven by equity (taking into account how much people are able and available to work), consensus (open discussions should be staged about equitable division of labor, weekly work hours, breaks, and holidays), and care (all work hours should contain some flexibility to account for the physical and emotional well-being, childcare requirements, and other needs of each member).

4. Hierarchies Trickle Down to Knowledge.

Expanding upon issues of hierarchy, this provocation considers how hierarchy is negotiated in the overall organization of a lab and its work. Here, we focus here on the hierarchies within lab membership itself. But it is important to note that these points, as well as the labor and

11 Karen Knorr Cetina, 'Laboratory Studies: The Cultural Approach to the Study of Science', *Handbook of Science and Technology Studies*, Thousand Oaks: Sage, 1995, p. 585.

12 Max Liboiron et al., 'How to Run a Feminist Science Lab Meeting', *CLEAR* blog.

attribution concerns addressed above, extend also to addressing hierarchies in external community relationships, as well as with any human and non-human research subjects. As we have already touched upon, distribution of power is a key concern for feminist methodology. Given that the knowledge produced in labs is collectively shaped,¹³ power negotiation is particularly crucial to ensuring that the knowledge practices of a lab represent the diversity of its members. Decentralization of power might look different for each lab depending on its size, institutional commitments, and the kinds of work it produces. For example, are lab decisions made through a public or anonymous voting process? Are there elected or volunteer representatives who make decisions on behalf of member concerns? Must unanimity be reached in voting?

Here, CLEAR again serves as a useful model, as the lab has outlined protocols for running meetings and coming to agreement based on established methods of talking circles, facilitation, and consensus-based decision making.¹⁴ Even when applying methods such as these, however, conflict will inevitably arise in democratic negotiations,¹⁵ and how disagreements are addressed is significant for establishing affirming feminist spaces. We will address conflict further in the following section, but one helpful strategy for overcoming decision-making hurdles is by outlining (and periodically re-outlining) the lab's mission and values, then considering the decisions to be made against these values. Even seemingly mundane questions such as how a lab represents itself in marketing collateral, or which sources of funding it may or may not accept, are key to connecting a lab's work to its values, and should be considered with intention in lab meetings. The MIT Media Lab, for example, has long embraced funding from ARPA, DARPA, and large corporations,¹⁶ and we also now know that the lab has knowingly accepted large sums of funding money from known sex trafficker Jeffrey Epstein over the years.¹⁷ How does this reflect on the Lab's values, and how has it trickled down to its research agenda?

Establishing shared values builds community,¹⁸ and building and maintaining community in the lab can aid in the overall work of hierarchical negotiation. Cultivating community can take many forms, such as regular check-ins or surveys that take stock of community member needs, with clear follow-ups to address those needs. Community can also be addressed in more unstructured ways, such as by encouraging and supporting social time. Some feminist labs, such as Laura Devendorf's Unstable Design Lab, offer open 'playtime', where lab members can informally talk and experiment. This kind of space for connecting knowledge-making work with

13 See Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts*, Princeton: Princeton University Press, 1986. Also see Ludwik Fleck, *Genesis and Development of Scientific Fact*, Chicago: University of Chicago Press, 1981 (1935).

14 Liboiron et al.

15 Iris Marion Young, *Inclusion and Democracy*, Oxford: Oxford University Press, 2000.

16 Wershler et al., unpaginated.

17 Ronan Farrow, 'How an Elite University Research Center Concealed its Relationship with Jeffrey Epstein', *The New Yorker*, 6 September 2019, <https://www.newyorker.com/news/news-desk/how-an-elite-university-research-center-concealed-its-relationship-with-jeffrey-epstein>

18 Laurie Fuller and Ann Russo, 'Feminist Pedagogy: Building Community Accountability', *Feminist Teacher* 26, no. 2-3 (2016): p. 179.

dialogue and 'lived histories' is useful for feminist community-building, as well as for feminist knowledge-production, as Jacqueline Wernimont and Elizabeth Losh argue in their discussion of feminist makerspaces: 'We do not separate "yack" from "hack" any more than one might partition a "stitch-n-bitch"'.¹⁹ It is important to stress here, however, that even informal social activities can reinforce hierarchies, as in Edison's lab, where community-building was more akin to 'male bonding' according to Wershler et al., 'in a way that very much anticipates contemporary tech/startup culture.'²⁰

5. Safety Includes Affirmation.

This provocation emerges from questions about how to make a lab physically and emotionally safe, as well as what safety means. How is the lab made into an affirming space for members, visitors, and its extended community? Where can lab members turn for support?

