

EASST *Review*

European Association for the Study of Science and Technology



LIST OF CONTENTS

EDITORIAL	4
Sarah Schönbauer	
STS LIVE	6
RENDERING WASTE (IN)VISIBLE THROUGH CATEGORIES: A REFLECTION OF MY VIEW ON WASTE.	7
Artemis Papadaki-Anastasopoulou	
IN A SPECULATIVE MOOD: AFFECTIVE WASTE-KNOWLEDGE AND SLUGGISH SCIENCE PRACTICES	11
Kathrin Eitel	
COMPOSTING PLASTIC-PACKAGED FOOD WASTE: A NOTE ON CLASSIFICATIONS AND TEMPORALITIES.	21
Laura Bomm	
THE ENVIRONMENTAL FOOTPRINT OF SOCIAL MEDIA HOSTING: TINKERING WITH MASTODON	25
Stefan Laser, Anne Pasek, Estrid Sørensen, Mél Hogan, Mace Ojala, Jens Fehrenbacher, Maximilian Gregor Hepach, Leman Çelik, Koushik Ravi Kumar	
BEYOND PLASTICITY	34
Tridibesh Dey	
CHERISH, NOT PERISH	40
BEYOND CLIMATE FIXES: FROM PUBLIC CONTROVERSY TO SYSTEM CHANGE	41
Les Levidow	
CALL FOR PAPERS	48
SCIENCE AS CULTURE (SAC): THREE CALLS FOR PAPERS	49
STS EVENTS	53
STS IN CONTEXT: PROVINCIALISING STS FROM CENTRAL EUROPE	54
Sarah R Davies, Tereza Stöckelová, Fredy Mora Gámez, Roos Hopman, Patrick Bieler, and workshop participants	
NEWS FROM THE COUNCIL	58
CALL FOR NEW EASST REVIEW EDITORS	59
MAKING STS BETTER	60

EDITORIAL

EDITORIAL

Sarah Schönbauer

Waste is a core concern in our time. Waste is part of our everyday lives, our routines, practices, and surroundings, inhabits every sphere of our earth, and even extends into space. There are many examples to be found. Waste is plastic litter in the ocean, it is space debris, radiation from nuclear power plants, and traffic that we produce with our digital practices -- e.g. when we zoom, use e-mail or store data online. Waste is everywhere, ranging from visible to invisible matter(s), from long-lasting to ephemeral forms of waste, from local to global waste, from waste within our bodies and outside. Or rather: there is no outside of waste. So what can we learn from waste and waste practices?

Let's use a more-than-prominent case to exemplify the relationships, the dependencies and the power constellations that waste can open up: plastic waste. Plastic represents a material that is impossible to untie from the rise of Western commodity societies that emerged after WWII, in which consumer goods that were previously not affordable became affordable. Roland Barthes once characterized plastic as withholding the "idea of infinite transformation" (1957: 223). The materiality of plastic allows to form products of all sorts, a characteristic with enormous consequences for its use, re-use, storage and disposal. The infinite transformative capacity has resulted in plastic being present in all possible shapes and sizes, forms and formats, from colorful flashy kids toys, to outdoor clothing, food containers, drinking bottles and car tires. And as we learned more recently, small plastic particles of all sorts which remain invisible to the naked eye. Consequently, plastic has also become an uncanny material, with the promises of modernity broken, plastic objects of all sizes turn into (potentially) toxic matter which resides in air, water, soil and in literally every sphere on earth. Plastic has indeed made it to the limelight of attention as it occurs in (human) bodies and persists within these bodies as chemical components, e.g. flame retardants or plasticizers. Plastic waste is invisible and visible, ephemeral and persistent. It shifts its material status, forms alliances between different scales, and creates affectedness(es). It is valued according to multiple valuation regimes: e.g. it is a helpful material for cheap and affordable things; it is uncanny when it resides in human and more-than-human bodies; it is a living space when it becomes inhabited by marine species; it is enjoyable when it represents a toy or gift.

These multiple valuation regimes also offer insights into the different care regimes at stake. When taken as an object of study, waste and the complexities it generates create insights into intricate relationships, multi-dimensionality, valuation regimes, purity politics and innovative capacities that are set in place. Waste is inspirational in following human and more-than-human actors across places and spaces, investigating the times and tempos of matter, the infrastructures built that handle waste and the visible and invisible labour involved. Following this, waste is importantly never "out of place" but, as Liboiron rightfully argued – in reference to Mary Douglas work – always *in place* (2019); an in-placeness which can open up the power imbalances, colonial and postcolonial relationships, gendered politics, naturalized dichotomies and affectedness(es).

Long story short: this issue is dedicated to waste as a matter of concern. Authors in the STS Live Section have attended to waste as garbage incinerators and the relationality of emotions and knowledge that is created by burning waste and the resulting slag; waste as part and result of our social media practices and the innovative capacities of a solarpunk approach for social media; the intertwining and plastic waste and compost materials as a temporal relationship; the limits of plastic's plasticity and its (im)mutability with a glance on the Indian city Jajiwai, and the social, political and epistemic dimensions of plastic; and the regimes of waste making dependent on its origin such as household and municipal waste and how one can reflect one's own researching gaze when creating waste categories.

Relatedly, the Cherish not Perish section focusses on the upcoming book by Les Levidov entitled *Beyond Climate Fixes: From Public Controversy to System Change*, in which the author attends to waste treatment, as a case to critique techno-market fixes to climate change and advocates academic-activist co-production as a way towards systems change.

We also want to take this opportunity to announce some changes in the EASST Review team. We thank our editor and esteemed colleague Vincenzo Pavone who stepped down from his editorial role, for his work on the Review over the past years. Consequently, and as we are also nearing the end of our term as editors in the upcoming year, we are looking for new EASST Review editors to strengthen the team and you can find the call for applications in this edition. Contributions to the EASST community are more important than ever, considering today's societal challenges and the need to comment and moderate reflections on these, and we encourage everyone interested to apply.

The Spring 2023 issue of the EASST Review will host reflections on research cultures and research practices, not limited to but also focusing on our own discipline. We encourage STS scholars of all levels to engage in mindful, creative and constructive dialogues to reflect on how researchers live and work and how we imagine our work and research cultures to be and become.

But first: enjoy the end of 2022 and let's keep the intricate relationships of waste in mind when unwrapping gifts.

Sarah Schönbauer

On behalf of the Editorial team

STS LIVE

RENDERING WASTE (IN)VISIBLE THROUGH CATEGORIES: A REFLECTION OF MY VIEW ON WASTE.

Artemis Papadaki-Anastasopoulou

During my PhD research there was one piece of information that surprised me the most and led me to rethink the ways I understand waste. My work is focused on the material politics of plastics and how the European Union (EU) regulates these materials. This is my account of that encounter and a reflection on what it means for my work and for opening up directions on future work of STS on waste.

While reading the Discard Studies blog, I encountered this information: **in the United States, 3% of waste is Municipal Solid Waste and 97% is Industrial Solid Waste** (Liboiron, 2013). I was very surprised by these numbers and what they point to, even if as an STS PhD student I am trained to think twice about statistics. Since these numbers came from a North American context, I was curious to see what is reported in the EU.

