

***Planetary Messmates: Engaging with Elizabeth Mazzolini and Philip Olson on the Topic of Waste***  
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I thank Elizabeth Mazzolini and Philip Olson for their replies to both my article "[Knowing Waste: Towards and Inhuman Epistemology](#)" (2012), and the subsequent exchange between [Zsuzsa Gille](#) and [myself](#) on the *Social Epistemology Review and Reply Collective* (2013a). I want to begin with Olson's "[Knowing 'Necro-Waste'](#)" (2013), which I read with pleasure despite its purportedly macabre subject matter (dead and decaying human bodies).

**Responding to Olson**

While humans *as* waste has mainly been discussed in symbolic, moral, economic, and political senses (for instance, the poor as 'wasted lives' and 'wasting society's resources'; see for instance [Bauman 2003](#)), Olson offers a timely provocation to consider a very material rendering of human bodies as waste. It is not, as Olson points out, simply human bodies on their own that must be considered, but the myriad chemicals infused in the human body before and after death, the wood and metals that encase human bodies in coffins, reinforced concrete, any prostheses that once belonged to the deceased (as well as any other items placed in coffins to be buried with the body). Human bodies, and all that accompany them into the ground (or into the atmosphere in the case of crematoriums) comingle with microorganisms, water, chemicals, soil, and other entities both spatially (leaching into and beyond the graveyard perimeter or into the atmosphere) and temporally (relatively slowly in the case of graveyards; relatively quickly in the case of crematoriums). Put this way, graveyards are a particular kind of landfill, and crematoriums are specialized incinerators. Olson's point, that this complex network of (dead) humans and what might be called their accouterments "both cooperate and compete with one another to know the dead" (ibid, 60) is certainly a point worth seriously contemplating within the context of an inhuman 'knowing waste'. To reiterate a point made [in my original article](#) (2012), changing entities within a constantly changing environment means that, amongst other things, fully determining and predicting the material constitution of this decomposing and re-composing network (not to mention its myriad symbolic, cultural, political, and economic meanings) is unachievable. In other words, even with the best engineers' models, we cannot know in advance the material conditions created by the projected nine billion human lives whose bodies will eventually become part of the Earth's biomass.

Olson also makes the interesting point that the exemption of human bodies from a solid waste classification certainly has regulatory implications. And this point presses us further; to consider that the major aim of health and environmental regulations and policies is to protect the environment from waste, whereas the regulations and practices concerned with human corpses attempt to protect those corpses from the environment. This speaks to a particular iteration of human exceptionalism, whereby humans somehow – even in death and decay – stand apart from all other perishable organisms, and nature in general: even in death we desire to remain purified from our environment. Olson also draws our attention to the increasingly urgent question of the implications of focusing on techno-scientific fixes ('[bio-cremation](#)' and the '[green burial movement](#)' in general) at the expense of the far more upstream concerns with how we arrived at a particular practice that attempts to protect ourselves – even in death – from the world in which we live and are a part. How, in other words, have we come to separate human concerns from those of all other living and nonliving entities and forces with which we live, die, and indeed depend upon?

Reflecting on this question, I particularly liked the conclusion of Olson's reply to be cautious in our "othering" of bacteria (2013, 62). I enthusiastically support this conclusion. For over ten years I have been working with, and writing about, bacteria in an effort to critically challenge conceptualizations of microorganisms as: (1) other to organisms, including human animals; and, (2) pathogens threatening humans that need to be (minimally) controlled or (ideally) eradicated. My appreciation of bacteria began close to home, with (human) animal bodies, and I have consistently argued that classificatory distinctions between 'us' and 'them' refuse our dense and indelible symbioses. I have tried to push this point beyond a companion typology to argue organisms are, from evolutionary (2009, 2010a), metabolic (2004, 2013a), immunological (2004, 2007, 2010b), sexual difference (for instance 2013b) and world-making (2009, forthcoming a) perspectives, not so much companions but fully enmeshed compilations, networks and assemblages we call cats, amoeba or humans.