Regardless of whether a lab is a digital humanities lab, media lab, wet lab, dry lab, hacklab, fablab, or makerspace, it must be physically safe. A lab is, as Wershler et al. assert, 'a complex assemblage of relational forces between its space, infrastructure, apparatus, techniques, and people'.²¹ Inattention to any one of these elements – in the case of safety, an inattention to people – creates a power imbalance not only between those who are safe (for example, directors or administrators who might have little direct contact with lab equipment) and those who are not safe (those who do have contact in the course of undertaking experiments or creative work), but it also creates a power imbalance between a lab's space and equipment and the people working there. What good is a lab if its materials are valued more than its human participants? Thus, in terms of physical safety, labs must regularly take stock of their exterior and interior infrastructure. Is the lab's electrical wiring up to its needs? Does it have adequate ventilation and clear information and procedures about hazardous materials and their disposal? Is it secure from intruders? Does the lab have a system in place for reporting and addressing malfunctioning equipment?

Looking after the emotional well-being of lab participants is also critical, and begins by respecting their identities and needs. Asking all lab community members to share their gender pronouns should be standard practice as new members join. There should also be a forum for members to note accommodations they might require in the lab, as well as religious observances or other commitments that might affect their work schedule. Appropriate, clear protocols for incorporating these needs into the lab's structure must then be established. Care for lab participants is also grounded in the constant and careful maintenance of the lab as an affirming space. What we intend here, after Jeannie Ludlow, is for the lab to go beyond notions of 'safe space' in order to build an environment that is supportive for growth. As we mentioned earlier, conflict and disagreement is inevitable in labs, and as Ludlow asserts,

19 Jacqueline Wernimont and Elizabeth M. Losh, 'Wear and Care Feminisms at a Long Maker Table', *The Routledge Companion to Media Studies and Digital Humanities*, 2018, p. 100. Note for non-English speakers, 'yack' refers to light, conversational talking.

20 Andre J. Millard, *Edison and the Business of Innovation*, Baltimore: Johns Hopkins University Press, 1990, p. 23.

21 Wershler et al., unpaginated.

feminist spaces are not always 'safe', in the sense that they challenge viewpoints and raise sensitive topics. Ludlow argues instead for what she calls 'contested spaces', ones that are not conflict-free but rather support respectful disagreement and tension.²² Cultivating the lab as a contested, affirming space, is key for supporting productive conflict-resolution and community-building. Emotional and physical safety must also be nurtured via a clear and transparent reporting structure for breaches in professional behavior. A lack of transparency about what happens in a lab, what constitutes professional behavior, and who may report to whom can quickly produce an environment where abuses of power take place.

6. Non-Humans are Community Members, too.

In this final provocation, we point to the more-than-human concerns that a feminist lab must take up. As we have already mentioned above, labs and lab practices emerged out of scientific value systems – systems which imposed worldviews onto knowledge production that were limited in scope. Robin Wall Kimmerer highlights those limits in *Braiding Sweetgrass*, and she makes clear how anti-colonial, feminist approaches can serve to bring neglected concerns back into view, specifically, those of non-humans. She writes:

In moving from a childhood in the woods to the university, I had unknowingly shifted between worldviews, from a natural history of experience, in which I knew plants as teachers and companions to whom I was linked with mutual responsibility, into the realm of science. The questions scientists raised were not 'Who are you?' but 'What is it?' No one asked plants 'What can you tell us?' The primary question was 'How does it work?'²³

