

Compost Politics: Experimenting with Togetherness in Vermicomposting

Sebastian Abrahamsson and Filippo Bertoni

AISSR, Department of Sociology and Anthropology, University of Amsterdam, Netherlands

ABSTRACT Emerging from the question of how to live together with our planet, more-than-human approaches to interspecies relations have often presented ‘cozy’ versions of conviviality (Whatmore 2002; Haraway 2008; Hinchliffe 2010). This was usually set against a (supposedly) exclusionary politics of nature, in a move that betrayed a still largely humanist ethics. From the focus on friendly companions, to the attention to practices of care or living-together, the notion of companion species and their entanglements with humans has been polarized towards a pleasant and ‘nice’ version of coexistence. But, dealing with composting, it becomes clear that relations with the environment are never so neat and clean. What are, then, the modes of being together with the ‘dirty’ side of the ‘green’? What practices emerge at the mundane interstices of the ‘big picture’ of a functional ecology? Wasting, eating, rotting, consuming, transforming and becoming-with are brought together in a variety of ways in practices of composting-with earthworms. Reporting on our own and others’ attempts to ‘live-together’ with earthworms, this paper tracks the non-relations and asymmetries of the transformations of more-than-human materialities inside (and outside) domestic composting bins. We argue that the example of living-together with dung earthworms sheds light on the interplays between attachment and detachment (Candea 2010), shifting the notion of conviviality from a green and comfortable ‘democratic collective’ (Latour 2004) to a messy, yet constantly productive and on-going coexistence.

How to Read this Paper

This paper is a *guide* to *vermicomposting*.

By and large, vermicomposting consists in employing earthworms to break down organic material (generally kitchen waste) into fertile soil called compost. Those who write vermicomposting guides and who want to help the beginner with composting often start from long personal experience, and merge this with expert and scientific advice and telling facts: they address the reader as “you”, they describe their own experiences, and they make propositions about what makes good vermicomposting practice. Throughout this text, we will similarly shift between these voices and modes of addressing the reader. In a way, vermicomposters who write guides or advice do so in an ethnographic mode: they observe and take part in a set of practices, and they come up with a description of them. Learning from them, we will bring together our ethnographic fieldwork with the attention to practices of

vermicomposters.¹ The structure and content of guides, as well as their advisory mode, also inform our writing. In this sense, this article is to be read as an alternative guide to vermicomposting that is specifically calibrated to an academic audience. While its structure is similar to that of other guides, and the questions on which it rests echo questions that any vermicomposter is familiar with, the responses that this guide offers are attuned to the sensitivities of academics working in and around the more-than-human.²

This paper is an *experiment in writing*.

While writing this article we realized how much work goes into bringing different genres together. Drawing inspiration from academic articles, vermicomposting advice, and our own experiences calls for a careful merging of different styles: we want to inherit the genre of guides while at the same time appropriating it for our case and our questions. To do so, we start from the questions that are usually found in vermicomposting manuals, and we address them both as vermicomposters and as academics. But merging also involves separating: in this sense a large part of the work of relating to the academic literature is cut out from the guide, and presented in the voices (one per section, marked in bold and followed by an * in the text) that make up the glossary at the end of the paper. These voices can be read both as a glossary, moving back and forth every time you encounter one in the text, and as a conclusion. A guide does not end or conclude at the end of the page, but it implicates the practices and realities it describes in its own fabric. What this has to offer to academic writing, we think, is the opportunity to rethink the work our articles can do and to engage in the practices also, crucially, outside of the text. This experiment in writing interrogates our style: what kind of politics and interventions can guides configure and articulate? We argue that taking guides* seriously can allow us to experiment with different ways of doing politics.

This paper empirically explores *questions of togetherness*.

Throughout the paper we will show how composting is about relations and, more specifically, about togetherness. We argue that composting shifts what togetherness might come to be. In response to calls for new kinds of ethics, politics, and normativities for the time of the 'Anthropocene,'³ we thus attempt to rethink togetherness through vermicomposting. Vermicomposting is about doing togetherness in a way that is neither detached nor engaged. While detachment can be a 'good' practice and engagement can have 'bad' outcomes, the "implicit normative distinction"⁴ between the two still seems to be attributed on the basis of a

¹ Beginning in 2011, we both devoted part of our time to composting with earthworms and ethnographically studying it.

² Bruce Braun, "Environmental Issues: Writing a More-Than-Human Urban Geography," *Progress in Human Geography* 29, no. 5 (2005); Jamie Lorimer, "Moving Image Methodologies for More-Than-Human Geographies," *Cultural Geographies* 17, no. 2 (2010); Sarah Whatmore, *Hybrid Geographies: Natures, Cultures, Spaces* (London: Thousand Oaks, Calif.: SAGE Publications, 2002).

³ Kathryn Yusoff, "Aesthetics of Loss: Biodiversity, Banal Violence and Biotic Subjects," *Transactions of the Institute of British Geographers* 37, no. 4 (2012); Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* (Cambridge, Mass.: Harvard University Press, 2004).

⁴ Matei Candea, "'I Fell in Love with Carlos the Meerkat': Engagement and Detachment in Human-Animal Relations," *American Ethnologist* 37, no. 2 (2010).

kind of relation, rather than on what that relation can do. This seems to suggest that there are normative guidelines for togetherness ‘out there.’ That there is *only one* (correct) way to separate good from bad. That this is what needs to be done with goods and bads, to *separate* them. By contrast, vermicomposting offers space for conceiving of detachment and engagement differently. The togetherness that is done through vermicomposting has a lot in common with Isabelle Stengers’ concept of cosmopolitics. Vermicomposting is political, we suggest, in the sense that it involves and brings together multiple different entities and activities. In “politics as usual” where generality and disinterested good will prevail, the political is “besieged with dramatic either/or alternatives”⁵ that aim to resolve differences in a common, detached good. By contrast, cosmopolitics, as envisioned by Stengers, makes space for a slowing down of the construction of this common world in order to “create a space for hesitation regarding what it means to say ‘good.’”⁶ Building on Stengers’ work, we propose that in vermicomposting, instead of cosmopolitics, we do *compost politics*. While this opens up a similar space for slowing down and allowing politics to hesitate, it also allows for the specific practicalities and dirty, fleshy attunements that constitute composting with earthworms.

Getting Started

How to set up the bin?

The container in which composting takes place is called a compost bin. A variety of containers can be outfitted for use as bins, but commercial bins are especially simple to use and assemble. To keep the bin separated from the ground, legs (or a tray used as a base) are fixed to the main collector tray, to which a tap is attached. This will help in collecting excess fluids, which can be used as powerful plant fertilizer. The main tray is the next layer added: here the worms will crawl and live. A number of other trays can be placed one on top of the other, to facilitate the activity of the worms and the collection of the compost. Finally, a covering lid closes the top of the wormery, keeping the light out and the smells inside. The bin is ready to use in a matter of minutes.

At this point, to begin composting, you must add the bedding and the worms. Generally, commercial bins come with a block of dried coconut fibre that needs to be soaked in warm water. This is supposed to be enough to get your worms started. Still, worms can be upset by the change of environment, or by the loss of the complex microbial environment that they were accustomed to up until they move into your bin. In this case, they might try to leave the bin; to resist your attempt at bringing them together. To facilitate the settling of the earthworms into their new setting, some soil from a potted plant or a garden can be added, together with soaked newspaper torn into small pieces. According to some experts, the paper creates a good airy and moist environment, and the soil transplants a lively soil biota composed of microorganisms that will help the worms break down organic matter and adjust to life in the bin.⁷

⁵ Isabelle Stengers, “The Cosmopolitical Proposal,” in *Making Things Public: Atmospheres of Democracy*, ed. Bruno Latour and Peter Weibel (Cambridge, MA: MIT Press, 2005), 1002.

⁶ Stengers, “The Cosmopolitical Proposal,” 995.

⁷ And it works! While Filippo had troubles with keeping his worms in the bin the first few days, Sebastian, who had added paper and soil, did not experience this.

Assembling* the bin is about bringing a number of active elements together. These elements can easily come together or resist your attempts at assembling them. To avoid that, specific entities need to be combined, and others need to be separated. In this sense, assembling is not only about merging, but crucially also about separation; it is about making a specific togetherness and avoiding others. While it involves worms with microbial organisms, food scraps, and a device for extracting valuable fertilizer, it is also about keeping the bedding separate from the fluid tray, and the food scraps from the kitchen, and the worms from your floor.