“Municipal waste accounts for only about 10 % of total waste generated when compared with the data reported according to the Waste Statistics Regulation (tab env_wasgen). However, it has a very high political profile because of its complex character, due to its composition, its distribution among many sources of waste, and its link to consumption patterns.”
(Eurostat, 2021, my highlight)

In the EU, of all waste generated about 10% comes from municipal waste management. Please do not skip that number as just another statistic. Indeed, these numbers can be challenged in many ways from an STS perspective (and not only). There are big issues with what is counted, who counts, how things are counted and how it is reported back to the European Commission and other EU institutions. The waste categories themselves present a black box to be opened (as I will discuss at the end of this article). Therefore, I do not suggest taking these number in face value. However, I still believe that they point to something interesting and worth discussing if we think through that numbers. So, let's do that.

First, what is municipal waste? According to Eurostat:

“Municipal waste consists of waste collected by or on behalf of municipal authorities and disposed of through waste management systems. Municipal waste consists mainly of waste generated by households, although it also includes similar waste from sources such as shops, offices and public institutions.” (Eurostat, 2013)

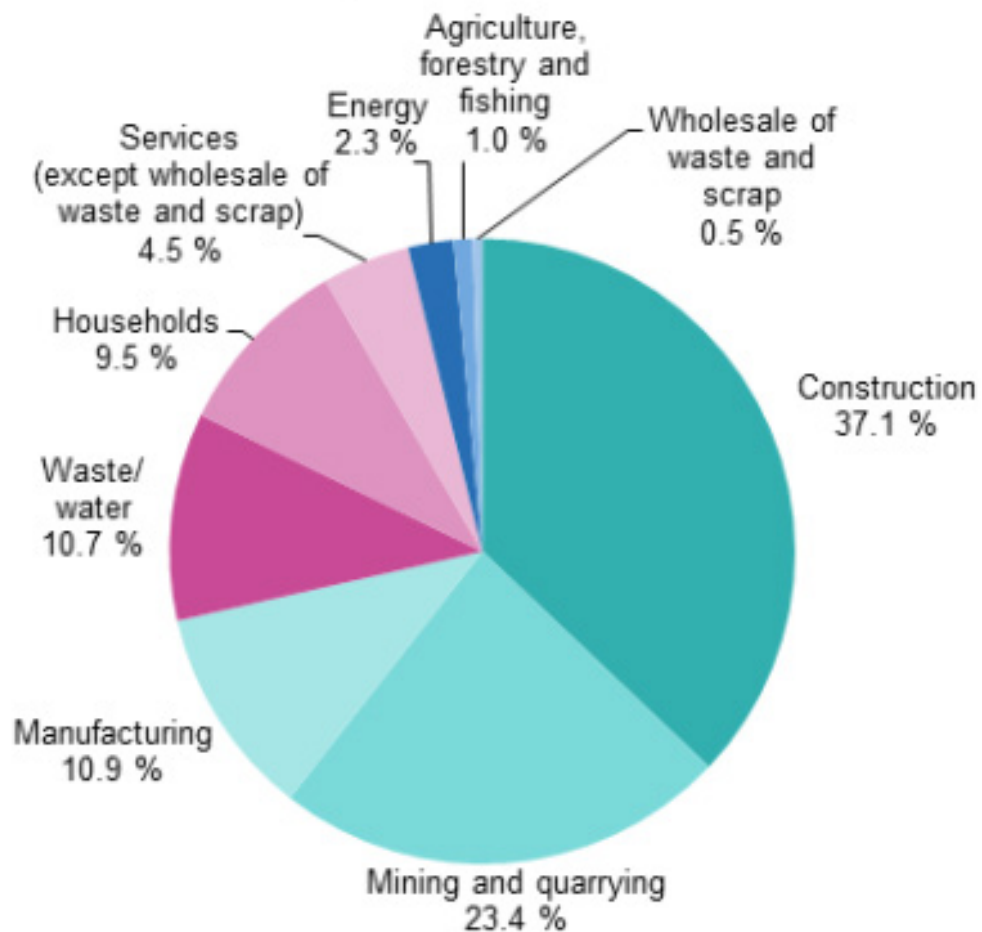
Municipal waste here is a large category that covers post-consumer waste. That means all waste that passed through our hands as consumers; all of what we touch and throw away in bins then collected by municipalities. It is the waste often targeted at campaigns on reducing waste, or of zero waste, or no more plastic waste. It is the category of waste that I have encountered most in my PhD work when discussing with stakeholders and reading on the regulation of plastics in the EU which set measures on banning single use plastic items from the market, minimum recycling contents in products, proper labelling, producer responsibility


schemes, and awareness raising campaigns. All of that is referring to municipal waste, representing about 10% of the total waste generated in the EU.

What I find interesting is how the above quote by Eurostat reporting that municipal waste is 10% of the total waste generated, is at the same time, a justification of why this category of waste is still significant. They state that even if *only* 10% of the total waste is municipal waste, this kind of waste has a *high political profile*. Eurostat's need to justify the political importance of municipal waste, in light of the statistic provided, points to a certain mainstream understanding which wants municipal waste to be the most significant and most discussed waste category. And therefore, reporting that municipal waste is *only* the 10% of the total waste demands that further justification. I am wondering how that 10% of municipal waste is more political than the kinds of waste making up the other 90%?

Figure 1: Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics#Waste_generation_excluding_major_mineral_waste (assessed 20.11.2022).

Waste generation by economic activities and households, EU, 2020 (% share of total waste)



Source: Eurostat (online data code: env_wasgen) **eurostat** 

According to the Eurostat pie chart shown above, waste generated by economic activities is the rest 90,5% of total waste generated.

Economic activities shown in the chart are mainly industrial processes. The 9.5% is all the household waste, all that goes through households (the major source of municipal waste). In my view, that 90.5% is not of a less 'political profile' than the rest, but certainly much less the focus of attention of political discussions.

To go back to the numbers and counting. I do not wish to uncritically assume that when something is less in percentage means it is also less in significance. These numbers are measuring waste in tonnes. It is the weight of waste counted. The multidimensional harms that waste can have cannot be reduced to such a measurement. There is chemical pollution for example which cannot be addressed in a simple dosage manner. The case of endocrine disruptors in plastics have challenged threshold ideas of pollution demonstrating how a small dosage can have indeed large effects (Liboiron, 2016). That means that for waste, less weight does not necessarily mean less harm. Waste and pollution are way more complicated than that and require situated and detailed empirical work to address such questions. I also do not want to argue that studying and doing research on household and municipal waste is less relevant or less significant because municipal waste represents a small fraction of the total waste in weight. However, I cannot fail to notice that there is a disproportionate focus on household waste normalised as 'the waste' which has significant material implications in (STS) research and beyond. In the words of Josh Lepawsky:

"It is crucial to notice this invisibility of waste. When our notion of what waste is and where it comes from is so strongly informed by what we think we know about waste because we have direct daily experience with it through the bins in our homes or the cans we put out on the curb, we have a very partial knowledge of waste. The partiality of that knowledge has practical consequences for how we might imagine solutions to waste problems" (Lepawsky. 2018: 14)

The reason I was shocked by the idea that less than 10% of waste is municipal waste in the EU, is because my view of waste was limited to household waste in a very subtle way (even if I was doing research involving plastic waste!). In fact, even now that I am aware that most of the waste, in weight, is not household waste, because of my practical material experiences it is so hard to even imagine these different kinds of waste in industrial settings. Is it that I did not know that industries create waste? No. Of course I knew that somehow. Nevertheless, my imaginary capacity to picture and grasp what these wastes are is *still* very limited. And that capacity of mine of course shapes the kinds of research questions I am keen on pursuing. It shapes my gaze on waste.

