CHAPTER 8

A 'Democracy of Compost'

Neo-materialist Encounters in Urban Spaces

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Introduction

Our soil 'environment' – the foundational material of our global existence – is in crisis. Beyond effects from anthropogenic climate change such as desertification and salination, humans have variously shifted soils from one place to another, mined them, sealed over them, drained them, contaminated them, and, in some cases, rendered them extinct (Rhodes 2015: 78). The cumulative impacts of these activities have been observed in the majority of the soils on Earth, with implications for the Earth's 'Critical Zone' (Richter et al. 2015: 1). The soils that are used to feed urban populations face particular threats: those outside of cities are subjected to fertility extraction and displacement, while those inside cities must compete with urban development, private property ownership or neglect for their very existence.

This chapter proposes a radical reimagining and democratizing of the centuries-old practice of composting as a means to: foster (re)connections between humans, as well as with more-than-human others; repair existing urban soils; and to coax new areas of fertility into being. By utilizing a theoretical framework of neo-materialism, we offer that deeper considerations for the diverse materiality of compost have the potential to lead humanity beyond instrumentalist ethics of exploitation or mere sustainability towards a new paradigm of regeneration and inter-species co-flourishing. We argue that composting in urban spaces must be integrated into systems of food production and consumption. We envisage a system of overlapping 'tight circles' of fertility linking urban farmers, food eaters, compost and urban soils. Discourses of compost should ex-

tend beyond notions of 'waste management' to embrace deeper understandings of the interdependence and entanglements of all matter. When we re-evaluate what is precious, and find ways to work within nature, we advance eco-ethical human/more-than-human interactions and city–soil relations to potentially re-stitch together what Nathan McClintock (2010) has referred to as 'the metabolic rift'.

Neo-materialist theory offers a potential antidote. It repositions the human among the nonhuman as opposed to a separate, individuated subject with capacity to act independently of the natural world (Sanzo 2018). By decentring the human being within earthly relations, humans and nonhumans are understood as coproducing agents of an ever-evolving world. Neo-materialist theory holds that much of what humans understand as uniquely human achievement has only been possible because of the material world that has shaped and enabled human thinking, practice and technologies. In this view, human beings 'do not control and dominate the material world, so much as emerge from and with it' (LeCain 2017: 429). Eminent scholar Jane Bennett (2004: 348) conceptualizes the world's materiality through 'thing-power' materialism, which gives the 'stuff' of the world potential and potency, and ontologies of their own that sit outside of the meanings or purposes that humans ascribe to them. She envisions that when we 'depict the non-humanity that flows around [and] also through humans' (Bennett 2004: 349) we will strengthen ecological relations. Her contention is that 'the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption' (ibid.: 364), whereas an ontological shift towards recognition of the inherent vibrancy of 'things' could lead to more respectful, less dangerous human engagement with the earth, and the more-than-humans that make it.

Soil can be seen as agential all on its own. It is the living skin of the Earth – the interface between geology and biology (Rhodes 2015: 75). Half of all the world's biodiversity lives within the soil, and a single teaspoon of healthy soil is said to contain a billion organisms (ibid.: 76). It is 'vital' material – a life support system for all terrestrial lifeforms on the planet (Krzywoszynska 2019: 2). Human activities throughout the Holocene period and into the Anthropocene have led to fundamental biological, chemical and physical transformations of the Earth's soils (Richter et al. 2015). Maria Puig de la Bellacasa (2019: 393) argues that acknowledging our intimate entanglements with soil – it does, after all, provide us with corporeal nourishment – will help to shift instrumentalist conceptualizations of soil as 'resource' towards a more relational understanding of soils as coproducers of our bodies and our world, as well as living entities with their own intrinsic worth (ibid.).

Daniel Richter et al. (2015: 13) assert that human beings are not just 'agents of soil disturbance', depletion or degradation, but also agents of soil production. Rather than approaching this as another example of humans dominating nature, we widen our gaze to view this provocation through the lens of neo-materialist theory, such that 'Earth's surface systems [are being transformed from "only"] natural bodies to those that are human-natural' (ibid.: 1). We offer that these interdependencies might be seen in the vital materiality of compost, and in reimagined (re-democratized) systems of urban composting.

