PART IV

INCOMMENSURABILITIES

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CHAPTER 13

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Substance as Method (Shaking Up Your Practice)

By due attention, more can be found in nature than that which is observed at first sight.
—Alfred North Whitehead, *The Concept of Nature*

This is a workshop. The idea is simple: Pick a substance related to your work that you don't *directly* care about, that you haven't paid due attention to, and find out how others learned to see more in it. Learn from them how their substance challenged them to rethink their theories and methods and, from that, consider how your theories or methods might also be rethought.

OBSESS!

This is an exercise in specificity and kinds. I call it "substance as method" (SAM). It is not a method to replace all other methods; it is not a replacement for ethnography nor a kind of ethnography in itself. This method is a tiny one next to those we do, but it has a chance to help us think and practice research differently, because it shows us different worlds. It begins by picking an adjacent substance.

Think about your research object (your subject, field, actions, the things that matter most to you), and then think about the substances around them. Make a list of ten to twelve secondary objects—materials that are part of other things, things or effects that are close but not central. Don't list things that are precious to you (this is not an "implosion" project; see below). Substances are not usually singular objects but rather something like a material, a substrate, a kind, a species, and so on. It could be a particular kind of wood, an element you've heard mentioned, a work tool. When

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I was working on fracking, I made a list: drill bit, worker's compensation contract, deep ground sonar, bromine (that comes up from drilling), plastic tarps lining water pits, handheld computers, man camps, pipeline pipes, bulldozers, tap water.

Then pick the fourth or fifth one. I picked *bromine*.

Your assignment is to then do some research: Locate specialists who care about that substance and read some of their work (scientific papers, newsletters, treatises about working with that substance, textbooks, etc.). Read quickly and widely. Because you chose a secondary substance, you don't know much about it. You are not trying to become an expert—it is okay if you don't understand all the technical language. Rather, you are realizing for yourself that there that there are specialists who spend a good portion of their lives caring about and investigating that substance—specialists such as scientists, technicians, workers, engineers, artisans, artists, fans, managers, and so on. For me, they are the kind of people who, if you asked them about bromine, would have a lot to say. A lot. They are geeks about it. They don't just know about it, they grapple with it in their life, they adapt to it, they have to invent concepts and theories to account for those interactions: vocabularies specific to the substance. Jane Bennett (2010) draws on accounts of metalworkers whose "desire to see what a metal can do" led to "intense intimacy with their material," which led them to discover new structures and a life in metal.

One workshop participant asked about choosing general versus specific substances for this exercise: should she select "candles in general" or "beeswax candles"? The answer is that it is not you who picks the level of generality. Find those other people for whom candles are their obsession and see what their categories of specificity are. The first question you ask yourself of a reading or a person: What is the substance for them? What words do they use, and what do they pick out with them? What are the boundaries (i.e., what is included in "it")? What "kinds" of it do they talk/care about? The answers may not be what you thought they would be. (That's good! It means you are already learning.)

With regard to candles: Are there people who make all different kinds of candles or do they specialize? For those who think of themselves as inventing new types of candles, do they think of them generically? What are the categories within which they think? Each human will have an emic type of scoping, and you map these as you go along. Not everyone will agree. For my substance, some write books about *bromine*, others *bromides*, others *halogens*. I read in order to notice what their "substances" of concern

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are: What do they pick out to study? Where do those things begin and end for them? I pick my starting point and then go look and find that it is much smaller or wider or way sideways for them—they put a bunch of other things together that I didn't even think could be "one" topic. That process begins to jostle me out of my categories.

SURPRISE!

The second thing you do as you skim through material or talk to someone is to pay attention to their edges: what don't they know about the substance, what surprised them? What excites them about the substance? What are they challenged by? Where have they run into problems in studying or working with the substance? This is the core of SAM: when someone has been stumped by a substance, but because they are obsessed with it, they refuse to give up and are forced—by the substance—to rethink their own concepts and tools. The key is that the substance resists the specialists' work and curiosity; it requires extensive exploration in order to understand its properties, and different and sometimes new tools are usually needed in order to figure out what it does, how it relates, or connects, or does things, and how it refuses to do other things. Its verbs are recalcitrant to speculation and need empirical work. The specialist often comes to realize that the substance might have types (e.g., types of bromides) and may behave totally differently in different environments or when connected to certain other substances. The substance puts the specialists' categories into variation. This point is where the substance becomes its own metaphor.

I read a book on halogen bonding in which one of the researchers told a story about their realization that bromine had been crucial to a number of pharmaceutical discoveries and yet their computer simulations weren't showing it. They realized that their software had built-in assumptions that noncovalent halogen bonds were *like* noncovalent hydrogen bonds in water—but they hadn't looked closely enough. When they did, they found that halogen bonds were slightly different, and that slight difference actually made them ideal for making "inhibitor" drugs. The researchers needed to rethink their entire notions of bonding and likeness, redo their tools, and create a new type of bond: "X-bonds" (because X is often used as a stand-in for halogens). Their substance, in other words, demanded its own variation; it was its own metaphor.