### *Microontology – Bacteria As Us*

[\*The Origins of Sociable Life\*](#) (2009) is dedicated to developing what I termed a *microontology*. Populating this 'unseen majority' are about  $5 \times 10^{30}$  bacterial cells on Earth (Whitman, Coleman and Wiebe 1998). Another estimated  $10^{18}$  bacteria circulate in the atmosphere attached to dust. We might say, as Olson does, that bacteria are "within us" (2013, 62), but a strong case can be made that bacteria *are* us. Bacteria invented symbiogenesis, the process through which the cells that make up our human bodies were formed (Margulis 1981). All eukaryotic cells are heterogenomic (their genomes have more than a single type of ancestor). Genetically and morphologically, eukaryotic cells are communities rather than individual entities. Moreover, of all the cells in a human body, 10% are eukaryotic (derived from bacteria) and 90% are bacteria (Sapp 2003, 235). We are, ancestrally, made up of, and through, bacteria. It also means that any given human/animal body is a symbiont: roughly 600 kinds of bacteria in our mouths and 400 kinds in our guts, and the countless more bacteria that in/cohabit our orifices and skin (Lingis 2003). Indeed, the number of bacteria in our mouths is comparable to the total number of human beings that have ever lived on Earth (Margulis and Sagan 2007). The number of microbes in our bodies exceeds the number of cells in our bodies by 100 fold. The human distal gut contains more than 100 times as many genes as our human genome (which has 2.85 billion base pairs). Every living thing that exists now, or has ever lived, is bacterial (Gould 1996; Sterelny 1999). "The 'human' that we know now" as Cary Wolfe astutely notes, "is not now, and never was, itself" (2003, xxiii).

Bacteria are not only within and of us: they are progenitors of our environment as well. Bacteria evince the greatest organismal diversity, and have dominated Earth's evolutionary history. Bacteria evolved all major forms of metabolism, multicellularity, nanotechnology, metallurgy, sensory and locomotive apparatuses (such as the wheel), reproductive strategies and community organization, light detection, alcohol, gas and mineral conversion, hypersex, and death (Margulis 1981). Bacteria sustain the chemical elements crucial to life on Earth's oxygen, nitrogen, phosphorous, sulfur, and carbon, and some twenty-five other gases through ongoing (re)cycling processes that enable flora and fauna to thrive (Sagan and Margulis 1993). Bacteria not only evolved all life (reproduction, photosynthesis, and movement) on Earth; they provided the environment in which different kinds of living organisms *can* exist (Smil 2002).

This microontology further recognizes that the vast majority of microbial activities have nothing to do with humans. Humans do not even know about the vast majority of assemblages that take place within the biosphere. Moreover, symbioses are obligate for animals but not bacteria. Putting this in

larger evolutionary perspective, “if you wiped out all multicellular life forms off the face of the earth, microbial life might shift a tiny bit.... If microbial life were to disappear, that would be instant death for the planet” (Woese in [Blakeslee 1996](#)). For these reasons, I approach with caution technoscientific responses to waste that purport to entirely harness, and dominate bacterial activities with certainty.

And this cautionary approach to certainty brings me to Elizabeth Mazzolini’s thoughtful response [‘The Costs of Inhuman Epistemology’](#) (2013). Reading Mazzolini’s response through Olson’s, we might question Mazzolini’s assertion that “it seems awkward to *skip over* this matter of pressing concern [waste making life very hard for many people] in favor of *extending agency* to entities whose interests are *less local to ours* as part of a project of critiquing and re-critiquing what waste *is*” (2013, 33 my emphasis). My research does not “skip over” or otherwise dismiss the realities of the billions of people who live on, in, and with waste in our contemporary “planet of slums” (Davis 2007). Acknowledging bacteria (and other nonhuman entities and forces such as solar radiation) as part of the very makeup of this evolving waste is not a matter of “extending agency”: humans simply do not have this power (see Clark 2010). Indeed, the very supposition that humans’ omniscience means we may grant or deny agency to others is an Enlightenment project well worth abandoning. Moreover, my research is intent on acknowledging that the microcosmos (and macrocosmos for that matter) is not “less local to our” interests: like it or not, we’re all in and of this planet together, a point Olson makes in his response. This is *not* to say all entities experience waste in the same way: clearly different people live with(in) waste in very different ways, with different consequences and implications (see Hird 2013c for further discussion). And given that the slum-dwellers Mazzolini calls our attention to live in, with, on, and through microorganisms in particular ways – *and* likely have an particular and specialized knowledge of the microcosmos – our analyses may well want to acknowledge and learn from this expertise. This is surely a significant part of the “forms of agency available to humans themselves – new ways of being human in response to environmental crisis” that Mazzolini urges us to explore. So rather than avoid “new forms of humanity in unfamiliar places”, this is exactly to my mind where we need to go. If our current environmental crisis is (at least in part) a consequence of the Enlightenment’s aim to control, dominate, and determine nature, then we precisely need to go to these “unfamiliar places” where “new forms of humanity” have and are emerging. We want to open ourselves to new (and perhaps old) ways of being human.