Further, Bradley Jones (2019: 3) describes compost as 'the (de)compositional processes and collaborative assemblages nourishing *all* life on earth' (italics authors' own). The application of compost is reported to: enhance soil fertility, tilth, nutrient uptake in plants and the water retention capacity of soil; reduce dependence on chemical fertilizers; reduce heavy metal bioavailability (Cooperband 2000: 287); mitigate and ameliorate urban and industrial soil pollution (Cogger 2005: 243; Kästner and Miltner 2016); and improve carbon sequestering properties in soils (Favoino and Hogg 2008: 61). While Jones's assertion may overstate humans' power to affect nature, we recognize that, unlike humic material broken down without human intervention, compost is a substance produced from human and more-than-human interactions, and its use is human determined. We note that while composting along with soil beings can be generative, these systems can also fail or overflow (see, for example, Abrahamsson and Bertoni 2014), prompting more direct approaches for productive collaborations between humans and more-than-humans.

Composting in urban environments commonly takes place at three levels – households, communities and municipalities – each of which encompasses different human-to-human and inter-species relational configurations, with implications for engagement, participation and outcomes. Here, through the lens of neo-materialist theory and the accounts of seven committed proponents of compost in Aotearoa New Zealand, we ask what values we might associate with compost, and the 'doing' of composting, in urban spaces. We also explore new imaginaries of urban composting to understand how this may serve as an important step forward for our cities, ourselves, and for nature.

Method

As composting is an embodied practice that generally takes place in the garden, the planned approach for this study was to conduct interviews

and ethnographic observations within these spaces, 'following' gardeners and composters 'in the field' (Lassiter 2005: 83–106). Due to COVID-19 restrictions over this 2020 field study period, close contact was not possible, and interviews were instead conducted via Zoom (Reñosa et al. 2021: 2). Participants were purposively recruited for their prominent involvement in composting practices. Variously, they are involved in community compost education (three participants), city council composting initiatives (two), local food waste recovery schemes (one), community composting hubs (four), urban farming (three) and environmental activism (one). Each semi-structured interview was guided by participant experiences and interests, and one included a 'Zoom tour' of a composting space. Interviews were audio-recorded, transcribed and thematically analysed, with inductive and deductive approaches employed (Braun and Clarke 2013: 201–22).

Results and Discussion

Our analysis articulates concepts of neo-materialist theory, human relations to urban compost, and notions of the health of soils that are used to feed cities. Through their observations of and engagement with the material of compost, and practical interactions in diverse ways with urban communities, the participants were united in a belief that urban composting practices should be decentralized, dispersed and democratized. Themes of circularity, connection, participation, access and community permeated these discussions, and the participants pointed to the relational aspects of the material of compost itself to signpost the way to support community-scale composting.

Cycles of Life and Death

Viewed through a lens of materiality, compost itself may contribute to improved understandings of, and (re)connections to, the vital circularity that sustains natural systems. It appears to embody the interconnected concepts of cycles of life, death, decay and rebirth, the idea of 'no waste in nature', and reciprocity. Modern humans have constructed a mode of existence that rejects the rules of assembly that apply elsewhere in nature – eating, breathing, defecating, and dying in-situ – and that perpetuate ongoing cycles of life, death and re-emergence. Considering modern urbanites' typical disconnection from death, and their visceral aversion to decaying matter (for example, DeSilvey 2006, and McGinn 2011: 173), Matt, a facilitator of community and restaurant 'waste' compost-

ing in inner-city Auckland, commented that urban citizens, in their 'clean and sanitized lives', are more inclined to embrace and celebrate the 'above-the-ground, living aspects of nature', while failing to appreciate the significance of the other side of that same coin – which is dormancy, death and decay. Matt proposed that compost is a vehicle for revealing the beauty of these critical components of nature's cycles. This view was complemented by Maeve, the founder of an Auckland-based environmental-action organization focused on soil and pollinator health, who accepted that death and decay are integral to compost, but conceptualized it fundamentally as material of rebirth:

> What I love about compost is that living systems go through a flow, between a death impulse and a life impulse – including us, so we ourselves are dying and re-coming into being constantly. Compost is one of those places where we can understand that system by working with it . . . you have a whole lot of things that have come to the end of a process, in terms of living impulse . . . and you put them together in a system . . . completing that part of the flow and returning [them] to a life impulse again.