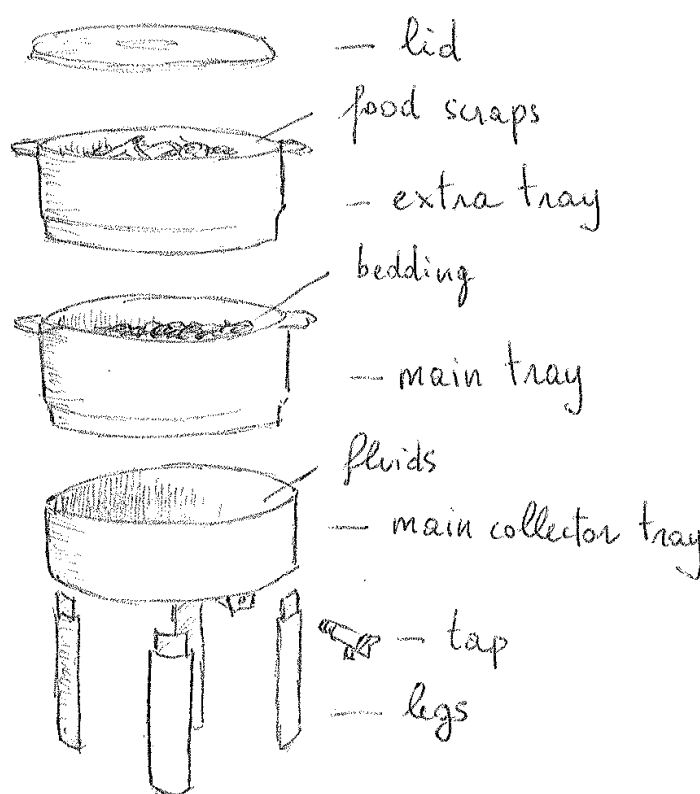


Figure 1 The various parts of the bin to be assembled. Drawn by the authors.

The combination and composition of heterogeneous elements is a strategic part of setting up the compost bin. When you keep a bin with decomposing waste in your kitchen you want it to be well closed, keeping moulds, bacteria and undesired smells away. The walls and lid of the wormery make it possible to keep your worms and food scraps in the kitchen. The bin is at once an apparatus for separating and for togetherness. Yet, while assembling the bin is central in keeping things apart *and* in bringing them together, containment and assemblage are not sufficient for vermicomposting to work. Togetherness is not only about the kinds of associations, alliances, and compositions that can be made. A working bin is more than just the sum of its parts, and it is more than a forced co-presence. As guides often put it, this is only the first step to vermicomposting: to compost is a process and setting the bin is the starting point,

but by no means the end of the process. Following the advice of vermicomposting guides, we will have to go beyond the making of the togetherness of these entities.

How does Vermicomposting Work?

Your goal for your worm bin is to put waste in and get (vermi)compost out, thereby recycling the nutrients. To do this, a complex series of events must take place.⁸

The kind of togetherness that vermicomposters seek is not merely done by putting things together, nor is it about containment, spatial proximity, or intimacy. Instead, the togetherness is a complex on-going set of processes and doings that are largely (but not entirely) in the hands—or, better, guts—of your earthworms. Everything passes through the earthworms' guts, and, as Darwin noticed (1881), produces fertile castings that enrich the soil.⁹ Passing through the guts encompasses an embodiment and a transformation. Composting is about merging the worm's eating and thriving with your disposal and casting-off of food waste. And it is about merging the worms' castings of digested material with your acquiring of fertile soil. This processual togetherness is not harmonious (more on this later), yet it cannot be simply forced. Instead, vermicomposting amounts to a precarious composition of different, yet potentially converging, activities and processes.

How does this happen? The guides will tell you that all sorts of bacteria, fungi, molds, and arthropods partake in the decomposition of your food waste. Next to the worms, numerous other critters are consuming and breaking down organic matter in your compost pile. Psychrophilic bacteria are the first to arrive. Then, as the temperature increases because of their activity, mesophilic bacteria follow. The latter release carbon dioxide and increase the temperature, paving the way for thermophilic bacteria. Then, as the temperature lowers again, it's the turn of actinomycetes and fungi. And of the earthworms.¹⁰

It is these entangled metabolic activities of diverse organisms in the bin that makes composting possible. The relations between these organisms are complex: "Over time, a large number of organisms in soil and litter have evolved different types of mutualist relationships with microorganisms."¹¹ For this reason, scientists focusing on earthworms came to call the system of relations that takes place in these cases an "external rumen:" like the rumen in ruminant animals such as cows, it is a space characterized by complex mutualist relations that help the processes of digestion. The worms have their own external rumen in the bin, since

⁸ Loren Nancarrow and Janet Hogan Taylor, *The Worm Book: The Complete Guide to Worms in Your Garden* (Berkeley, Calif.: Ten Speed Press, 1998), 25

⁹ Charles Darwin, *The Formation of Vegetable Mould, through the Action of Worms, with Observations on Their Habits* (London: John Murray, 1881).

¹⁰ This account is taken from Cromell 2010:32-3. As the aim of the guide is to offer a pragmatic overview of the processes that occur in the bin to help vermicomposters, the process is simplified and generalized. A trace of this is in the authors' use of the term actinomycetes, prior to their reclassification as actinobacteria. Cathy Cromell, *Composting for Dummies* (Hoboken, NJ: Wiley, 2010).

¹¹ P. Lavelle and *et al.*, "Regulation of Microbial Activities in Functional Domains of Roots and Invertebrates," in *Microorganisms in Soils: Roles in Genesis and Functions*, ed. F. Buscot and A. Varma (Berlin: Springer, 2005), 294.

they (like the cows in their rumen) have mutualist relations with other organisms that help them to decompose and to digest organic matter. The term external rumen makes evident the importance of other organisms that partake in this process and, simultaneously, extends the bounded body of the worm. In this sense, it evacuates metabolic processes of a clear-cut subjectivity: is it the worm that digests? Or the microflora in its guts? Or the more diverse external system of mutualists that settle in your bin? Here, the term external rumen highlights the role of the bin as a digestive tract as a decomposing tool.

After you have assembled the bin, the heterogeneous entities described above will begin to break down your food scraps meaning that the process of composting, and decomposing has begun. This is what the kind of togetherness that you need to achieve in vermicomposting is about: **decomposing**.^{*} But this very specific composition of different activities and entities does not happen in a void, and needs the attention and maintenance of the vermicomposter.

How to Maintain the Bin?

Even if the worms do the digesting, you will still have to arm yourself with patience and dedicate a lot of attention to your wormery to keep the decomposition and the composting going. Vermicomposting advice dwells on how to maintain your bin in an “optimal condition.” This requires you to pay attention to a number of issues. Guides will tell you that temperature, moisture levels, pH levels, aeration, light, and food types and quantities are some of the key aspects a vermicomposter will have to be particularly attentive to. Above all, you will have to add your leftovers to the bin. But not all waste will do the job: the food scraps you feed your worms should adjust to their preferences. Knowing what to feed your bin requires tinkering. As we learned from our own experience and from guides, variety, moderation, experimentation and adaptation are key to a thriving compost bin. Conducting our experiment, we found inspiration in lists of good and bad food, such as the one below.

The more variety in ingredients, the better the vermicompost. Try not to overload your worm bin with fruit and vegetable skins, which may attract vinegar flies. Also, avoid lots of salty food waste, which will dry out the poor little worms. Everything in moderation! Worms are known to have food preferences (really), so experiment to see what your red wigglers prefer. Here’s a hint: sweet mushy stuff like melon, pumpkin, and squash is popular at my house.

- Other good additions include
- Raw or cooked vegetables
- Coffee grounds and filters
- Tea and paper tea bags
- Stale bread and grain products
- Ground-up eggshells
- Fruit rinds and cores

Add citrus in very small amounts so the bin doesn’t become too acidic.¹²

¹² Cromell, *Composting for Dummies*, 158.