We insist that all living beings impacted by a lab's work should be considered as part of its community. When a lab works with non-human subjects, ethical questions are readily noticeable; however, we would like to point out that non-humans outside of the lab also require care. How are the needs of our non-human planetary cohabitants taken into consideration in the lab's work? How are ethical material usage and disposal taken into account (practices which can of course also affect human animals, with marginalized groups disproportionately affected)?²⁴ One example that is alarmingly prevalent in labs is the use of plastics. Plastics are found widely across lab disciplines – from the test tubes of biolabs to the circuit boards of hackerspaces. These implicate a lab in the systemic extraction and waste practices currently affecting all of Earth's living beings.

In order to address questions of material usage and waste, we propose Amanda Starling Gould's 'Digital Environmental Media Studies (DEMS)' framework as a useful starting point to think with.²⁵ While the framework is built around the digital, it can be applied to other

22 Jeannie Ludlow, 'From Safe Space to Contested Space in the Feminist Classroom', *Transformations: The Journal of Inclusive Scholarship and Pedagogy* 15, no. 1 (2004): pp. 40-56.

23 Robin Wall Kimmerer, *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*, Minneapolis: Milkweed Editions, 2013, p. 49.

24 'Pollution Affects Americans Unequally: Interview with Robert Bullard', Union of Concerned Scientists, *Catalyst* (Spring 2017), <https://www.ucsusa.org/sp17-inquiry-robert-bullard>.

25 Amanda S. Gould, 'Restor(y)ing the Ground: Digital Environmental Media Studies', *Networking Knowledge: Journal of the MeCCSA Postgraduate Network*, 9.5 (5 July 2016).

knowledge practices, as it encourages taking the full supply chain of sites of knowledge-making into consideration, from beginning (such as minerals and plastics) to end (such as wastes and toxicants). Reuse, repair, and other 'circular economy' practices are, as Isenhour and Reno make evident, firmly tied to a feminist ethics of care,²⁶ and are of vital importance to a feminist lab's work.

From Feminist Labs to Feminist Logistics

The provocations we have outlined here consider how models of thinking-together could benefit from the application of feminist methodologies and approaches. While we have written them for feminist labs, they can also be applied towards broader feminist logistics. How can human and non-humans, together with technologies, spaces, and infrastructures, be organized into collective feminist sites? To be clear, attending to these concerns can be time-consuming, tedious, and perhaps worst of all – boring. Here we find useful Astra Taylor's call for doing the laborious work of organizing, arguing that 'endless meetings, strategy sessions, research, spreadsheets, [and] conference calls' are invaluable efforts in social justice work.²⁷ We believe these to be equally important for spaces of feminist knowledge-making and logistics.

We have also implicitly argued here for making lab practices and logistics *visible*, and thereby accountable, to those who have been and continue to be written out of labs. However, as we insist throughout, it is not simply a matter of diverse representation. While crucially important, this cannot, in and of itself, cure deeply embedded patriarchal, colonial, racist, ableist, imperialist, ageist, and environmentally damaging assumptions. Rather, those assumptions themselves must be addressed, as they are intrinsically tied to the infrastructure and administration of that crucial engine of knowledge production: the lab. Questions such as what counts as expertise and who counts as an expert (in the words of Latour and Woolgar, an issue of 'credit and credibility')²⁸ remain of vital importance. Thus, by way of the preceding six provocations, we end with a final challenge. What might be possible if we rethink not just the who and what of labs, but the how?

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26 Cindy Isenhour and Joshua Reno, 'On Materiality and Meaning: Ethnographic Engagements with Reuse, Repair & Care', *Worldwide Waste: Journal of Interdisciplinary Studies*, 2.1 (2019).

27 Astra Taylor, 'Keynote', *Rhizome Seven on Seven*, New York, 2016, <https://rhizome.org/editorial/2016/may/14/seven-on-seven-2016>.

28 Bruno Latour and Steve Woolgar, *Laboratory Life*, pp. 167-179.

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