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LAB TECHNIQUES

The chapters in this book so far have demonstrated that hybrid labs are a dynamic assemblage that binds together space, apparatus, infrastructure, people, and various kinds of imaginaries. Both social studies of science laboratories and studio studies of art and design have argued that material mediators (to use Antoine Hennion’s term) are a central part of this work of assembly.¹ But the hybrid lab is also an entire toolbox of techniques—material, symbolic, cultural, and bodily—that define how objects and subjects come about.

The deep entanglement of the laboratory assemblage became evident in our discussion of lab apparatus (chapter 2), which defines both the subjects and the objects involved. A lab is also constituted by the techniques that sustain it as a material and symbolic site of activity. These techniques are an important part of various genealogies of art and science, and their persistence over long periods of time is one of the factors that create family resemblances between labs and older spaces for the production of knowledge. But lab techniques do more than create historical connective tissue; they are also sites of hybridity and discontinuity. Sometimes techniques move laterally from one field into another. At other times, new techniques appear in relation to emergent technologies. On still other occasions, once-popular techniques can be abandoned completely for a range of reasons, from the ethical to intellectual to the pragmatic.

Lab techniques are also a useful prism for the observation and analysis of the issues that hybrid labs raise in current technological culture. In this final chapter we roll out a brief and incomplete catalog—something more akin to a demonstration of what such a catalog might look like—of nine techniques: 3D printing, collaborating, collecting, dis/assembling, experimenting, failing, living labs, prototyping, and testing. All of the foregoing embody many of the themes throughout our book—technique is just yet another way to understand how these aspects come together in the expanded lab model we propose.

We have already discussed some aspects of lab techniques simply because addressing any one feature of the extended lab model involves implicating others. The way labs occupy space, their use of apparatus, and even administrative paperwork are all constitutive techniques that play roles in assembling labs, summoning people into them and transforming them into lab denizens, all while engaged in various acts of knowledge production. Research and teaching collections work in a similar manner, demonstrating not only how the objects they contain are organized into a collection but also that the collection organizes subjects into particular positions of knowledge.

Many of the techniques we address in this chapter provide insights into the porous distinction—more likely an interface—between the lab’s “inside” work and how it links up with contemporary technological imaginaries and economies outside the lab. Techniques govern the insides and outsides of the lab, but they also sometimes carve out the space to become, in Peter Galison’s words, a trading zone for multidisciplinary alignments, discourses, and practices.² Given the deeply hybrid and interdisciplinary nature of techniques, the fledgling set of key words we present here is meant to be introductory and suggestive, especially as we

intend to continue expanding on this initial list of techniques on the University of Minnesota Press’s Manifold platform for *The Lab Book*.

We also know that labs construct consistent worlds with the help of the imaginaries they produce. Like art studios, labs function as hubs of creative discourse; but we want to approach their creativity as part of the way labs assemble and organize their space. In pragmatic terms, this organization occurs through specific practice-based forms of knowledge that, when bundled together, we refer to as “lab technique.” It’s worth devoting some time to observing how the studio employs objects and practices to produce material knowledge. As Farías and Wilkie emphasize, the studio is “not the place in which inventions are validated, evaluated and valorised”; it is more like a site of reverse engineering, because it picks apart experiments and puts “aesthetics in action” by focusing on the process more than the product.³ This idea of aesthetics in action is a particularly effective way of approaching lab activities, because we can expand it from aesthetics to assert that labs are sites that put materials in action as well as theory in action.

As Cornelia Vismann articulates particularly well, cultural techniques manage things and subjects, material sites and their discursive range: “To inquire about cultural techniques is not to ask about the feasibility, success, chances and risks of certain innovations and inventions in the domain of the subject. Instead, it is to ask about the self-management or autopraxis [*Eigenpraxis*] of media and things, which determine the scope of the subject’s field of action.”⁴ This definition resonates with and responds to a similar body of work that deals with cultural practices of technology. Indeed, when Jonathan Sterne writes that “technologies are crystallized bits of practical art and practical reason—they are techniques externalized and delegated to machines,” we are in a very similar territory, with the important caveat that it works the other way around as well: so-called human practices are often crystallized bits of technological reason and infrastructure.⁵ The lab technique of “testing” is one important example: a broad modern epistemic disposition feeds into particular human actions that embody that disposition, in which testing, experimenting, trying out, rehearsing, and prototyping share a particular closeness as forms of material practice of knowledge.