Every guide will offer lists of foods that are preferred and foods that are better to avoid or limit. While the main points are similar, the lists can vary a lot. For example, a different guide tells us that it is better to avoid or limit “Citrus, meat and bones, garlic, heavily spiced foods such as many Asian and Mexican dishes, hair, dairy products: milk, yogurt, or butter, eggs, fresh green wastes and fresh manures, poisonous plants, oils.”¹³ The reasons for the recommendations vary, just as much as the recommendations themselves. From the risk of changing the pH of the soil, to the risk that the foods will “turn rancid and smelly as they decompose” and “attract undesirables such as houseflies or vinegar flies,” to the likelihood of increasing pests and infestations (more on this later), to the possibility of having food scraps left behind because the worms prefer other foods, to the danger of coating the skin of the worms with grease and suffocating them. Eating and feeding happen in the complex environments that develop in the bin, and eating and feeding help to shape those environments.

As a vermicomposting human, you will have to pay attention to these environments, and try to balance them in the face of their dynamic changes. “Monitoring your worm bin is essential in keeping track of living conditions. You’ll know when a problem is occurring, so you can take corrective measures.”¹⁴ The temperature should be kept between 15° and 25° C, isolating the bin from the cold in winter, and from the heat in summer (hardly ever a problem in the Netherlands). The moisture level should also be adjusted according to the humidity outside of the bin. “Moisture levels in bins should be kept between 70 and 80 percent. This is the optimum moisture for worms.”¹⁵ Or, more simply, if the bin has condensation on the insides of the lid, leaving the bin open during the day will lower the moisture level. Also the pH level should be kept in check and be adjusted according to the kind of foods that the worms are eating: a neutral pH like seven would be the best condition. Adding egg shells or specific additives could help keeping that in check after a particularly heavy feeding. Furthermore, the bedding should be kept well aerated and dark.

And, of course, there is the harvesting: when your compost is ready, you will have to take it out of the bin in order to use it while making sure the worms are kept in the bin. Different methods can be used to do this: from hand sorting, to screening the compost. Light and water can be used to push the worms to take refuge in different parts of the bedding, allowing you to take out the compost. Some commercial bins have a system of trays that pile up, allowing you to easily take the lower tray, filled with compost, and leave the worms crawling on the top layer. Also, some vermicomposters (especially those that do it on a large scale) will use another method, known as the ‘death method’: they simply kill or remove all the worms and replace them each time they want to extract their compost.

It is now clear that what goes on inside the bin is not autonomous and cut off from what goes on outside of it. The box, while it holds some things together and separates others is also a membrane that allows the exchanges between your kitchen and the wormery to take place and keep the metabolic processes of your worms’ external and internal guts going. The guides stress that vermicomposting is basically a process to obtain compost. An on-going process, since it is aimed at recycling food waste. While you will have to set it up at some point, the digestion and decomposition will go on as long as you need it, thanks to the

¹³ Nancarrow, *The Worm Book*, 55.

¹⁴ Nancarrow, *The Worm Book*, 61.

¹⁵ Nancarrow, *The Worm Book*, 62.

attention you dedicate to it. The care you put into your bin has a crucial role in your composting. **Maintaining*** the bin is the form that care takes in vermicomposting. If assembling the bin only takes a few minutes and decomposing is what the worms and the organisms in their external rumen do, there still is a lot of work for the vermicomposter. While the decomposition processes happen without you eating and digesting the food scraps, you still take part. Guides give advice on assembling the bin and bringing all the necessary entities together, and teach how crucial the worms' metabolic activities are. Yet, they also call you to action, reminding you how the worms are not independent but rather rely on your care.

Troubleshooting

Why are the worms trying to escape?



Figure 2 Escaping worms. Photo from Wikimedia commons.

From one day to the next, close to 20 worms had left the bin on Sebastian's balcony in Amsterdam. In the darkness of the night, they crawled out and ended up on the tray that he kept underneath the wormery. As usual, he had given them food; he had let them breathe during the day by leaving an open space between the lid and the box; and earlier in the week he had created little pockets of air by scooping around the soil. So, why did they escape?

Why did the worms leave the bin? As one of the websites offering vermicomposting advice suggests: “This is probably just about the MOST common vermicomposting question out there!”¹⁶ While such questions ask about reasons, their relevance for the vermicomposter is a pragmatic and empirical one. They are aimed at solving the problems that instigated the worms’ leaving the bin by focusing on the specificities of the situation at hand. Mind you: the problem is not about the worms that left the bin—who were probably already desiccated by the time you found them. Rather, the question unfolds the problems that triggered the earthworms to leave. This marks a shift away from issues of containment and control that the question animating this section of the article seems to raise. Acting on the bin is necessary to adjust the adverse conditions and bring the wormery back to composting, preventing more worms from dying. But this event cannot be generalized: guides cannot offer a general rule on what to do. Rather, they present some suggestions and some variables that are likely to influence the situation and let you try out which course of action to take. It could be the kind of food, or the quantities, or the pH, or the moisture, or any number of other factors; or combinations of different factors, or even unpredictable or imperceptible ones. To decide what to do and keep the worms from leaving, the guides suggest, you will need to *know* your wormery, your worms and their needs. But *how* to know a compost bin and its more-than-human residents? The on-goingness and complexity of the processes that take place in the bin make the work highly variable and contingent. **Knowing**,* in other words, emerges as a process, the outcome of which cannot be apprehended in advance, as it hinges on the provisional and makeshift adjustments you engage in. So what does that look like?

The dead worms that had left Sebastian’s bin were removed from the scene. Some of them, however, were still alive. These were placed back inside the bin. The problem here was not necessarily that some individual worms had left the bin, but that there was a risk that some of the factors listed above may cause more worms to do so. Checking the soil, it turned out that Sebastian’s bin was very moist. This may have been what made the worms leave. An answer to this could have been to keep the lid open (but only during the day when there was light to keep more worms from leaving) to let in air. Another answer would have been to reduce the amount of feed with high concentrations of water (cucumber is a good example), since this will also make the soil moist. A third option, which was the one followed in this case, would have been to do nothing: to wait and see if the worms adapt and settle. Which sometimes they do.

In this scenario, a scientific answer that establishes the exact cause for the worms leaving is neither necessary, nor viable. What suffices is a heuristic way to address the problem and make sure worms do not keep leaving the bin. As we saw, the guides suggest that you maintain an “optimal condition.” From the escaping worms, we learn that this is not a stable state, but a provisional and makeshift adjustment. This instability opens the space for a kind of knowing that is on-going, one that is never complete and exhaustive, but always redone. Vermicomposters will never find the perfect and infallible instruction for vermicomposting. More likely, they will find out, in time, what their worms like, what they do not like, how (or if) to adjust to temperature and feeding changes, and how to tinker with the soil so that the bin does not become infested with parasites (more on this later). As a vermicomposter, you will find, that is, a fluid recipe that can be changed and modified to adjust to different contexts,

¹⁶ Red Worm Composting, “Why are my worms trying to escape?,” accessed 13 December 2012, <http://www.redwormcomposting.com/general-questions/why-are-my-worms-trying-to-escape/>.

problems and situations. Here, the guides are crucial, together with an endless list of blogs, online guides, forums, videos and instructions of various types. But, most of all, as in the majority of DIY fields, experience plays a crucial role, since it best adjusts to the contingencies. Together with experience, mistakes, attempts, educated guesses, lucky strikes, and failures are integral aspects of knowing your bin. Knowing emerges in vermicomposting, once again, as a set of practices, multiple and contingent. In other words: you may not *know*, but rather *become attuned* to your worms. Compost politics is neither assimilation through identity nor the dream of harmony but rather a mutual domestication of multiple and different activities.

Knowing, in this specific sense, becomes an essential tool in vermicomposting: you will need to become attuned to the preferences of your worms, and to the changes in the bin, in order to adjust to them. Without the tinkering the worms will all leave the bin or die. In practice, this knowing takes the shape of a co-constructed, mutual, on-going and dynamic effort to attune your caring with the activities of the worms. Still, one that is not reciprocal in any egalitarian way, but rather sensitive to differences. ‘Learning to speak worm,’ here, means learning to become attuned to the subtleties of the worms’ relation with the wormery, with the food, with the bedding, with their environment. And food is a language that worms understand. It is a ‘language,’ but one that is not inflected in words, sentences and grammar, but in the utterance of practices, in the less codified tinkering of everyday life.¹⁷ It is a language shaped not in the mouth but through guts. More than learning to *speak* worm, you’ll have to learn to *feed* worm. And, simultaneously, the worms will not learn to speak back to you, but to *eat* your leftovers. Knowing, here, is about feeding, caring, and maintaining the bin.