The second practice is thus to locate those specialists ("philiacs," lovers of the substance) who care so much about a substance that they let

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it surprise them as such; they are humbled by it. As they persist in their pursuit of it they create knowledge, remake themselves as knowers, and mutate the world toward the substance. They become interested in the duration of the engagement with being stumped, the hesitations. In one case I read through an entire textbook, and only a few paragraphs jumped out as interesting to me: those in which the author had to tell some history in order to explain why something that is now so obvious was overlooked for so long. Much of it was too technical for me in terms of chemistry, but I could follow the grammar of surprise: chemistry worked just fine, until it didn't. Chemistry as they knew it worked just fine for bromine until they were looking at its role in macromolecules, and X-bonding, when they realized that modeling on water had led them astray. They had assumed it generalized. Nope. They had to undo their notion of bonding.

Depending on your substance, you may need to delve into the "gray literature," written for and by people in a particular industry. These publications are where people exchange job news, and they create an extraordinary map of what those people care about. You can use these texts to map their areas of concern and what they think is important—which are often quite unexpected—and what they care less about, which they indirectly identify by not discussing it (e.g., fracking companies couldn't care less about activists—our activities barely show up on their radar when compared with geological speculations and what competitors are doing, as the latter affect their bottom line much more). You can see in that gray literature the things that drive and challenge them. The things that they find necessary to talk about. These are lively edges where disagreement and invention are taking place.

Or, you may need to read white papers or protocols. In one workshop a student was curious about the USB sticks that her informants used to exchange pictures. She looked up the USB protocol white paper and attended to what was necessary to talk about. It was all about the balance between speed and durability and error rates. Here is a device that you stick into and pull out of a computer so many times that it had been given a life span. Errors are not a problem; they are what USB does in continually sending data back and forth and testing them for errors. The issue is the speed of errors, not the happening of them. Error is a flow rate put against a proper transfer rate. These failures are balanced at an acceptable level. SAM is used here to read the protocol as a record of what its developers were struggling with—that is, why they had to specify it: because disagreements and misunderstandings occurred. The text records things that can vary but shouldn't,

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that can go wrong, the things that need to be standardized. That means that underneath what the writers said is all this variation that needed to be made into one whole. To the extent that you don't see the standard as one among many is the extent to which you've accepted the normality of that standard, that concept, that substance.

RESONATE!

"The encounter between two disciplines doesn't take place when one reflects on the other, but when one discipline realizes that it has to resolve, for itself, a problem similar to one confronted by the other." —Gilles Deleuze, "The Brain Is the Screen"

The third step is to resonate with the surprise of others. As much as substances can spawn new theories, new software, and new methods among researchers caring for their specificity, we can also note how all of our theories are in correspondence with often implicit substances. Literally *in correspondence,* because we think with conceptual prototypes (core examples). In my case, while reading about how bromine created different notions of bonding, I began to notice how deeply my notions of connections (among professionals, among companies) depended on a binary of "direct" versus "indirect" (through communication channels or through structures such as capitalism). The USB sticks led me to wonder about my connections as having life spans and error rates, rather than as being true or good or bad.

When I looked at studies of how bromides function in landfills, I learned that researchers discovered that the concept of "breakdown" needed to be broken up, because landfills have four very different layers, each of which engages in a different transformation. Bromides sometimes broke down into constituent parts, sometimes they bioaccumulated in creatures and became more complex, sometimes they went from toxic to relatively nontoxic, and sometimes they became both more toxic and light enough to fly away into the atmosphere. As these researchers freaked out at this multiplicity of pathways, I started rethinking my comparatively simple assumptions about what it means for a company to break apart or a person to break down. I'd written these words as if I knew what they meant, as if they were relatively simple processes or metaphors.

The third practice of SAM is therefore to use others' surprise about their substance to teach yourself to put your own concepts into variation, especially simple words such as *connection* or *breakdown,* or theory words such as *entanglement* or *neoliberalism*. I like this exercise because it points to

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our own conceptual shortcuts. What if one of my theoretical terms causes me to overlook the very thing that matters most to me or my informants? Every time I use the word *biopolitics*, I may be overlooking something that matters, because it fits biopolitics "enough" (the way hydrogen bonding fit most of the things these researchers wanted to use halogen binding for, such that when they hit something where it mattered, they overlooked it). So how do even the little words I like—*power*, *force*, *cause*, *entangle*, *attune*—skip over the challenge?