Discussion of both techniques and practices often leads to the Aristotelian term *techné*, which Sterne explains by way of musical example: “Creation and contingency are central to how we should understand *techné*. A simple example would be a musician’s ‘technique,’ which describes the practical sense that she bring to her instrument and the actual process through which she plays it. A musician’s technique encompasses both her actual movements and the practical, embodied knowledge she brings to the instrument.”⁶

Many of the examples in our short glossary of techniques exhibit this combination of embodiment with particular technological objects and specific practices. If we are paying close enough attention, it should also be possible to discern the infrastructures that guide the emergence of actions, perceptions, and movements. Creative practices of knowledge production bear a performative relation to what takes place as research and pedagogy. Because such techniques and practices are often relegated to a position as the silent components of knowledge, we are drawing attention to their considerable significance here.⁷

3D PRINTING

Pithily defined, “3D printing is the social use of an industrial process” that brands the contemporary lab scene.⁸ As part of the contemporary lab’s bundle of prototyping, experimenting, and testing techniques, the 3D printer is a boundary object that mediates between different disciplinary attachments to the technology while opening up a space to consider the relation of technique and method.⁹ As a boundary object, it also performs one of the major functions of the hybrid lab: bringing people, expertise, and interests together

and priorities in many ways, including the choice of components, circuit design, where the board is placed internally, and even the degree of technical facility with which it has been installed. Which raw materials to use and where to purchase them, how to make a good solder connection, whether or not to use hot melt glue as material support for joints, whether to cut through the original plastic or remove components, and many other factors are all matters for discussion and debate within the hardware modding community, as a quick look at YouTube or other online forums demonstrates. These questions of style in turn become a scaffolding for the establishment of cultural capital, shaming, and prestige within the community (complete with online “how to” and “how not to” videos). If a new figure comes on the scene with more technical expertise, then the opinion of the entire community about what constitutes best practice for assembly and disassembly can shift dramatically.

EXPERIMENTING (*SEE ALSO TESTING; FAILING*)

The experiment is not just a recurring technique of the lab; it is the lab’s signature technique in modern and contemporary contexts. The lab-based experiment is even enshrined in national guidelines for science education such as those produced by the U.S.-based National Science Teaching Association, which declares, in no uncertain terms, that “while reading about science, using computer simulations, and observing teacher demonstrations may be valuable, they are not a substitute for laboratory investigations.”³¹

Besides the material practice of conducting lab science, the experiment also launched the world of scientific academies and institutions, journals, sites, technologies, and techniques that form the milieu in which knowledge emerges in modernity. It opens the lab up both spatially and temporally. It can act as a way of “drawing from real things in the world” instead of offering the comfort of a solitary isolation that the lab might easily connote. But its temporal axis also matters. Besides pointing back to the long history of scientific experimentation, the experiment provides researchers with a means of speculating about various possible futures. That is, it projects toward the unknown while aiming to enrich our current understanding or experience in some novel way. As a form of speculation, experimenting is deeply related to the techniques of testing and failing; it paves the way for trying out things without necessarily knowing in advance where they lead. Experimenting is thus a characteristically modern practice that cannot be reduced to a history of theory, as Ian Hacking famously argued, referring to Francis Bacon’s foundational role: “He taught that not only must we observe nature in the raw, but that we must also ‘twist the lion’s tail,’ that is, manipulate our world in order to learn its secrets.”³²

The experimental setting is replete with “instruments, contraptions and apparatuses” that form the background for the experimental structure or set the scene that allows epistemological work to occur.³³ Nevertheless, the experiment is not entirely reliant on equipment; it can be low tech and built on particular epistemological, social, and discursive techniques such as “testing, trials, enquiry, demonstration, evaluation.”³⁴ As Hans-Jörg Rheinberger argues, when trying to understand the experiment, the shift from words to practices matters most: “What we can do is to map out a discursive territory where it is possible that scientists and artists can mutually look at their hands, paying less attention to what they say but much more on what they do when they practice their craft.”³⁵

Located between art and science, humanities and design practice, many hybrid labs are effectively infrastructures of the experiment: a set of particular instruments—often referred to as “media”—that then take the role of enacting forms of knowing in relation to discursive structures. The experiment, then, is less one specific technique than a systematic set of technologies, epistemological attitudes, systematic practices,

and wider discursive aims in which it is expressed. Entire labs, or even networks of labs, can be organized around their relationship to a single experiment.³⁶

Notwithstanding all of the above, experimenting is not exclusively a scientific technique; the arts, humanities, fine arts, and social sciences also make use of experimenting. Because of this commonality, it frequently mediates between artistic and scientific practices, creating significant potential for cross-pollination. Hence, many of the famous sites of (artistic) experiment like the Black Mountain College have also been sites of social experience and invention.³⁷

To better understand the relationship of the idea of experiment to the lab, consider the Medea lab in Malmö, Sweden, which is a lab precisely because its occupants place the experiment at the center of their work: “We decided to explicitly call our environment a lab due to the experimental character of the work we do. It is experimental in the sense of conducting work where the outcome is not predetermined, and where the participants bring with them quite different kinds of experiences and get to work with people they are not accustomed to working with.”³⁸ The links between experiment, experience, and expertise build a sense of the lab as an embodied, collective space: we are in this together. The “we” is important, because twisting the lion’s tail effectively takes more than one person (see “Collaborating”). Of course, it becomes easily tautological: labs are spaces of experimenting, and experimenting is what you do in a lab, or, “Give Me an Experiment and I Will Raise a Laboratory,” as Matthias Gross puts it in his inversion of Latour’s famous phrase “Give Me a Lab and I Will Raise a World.”³⁹ This is ultimately another argument for why it is necessary to employ a model like the extended laboratory; on a complex object like a lab, one perspective is not sufficient.