When new life is brought to the multispecies 'life form' of soil, the life-giving capacity of soil itself is enhanced. On a 'Zoom tour' of her garden, Maeve pointed out the parts of the land that, through the application of compost from 'hard core' [dead] soils, she had transformed into areas with the 'most amazing fertility'.

There Is No 'Waste' in Nature

Maeve's thinking was that 'there is no waste in nature – just circularity within the system'. With life-giving 'materials of rebirth', and as we have understood through the cycling effects in and of composting, there is material 're-use' taking place. Western societies continue to seek increasingly out-of-sight-out-of-mind 'solutions' to what has been framed as a 'problem' of waste organic materials. But ontologies of waste (Sharp et al. 2021: 2), and urban concerns for what should be done with it, are concepts that are not so cut and dried when viewed through a neo-materialistic lens. Hana, a community farmer and compost educator, stressed the importance of providing city dwellers with opportunities to meaningfully *connect* with the waste that their modern lives are producing. Matt commented that, by repositioning food 'waste' as a precious resource, people might notice the two, equally important life-giving 'parts' to our food: the part we eat *and* the part we throw out. With care and consideration for *everything* that is removed from the earth, our 'waste' can be turned into other things of immense value – healthy soil

and diverse lively worlds – both for ourselves and the more-than-human others with whom we are intimately entangled.

Reparation and Reciprocity in and with Nature

Soils worldwide have been subjected to increasingly intensive agricultural practices to keep pace with human demands (Puig de la Bellacasa 2015: 692). Maeve made the claim that using compost is 'the only way to repair ecosystems'. Other participants have spoken of the power of these human–nonhuman collaborations to bring (back) life and assuage human-wrought environmental damages by attributing magical qualities to them. Sam, a community compost educator, claimed 'it [composting] is like alchemy'. Like Maeve, Ngaire referred to compost as a 'material of rebirth', elaborating: 'You can go around the city and you can dump this stuff on some dirt, and then a little while later, it's soil, and it's living and you can put plants in it. . . . it's like a brush, that you can brush over a city, and it goes from dead to alive'.

Sam called compost 'a healing balm' that we can apply to the damaged earth, as if attempting to atone for damages caused to soils and ecosystems as a result of these extractions. Further, Maeve claimed that people feel a deep grief that our species has caused so much devastation, contending that the work of composting 'is not just about healing ecosystems, it's [also] about healing as individuals and as communities'. The possibility of reparation through compost might therefore be conceived of as building resilience in urban soils – and in urban humans – for their mutual benefit.

Generating new soil and nourishing new life helps us to see compost and composting performing as 'interconnected bodies and lifeworlds of humans and non-humans' (Turner 2014: 5). Given our regular extractions from 'nature' in urban environments, composting might be seen as a moral activity that *should* be undertaken in order to 'give back' to nature. Our participants, such as Matt, framed composting as something relatively simple that people can do to 'give back to the soil that has generated *everything*, really, for us', adding: 'It is one of the most important things we can do, because while we live, we all need to be eating . . . the parts of the plants that we don't eat can be used to generate soil for the next plants'.

It could be argued that composting practices that emerge from human sentiments of gratitude towards soils do not constitute an ethos of 'giving back to the soil' for the soil's sake, so much as an instrumentalist concern about the productive capacities of soils solely for the benefit of humans. While the act of 'composting' may be considered to make a pos-

itive contribution to the environment, if thought of as something we do in response to removing nutrients from the ecosystem, solely to ensure the future ability of that same ecosystem to provide for us again in the future, we again overemphasize the place of humans within the wider materiality of the Earth.