As we could see, freedom and control are not necessarily what is at stake. The point is not to know how to contain and control your worms, but it is to know how to feed them well. In the example above, you need to know what may have caused the earthworms to leave, not in order to control them, but in order to better *care* for the wormery. Tinkering with your bin, you are changing the conditions of the soil, and can try to make it more or less acidic, more or less moist, filled with this or that kind of food scrap. What is at stake is not the freedom of the worms, but the on-going metabolic activities of the bin.¹⁸

¹⁷ And, in this sense, it reminds us of Wittgenstein’s approach to language as *language game*. Ludwig Wittgenstein, *Philosophical Investigations* (Chichester: John Wiley & Sons, 2009).

¹⁸ In this sense caring for the wormery is mindful of the lessons learned in analyzing eating, but also of similar lessons drawn from reflections on mastery as transcending ideas of control and care within Amerindian anthropology. Carlos Fausto, “Feasting on People. Eating Animals and Humans in Amazonia,” *Current Anthropology* 48, no. 4 (2007); Annemarie Mol, “I Eat an Apple. On Theorizing Subjectivities,” *Subjectivity* 22, no. 1 (2008).

How to Deal with Infestations?

Figure 3 Red mites infestation. Photo courtesy of <http://r4wormcompost.files.wordpress.com>.

Filippo was away for a few weeks and asked some friends to drop by and give some leftovers to the worms. But when he came back, it became obvious that the food scraps his friends brought had not fed the worms, but the mites that lived in the bin. An explosion of brownish spider-like creatures covered every surface of the bin. While mites were present in the bin also before this event, the population grew so much over a short time that there was no other alternative but to put the bin straight out on the balcony, to avoid having the infestation spreading around the kitchen.

Mites, ants, nematodes, flies, slugs, rodents, and all sorts of critters can be attracted by the bin and settle in it. This was also the case for both of us: Filippo had mites and Sebastian had his bin swarming with nematodes. How to deal with these, and how they interact with the bin are crucial questions. While they are considered ‘unwanted,’ this is not simply about deciding who should stay and who should go away once and for all: practically, such a decision would not be easily enforced. Hermetically sealing the bin would not help the composting; more likely it would stop it. As a vermicomposting website puts it: “for the most part you don’t need to get too stressed out about mites in your bin. Be assured, they are there to serve a function, and may simply indicate that your system has shifted out of balance somewhat.”¹⁹ Generally, then,

¹⁹ Red Worm Composting, “A mite is a mite is a mite is a mite not quite,” accessed 13 December 2012, <http://www.redwormcomposting.com/worm-composting/a-mite-is-a-mite-is-a-mite-not-quite/>

they are part of a healthy compost bin and of the worms' external rumen; without the complex ecosystem of soil bacteria, nematodes, mites, and fungi the worms would not be able to decompose organic matter. Eliminating all the other entities from the wormery, then, is not the solution:

The worm bin is an amazing, complex habitat, with hundreds or thousands of decomposer species all working together to turn your kitchen scraps into fertilizer. And you thought you just had a bin of redworms! Not true—redworms are greatly outnumbered by other macro- and microscopic organisms. All these organisms are decomposers and beneficial to the ecosystem—so don't fear any newcomer you may find in the bin—in all likelihood it's just another one of your redworms' friends.²⁰

However, when, as in the example above, there is an infestation, some of the decomposers stop being friends and become parasitic. Something needs to be done, but what and how? To answer this question we should consider more closely the kind of activity that goes on in the bin, and how that merges with the effort of the vermicomposter in caring for it.

As with the worms that left the bin, the problem with infestation is not one of control, but of maintaining and feeding. As we saw, all kinds of human and nonhuman activities and practices are brought together in and around the wormery: the worms' metabolic processes and eating, the external and internal organisms' chemical processing and decomposition of organic matter, your adding of food scraps and checking the conditions of the soil, and even the mites' infestation and thriving in the bin. Vermicomposting is a multiplicity of practices and metabolic processes that articulate and complicate the boundaries between the different transformations that go on in and around the bin, between insides and outsides, and even between humans and nonhumans.

In this sense, there are no general guidelines for **compost politics**.^{*} The situations differ and so do the remedies, and it is not always possible to grasp the situation. This becomes clear in the case of the mites. Sometimes, the mite population in your bin can increase dramatically: the convergence of the various activities, processes and metabolisms is disrupted. The coexistence does not work anymore. What to do in this case? Some guides suggest that "There is really no need to worry about them because mite population blooms are cyclical and will decrease naturally with time. They are the types of mites that eat dead decaying organic material just like the other beneficial organisms in the worm bin, so there is usually no need to take action against them."²¹ Other vermicomposters have more radical solutions to infestations: "Heavily water, but do not flood, the worm beds. Mites will move to the surface, and worms will stay below the surface. Use a hand-held propane torch to scorch the top of the bed and kill the mites. This procedure may be repeated several times, at three day intervals, if needed."²²

²⁰ Vermiculture Canada, "Other organisms in the bin," accessed 20 December 2012,

http://www.vermica.com/articles/other_organisms_in_worm_bins.htm

²¹ Happy Ranch, "Mites," accessed 20 December 2012, <http://www.happydranch.com/articles/Mite.htm>

²² New York Worms, "Dealing with mites in earthworm bins," accessed 20 December 2012,

http://www.nyworms.com/earthworm_mites.htm

The composition of the different activities and (metabolic) processes in vermicomposting is not pre-given; it is an achievement. Crucially, although such convergence can be articulated in so many words in guides and manuals, this is not a discursive achievement: it is about practical tinkering, about handheld propane torches, acidic pH levels, rotting cucumbers, infesting mites and earthworms' guts. It may be about intervening in the bin, killing mites, risking the balance of the wormery. But it may also be about not intervening and letting the infestation run its course. In vermicomposting, you will have to practically maintain the bin and tinker with it to keep it in an 'optimal condition,' but this activity plays out, intervenes and interferes with other on-going activities, like decomposing, feeding, and maintaining.

Knowing exactly what goes on in the bin is neither necessary nor possible. And caring for the bin is not the same as controlling it. Instead, to learn to become a vermicomposter is to learn to become attuned to different ongoing and makeshift processes. These will never converge into a single, common one. At best, they can be tinkered with to make them coexist, if only temporarily. They can be adjusted, constantly, to try to fit vermicomposting. This becomes clear when we reflect on how the different senses of eating and feeding are foregrounded.

From Food to Compost

Feeding: between eating and composting

In vermicomposting **feeding*** is crucial. This entails making good decisions about which foods to use, but equally important is the question of how to feed the worms. For example, the size of the portions and the frequency of the feeding require careful planning. "Plan on feeding your worms about half their weight in food scraps per day. When starting a new bin, offer just a handful of food until they get acclimated and start digging into your provisions. As a general guideline, feed your worms when the majority of the previous food has disappeared."²³ Another aspect concerns how feeding takes place. The food might be cut in smaller parts, to facilitate the decomposition: one guide asks "to chop or not to chop?" the food you feed the worms. In a short time you will learn how to care for and prepare the food. Through our experiment, we learned that saving, sorting, chopping and handling our food scraps quickly became an everyday routine, like preparing our own food. The difference is that the worms' meal is made of what we would otherwise have thrown away. Potato peel, rotten tomatoes, mouldy bread, egg shells: these are the kind of things that we would prepare for our worms to eat. For the vermicomposting human this is not food, but food waste.

To say that vermicomposting is a practice through which *food* is shared between humans and worms would, in this sense, be misleading. The stale and mouldy bread that we occasionally fed our worms was fed to our worms precisely because we no longer wanted to eat it. The worms, however, did not mind the mould, or the egg shells. Similarly, the worms did not excrete what for them was "fertile soil" but waste matter, worm castings. As a vermicomposter, you may use the worms' casting for growing plants. And you may use it to grow new food.

²³ *Composting for Dummies*, 157.