Concluding this writing, I believe that there is so much to be explored and gained from an STS perspective on waste, but I want to point to an area of personal interest: bureaucracy. I therefore want to echo Reno (2015) who calls ethnographers to look at waste management regimes and add that there is a lot to be gained from an STS focus on waste management and policies. In my work I have encountered how seemingly easy categories and definitions of objects, such as the plastic bag or single-use plastics, are so difficult to define in EU policy. These material categories become the focus of political debates and open up ways to explore socio-material relationships in contemporary societies. These categories and definitions are political, and they shape the world in materials terms (Bowker and Star, 1999). Unpacking waste categories and ways in which waste, not limited to municipal waste, are counted and defined in bureaucratic practices of waste management can help and contribute greatly to proposed solutions and envisioning better futures of life with materials, chemicals and waste.

BIBLIOGRAPHY

Bowker GC and Star SL (1999) *Sorting Things Out: Classification and its Consequences*. Cambridge, Mass: MIT Press.

Eurostat (2013) Glossary: Municipal waste. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Municipal_waste (accessed 20.11.2022).

Eurostat (2021) Municipal waste statistics. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Municipal_waste_statistics (accessed 20.11.2022).

Lepawsky J (2018) *Reassembling Rubbish : Worlding Electronic Waste*. Boston: MIT Press.

Liboiron M (2013) The Politics of Measurement: Per Capita Waste and Previous Sewage Contamination. In: *Discard Studies Blog*. 22 April. Available at: <https://discardstudies.com/2013/04/22/the-politics-of-measurement-per-capita-waste-and-previous-sewage-contamination/> (accessed 20.11.2022).

Liboiron M (2016) Redefining pollution and action: The matter of plastics. *Journal of Material Culture* 21(1): 87-110.

Reno J 2015. Waste and waste management. *Annual Review of Anthropology* 44:557-572.

Artemis Papadaki-Anastasopoulou was born in Athens, Greece and she is currently a PhD candidate at the Science and Technology Studies Department at the University of Vienna. She did a BA in Molecular Biology & Genetics, an MSc in Neuroscience and an MA in STS. Her PhD research is focused on EU policies on plastics with a focus on the Single-Use plastics Directive and its implementation in Greece. She is interested in materials and how they become the center of political debates and in policy practices including how local issues relate to EU policies from a south-east European perspective. She also loves the sea and her vegetable garden.



IN A SPECULATIVE MOOD: AFFECTIVE WASTE-KNOWLEDGE AND SLUGGISH SCIENCE PRACTICES

Kathrin Eitel

THIS ESSAY IS A THOUGHT EXPERIMENT ABOUT WASTE-KNOWLEDGE, AND TECHNOSCIENTIFIC KNOWLEDGE IN GENERAL: HOW IT IS AFFECTED, HOW IT AFFECTS UNINTENTIONALLY AND POTENTIALLY TOXICALLY, AND WHEN IT SHOULD BE OPEN TO BEING AFFECTED.

It is the speculative affirmation that things might be otherwise but will be otherwise only if we learn to cultivate the art of being affected by what we learn to listen to, and of thinking with – not about – what affects us. (Isabelle Stengers in an interview with Jensen and Thorsen, 2019: 18)

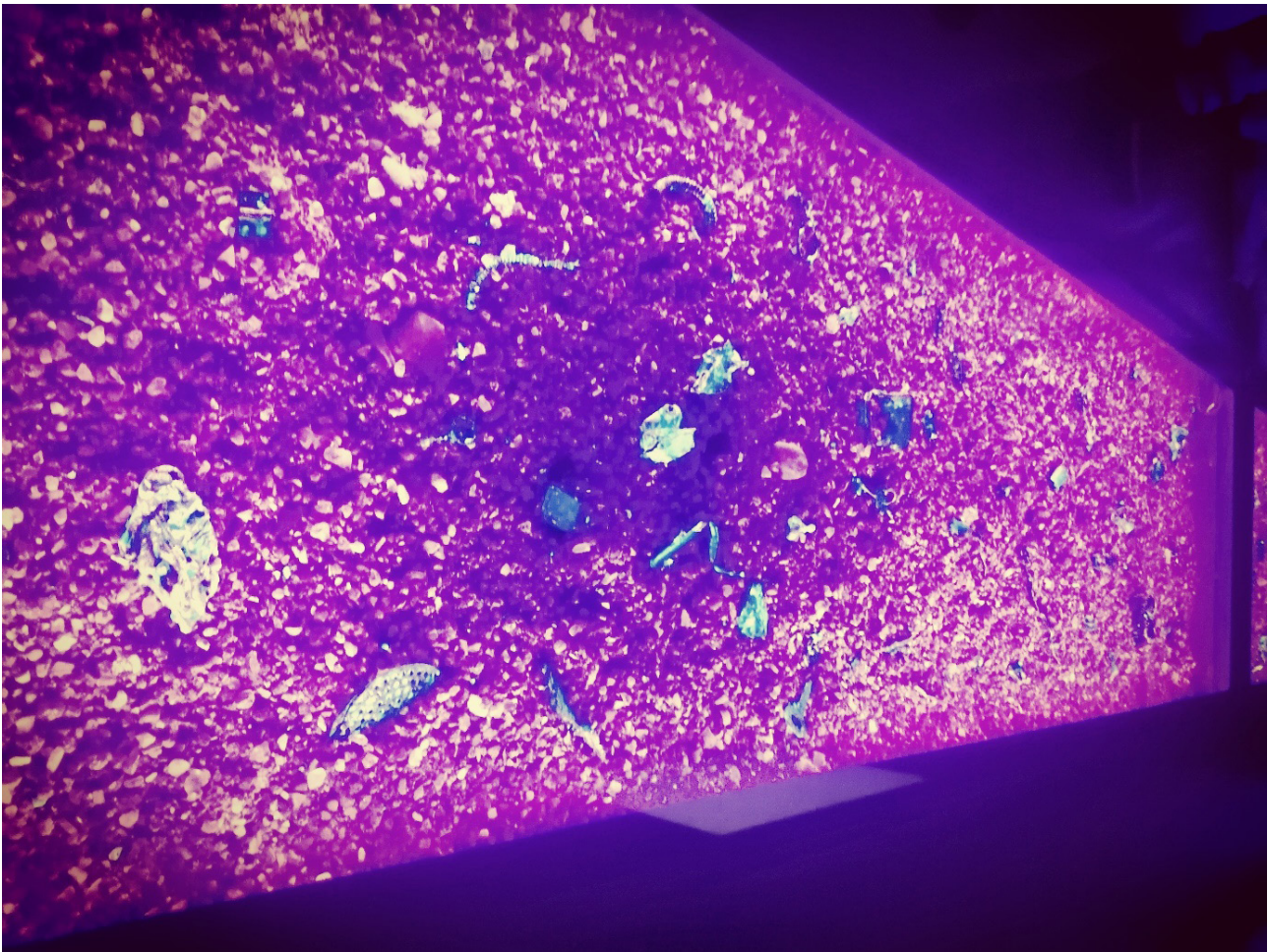
It is dark as we step into the room. With a soft click, Mrs Camoreggio (name changed), our tour guide through a waste-to-energy plant in Switzerland, switches on the lighting, indirectly illuminating the narrow corridor below, from where my students and I surge. Proudly, she presents us with what in technical jargon is called 'slag': a slimy substance that leaves the incinerator (at a temperature of more than 1,000 degrees) as a waste product in a process that converts garbage to district heating – a form of heat, by the way, that has become astonishingly desirable in times of climate change and skyrocketing gas prices. On its way, the slag gathers other materials that have proven incombustible. Then it cools down. Along with it cool potentially valuable materials, such as aluminium, copper, or zinc, which could not be decomposed by the fire.