We are not suggesting here that a focus on reciprocity or 'the circular economy' (fashionable in the Global North) nullifies the generative potential of 'care-full' utilitarian relationships (see Meulemans 2020). But by framing our participation as takers *and* givers in the system, we might reinsert ourselves into those cycles as partner-collaborators – mutual labourers. Further, scale is important, where the 'distance between production and consumption' has a material effect on social and ecological benefits and harms – for example, the transportation costs and fossil fuel used to move 'waste' materials around cities (McClintock 2010: 192). We might think instead of framing this circularity as a proliferation of 'tight circles' of hyper-localized fertility use and re-use within urban spaces.

Noticing, Learning and Enacting

Circularity is read through neo-materialist encounters with compost, and so too is enactment and interconnectedness. We have outlined the theoretical underpinnings of neo-materialism as manifest in experiences of urban composters, but how do these soil actors actually come to know compost and bring it into existence as 'vibrant matter'? How do they become aware and take action to re-stitch the city–soil metabolic rift (McClintock 2010)?

There is an acknowledgement of humanity's interdependence with the natural world, and a sense that the practice of composting enacts a particular environmental ethics. Compost itself may function 'as a kind of learning instrument . . . connecting [human] communities with the biology and the livingness of the soil that is under them and around them' (Matt). Soils are ecosystems animated by diverse interconnected beings, providing heuristic relationships and connectivity that serve to inform and inspire compost advocates, and the newly inquisitive, to make and use compost. Maeve says:

> When I discovered that mycorrhizal fungi was one of the most critical materials to sequester carbon, I just wanted to make compost. I became really committed to compost – and I think that's what happens to people – they become *committed* to compost. [She showed us her cow pat pit:] The pit is in between my limes and lemons and it's just a hole in the ground, and I've just turned it over – so that's cow manure and you can see it's not quite

> powdery yet, but it's well on its way to [having] the most amazing fertility, and it's just teeming with microbes.

With these examples Maeve showed how, as the occupant of a large plot of land on the outskirts of the city, she has come to notice, learn and enact compost (Sharp 2018), and be a part of it becoming through attentiveness and action. She revealed herself to be a compost practitioner who assumed the role of overseer or facilitator of natural processes, yet sees herself as just one part of the environment that she lives within. Beyond the confines of her own garden Maeve is a compost educator and environmental activist committed to providing pathways for *everyone* to participate in composting. She emphasized to us that it is critical to help city-dwellers – including those who live in apartments or high-density urban environments – to understand that 'we are all part of an ecosystem'. By attempting to replicate and extend the networks, connections and interdependencies evident within soil communities into the human sphere, compost educators and practitioners promote an emergent feeling of responsibility for the flourishing of the soils that we depend upon.

Connecting Urban Farmers, Food Eaters, Compost and Urban Soils

How might we negotiate this neo-material understanding of soil in urban management practices? How might we reconcile this repositioning of humans and nonhumans as interdependent actors in soil production, and how might we operationalize these learnings of interconnectedness for mutual benefit? Compost by its nature is uniquely capable of answering the imperative to care for environment(s). Where human actors can actively keep organic waste out of landfills, and redirect compost's cycles to productive spaces instead, humans and nonhuman soil actors can work together to cycle, nurture or gift fertility (back) into soils through compost, at rates that are sustainable. Opportunities for noticing these relationships can take place where composting is visible, embodied and enabled. However, the current paradigm of food production and distribution in Aotearoa New Zealand – where food is grown outside of cities and consumed inside cities – challenges this ideal. As a consequence, soil fertility is displaced, resulting in fertility deficits in rural food producing areas, but fertility surpluses in cities. Ngaire was involved in an urban farm project enacting food rescue through the reclamation of food 'surplus' from households:

> We are getting to a point where we don't need as much [urban compost] anymore . . . compost can't exist without the food system . . . being fixed . . . vegetable production needs to be smaller scale, and much more spread

> out . . . communities [need to] interact with . . . grower[s] and get their 'waste' back to them so that the grower can put the nutrients back.