This is a kind of agitating empiricism. I am interested in all the people who have run up against the failure of their existing vocabulary and theories to deal with a substance. And I am learning from that, because it is rare: in the general way of things I do not have to regularly generate new vocabularies. Especially theoretically speaking, I am mostly pressing against other words (my own words/concepts). Spending too much time in academia, perhaps, I feel as if I don't have enough encounters with things to really question my theories, so I am doing this by proxy. Seeing whether their process might help me think differently.

In SAM, you work on your habits of thinking, but *not* by getting a better description of the substance, *not* by adding multiple perspectives. You listen to find resonance between each of your various struggles with substances. So it is not an empiricism of description; it is not about being more relational with your substance, nor about adding layers or thinking substance as multiple. You are not writing by thinking. You listen to others because you want to challenge your habitual theorizations and bring your own attention to your way of struggling with objects, relations, and worlds. You are provoking yourself, putting your own concepts and methods into variation, not acquiring a new technique.

SPECIFY!

Putting your concepts into variation is a practice of relentless specificity. Always ask: What kind of X is this X? What kind of entanglement is this entanglement? Is it entangled like vines (with or without thorns), or like hair (in need of combing or shampoo), or like a trap (who set it), or like family relations (with what affect), or like a fishing line, or like a story? Your research is the answer to this question. You may decide that *entangle* is not even the right word.

Whenever you find a word coming to your tongue or keyboard, ask yourself whether perhaps you are skipping what matters, avoiding a com-

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plex relation that is right in front of you. Instead of staying with its trouble, this word may seem to apply "enough" and may help you avoid naming the thing that you might really want to name there. The word/concept plugs a hole but maybe not in the way you want. Ask yourself what kind of itself it is!

If you want somewhat baroque inspiration, Hans Blumenberg (2016) wrote a fascinating little book called *Paradigms for Metaphorology* in which he discusses words such as *truth* that cannot be empirically grasped and therefore can be accessed only by means of "absolute metaphors" that themselves have a history: Is truth something that you know because it is convincing, or is the fact that something is convincing proof that it is rhetoric and not truth? At different times, each of these has been a dominant absolute metaphor of truth. More than a dozen distinct absolute metaphors of truth exist, each with subtypes. Blumenberg finds that absolute metaphors "owe their 'success' precisely to the fact that they do not permit the question of relation to reality to rise in the first place, since it serves to indicate a basic attitude that first gives what we call 'reality' its gestalt" or feeling (Savage 2016, 143). They give form to our experience (to our phenomenology as Sara Ahmed, 2006, describes). When we think, meditate, poetically write, we do so already within certain relations, within and around the substances we are familiar with (even if we haven't named them as such). But that doesn't mean they can't be replaced with others or corrected with more precise ones.

For more modern inspiration, you can turn to pretty much any of Foucault's lectures that he gave weekly (during semesters) for decades. Read them this time for how he read texts rather than for his takeaways. One of his practices was to approach a text as though it were the only evidence for the meaning of the words in it. If a text used *crime* or *market*, he would come up with a precise definition of those words for that text. It is a technique of turning the document inside out: rather than interpreting it on the basis of what you think the words mean, let it teach you new definitions of all of its words. It often seems like Foucault played a game: make a list of the seven precise characteristics of a word, as it was used. In his book on biopolitics, the result is a specification of markets in the plural: in one text this kind of market appears with these seven aspects, in the next text (or even a few pages later) another kind of market is delimited. I find that this practice of reading confronts me with my own desire to keep words stable, meaning what I already think they mean.

Bennett, in *Vibrant Matter*, calls for something like substance as method: "We need to . . . devise new procedures, technologies, and regimes of

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perception that enable us to consult nonhumans more closely, or to listen and respond more carefully to their outbreaks, objections, testimonies, and propositions" (2010, 108). Just as she drew upon the history of metalworkers to undo her notion of matter, we, too, can challenge our theoretical terms in resonance with the surprises of others.

A simple mnemonic for this practice is "avoid etymology!" Etymologies stay within your theory, your wordplay horizons, your paradigms. They are incredibly productive of words but rarely jostle your being. Similarly, "resist binaries!" Any binaries you find yourself relying on are clues to where a lapse in thinking occurs: living versus nonliving, life versus matter. These opposites can be turned into new configurations like vibrant matter, but take it further with your substances and ask, What kind of life is this life? What kind of matter is this matter? What kind of vibrant matter is this vibrant matter? The goal is to prevent a satisfying phrase or beautiful wordplay from turning into a reason to stop looking more. Surely these two things are not exactly the same in their vibrancy, so what kind of vibrancy is each?

WORLD!