### **Responding to Mazzolini**

And this brings us to Mazzolini’s discussion of indeterminacy. I wonder at the apparent division being made here between scientific and postmodern considerations of indeterminacy. While the latter has, according to Latour (2004), apparently “painted itself into a corner” (Mazzolini 2013, 32) through “endless cycles of critique” (ibid), science concerned with indeterminacy seems to have somehow avoided this fate. Moreover, it is the case that indeterminacy can, and is, used by conservatives in industry and government (and science and engineering and community activist groups) to “accomplish politically insidious ends” (ibid), *but so can certainty*. [Benjamin Hale and Lisa Dilling](#) (2011) demonstrate how governments focus their attention (and attempt to focus that of the public) around supposedly determinate consequences – what I (citing Donald Rumsfeld) called ‘known knowns’ in my original article – of various environmental disasters such as oil spills and landfill explosions. Grass roots environmental groups and human rights organizations have, by contrast, effectively mobilized indeterminacy to draw attention to the ‘known unknowns’ and ‘unknown unknowns’ that corporations and governments want to avoid acknowledging (see Hird

et.al. forthcoming b for further discussion). Here, “vulnerable people” *do* engage indeterminacy – as both “critiquing” *and* (rather than “versus”) “effecting change” (Mazzolini 2013, 32).

And this brings us to one of Mazzolini’s central concerns: “whether forwarding indeterminacy is too costly for members of our own species” (ibid, 33). Mazzolini’s own fascinating and timely discussion of waste on Mount Everest (2012) addresses this very question. Leaving aside tensions between ‘uncertainty’ and ‘indeterminacy’ for now, I want to emphasize that Mazzolini’s article addresses what surely needs to be a central concern of waste studies: to think carefully, and indeed be skeptical towards, the characterization of waste as an issue of individual responsibility. In a similar fashion, I am interested in how municipal solid waste is resolved as an individual responsibility within a system of neoliberal governmentality (see Hird et.al. forthcoming b). Demonstrating how garbage on Mount Everest is circumscribed to litter, which instantiates the ‘good’ (picks up litter) from ‘bad’ (leaves litter on the mountain) visitor, Mazzolini reminds us that visitors and local residents also leave bodily wastes (urine and feces – the latter of which is, of course, almost entirely composed of bacteria) on the mountain, which cannot be “observed, managed, and judged” in the same way as litter (2012, 159). Mazzolini suggests “embracing uncertainty” to “interrupt epistemologies of righteous individualism” (ibid, 162). Recognizing, as all of the authors in this reply-and-response do, that uncertainty can be exploited, Mazzolini nevertheless asserts “uncertainty could also contribute to a non-subject-based environmentalism if it were to be embraced” (ibid). Mazzolini lauds uncertainty as having “valuable and productive possibilities” and that “embracing uncertainty could help create new knowledge formations” (ibid). Indeed, Mazzolini responds to the lesson she asserts we need to take from Latour (2004) and Gille’s (2013) articles – to “consider very seriously as one of the most vital considerations of waste studies whether forwarding indeterminacy is too costly for members of our very own species” (2013, 33) quite categorically in her own research: “certainty”, she writes, “might not be all it’s cracked up to be anyway” (ibid).

Mazzolini provides a provocative quote supporting her assertion that embracing uncertainty can help create new knowledge, which is worth repeating here:

[T]he uncertainties surrounding the key variables in the man [sic]-land interactions in the Himalaya (and, worse still, the uncertainties as to what the key variables *are*) render the problem” unamenable to the traditional problem-solving methods of applied science. The problem, we conclude, is that there is not *a* problem but a multiplicity of contending and contradictory problem definitions, each of which takes its shape from the particular social and cultural context that it helps to sustain. The problem, in other words, is *trans-scientific* in nature. (original emphasis, Thompson, Warburton and Hatley in Mazzolini 2012, 162)

Perhaps the authors of this quote should be accused of postmodern ‘hand-wringing’, painting “themselves into a corner”, and cow towing to “the imperative to constantly reflect in an infinite house-of-mirrors as critique for critique’s sake” in an exercise “too costly for members of our own species” (Mazzolini 2013, 32). After all, the authors are drawing attention to the inadequacy of defining “the problem” in singular terms that then may be solved (rendered certain) through “traditional” methods of applied science, and argue instead for a multiplicity of ways of defining this complex human-bacteria-virus-soil-moisture-pH- air pressure interaction (in the great example Mazzolini uses). But, with Mazzolini, I contend “uncertainty, disagreement, and heterogeneity are

useful because they interrupt a unified individual responsibility – the basis for certainty and righteousness” (2012, 163). For me, the unified individual responsibility that needs to be interrupted refers equally to division between humans and everything else (bacteria, flora, fauna, inorganic entities) not least because this exceptionalism sets the terms of what this responsibility can be. To my mind, forwarding indeterminacy is therefore not “too costly”; rather it is essential if we are to provoke “new ways of being human in response to environmental crisis”. *This* is indeed an “unfamiliar place” to explore and inhabit (2013, 33).

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