Figure 1: Solidified slag, demonstrating a granular but uniformly grey mash.



Another soft click transforms the environment from one illuminated by a cool, clinical white light, to a pleasant pink glow. This immediately feels much more comfortable, and Mrs Camoreggio enthusiastically shows us the remaining aluminium, copper, and zinc, which now gracefully appear from the solidified slime by means of the black light. Suddenly, I have the feeling that I am listening to a success story, as Mrs Camoreggio explains to us how recent technological innovations, over the course of a few years, have made the extraction of these valuable materials possible. By adding toxic chemical substances, the materialisation process of the slag can be reversed. It becomes gooey again, enabling the materials' subsequent removal. It sounds like a journey into the past, where time is outwitted. I am wondering how years of experience of working with and giving tours in the waste-to-energy plant as a female (in a male-dominated world) has affected the knowledge that is conveyed to us. Or, in other words: how does ordinary knowledge, in the form of experiences accompanied by emotions, correlate with 'hard facts', facts that are considered scientifically proven and preferably detached from anything like feelings or personal experiences?

Figure 2: Black light reveals the metallic substances in the slag.



Affect is often described as the set of pre-individual bodily forces that are connected to autonomic responses (White, 2017: 178), and as a form of indirect and non-reflective thinking that establishes spaces for "thought in action" (Thrift, 2007). Affect denotes "visceral forces beneath, alongside, or generally *other than* conscious knowing, vital forces insisting beyond emotion" (Seigworth and Gregg, 2010: 1; emphasis i.o.). It is a capacity "to act and be acted upon" and resides in an "*in-between-ness*" (Seigworth and Gregg, 2010: 1; emphasis i.o.). It is above all sticky – it is "what sticks, or what sustains or preserves the connection between

ideas, value, and objects" (Ahmed, 2010: 29). The decisive aspect of affect is its omnipresence: it "hums with the background noise of obstinacies and promises, ruts and disorientations, intensities and resting points ... [and] stretches across real and imaginary social fields and sediments, linking some kind of everything" (Stewart, 2010: 340). However, affect is often stigmatised as being of minor importance – especially when it comes to the creation of an *otherwise* knowledge that could contest the fixed rationalities upon which scientific knowledge production relies. But affect does not stand-alone. It continuously becomes with. As Sara Ahmed (2010: 30) precisely describes, affect comes with the "messiness of the experimental, the unfolding of bodies into worlds, and the drama of contingency, how we are touched by what we are near".

[LEAKY EMOTIONS]

Given that it is in affect's nature to permeate, it may be said that all knowledge, including scientific rationality, is always affected. What waste-knowledge *is* – and when it becomes – is very much dependent upon authority structures, power hierarchies, and sociocultural understandings of dirt and purity that are, in turn, connected to hegemonic dichotomies, such as nature–culture, woman–man, worthless–valuable (or, to cluster these: 'nature = woman = emotion' versus 'culture = man = rationality/science'). At the same time, knowledge is always embedded and thus situated (Haraway, 1988), but the form that such knowledge takes is dependent on ontonormative forces that claim a prerogative of interpretation. Knowledge about waste thus becomes fixed in certain sociomaterial constellations. For instance, waste recycling programmes, waste reduction policies, and other regulations define what knowledge is and how it should be handled, and thus predetermine the relations within which 'knowledge hangs'. Based on the presupposition that waste is mainly considered either toxic for living beings, biospheres, and the whole planet, or valuable for the extraction of profitable second-hand natural resources, Science and Technology Studies-related studies could demonstrate other relationships that waste and pollution undergo, enacting even fruitful encounters with multispecies (i.e. in marine plastispheres) as well as with humans (i.e. as in the reclamation of waste for survival and emancipation). However, attitudes to waste and pollution generally have an emotive element. This linkage makes knowledge apperceptive and useful for quotidian navigation. What do you imagine when you think of waste? It is a leaky, maybe disgusting, but certainly smelly material that probably comes to mind; maybe the thought of it sends shivers down your spine, makes your face contort or your eyes jump to the next section of this contribution. What probably does not come to mind at first is the clean plastic recycle (pictured in Figure 3) that, in my experience, fills engineers with zestful enthusiasm.

Thus, knowledge about waste is always bound up with emotion. Yet, I would suggest that it is undesirable, unsustainable, and – waste being an affecting material *per se* – not at all feasible simply to brusquely dissect this linkage and to artificially exclude emotion from the epistemological production process. For example, the knowledge of how to deal with household rubbish is often associated with feelings of disgust – especially when it comes to organic waste – while the knowledge of how to avoid as much plastic as possible in everyday life, as with knowledge of technological 'innovations' in the recovery of valuable materials, can cause joy and euphoria. In this way, knowledge and power at once resonate in the kind of ordinary affects that Stewart (2007, 1) describes as "varied, surging capacities to affect and to be affected that give everyday life the quality of a continual motion of relations, scenes, contingencies, and emergences". These emotions catch people in something that feels like something. It feels like something and, I would add, *changes consciousness*. As a knowing-with, consciousness always comes with a knowledge of being in the world, with and through affective settings and situations, providing ways to navigate through quotidian life worlds.



Figure 3: Clean plastic pellets that are widely lauded by engineers as a victory for technology over undesirable waste.

While Mrs Camoreggio explains the tedious technical processes of the waste-to-energy plant – with its grey walls, crusty furnaces, and plentiful safety signs – I have to think about how the knowledge she is transmitting is obviously characterised by her many years of experience in this field, experience that goes far beyond, or rather, that is interwoven with, ‘pure’ scientific knowledge. It seems to have become affective knowledge, that is, a learned practice or skill resulting from the interplay between knowledge, emotion, and bodily experience; it is knowledge that is not considered ‘proper’ and that resides in the in-between-ness, it is difficult to grasp and often cannot be explained, but it strongly influences the way one responds to something.

Affective knowledge is, on the one hand, hardly discernible and often neglected (especially within frameworks of ontionormative epistemologies that are aligned with heteronormative dichotomies of male–female and scientific knowledge–ordinary knowledge) in technoscientific fields. On the other hand, it is embodied. It becomes visible through the in-between-ness of how we navigate truths, social realities, and life in general.