In other words, compost and composting need to occur where food is grown. And food growing needs to occur where food eating happens. By re-scaling food systems into tighter cycles of fertility use and re-use, networks of urban farms could enable urbanites to reconnect with their food and the soils that produce them. Locally produced food combined with local composting initiatives could facilitate productive cycling of fertility through each stage of the food production and consumption process, as well as reducing transportation costs and emissions. Composting in cities currently occurs predominantly as a decentralized practice (home composting), or in centralized, large-scale facilities run by municipalities. A reimagined 'soil system' might connect a decentralized network of composting hubs that would in many ways mimic the rhizomatic relations modelled by compost, and contribute to new forms of 'ethical ecological thinking and practice' (Turner 2019: 770). We drew from our participants – all strong advocates of community composting – to assemble a range of ideas (Table 8.1) for how different urban composting systems either foster or inhibit productive connections. Further observations (italicized in the table) as drawn from national industrial biogas advocacy reporting (Bioenergy Association 2020) were added for further context.

Home composting is identified as the preferred option for homeowners who have the space, the inclination and the skills to produce quality compost in their own gardens. However, in rapidly intensifying urban environments this is an option that is increasingly out of reach or undesirable for many people. Ngaire also cautioned against potential home composting 'failures and inefficiencies', as it facilitates the proliferation of 'x-number more rat homes'. At the opposite end of the spectrum, numerous environmental and social disconnects associated with centralized municipal composting solutions were identified (see Table 8.1). Large-scale, technocratic and transport-heavy systems are seen to solve the 'problem of waste' by encouraging a throwaway ethos of non-responsibility and disconnection from natural life-sustaining processes:

> What's deeply distressing is how councils and governments are investing in these huge food waste solution scenarios that don't fund, support, or nurture an individual's connection to their ability to restore the ecosystem through using our waste as a way to repair . . . Having a collection at the side of the road where it just goes to the 'never never' will not enable people to learn. (Maeve)

Table 8.1. Approaches of connection and disconnection (drawn from interviews with seven community compost facilitators and educators) of differing systems of composting. Qualitative entries in *italics* are drawn from a report (Bioenergy Association 2020) that advocates centralized composting.

Home Composting	Community Compost Hubs	Centralized Composting
Connections • Hyper-local (no transport) • Fertility remains on site • Quality, lively 'good' compost • Closed-loop system **Disconnections** • Lack of interest • Feelings of disgust • Not everyone can participate • Limited skills, money, space, time • Attracts vermin • Inefficient – not enough biomass to make quality compost	**Connections** • Reduces transport costs and emissions • Fertility available for communities, local soils • Quality, lively, 'good compost • Everyone can participate • Ideally link to urban farms or parks • Facilitates engagement with waste • Helps to grow communities • Provides jobs • Opportunities for education/awareness • Connects communities to biology/soil life **Disconnections** • Funding and management required for success • Attracts vermin • Risk of illegal dumping	**Connections** • Potential to divert large volumes of food and green waste from landfills • *Potential for methane (biogas) burn-off as alternative to fossil fuels* • *Provides stable employment* • *Biofertilizer produced* • *Funding guaranteed through taxpayer* • *Simple, low input, low 'disgust' in handling for households* **Disconnections** • Expensive – requires large capital investment • Technological 'fix' separates humans from nature • Curbside collections disengage humans from their waste • Fossil fuel reliance in transport to/from site – big carbon footprint • Produces excess nitrogen/leachates contaminate local soils and waterways • Requires major engineering to manage correctly • Fertility removed from rural areas • Inferior 'bad' compost – no worms, dead matter, mineral substrate

Matt was equally critical of centralized systems in which waste gets picked up and taken 'away to awayland', a paradigm he claimed denies individuals and households the capacity to appreciate the value of their waste and the opportunity for connection to their 'local place'.