Vermicompost, which is what you get when food scraps and bedding are processed by worms, is one of the main reasons people start keeping worms. To some gardeners, using casting or vermicompost to fertilize the vegetable garden completes the cycle.²⁴

What happens in vermicomposting is thus a series of transformations by which food may be turned into waste and waste may be turned into food. This conjures an image of a closed cycle, one that is completed once your food waste has been used to produce new food. The image of a 'cycle,' however, is misleading. In fact, it is too unitary and does not account for non-convergences, differences, and imperfect encounters. If it is true that you can use the compost to grow new vegetables, it is also true that a number of transformations go on in composting, and nothing 'comes back,' nothing is 'the same.' Eating, feeding and composting are transformative and always involve changes, that, although small, require specific solutions to specific problems. And so each moment in vermicomposting can be distinct from the next one, and require different approaches. For this reason tinkering and attending to differences and specificities is crucial in vermicomposting. As much as the bin is not about containment, so too composting is not necessarily about closing off cycles.

Conclusions, in the form of a Glossary

ASSEMBLING – Guides always begin with the assembly of the bin. To host vermicomposting effectively, the wormery needs to have certain characteristics and bring many different entities together—whether you are using a commercial bin or building your own. *Assemblage* is a term that has been gaining weight in social sciences, and rightly so since it can do important work. But the avenues through which it came to its current popularity are complex and we will not delve into their histories.²⁵ Here, we will focus on what it does in our vermicomposting case.

At first sight, talking about the assembly of the bin seems to be fairly trivial. After all, we have all assembled things: you get the pieces, follow the instructions, and put them together. But, attending to what goes on in the assembly of the bin allows us to complicate the centrality of human action. It is not only the vermicomposter that merges worms, bacteria, plastic trays and bedding together: the act of bringing entities together is *diffused* in the bin. The bedding, the soil, the microflora and the bin do much of the togetherness of worms and humans, as do the food scraps in your kitchen. They are not just inert pieces that you put together. Without all of them, you could not achieve the togetherness that is needed to compost. This is a classical insight in STS.²⁶ So assembling is not only about bringing entities together and shaping alliances that work. It involves more than the strategic association of heterogeneous things: the actions of and relations between the various entities that come together is also part of assembling.²⁷ Simultaneously, we learn that doing togetherness also involves separating.

²⁴ Nancarrow, *The Worm Book*, 95.

²⁵ For a good overview of the Deleuzian origin of the term and its potential misconceptions, see John Phillips, "Agencement/Assemblage," *Theory, Culture & Society* 23, no. 2-3 (2006): 108-109.

²⁶ See, for example, Michel Callon, "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay," in *Power, Action and Belief: A New Sociology of Knowledge?*, ed. John Law (London: Routledge, 1986).

²⁷ This suggestion has travelled less easily than the idea that agency is not exclusively human. In a sense, even in Latour's own more recent work this has been overlooked by giving precedence to a more

Adding the worms to the bin is also keeping them away from the kitchen. It is also about their relation with the bedding and the bacteria in the soil. *More than one and less than many*, as Marilyn Strathern and Annemarie Mol would have it.²⁸ All sorts of relations and actions are part of the togetherness of the bin, reminding us that assembling does not work if it merely responds to an additional logic. Thus, assemblage is important for achieving togetherness, but it is not the end of the story.

DECOMPOSING – The togetherness that is sought in vermicomposting is not simply about putting things together. It also has to do with compost. This requires a complex set of metabolic processes, most of them involving earthworms' digestion decomposing food scraps into organic matter. The entities that populate these processes proliferate. Not only are there earthworms, but also their guts, their gizzards, their whole digestive systems, their complex physiology, their intestinal flora and fauna. Even more so: the worms' digestion is stretched not only inside their guts and bodies, but also outside, in the bin, together with a number of other organisms and entities. This is one of the biggest challenges of considering decomposition: it questions the boundaries of subjects and objects, of inside and outside, of one action (e.g. eating) and another (e.g. excreting). It spreads the activity of decomposing among different and heterogeneous entities and through diverse activities and processes. In this sense, it reminds us of Judith Butler's work on gender: "My argument is that there need not be a 'doer behind the deed,' but that the 'doer' is variably constructed in and through the deed."²⁹ In the case of decomposition, this is true in a very fleshy way: it is about the transformations of food waste into compost and into the bodies of worms, and a vast array of other organisms and entities. Simultaneously, the deed is not clear-cut either, but it is itself the merging of other processes. We have called this a composition, but the term is not precise. It is not merely about putting together different entities and activities, but concretely about decomposing and all the kinds of processes that go into that.

This offers us a first clue towards the lesson that vermicomposting can teach us about togetherness and its politics. Starting from evoking the "modernist clash with nature" represented in James Cameron's *Avatar*, Bruno Latour offers a manifesto for a different 'politics of nature': a *compositionist* one.³⁰ He chooses composition because

it underlines that things have to be put together (Latin *componere*) while retaining their heterogeneity ... Above all, a composition can *fail* and thus retains what is most important in the notion of *constructivism* (a label which I could have used as well, had it not been

linear understanding of assembling. This is clear in his suggestion to 'reassemble the social': while his use of assemblage there is diffused and involves nonhuman agencies, the action of reassembling that the sociologists are called to undertake still figures a subject that is in control and that simply puts things together. For a similar exploration of the limits of *association*, see Filippo Bertoni, "Soil and Worm: On Eating as Relating," *Science as Culture* 22, no. 1 (2013).

²⁸ Marilyn Strathern, *Partial Connections* (Savage, Md.: Rowman & Littlefield Publishers, 1991); Annemarie Mol, *The Body Multiple: Ontology in Medical Practice* (Durham, N.C.: Duke University Press, 2002).

²⁹ Judith Butler, *Gender Trouble: Feminism and the Subversion of Identity* (New York: Routledge, 1990), 142.

³⁰ Bruno Latour, "An Attempt at a 'Compositionist Manifesto,'" *New Literary History* 41, no. 3 (2010).

already taken by art history). It thus draws attention away from the irrelevant difference between what is constructed and what is not constructed, toward the crucial difference between what is *well* or *badly* constructed, *well* or *badly* composed. What is to be composed may, at any point, be *decomposed*.³¹

Up to now, Latour's composition fits very well with what goes on in the bin. But he pushes his claims further, aiming to embrace the task of finding universality. "From universalism it [compositionism] takes up the task of building a common world; from relativism, the certainty that this common world has to be built from utterly heterogeneous parts that will never make a whole, but at best a fragile, revisable, and diverse composite material."³² Here is where we play the Stengerian card of the idiot, and slow down behind Latour. Instead of the universalism and grand narrative of composition, we put forth the decomposition that animates the vermicomposting bin. This is precise, located in practices, and it requires a lot of effort to travel outside of vermicomposting circles. But, simultaneously, it is more true to the dirty and messy practices and politics it is involved in. This allows it to reinvent and reshape politics in terms of the practices and matters (*of concern* and *of fact*) that are involved in it, avoiding the opposite move which characterizes a call for the Latourian "Parliament of Things."³³ In this case, as we will see, the concerns of eating, being eaten, and feeding will ground a different kind of politics from the democracy of the compositionists.³⁴ A politics that diffuses activity among heterogeneous entities and processes, encompassing fluidity and transformation, and grounding this mutability in the asymmetries of eating.

MAINTAINING – The importance of going beyond bounded notions of humans and nonhumans (and earthworms, and guts, and eating) becomes clear when considering the maintenance of the bin. At first sight, the division of roles seems simple: the worms do the digestive and transformative work of composting, while you assemble and take care of the bin and keep light, moisture, and feeding routines in check. But this division is only superficial. The worms and you become attuned to each other, and to the special environment that is the compost bin. Your worms become worms-with-wormery and you become human-with-wormery: their activities and yours need to become entangled and non-reducible, if they are to succeed. If you don't adjust your feeding to their preferences, they will not thrive; if they don't adjust to the bin, they will die somewhere on the floor of your kitchen. Still, this muddying of boundaries is not a flattening, nor is it easy. It takes work, and it can always produce friction, and lead to failure. In this sense, Latour's rendition of Callon's "generalized symmetry" is not helpful here, since it gives the impression of a flat set of relations.³⁵ The need to make space for asymmetry in

³¹ Latour, "An Attempt at a 'Compositionist Manifesto,'" 473-4.