This also reminds me very much of the urban recycling infrastructures e.g. in countries of the Global South, where the so-called ‘informal’ sector maintains the cleanliness of entire cities through the labour of bodies that rely on deep experience within the material, social networks of these urban environments (e.g., Fredericks, 2018; Nguyen, 2019; Stamatopoulou-Robbins, 2020; Doherty, 2021; Eitel, 2022a). Or as AbdouMaliq Simone (2019: 8) describes it, it is the “rhythm of endurance” that characterises those settings in which people know “how to move and think through various angles” (Simone, 2019: 8; see also Lancione and Simone, 2021), and which, as Itty Abraham (2022) puts it, (postcolonial) global

technology studies need to consider. However sluggish an endeavour this may be, given the normativity of other forms of knowledge, it need to be taken into account in order to stop epistemic violences.

Knowledge may also be embodied indiscriminately, as through slow violence, that is, violence that harms bodies over an initially unforeseen time span and whose effects become visible only later (Davies, 2019; Nixon, 2013). An example might be the case of marginalised urban dwellers who have no choice other than to live close to dumping fields where toxic ashes and methane emissions harm humans and non-humans alike, both directly – from pollution on site – and indirectly through the acceleration of climate change. Here, the insight heavily inscribes itself into the body. This inscription comes to be through the processing of accumulated impressions and experiences of knowledge gained with regard to one's own social status, which are elucidated by spatial distribution and exclusion from relevant knowledge. In this way, affect in part defines and determines embodied forms of knowledge, and is dependent on scale. For instance, in the case of one person who 'breathes the crap' because they work in the landfill, and another who 'gets rid of the crap' because they get to live in a clean city, one form of knowledge will be preferred or heard, depending on the distribution of power and degree of social inclusion, while the other will be excluded, or near excluded, from the discourse. A kind of biopolitics that proceeds transversally and in rhythmic pulse may shift techniques of oppression towards a governing-through from somewhere other than top-down government procedure.

[SENTIMENTS AS A PASSAGE]

Seeing affective (waste) knowledge as something not bound to a person or a body in the physical sense but rather to technologies, such as waste regimes, reveals another political dimension of this discussion. Knowledge per se is always in need of a means of dissemination – something that transports it over seemingly disconnected fields of interest and areas of daily life. It is affect here, as what Seigworth and Gregg (2010: 1) describe as the "passage (and the duration of passage) of forces or intensities", that transports knowledge. Whether it be rendered as something scientific, emotional, or other-than-conscious, affect conserves knowledge by wrapping it up in emotional layers that provide a landing ground for adjacent thoughts and emotions. In this way, affect as "force or forces of encounter" is situated in an "*in-between-ness* and resides as accumulative *beside-ness*" (Seigworth and Gregg, 2010: 2, emphasis i.o.). As affect accumulates, "becoming a palimpsest of force-encounters" (Seigworth and Gregg, 2010: 2) or "moral sentiments" (Fassin, 2012: 1), it fixes an actor's (whether a body's or a technology's) belonging to the world as well as the world's belonging to the actor.

The idea that technological innovations based on specific scientific knowledge are perceived to have almost supernatural power is not novel. Contemporary STS research has focused extensively on how 'expertness' has become a welcome legitimisation for programmes and initiatives undertaken in accordance with the UN's Sustainable Development Goals, for example, and in the name of 'sustainability' or 'waste recycling'. In this way, the sustainability discourse, which complements the development discourse, has given rise to what Didier Fassin (2012: 1) aptly calls "moral sentiments". These exist nebulously around technologies and policy programmes that are dedicated to 'helping' the survival of our planet, engendering good feelings in those who act "morally correct".

Within the development discourse, moral fixes about the correct forms of waste recycling have been established over the course of many years (Eitel, 2022b). Manifested in 'waste regimes', accumulated affective knowledge has enabled the maintenance and distribution of irrefutable 'proper' technoscientific knowledge about how to deal with waste best that has developed alongside long-established ways of doing politics. Based on waste fantasies that envision a world in which

universal recycling and disposal strategies are easily implemented everywhere and anytime (despite local diversity 'on the ground'), knowledge and fuzzy sentiments alike are crucial players in the field (Eitel, 2022a). Waste regimes "consist of social institutions and conventions that not only determine what wastes are considered valuable but also regulate their production and distribution", as Zsuzsa Gille (2007, 2012: 29) points out. Moreover, they are based on a complex concatenation of prevailing (waste) knowledge that has solidified the continuous production of ontionormative epistemologies through repetitive and self-referential practices of 'standards', both inside and outside science, namely: measurement and computation, legibility, peer proof, replicability, and traceability (Knox, 2020; McKittrick, 2021).



Through the contingent interplay of the relationship between scientific–expert knowledge and technological fixes and innovations that produces transversally situated and temporally widely ramified waste regimes, power merely shifts from nation states to the transnational level, evading any real redistribution. Such 'new' regimes of sovereignty are just as intertwined with the production of identities and with patriarchally influenced ways of governing that draw clear lines of inclusion and exclusion, of what should and should not be preserved, and of what is or is not a matter of life or death (e.g., Mehrabi, 2020). Or, in other words, they are making agential cuts – as Karen Barad (2007, 2015) would put it. Technoscientific practices in this sense form, shape, and conceptualise our world through knowledge. This knowledge is often not visible and yet it is key to many phenomena that affect the planet unequally, such as climate change. It affects incessantly.

Figure 5: A control room in a disposal plant in Central Europe. A representative example of how waste and its disposal are made manageable through processes of calculation, measurement, and control.

While Mrs Camoreggio keeps explaining, I am thinking of how obvious it is that her knowledge is based on much more than 'pure' scientific knowledge. It is interwoven with affect. If sentiments are capable of guiding entire programmes and initiatives, as Fassin (2012) has demonstrated in the case of the development discourse, then how does the affective dimension apply to scientific knowledge and the architectures that keep it alive? As an organic technology that is also quite similar to the slag at the beginning, waste regimes seem to be stable and aloof. But ironically, they have much in common with the affectivity of accumulated emotions – that is, sentiments – on which they seem to rely, and which they toxically attempt to eliminate when it comes to 'expert knowledge' (understood as neutral, objective, and universal scientific knowledge that is representational and has nothing at all to do with affects).

[AFFECTIVE INVERSIONS THROUGH FEMINIST SPECULATIONS]

Feminist STS scholarship views scientific and technological practices and applications as intertwined and inseparable, and as productive of gendered relations of power that intersect with other power differentials and markers of identity. Gender and identity are, then, always a product of science and technology (Åsberg and Lykke, 2010). Studies undertaken from this feminist perspective also pay attention "to the ways in which the discursive and material aspects of sociotechnical relations and processes of materialization are inextricably intertwined" (Åsberg and Lykke, 2010: 299), something that Donna J. Haraway (1989) also calls "material-semiotic". In these material-semiotic processes that bring forth bodies, identities, and knowledge, emotionality seems to have only a deferred place, shelved in spheres from which common scientific methods are unable to extract data.