The world is made from substantive encounters. SAM is about scoping into each person's (or nonhuman's) world: the substances they live for and with. Out of that living have come ways of living and scoping that work, for them. These ways are the effect of hard work. People have struggled with their substance—to shape it to them and them to it—and this is their current relationship with that, so far, until it isn't. The categories they are using are living, lively categories. They didn't get them from someone else, or if they did, they've tested them and shed or modified the ones that didn't work.

Stengers (2014), with Whitehead, dives into the empiricism of each encounter with anything as substance. Every encounter happens at a scale particular to that encounter. They talk about different people walking past a statue differently. Some people walk past the statue and see a navigation tool; they treat it as "always the same" (they ignore almost every alteration of the statue). Then comes the person who takes care of the statue, for whom its decay is what she cares about: every time she walks past she sees a different statue—a chip missing, a stain from rain, and so on. Next is the sculptor who appreciates the type of rock and the tools used to make it, and then the physicist who sees a cloud of electrons and for whom the

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object's statue-ness is not the issue. These perspectives are all different ways of loving and caring about that statue: different scales, approaches, noticings. These are all different ways of being with the statue—all different kinds of "statue"—that in turn might resonate with different kinds of other objects that I have been overlooking in my world. Worlds are made through these differences. SAM is attending to the world-making in these encounters, and to the encounters that inhabit worlds.

In many ways SAM is the inverse of the exercises in "Writing the Implosion" (Dumit 2014). The world was assumed and mapped in an implosion; with SAM we are figuring out how it was made and continues to be remade. Implosions are based on your chief artifact/object/project of concern, starting from your own point of view and then mapping what you know and don't know. This process provides an understanding of how you came to be the person who cares about and knows the artifact in the way that you do, and how the artifact circulates as that artifact in the world, and how the world as the world you know inhabits that artifact. You don't change yourself when doing an implosion. In SAM we practically change ourselves by finding out the worlds that others live in through their projects. We resonate with their challenges and maybe find out that our artifact isn't what we thought it was, that we aren't what we thought we were, because they and we are more than what their and our (now previous) words/worldings enabled.

Note that seeing more in something is not always better. Stengers (2014), with Whitehead, points out that our habits of seeing and thinking are precisely the effect of our previous encounters up to this point. They are our wager on our own survival (what we are able to attend to in the form that we do). Substance as method is an offering: perhaps you find more here in a way that is helpful to you; perhaps your current terms and ways of engaging and playing are getting in the way. Perhaps a little jostling or shock of surprise will help. We do it because we feel stuck or troubled, not because it is a necessary solution.

In giving workshops on SAM, one concern raised by participants is that it seems we are not following substances at all but how they are rendered in the literature. Why ask others about a substance, and especially, why read what they have said about it? Why not follow the substance ourselves, get our hands dirty, engage with it directly?

As if you could be with the substance itself. No. Only the current you with the encountered substance, your worlded substance. You probably are doing this anyway with your chief objects/artifacts/projects of concern.

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You are being challenged by them. For secondary substances it is a much longer road to reach the point where you go beyond being changed by the training and the substance. Recall how the chemists worked productively with bromine for decades and still (in retrospect) missed something. And then at some point, when they asked a different question, bromine said no, and they realized that their basic approach and concepts needed to change. One thing we can learn from others is how their substances taught them to pay attention differently—so that maybe we can pay attention differently to our substances. Texts are never just representations of something that is known but active attempts to use words in order to change others' forms of life (to teach). From texts we can learn from people who are in the position of trying to pass on something they have learned when their world was rocked, their theories were put into variation, and they were jostled by a substance that demanded to be its own method.

PROTOCOL

- Make a list of seven substances that you are directly writing about, then pick the fifth one. Don't engage in etymology or play with it symbolically; doing so stays within your theory, within your paradigms. It is incredibly productive of words, but it rarely jostles your being.
- Follow the substance out to the specialists (or their writings) who live, love, obsess over it, who don't just know about the substance—they can't stop talking about it, how it exceeds them, challenges them.
- Find the moments when the substance surprised them, when they had to invent new concepts and theories to account for their interactions, vocabularies, and methods specific to the substance. These instances are when they realized that their previous ways of seeing assumed a different substance. Instead their substance now demands to become its own metaphor and method.
- Let those moments of their surprise, improvisation, and invention resonate with you, as a practitioner and theorist, and see in your own thoughts, concepts, and methods their substantial limitations, how they might be dependent on other substances. Take these as offerings that may (or may not) be helpful.
- This is not ethnography. It is a way of nudging yourself out of your ethnographic comfort zone (maybe a zone that you don't know

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you have). It is about shaking up your own ethnographic concepts and methods so that the ethnography you do practice and write will be more open to the surprises that it finds.

If you want a more fleshed out example of substance as method or to hear more about how weird and troubling bromine continues to be, see Dumit (forthcoming).

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