³² Latour, "An Attempt at a 'Compositionist Manifesto,'" 474.

³³ Latour, *Politics of Nature*.

³⁴ See also Anders Kristian Munk and Sebastian Abrahamsson, "Empiricist Interventions: Strategy and Tactics on the Ontopolitical Battlefield," *Science Studies* 25, no. 1 (2012).

³⁵ This problem is more connected to a frequent misreading of Latour, since he explicitly says that "ANT is not, I repeat is not, the establishment of some absurd 'symmetry between humans and nonhumans.' To be symmetric, for us, simply means *not* to impose a priori some spurious *asymmetry* among human intentional action and a material world of causal relations." In Bruno Latour, *Reassembling the Social*

maintaining the bin remind us instead of Fausto's presentation of the Amerindian category of mastery: "One of the important features of this relation is its asymmetry: the owners control and protect their creatures, being responsible for their well-being, reproduction and mobility. This asymmetry implies not only control but care."³⁶ But our bin is not in Amazonia: what transporting this category of mastery to our bins does for us is to do away with the assumed distinction between control and care. And, simultaneously, it rids us of the normative division between 'good' engagement and 'bad' detachment, following Candea.³⁷ In this sense, various explorations of care on the farm have already taken steps towards dirtier normativities emerging with caring practices.³⁸ The practices that go into the maintenance of the bin, then, allow for—at least—a partial evacuation of the cozy language of love and passion, while still sharing in some of the language of care. We do not love the worms, and probably few vermicomposters do.³⁹ Or maybe we do. But if we do, we do not love them in the sense of a comfortable love, a passion that is easy and does not make demands on us. If it is love that inspires our care, it is a love that is about asymmetric relations, about profound differences, about irreducible otherness. Care might need the language of love, but of a love that is dirtier and not easy. In this sense, the first step to take to avoid homogenizing our stories into comfy and cozy ones is to refuse all-encompassing normativities, both the 'bads' and—especially—the 'goods.' Only in this way can we be true to the mantras of companion species: "partners do not precede their relating; all that is, is the fruit of becoming with."⁴⁰

KNOWING – The advice offered to vermicomposters often involves calls for knowing the bin and its contents. But, while knowing your worms is crucial to be able to tinker with them, it is not severed from other practices in an obvious way. It is neither an objective, detached, and absolute knowing, nor one that involves engaged judgement, control, and containment. Instead, knowing the bin is a situated and makeshift set of hands-on practices. Since it is concerned with the tinkering and caring that maintaining the bin involves, the kind of knowing that emerges from vermicomposting advice is a *knowing in practice*. In vermicomposting, knowing is maintaining the bin and feeding the worms. It resembles the kind of knowing where an attention to practices allows us to "spread the activity of knowing widely."⁴¹ Doing this displaces the familiar dichotomy between knowing subject and known object. The polarities that characterize knowing in the bin have to do with the care taker and the cared for, the

(Oxford, UK.: Oxford University Press, 2005), 76. Still, this is a misreading that he seems to facilitate with his work in *Politics of Nature*, and that requires, for us, a more careful treatment.

³⁶ Fausto, "Feasting on People," 333.

³⁷ Candea, "'I Fell in Love with Carlos the Meerkat.'"

³⁸ Hans Harbers, "Animal Farm Love Stories," in *Care in Practice. On Tinkering in Clinics, Homes and Farms*, ed. A. Mol, Ingunn Moser, and Jeanette Pols (Bielefeld: transcript Verlag, 2010); John Law, "Care and Killing. Tensions in Veterinary Practice," in *Care in Practice. On Tinkering in Clinics, Homes and Farms*, ed. A. Mol, Ingunn Moser, and Jeanette Pols (Bielefeld: transcript Verlag, 2010); Vicky Singleton, "Good Farming. Control or Care?" in *Care in Practice. On Tinkering in Clinics, Homes and Farms*, ed. A. Mol, Ingunn Moser, and Jeanette Pols (Bielefeld: transcript Verlag, 2010).

³⁹ In fact, Sebastian is not particularly keen on touching them, while Filippo drove his bin out of the house, and slowly led his herd of worms to extinction with his travels.

⁴⁰ Donna Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2008), 99.

⁴¹ Mol, *The Body Multiple*, 50.

feeder and the fed. What emerges from vermicomposting resembles more practices of domestication: knowing is a kind of mutual *attuning*.⁴² Mutual, here, does not mean homogeneous or symmetrical, though, but involves an uneven, heterogeneous and irregular reciprocity, a coexistence more than a communion. Knowing as maintaining and feeding intimately connects to the engagement of the composter in keeping the compost bin going, but also the relations of worms with soil and decomposing matter and of the microbiome of the bin and the guts of the worms. If you don't 'know your bin', you won't be able to keep composting going. Knowing your bin is a pragmatic need in composting: you have to understand *how to* tinker with it, and what to adjust, in order for the composting to go on.

COMPOST POLITICS – Vermicomposting is complex: the coexistence of heterogeneous and disparate processes and entities may bring about problems. To the vermicomposter, this begs the political and normative question 'what to do?' Through hands-on experience, we learn that there is no univocal answer to this question. There is no 'natural' answer, no moral guidelines 'out there.' Still, composting is possible. "In some ways, trust and interest, even for very different stakes, could be shared."⁴³ The agreement that Vinciane Despret talks about when exploring ethological research, like the convergence that happens in your bin, is an achievement—one that is achieved also, and crucially, through disagreement. You, the worms, the microbial fauna of the bin do not 'want' the same thing.

With different stakes come different politics. Freedom and democracy are not to be contested in vermicomposting. It is not free will and intentionality. It is compost. It is worm manure. At least for the vermicomposter. For the worms it mainly plays around eating (in the extended sense discussed above). In this sense it is not so much disagreement that characterizes the bin, as the materially heterogeneous and tangibly different practices and activities that make vermicomposting possible.⁴⁴ In this sense we take seriously Stengers' suggestion that "the 'cosmopolitical' proposal, as I intend to characterize it, is not designed primarily for 'generalists'; it has meaning only in concrete situations where practitioners operate."⁴⁵ This asks us to attend to the specificities of the 'concrete situation' we work with, in

⁴² The category of 'domestication' is a particularly complex one. Molly Mullin, and Rebecca Cassidy, *Where the Wild Things Are Now: Domestication Reconsidered* (Oxford: Berg, 2007). In our use the term is closer to attunement. Vinciane Despret, "The Body We Care For: Figures of Anthro-Zoo-Genesis," *Body & Society* 10, no. 2-3 (2004); Nigel Thrift, "From Born to Made: Technology, Biology and Space," *Transactions of the Institute of British Geographers* 30, no. 4 (2005); Candea, "'I Fell in Love with Carlos the Meerkat': Engagement and Detachment in Human-Animal Relations; Karen Michelle Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham: Duke University Press, 2007).

⁴³ Despret, "The Body We Care For," 116.

⁴⁴ This shifts the response from a more dialogical language—the one of disagreement [cf. Jacques Rancière, *Disagreement: Politics and Philosophy* (Minneapolis: University of Minnesota Press, 1999)], translation [cf. Eduardo Vivieros de Castro, "Perspectival Anthropology and the Method of Controlled Equivocation," *Tipiti Journal of the Society for the Anthropology of Lowland South America* 2, no. 1 (2004)], democratic deliberation and diplomacy (cf. Bruno Latour, *Politics of Nature*)—to one that is done in practices, as we shall see.

⁴⁵ Stengers, "The Cosmopolitical Proposal," 994.

this case composting. So, in compost politics, instead of cosmos, it is compost that “refers to the unknown constituted by these multiple, divergent worlds and to the articulations of which they could eventually be capable.”⁴⁶ The multiple, divergent worlds that are articulated in vermicomposting are the worlds of earthworms, their external and internal digestive processes, the mites, the nematodes, the decomposing kitchen waste, the vermicomposter and the other worlds we unfolded in this paper. The limits of the language of *translation* and *diplomacy* that is proposed as a path to ‘controlled equivocation’⁴⁷ or to ‘civilized practices’ in cosmopolitics become clear when dealing with contexts in which human and nonhuman boundaries are muddy. In the dirty and messy togetherness of compost, constructing a common world is not about bridging differences, bringing about similarity, understanding and agreement. The togetherness of the bin is political, in that it calls for assembling, arranging, composing, separating, and working *with* others. But the commons of compost are divergent, heterogeneous, profoundly different: if compost was a common world, the waste would be waste, not food. The castings would be manure, not soil. The politics of compost are grounded in these differences, and still they come together in vermicomposting notwithstanding—better even, *thanks to*—these divergences. What this can mean for our politics of nature is that we cannot dream of simply or easily “bringing nonhumans into politics.”⁴⁸ We need to reinvent politics after the divergent relations and varied practices in which humans and nonhumans are already together, so closely and variously that distinguishing between them is not obvious.