The acknowledgement of affective knowledge 'from the margins' – knowledge that is neglected by ontonormative and prevailing epistemologies and intellectual principles, and is considered 'unscientific' or merely 'emotional' vis-à-vis ordinary knowledge – is crucial for a truly global STS. I suggest everting this knowledge in order to grasp affect as it oscillates from suppressed, neglected, or marginalised corners of knowledge production, where it finds no entry into prevailing forms of knowledge that affect the practices of regimes and systems. This means everting knowledge as that which always comes with specific worldviews, values, and identities, for instance by way of integrating marginalised worldviews, i.e. through speculative storytelling – or, if you like, figurations. I suggest that *affective inversions* investigate how knowledge and its systems are based on affect and vice versa. Accordingly, I draw on Susan Leigh Star's and Geoffrey Bowker's (1999) concept of 'infrastructural inversion', which denotes a research strategy to closely examine the mundane (the functioning of infrastructures) by turning everything upside down, bringing inner life to the outside. A strategy of affective inversion implies first that *interventions* in affective knowledge can turn to the outside what is and what is not inscribed and emphasised. Second, it implies the *immersion* of content through feminist speculations. By taking seriously the reality-constituting power of tropes and narratives, feminist speculations reclaim interpretative sovereignty over classifications, identities, (future) realities, and the production of affective knowledge.

In the form of a situated art of crafting the world, speculations aim to contest discursive fixes, knowledge framings, and hegemonic positions. This could be 'SF', as Haraway (2016: 2) defines it: "science fiction, speculative fabulation, string figures, speculative feminism, science fact, so far". In this way, speculative feminism "gives its destabilizing power to the mostly proximate sense we may have of the possibility for things to be otherwise, what we may feel in the interstices of what presents itself as reality", as Isabelle Stengers points out (Jensen and Thorsen, 2019: 14). As the sub-plenary session on 'Techno-science-fictional futures: methods, forms, norms' at the 2022 EASST conference has exemplarily demonstrated

(Cozza et al., 2022), this call is already being answered by a growing number of STS-inspired scholars who base their speculative visions on ethnographic studies.

STS as a discipline¹ is well equipped to undertake experiments and interventions in its own areas of epistemological production, to be affected by other ways of knowing (waste and recycling) in its critical examination of North–South divides (Abraham, 2022), and to overcome seemingly fixed binaries of the conceptual and the empirical (Jensen, 2014). The study of waste from a (feminist) STS perspective is crucial here to understand that toxicity and pollution (understood in a broad sense) are more than environmental exposures and problems, but that they also affect epistemologies, other-knowledge, and bodies in a toxic and eventually violent way. I am not suggesting that our knowledge is waste, but that the way it is built on, ramified, and enacted is highly toxic both within and outside academia. Ultimately, I think that such interventions may provide a chance to become affected by the unquantifiable and the ephemeral, through an assault of that which seems at once chaotic and impressive.

Focusing on what leaks out of scientific practices in the Global North, and what STS can learn from affective approaches, new knowledge regimes, and other local, indigenous, and black epistemologies, brings me to the following call: STS and technoscientific practices need to come out of their sluggish vortex of imagination about sovereign knowledge. This is inherent to many academic institutions and is lived, whether in the in-house disciplines or in development policy projects, by transferring knowledge unilaterally (= *demystification of the imperative knowledge transfer*) as well as by training ‘experts’ who are then supposed to drive development in the Global South according to our knowledge benchmarks (= *decolonization of epistemic infrastructure*). As knowledge is wielded through transnational and transversally situated regimes (such as waste regimes), it is crucial to understand decolonialisation as an endeavour to dispossess power, to demystify the imperative of knowledge transfer, and to decolonise epistemic infrastructures. This is an incomplete list. I end this essay by conveying emotions that my generation know all too well: hope that what is expressed will have an impact, and fear of criticism and exclusion once the text is ‘out there’. These are emotions that too often go unspoken. They are emotions that trigger how we accomplish research, what we think is waste-knowledge, and what we consider to be valueless and a waste of knowledge.

¹ Commonly referred to as a research stream, STS has in my view acquired more and more features of a discipline, through the foundation of scientific associations; entire BA, MA, and PhD programmes that carry STS prominently in their titles and curricula; and through the foundation of STS departments.

BIBLIOGRAPHY

Abraham I (2022) Impermanence, hybridity, violence: Notes towards a Global Technology Studies. *Science, Technology and Society*. Epub ahead of print 26 June 2022. DOI: 10.1177/09717218221102596.

Ahmed S (2010) Happy objects. In: Gregg M and Seigworth GJ (eds) *The Affect Theory Reader*. Durham, NC: Duke University Press, pp. 29–51.

Åsberg C and Lykke N (2010) Feminist technoscience studies. *European Journal of Women's Studies* 17(4): 299–305.

Barad K (2007) *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Durham, NC: Duke University Press.

Barad K (2015) TransMaterialities: Trans*/Matter/Realities and queer political imaginings. *GLQ: A Journal of Lesbian and Gay Studies* 21(2–3): 387–422.

Bowker GC and Star SL (1999) *Sorting Things Out: Classification and its Consequences*. Cambridge, MA; London: The MIT Press.

Cozza M, Klimburg-Witjes N and Wyatt S (2022) First-ever poetry, flash fiction and short story competition... introducing the winners. *EASST Review* 42(2): 58–59.

Davies T (2019) Slow violence and toxic geographies: 'Out of sight' to whom? *Environment and Planning C: Politics and Space* 40(2): 409–427.

Doherty J (2021) *Waste Worlds: Inhabiting Kampala's Infrastructures of Disposability*. Oakland, CA: University of California Press. Eitel K (2022a) *Recycling Infrastructures in Cambodia: Circularity, Waste, and Urban Life in Phnom Penh*. London/New York: Routledge.

Eitel, Kathrin (2022a). *Recycling Infrastructures in Cambodia. Circularity, Waste, and Urban Life in Phnom Penh*. London/New York: Routledge.

Eitel K (2022b) Reshuffling Responsibility: Waste, Environmental Justice and Urban Citizenship in Cambodia. *Worldwide Waste: Journal of Interdisciplinary Studies* 5(1): 1–13.

Fassin D (2012) *Humanitarian Reason: A Moral History of the Present*. Berkeley, CA: University of California Press.

Fredericks R (2018) *Garbage Citizenship: Vital Infrastructures of Labor in Dakar, Senegal*. Durham, NC: Duke University Press.

Gille Z (2007) *From the Cult of Waste to the Trash Heap of History: The Politics of Waste in Socialist and Postsocialist Hungary*. Bloomington, IN: Indiana University Press.

Gille Z (2012) From risk to waste: Global food waste regimes. *The Sociological Review* 60(2): 27–46.

Haraway DJ (1989) *Primate Visions: Gender, Race, and Nature in the World of Modern Science*. Hoboken: Taylor and Francis.

Haraway DJ (2016) *Staying with the Trouble: Making Kin in the Chthulucene*. Durham, NC: Duke University Press.

Jensen CB (2014) Continuous variations: The conceptual and the empirical in STS. *Science, Technology, & Human Values* 39(2): 192–213.

Jensen CB and Thorsen LM (2019) Reclaiming imagination: Speculative SF as an art of consequences. An interview with Isabelle Stengers. *NatureCulture* 5. Available at: www.natcult.net/interviews/reclaiming-imagination-speculative-sf-as-an-art-of-consequences/ (accessed 7 December 2022).

Knox H (2020) *Thinking Like a Climate: Governing a City in Times of Environmental Change*. Durham, NC: Duke University Press.