Instead, there is advocacy in this space for a diffuse network of community composting hubs, which are envisioned to foster access, connections and participation. Hana claimed that cities could be composting at scale in a decentralized fashion if they had networks of compost hubs servicing households and communities. This correlates with a study conducted in the city of Chicago, which determined that decentralized composting systems encourage community engagement and facilitate the diversion of substantial volumes of food waste from landfills, thereby delivering ecological, economic and social benefits (Pai, Ai and Zheng 2019: 1).

Maeve was adamant that everyone should have the opportunity to participate in the composting stream. At the time of research she was working alongside local government bodies throughout Aotearoa New Zealand to bring to fruition future cityscapes that would include a decentralized network of rates-funded or economically self-sustaining community composting hubs. In her utopian vision, there will be one such hub located every 500 square metres in every city:

> [People live in cities . . . they need to have places where they can participate . . . urban farms and composting hubs are integral to that . . . places where they can go and drop stuff off . . . and *see* their waste becoming fertility. I want to see our urban farms and our compost hubs becoming as commonplace as cafes . . . or your local dairy or butcher . . . [where] nobody is talking about waste, [and] everyone is talking about resource, and we are creating systems [that] are much more decentralized, resilient and hyper-local. Everyone should have access to that.

As radical as the vision of a compost hub on every corner seemed, Maeve was confident that 'people can change their behaviour very, very quickly when they understand why, and they're given the tools to do it'. Jess expressed a desire that composting would become 'totally mainstream, absolutely normal, . . . just what people do', facilitated by resourced education and training for individuals and champions of the initiative. Where large modern cities have effectively 'declared their independence from nature', such a model of decentralized composting offers regenerative urbanization (Girardet 2014). When humans participate and cooperate with each other and with nonhuman materiality, the analogy of a 'democracy of compost' gains relevance. If composting becomes accepted as a natural part of daily life, our cities may be configured around overlapping, self-sustaining 'tight circles of fertility', driving individuals within smaller communities to cycle nutrients (grow-eat-compost) hyper-locally, through new imaginaries of urban farms and community composting hubs.

Conclusion

Traditional hierarchical human-centred thinking has produced and perpetuated ecologically destructive practices. The ontological fracturing of social and material worlds has led us (humanity and more-than-humanity alike) beyond the relatively amenable environmental conditions afforded by the Holocene, into the uncertainty and existentially threatening realm of the Anthropocene. The participants in this research exhibit understandings of the 'vital' importance of more reciprocal human and more-than-human relations through their personal composting values and compost-mimicking eco-political actions. Composting is often construed as a largely instrumental practice that home gardeners 'do' in order to enhance the productive potential of their own space, or that municipalities 'do' primarily to deal with 'waste', but this study's participants advocate wider (and deeper) considerations of compost as a material substance representative of convivial, truly ecological communities.

Compost, 'a multispecies cycling of nutrients and energy' (Jones 2019: 7) offers human communities the opportunity to place themselves 'within' rather than 'above' the natural world that they are just one part of. Engagement with the lively networks of interconnected species and materialities inherent in compost appears to motivate these composting practitioners to radically reimagine current waste management policy and practice within urban settings. They advocate the emulation of compost's network characteristics through the establishment of decentralized networks of composting hubs (ideally linked to hyper-localized urban farms) to serve the human and more-than-human communities that coexist within our modern cities. Under this new paradigm, compost is not just for home gardeners and waste-managing municipalities: it is a conduit for *all* of us to participate in nature's cycles and become soil coproducers rather than simply soil consumers (givers as well as takers). If human communities can begin to see themselves as 'part and product of the material world' (LeCain 2015: 3) then some form of 'democracy of compost' may contribute to the co-flourishing of humans and more-than-humans alike in a more eco-ethical, generative Anthropocene.

Monique Wing is a student of geography, and she came to gardening and composting in a personal capacity in response to her concern for human-wrought environmental harms. Her research is informed by feminist critical theory, which she uses to explore the potential for better, more just and sustainable human interactions and relations with the natural world.

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