FEEDING – The convergence that takes place in compost not only involves different actors, but also a multiplicity of practices: agreement is neither necessary, nor possible if it is conceived as a reduction of differences. But disagreement and heterogeneity can still come together and somehow work. Feeding offers a good way to shift how we think of this divergent togetherness. In fact, it is never one-sided. It always comes with divergent bodies, practices and desires—very divergent in the case of vermicomposting, since we feed the worms with what we would not eat. You feed your leftovers to your worms and they feed on it. The worms’ feed gets eaten and decomposed. With its transitive and intransitive senses, feeding holds all of this together as it describes both the activity of the vermicomposter and the worms. As Strathern points out, feeding, just as eating, “seems to be a general way of articulating the entailment of all kinds of entities in one another.”⁴⁹

In this entailment, the object can be enacted in some practices as waste, in others as feed, in others as food, and in others yet again as compost. These multiple enactments are ongoing and they need to happen simultaneously for vermicomposting to work. In this sense, then, feeding/eating, with its transformative and relational character, allows us to

⁴⁶ Stengers, “The Cosmopolitical Proposal,” 995.

⁴⁷ The connection between Viveiros de Castro’s “controlled equivocation” and Rancière’s disagreement within the frame of cosmopolitics follows from Marisol de la Cadena’s proposal for an “indigenous cosmopolitics.” A proposal, we suggest, that remains within a discursive realm because of the specific kind of (human-centered) politics with which it works. Eduardo Viveiros de Castro, “Perspectival Anthropology and the Method of Controlled Equivocation”; Jacques Rancière, *Disagreement: Politics and Philosophy*; Marisol De La Cadena, “Indigenous Cosmopolitics in the Andes: Conceptual Reflections Beyond ‘Politics,’” *Cultural Anthropology* 25, no. 2 (2010).

⁴⁸ As a growing number of scholars seems to be suggesting, especially after Bennett (2010).

⁴⁹ Marilyn Strathern, “Eating (and Feeding),” *Cambridge Anthropology* 30, no. 2 (2012): 11.

conceptualize the togetherness as a patchwork, as a composite of differences that do not necessarily require a common world. Our worms and us, the vermicomposters, eat and feed/are eaten and fed by transforming and transubstantiating matter into food/waste, but we do it crucially differently. The togetherness of our bin is in friction, and yet brought together by the on-going processes of eating, feeding and decomposing without reducing this friction, but relying on it. The divergences of feeding, eating, and being eaten push us outside of a constricting Western naturalism.⁵⁰ The food/waste that you/the worms feed can simultaneously be *the same* object, and *not the same* object. The reality of the compost bin is not pre-given, but rather emerges from practices and processes, otherness and difference are not conceived as self-identity.

Feeding/eating brings different activities and diverging 'desires' together. In so doing, it allows for multiplicity and practices to come together in on-going events.⁵¹ Through the compost politics of vermicomposting, different bodies, desires, and practices are kept different and in tension rather than being resolved through what would be considered the 'common good.' It is in this sense that vermicomposting allows us to push the notion of animal companions beyond the assumptions of intimate, straightforward and innocent relations, of cute and domesticated pets, and closer to that of Haraway's notion of companion species. The experiment with vermicomposting shows that the notion of companionship can signal something less cozy, more complex, and yet all the more interesting, especially if we stay close to the troubling sense of togetherness that the etymology of the term offers. From the Latin *cum panis*, with bread, can signal something very different when the bread shared is not the same. If the togetherness of eating and feeding brings differences together it does so not in making them similar again, or in resolving them in a common world, but in the transformation and destruction that digestion and decomposition involve. Simultaneously, though, the asymmetries found in your bin are not normatively already denoted as positive or negative. Feeding unsettles the "implicit normative distinction between engagement and detachment"⁵² that Candea criticized. But the feeding that takes place in the wormery goes even further. It does not simply show how detachment can also, in some practices, be a useful strategy for shaping relations. And it does not remove the problem of normativity either. Rather, it amplifies it. In this sense, we can appropriate what Strathern writes of eating in Melanesia: "Food itself is the result of others' feeding, hence eating in general exposes the eater to all the pleasures and hazards of relationships."⁵³ In feeding and eating the normative question becomes vital, shifting the possible answers from the general to the particular, to the provisional time of practices.

⁵⁰ Matei Candea, Alcayna, and Lys Stevens, "Internal Others: Ethnographies of Naturalism," *Cambridge Anthropology* 30, no. 2 (2012).

⁵¹ In this sense we push Strathern's framing of Vargas' comment further: it is Eating more than Having that characterizes a metaphysics—if such a material semiotic position can engender a metaphysics at all—"of ecology rather than ontology." E Vargas, "Tarde on Drugs, or Measures against *Suicide*," in *The Social after Gabriel Tarde: Debates and Assessments*, ed. Matei Candea (London: Routledge, 2010); Strathern, "Eating (and Feeding)," 12.

⁵² Candea, "I Fell in Love with Carlos the Meerkat," 243.

⁵³ Strathern, "Eating (and Feeding)," 9.

In eating, there are no ethical guidelines ‘out there’ for the politics of the compost (or cosmos). It is not your intimacy with your worms or your detachment from them that will guarantee the success of your vermicomposting experiment. It is not the kind of relation, be it one of engagement or detachment, which is normatively charged. It is what this relation does, what it enacts. It is how its togetherness is achieved in specific and provisional moments that becomes the appropriate site for the normative question. Only your tinkering, your on-going effort to interfere with the decomposition in such a way as to compost your leftovers, can impinge on the ‘good’ or ‘bad’ result of your bin. Appropriating Strathern’s quote, we can say that, in vermicomposting, “what one never knows is whether [feeding] will be to positive or negative effect. The [bin’s] future well-being will bear that information.”⁵⁴

GUIDES – This entry is purposefully the last one of the glossary, although it was the first one of the text. It is so because it allows us a reflection on our writing style. Experiments in writing are not like the kind of experiments that take place in labs. They do not bring about matter of facts. They merely try things out, stretch metaphors and styles, and provisionally do things differently. They, at times, might succeed and seduce more readers. But, what this experiment with the style of guides does, for us, is something different. Guides work by offering heuristic notions, exemplary cases, and pragmatic answers. Still, these generalizations, examples, and solutions can only work in so far as they are practically enacted in hands-on experiments and concrete situations. They do not address *why* questions; instead they move from asking *how* to asking *how to*. In this sense, guides take seriously the position of Leibniz that Stengers embraces in cosmopolitics:

Leibniz wrote that the only general moral advice he could give was ‘Dic cur hic’ – say why you chose to say this, or to do that, on this precise occasion. ... The question of responsibility is thus divorced from the definition of truth. Responsibility is not a matter of who is being ‘truly’ responsible, it is a matter of concern, and, as such, open to technical advice.⁵⁵

Technical advice is what you can get from a guide. This is not only divorced from truth, but also from knowledge as an aseptic thing that happens in the mind and is cut off from the fleshy and dirty world of practices. Instead, it deals with knowing in practice: knowing by experimenting, tinkering, and getting your hands (and kitchen) dirty. A knowing that confuses objects, subjects, and the directionality of action. While it is always open to criticism and improvement, it also evokes a different form of politics: one that, to us, proved to be particularly relevant when dealing with the problems of compost politics. But also, crucially, one that is open to transformations and appropriations.

⁵⁴ Strathern, “Eating (and Feeding),” 11.

⁵⁵ Stengers, “The Cosmopolitical Proposal,” 188.