- Lancione M and Simone A (2021) Dwelling in liminalities, thinking beyond inhabitation. *Environment and Planning D: Society and Space* 39(6): 969–975.
- McKittrick K (2021) *Dear Science and Other Stories*. Durham, NC: Duke University Press.
- Mehrabi T (2020) Queer ecologies of death in the lab: Rethinking waste, decomposition and death through a queerfeminist lens. *Australian Feminist Studies* 35(104): 138–154.
- Nguyen MTN (2018) *Waste and Wealth: An Ethnography of Labor, Value, and Morality in a Vietnamese Recycling Economy*. New York, NY; Oxford: Oxford University Press.
- Nixon R (2013) *Slow Violence and the Environmentalism of the Poor*. Cambridge, MA: Harvard University Press.
- Seigworth GJ and Gregg M (2010) An inventory of shimmers. In: Gregg M and Seigworth GJ (eds) *The Affect Theory Reader*. Durham, NC: Duke University Press, pp. 1–25.
- Simone A (2019) *Improvised Lives: Rhythms of Endurance in an Urban South*. Cambridge; Medford, MA: Polity Press.
- Stamatopoulou-Robbins S (2020) *Waste Siege: The Life of Infrastructure in Palestine*. Stanford, CA: Stanford University Press.
- Stewart K (2007) *Ordinary Affects*. Durham, NC: Duke University Press.
- Stewart K (2010) Worlding refrains. In: Gregg M and Seigworth GJ (eds) *The Affect Theory Reader*. Durham, NC: Duke University Press, pp. 339–353.
- Thrift NJ (2007) *Non-Representational Theory: Space, Politics, Affect*. London; New York, NY: Routledge.
- White D (2017) Affect: An Introduction. *Cultural Anthropology* 32(2): 175–80. <https://doi.org/10.14506/ca32.2.01>.

Kathrin Eitel is a cultural anthropologist and feminist STS scholar currently working at the Department of Social Anthropology and Cultural Studies at the University of Zurich. Her work focuses on urban resilience, technological megaprojects, and resource scarcity, mainly in Southeast Asia and Europe. Kathrin is currently very interested in the different forms anthropological knowledge can take and the impact collaborative and transdisciplinary projects can have on social inequalities, (post)colonial structures, and the effects of climate change. Twitter: @kathrin.eitel | Website: www.kathrineitel.com



COMPOSTING PLASTIC-PACKAGED FOOD WASTE: A NOTE ON CLASSIFICATIONS AND TEMPORALITIES.

Laura Bomm

The air is filled with a scent. A scent I know from walking past filled garbage containers. A sweet and rotten odour permeates my nostrils. Yet, there is another scent. Something woody and moist. Reminded of a walk in the woods, I see dozens of black birds flying above us. Their voices echo across the ground. And suddenly, their chatter is drowned out by a loud sound. “Beep, beep, beep” and we all know to carefully watch out. A green-orange truck rides backwards. Then, the truck stops. The beeping stops. Accompanied by a mechanical creak, its truck bed sets in motion. The loading flap opens. And what is tipped in front of our feet is a vibrant mixture of packaged and unpackaged fruits and vegetables. White, transparent, blue, and black plastic materials are enmeshed with wet halves of watermelons, white radishes, yellow banana peels, squashed tomatoes, ripped paprika, and other often undistinguishable food items. Challenged to make sense of this mixture in front of our feet, and yet amazed by its colour combinations, I took the picture below.

They can contain food, protect their quality against physical and biochemical changes, give space for marketing purposes, and provide convenience to users. The most widely used material for packaging food in Europe is plastics (Ellen MacArthur Foundation, 2017). “As packaging, plastic was configured as a container or barrier technology and also as profoundly mundane and unnoticed.” (Hawkins, 2018, p. 99). Often hidden in plain sight, plastic packaging materializes



© Laura Bomm

in various forms and shapes including plastic bottles, cups, nets, crates, boxes, wrappers, and bags. Enabling multipacks, small format packaging, pre-prepared food, and to-go goods, the faces of plastic packaging are manifold. In their socio-material entanglements, many actors know plastic packaging for increasing the durability and shelf life of food items. Slowing down the speed at which food becomes food waste, plastic packaging is a vital technological ingredient facilitating contemporary food and consumption cultures. However, whilst plastic packaging can postpone food degradation processes, it does not preserve food forever. Somewhen, plastic-packaged food also reaches a point in time when it becomes waste and flows into waste recovery streams. The fieldnotes and picture above record one of these waste recovery streams: a composting facility in Vienna. In 2019, I visited this facility as an interested citizen as well as a young STS scholar working on the role of plastics in society with a time-sensitive gaze (Title of dissertation: "(Re-)Thinking plastics with time: The role of temporal narratives for citizens' sensemaking of plastics"). And in turn, my EASST Review contribution consists of a short note regarding classifications and temporalities of composting plastic-packaged food waste, and how waste can be seen as a rich matter for a variety of different perspectives of Science and Technology Studies (STS) and other related disciplines.

Labelled as market waste, expired, exceeded shelf life, and unsellable, at Viennese markets, the guide of the composting facility tells us that several trucks with such food waste are brought to the composting facility each day. Only when food waste from the market is categorized as being too contaminated with plastics is its destination an incineration plant. Even though there are plastics (yet apparently not enough) enmeshed in the food remnants, this truckload reached the composting facility. It is a place with several different machines and a huge field with piles of composting matter, where food waste is turning into desired compost for many Viennese gardens and balconies. Thereby, food waste reaching the facility is not merely treated as waste, but also as a future resource. What is food waste today, can be a valuable matter tomorrow. Understanding that both food waste and plastic waste are matters that are open to change in categories, meaning that waste categories are not stable and dynamically change over time (Evans, 2014; Hawkins, 2018). Approaching food and plastic waste not fixed categories, speaks to the STS sensitivities that many EASST scholars pursue. Staying attentive to the transformative character of waste – including plastic-packaged food waste –, also invites scholars of STS to enrich understandings of how waste enacts and becomes enacted through socio-material relations as well as to unpack how these relations (de-)stabilize and shape how we live with waste today and in the future.

When standing in front of this truckload with a mixture of unpackaged and packaged food items, one of the first questions a visitor asked was how the food waste would be separated from the plastic waste. Visitors started to discursively categorize the truckload, using categories like still edible food, food waste, and plastic waste. What collectives of dumpster divers might have categorized as edible food items, other citizens, market sellers and employees at the composting facility categorize as food waste, as biological waste that can feed into waste recovery streams. This encounter did not only open up questions about the ontologies of waste, but also about the classifications of waste. At this composting facility, visitors classified the remnants of plastic packaging as "matter out of place" (Douglas, 2002, p. 36). Even more so, the plastics remnants were seen as matter that contaminates another waste category. In doing so, citizens raised concerns about how mixing categories of waste - or the "impurity of waste" (de Bercegol & Gowda, 2020, p. 171) would turn the valuable compost into an impure and contaminated resource. Thereby, waste becoming part of certain -yet regularly intertwined- categories are spheres where STS scholars can contribute with their sensitivities to better grasp how ordering practices and classification systems bring value and take away value from waste (Douglas, 2002). We are equipped

to dive into the underlying waters of how something becomes constructed and understood as waste and how waste can (be) turn(ed) into other categories. At the same time, STS sensitivities can sharpen our scholarly attention to who are the actors whose classification systems are (not) at play and whose ordering systems (do not) shape the handling of (waste) materials; whose classifications of waste matter; and frankly speaking, how these inform the future of humans' coexistence with (waste) materials.