Crucially, the experiment is recorded in field notebooks, lab books, and other media—sketches, photography, video, graphing devices, chromatographs, computers, and so on. These inscriptions are not just for purposes of verification; they exist in order to communicate anything at all about experimental results and, as an effect of that communication, to build new expert interpretive communities. Writing in the context of the SpecLab, Johanna Drucker defines the experimental set of practices in speculative computing as a diversion from an earlier, standardized mode of knowledge in digital humanities. In a case like this, the experimental turns into a set of propositions and principles that “push subjective and probabilistic concepts of knowledge as experience (partial, situated, and subjective) against objective and mechanistic claims for knowledge as information (total, managed, and externalized).”⁴⁰ Even if the emphasis in SpecLab practice is on the term “speculative,” the link to experience is nevertheless a central part of this methodology. Following from Drucker’s invocation of Charles Peirce’s definition of a sign as “something that stands for something to someone,” Drucker sees SpecLab’s work as sited not just in space but within particular discourses and their attendant interpretive communities.⁴¹ A situated set of experiential coordinates counts as part of knowledge creation. This means that experiments must incorporate experience into their embodied and affective forms as part of creation of knowledge, accounting for the situated, historical, perspectival form of a participating or perceiving subject. Questions of gender and sexuality, race and ethnicity, positions and intersectionality are all part of the world of lab techniques.

FAILING (SEE ALSO EXPERIMENTING; TESTING)

There’s no shortage of glorification of failure in contemporary creative scholarship and artistic discourse. The mantra of failure has shifted from the twentieth-century avant-garde arts, where it was cultivated to become an art methodology, into broader public discourse, largely because of unmet expectations in the face of technological hype. Even business schools and venture capitalism have embraced failure as another tool in

the box (both of which constantly intone that we ought to “fail better!”). Because labs are places of experimentation, and experiments often, well, *fail*, it’s also not surprising that there is also a substantial element of failure in contemporary lab discourse. Andreas Treske describes their Media Archaeology Lab at Bilkent University in Ankara in ways that combine production and experimentation, success and failure. Despite hosting a variety of audiovisual equipment, the lab also hosts techniques of testing: “It’s not simply an archive, and it’s not simply a production facility. It is a space where you are able to combine things in different ways, where mistakes are allowed, and where the result is creative, and therefore has the potential to allow freedom in development and practice.”⁴²

But failure has always been an important part of laboratory technique. As we discussed in chapter 5 (“Lab Imaginaries”), even before the modern avant-gardes, Edison excelled in failure, turning it into part of the mythology of the inventor. That tradition is alive and well in contemporary hybrid labs. As Aymeric Mansoux argues, tongue firmly in cheek, “the stereotypical media art lab is a space where artists who are not always sure of what they can do with media technology due to a lack of technical knowledge come to research and develop a project.”⁴³ Of course, methodological production of failures can have epistemological value considering how central failure is in net art and glitch art, which attempt to show the cracks and stitches beneath the smooth surfaces of computer interfaces and/or branding.⁴⁴ Dismissing techniques of failure would be a major oversight when what’s necessary is to investigate its multiple forms of existence as a lab technique.

The discourse of risk in digital innovation, replete with slogans like “move fast and break things,” might well have hijacked contemporary notions of failure. But failure is also an elemental part of the history of technology and, as such, media-archaeological practices reveal there have always been other ways to articulate the term. While describing his plans for a media archaeology lab, Olsson points to the importance of failure as an integral part of the project: “In tinkering with old, forgotten, and dead media it opens our eyes to mistakes, waste, and failure. It offers a space for ‘broken world thinking’ (Steven Jackson), which could be considered crucial today.”⁴⁵ As Olsson points out, the focus on brokenness can itself be an entry point for an alternative account of media technologies as both historical and contemporary. In a similar vein, O’Gorman describes his own brand of hybrid lab work as an interest in the “misfit toys, half-baked things, malfunctioning apparatuses” that are created as extensions of philosophical arguments and experiments.⁴⁶

Finally, failure is important because it points to the possibility of moving beyond narrow functional uses, or the limits of what is currently believed to be possible. Lab spaces can operate as safe spaces for failed attempts that allow researchers to investigate the possibilities and potentials for different technologies and techniques. As Jamie Allen and Claudia Mareis put it, while the studio has long been considered “a sacrosanct place of experimentation and failure,” hybrid labs carry this legacy forward in new ways that do not necessarily reproduce the various connotations of the studio as spaces designed to produce and channel individual inspiration.⁴⁷

LIVING LABS

One of the reasons that labs are everywhere in contemporary culture is the success of techniques like the living lab. As Pieter Ballon and Dmitri Schuurman argue, the term “living lab” more accurately describes a relationship or a method than a particular kind of space.⁴⁸ In this spirit, we discuss living labs as a discursive practice and a cultural technique that relates to how urban space is designated as a lab, and how this mobilizes discourses about innovation, consumption, and allocation of potential roles to citizens as stakeholders. As such, the living lab is an ongoing test situation that also speaks to how smart cities are being introduced.