Sebastian Abrahamsson is a postdoctoral fellow at the University of Amsterdam. His current work analyses how food and practices of food wasting relate in everyday life. Email: c.s.abrahamsson@uva.nl

Filippo Bertoni is a doctoral candidate at the University of Amsterdam. His thesis follows the relationalities of earthworm ecologies and the ways in which these can reshape our notions of relations, togetherness, politics and systems. Email: f.bertoni@uva.nl

ACKNOWLEDGEMENTS Next to the effort and inspiration provided by our worms, this paper has been greatly improved by encouragement and comments from our colleagues. In Amsterdam, the “Eating bodies” team has been crucial in taming our ideas. Thanks to Annemarie Mol, Emily Yates-Doerr, Else Vogel, Tjitske Holtrop, Rebecca Ibáñez Martín, Cristobal Bonelli and Anna Mann. At the RGS/IBG conference in Edinburgh in 2012, we got comments from those who attended the session convened by the organizer of this special issue. Thanks to the editors Uli Biesel, Franklin Ginn and Maan Barua for excellent feedback on our manuscript. We would also like to thank the two anonymous reviewers who provided us with comments on a version of this paper and the ERC for the Advanced Grant, AdG09 Nr. 249397, for “Eating Bodies in Western Practice and Theory” that allows us to work on this topic. Finally, thanks goes to Katja de Vries, Levent Özata and Nikolaos Olma for helping us in our quest to do compost politics.

References

- Barad, Karen Michelle. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham: Duke University Press, 2007.
- Bertoni, Filippo. “Soil and Worm: On Eating as Relating.” *Science as Culture* 22, no. 1 (2013): 61-85.
- Braun, Bruce. “Environmental Issues: Writing a More-Than-Human Urban Geography.” *Progress in Human Geography* 29, no. 5 (2005): 635-50.
- Butler, Judith. *Gender Trouble : Feminism and the Subversion of Identity*. New York: Routledge, 1990.
- Callon, Michel. “Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieuc Bay.” In *Power, Action and Belief: A New Sociology of Knowledge?*, edited by John Law, 196-223. London: Routledge, 1986.
- Candea, Matei. ““I Fell in Love with Carlos the Meerkat”: Engagement and Detachment in Human–Animal Relations.” *American Ethnologist* 37, no. 2 (2010): 241-58.
- Candea, Matei, Alcayna, and Lys Stevens. “Internal Others: Ethnographies of Naturalism.” *Cambridge Anthropology* 30, no. 2 (2012): 36-47.
- Cassidy, R., Mullin, M. H. *Where the Wild Things are Now: Domestication Reconsidered*. Oxford: Berg, 2007.
- Cromell, Cathy. *Composting for Dummies*. Hoboken, NJ: Wiley, 2010.
- Darwin, Charles. *The Formation of Vegetable Mould, through the Action of Worms, with Observations on Their Habits*. London: John Murray, 1881.
- de Castro, Eduardo Vivieros. “Perspectival Anthropology and the Method of Controlled Equivocation.” *Tipiti Journal of the Society for the Anthropology of Lowland South America* 2, no. 1 (2004): 3-22.

- De La Cadena, Marisol. "Indigenous Cosmopolitics in the Andes: Conceptual Reflections Beyond 'Politics.'" *Cultural Anthropology* 25, no. 2 (2010): 334-70.
- Despret, Vinciane. "The Body We Care For: Figures of Anthro-Zoo-Genesis." *Body & Society* 10, no. 2-3 (2004): 111-34.
- Fausto, Carlos. "Feasting on People. Eating Animals and Humans in Amazonia." *Current Anthropology* 48, no. 4 (2007): 497-530.
- Happy Ranch, "Mites," accessed 20 December 2012, <http://www.happydranch.com/articles/Mite.htm>
- Haraway, Donna. *When Species Meet*. Minneapolis: University of Minnesota Press, 2008.
- Harbers, Hans. "Animal Farm Love Stories." In *Care in Practice. On Tinkering in Clinics, Homes and Farms*, edited by A. Mol, Ingunn Moser and Jeanette Pols, 141-70. Bielefeld: transcript Verlag, 2010.
- Latour, Bruno. "An Attempt at a 'Compositionist Manifesto.'" *New Literary History* 41, no. 3 (2010): 471-90.
- . *Politics of Nature : How to Bring the Sciences into Democracy*. Cambridge, Mass.: Harvard University Press, 2004.
- . *Reassembling the Social*. Oxford, UK.: Oxford University Press, 2005.
- Law, John. "Care and Killing. Tensions in Veterinary Practice." In *Care in Practice. On Tinkering in Clinics, Homes and Farms*, edited by A. Mol, Ingunn Moser and Jeanette Pols, 57-72. Bielefeld: transcript Verlag, 2010.
- Lavelle, P. et al. "Regulation of Microbial Activities in Functional Domains of Roots and Invertebrates." In *Microorganisms in Soils: Roles in Genesis and Functions*, edited by F. Buscot and A. Varma, 291-324. Berlin: Springer, 2005.
- Lorimer, Jamie. "Moving Image Methodologies for More-Than-Human Geographies." *Cultural Geographies* 17, no. 2 (2010): 237-58.
- Mol, Annemarie. *The Body Multiple: Ontology in Medical Practice*. Durham, N.C.: Duke University Press, 2002.
- . "I Eat an Apple. On Theorizing Subjectivities." *Subjectivity* 22, no. 1 (2008): 28-37.
- Munk, Anders Kristian, and Sebastian Abrahamsson. "Empiricist Interventions: Strategy and Tactics on the Ontopolitical Battlefield." *Science Studies* 25, no. 1 (2012): 52-70.
- Nancarrow, Loren and Janet Hogan Taylor. *The Worm Book: The Complete Guide to Worms in Your Garden*. Berkeley, Calif.: Ten Speed Press, 1998.
- New York Worms, "Dealing with mites in earthworm bins," accessed 20 December 2012, http://www.nyworms.com/earthworm_mites.htm
- Phillips, John. "Agencement/Assemblage." *Theory, Culture & Society* 23, no. 2-3 (2006): 108-09.
- Rancière, Jacques. *Disagreement: Politics and Philosophy*. Minneapolis: University of Minnesota Press, 1999.
- Red Worm Composting, "A mite is a mite is a mite is a mite not quite," accessed 13 December 2012, <http://www.redwormcomposting.com/worm-composting/a-mite-is-a-mite-is-a-mite-not-quite/>
- Red Worm Composting, "Why are my worms trying to escape?," accessed 13 December 2012, <http://www.redwormcomposting.com/general-questions/why-are-my-worms-trying-to-escape/>.
- Singleton, Vicky. "Good Farming. Control or Care?" In *Care in Practice. On Tinkering in Clinics, Homes and Farms*, edited by A. Mol, Ingunn Moser and Jeanette Pols, 235-56. Bielefeld: transcript Verlag, 2010.
- Stengers, Isabelle. "The Cosmopolitical Proposal." In *Making Things Public: Atmospheres of Democracy*, edited by Bruno Latour and Peter Weibel, 994-1004. Cambridge, MA: MIT Press, 2005.
- Strathern, Marilyn. "Eating (and Feeding)." *Cambridge Anthropology* 30, no. 2 (2012): 1-14.
- . *Partial Connections*. Savage, Md.: Rowman & Littlefield Publishers, 1991.

- Thrift, Nigel. "From Born to Made: Technology, Biology and Space." *Transactions of the Institute of British Geographers* 30, no. 4 (2005): 463-76.
- Vargas, E. "Tarde on Drugs, or Measures against Suicide." In *The Social after Gabriel Tarde: Debates and Assessments*, edited by Matei Candea, 208-29. London: Routledge, 2010.
- Vermiculture Canada, "Other organisms in the bin," accessed 20 December 2012, http://www.vermica.com/articles/other_organisms_in_worm_bins.htm
- Whatmore, Sarah. *Hybrid Geographies Natures, Cultures, Spaces*. London; Thousand Oaks, Calif.: SAGE Publications, 2002.
- Wittgenstein, Ludwig *Philosophical Investigations*. Chichester: John Wiley & Sons, 2009.
- Yusoff, Kathryn. "Aesthetics of Loss: Biodiversity, Banal Violence and Biotic Subjects." *Transactions of the Institute of British Geographers* 37, no. 4 (2012): 578-92.