At the composting facility, the guide explained that plastic packaging is not separated from food waste. Instead, the mixture from the truckload is shredded and then amassed onto long compost piles. We were shown piles of compost in different degradation stages. These compost piles with plastic-packaged food waste were interesting from an STS perspective, as they made very tangible some of the materializing intertwinements between material and temporal processes (Bensaude-Vincent, 2018; Hawkins, 2018). To be more explicit, over weeks, microbes nourished on the food fibres and juices. Food waste materials became one with the lifecycles of detritus feeders, with fungi, and other microorganisms. Over the timeframe of a few weeks, biological decay and degradation turned food waste into organic matter. Instead, food waste had turned into compost. Consequently, food waste was not recognized as such anymore. Whilst being exposed to the same timeframe left for degradation in the composting piles, shredded plastic packaging was still sitting between the organic matter. Through the durable characteristic of plastic materials, the plastic remnants and microplastics did not magically vanish in the given timeframe, but persisted. Different timescales of existence, different trajectories, different synchronies and rhythms of nature, and different persistence and durabilities are just some of the temporalities we can encounter when glimpsing at practices of composting plastic-packaged food waste. Thus, it becomes tangible that plastic-packaged food waste - like other matters of waste - is enmeshed with different dimensions of temporalities. How different dimensions of temporalities orchestrate our lives with waste, how temporalities contribute to informing our practices and consumption (paces), how temporalities of certain infrastructures contribute to the (un)making of waste, and how care for (future) waste unfolds are just some of the questions provoked by the tight entanglement between time and waste. The book by Allon, Barcan, and Eddison-Cogan (2020) with interdisciplinary contributions is an interesting glimpse at the diversity of scholarly engagement with the manifold relationships between time and waste.

The persisting plastic particles in the compost piles were accompanied by visitors' worries for and concerns about future human health, especially when soil - a space where food is grown - would contain potentially toxic plastic-related chemicals. This is interesting from an STS sensitivity as it exemplifies how the future of distant others is colonized (Giddens, 1991) by our contemporary practices of composting plastics-packaged food waste. With waste from materials like plastics exceeding human lifetimes and existing in deep time, their impacts on human and environmental health have not yet materialized or are not yet fully detectable (Gray-Cosgrove, Liboiron, & Lepawsky, 2015). Even though knowledge on plastic-related impacts yet limit what we can see of plastic waste and its potential impacts (as it is also restricted by our own, short existence in relation to deep time), people's worries around the future of plastic waste already reached the present day. Pulling potential future consequences of socio-technical phenomena - such of plastics and their accompanying waste and substances - into a closer temporal reach brings into "question [...] our responsibilities toward future generations", but also allows socio-scientific investigation to uncover "condition of structural irresponsibility" (Adam & Groves, 2011, p. 17). In this sense, the manifold spheres of waste (temporal and otherwise) invite STS scholars and related disciplines to enrich understandings about the making of our societal futures with waste and unravel how responsibilities around these remnants of progress and innovations are distributed.

BIBLIOGRAPHY

- Adam, B., & Groves, C. (2011). Futures tended: Care and future-oriented responsibility. *Bulletin of Science, Technology & Society*, 31(1), 17-27.
- Allon, F., Barcan, R., & Eddison-Cogan, K. (2020). *The Temporalities of Waste: Out of Sight, Out of Time*: Routledge.
- Bensaude-Vincent, B. (2018). Of Times and Things. Technology and Durability. In *French Philosophy of Technology* (pp. 279-298): Springer.
- de Bercegol, R., & Gowda, S. (2020). Waste in the urban margins: The example of Delhi's waste pickers. In *Living in the Margins in Mainland China, Hong Kong and India* (pp. 153-175): Routledge.
- Douglas, M. (2002). *Purity and danger: An analysis of concepts of pollution and taboo*. London: Routledge.
- Ellen MacArthur Foundation. (2017). Beyond plastic waste. In (Vol. 358): American Association for the Advancement of Science.
- Evans, D. (2014). *Food Waste: Home Consumption, Material Culture and Everyday Life*. London: Bloomsbury Academics.
- Giddens, A. (1991). *Modernity and self-identity: Self and society in the late modern age*: Stanford University Press.
- Gray-Cosgrove, C., Liboiron, M., & Lepawsky, J. (2015). The challenges of temporality to depollution & remediation. *Surveys and Perspectives Integrating Environment and Society*(8.1).
- Hawkins, G. (2018). Plastic and presentism: the time of disposability. *Journal of Contemporary Archaeology*, 5(1), 91-102.

Laura Bomm is a PhD candidate at the Department of Science and Technology Studies and the PLENTY plastics research platform (Vienna University). With her interdisciplinary background in Forest- and Nature Conservation (BSc) and Health, Communication, and Life Sciences (MSc), her research interests gravitate around issues and phenomena situated at the crossroads of society and the environment.

She is currently finalizing her PhD dissertation titled "(Re-)Thinking plastics with time: The role of temporal narratives for citizens' sensemaking of plastics". In doing so, Laura unravels in which ways different temporalities and temporal features matter for how problems with plastics are constructed and understood, how certain plastic artefacts are legitimized over others, how responsibility towards practices with plastics is distributed, and how (non-)actions and solutions are imagined for challenging society's relationship with plastics now and in the future.

With her interest in plastics and participatory methods, Laura recently developed the discussion game called "Unser Leben mit Plastik" ("Our live with plastics") for the Viennese ScienceCenter-Netzwerk. Inspired by a citizen engagement method that she developed together with colleagues earlier in her PhD, Laura's game will accompany the Ocean Eye Escape Box about marine microplastics on its journey through Austria.



THE ENVIRONMENTAL FOOTPRINT OF SOCIAL MEDIA HOSTING: TINKERING WITH MASTODON

Stefan Laser, Anne Pasek, Estrid Sørensen, Mél Hogan, Mace Ojala, Jens Fehrenbacher, Maximilian Gregor Hepach, Leman Çelik, Koushik Ravi Kumar

“Wondering if it is possible to calculate [the] #environmental #carbon footprint per user of the bird app vs Mastodon.” / “Does anyone know if ... the fediverse is ... less computationally heavy ... than the regularverse...?” – These two questions, posted on Mastodon and Twitter on the same day, sparked an international discussion about hosting social media differently. What began as a chain of threads transformed into a collective research experiment mediated by a Zoom meeting. This text collects some of the early reflections of that project. What does it mean to host a social media platform that is attentive to ecological concerns? We start from the premise that mainstream social media platforms like Twitter have to hunt profits by building resource-intensive advertising machines. Hosting “the bird site” (aka. Twitter) wastes energy and calls for a quick turnover of electronic hardware while naturalizing social relations that put individuals as consumers at the center of attention. Presuming the platform will survive, the waste of resources will continue amid concerns of global advertising partners under the new leadership of Elon Musk. We argue that hosting an instance of Mastodon on your own server helps directly to address wasting practices regarding electricity, labor, and attention. An alternative, decentralized platform is not an unproblematic savior – yet it allows for grappling with **how** to waste. Accordingly, we attempt to orient our social media practices towards resourcefulness and the sun.

A growing body of literature on waste and discard studies has crafted a powerful critique of waste management and politics (Callén and Sánchez Criado 2015; Liboiron and Lepawsky 2022; Gille and Lepawsky 2022; Ek and Johansson 2020). In today’s dominant waste regime, waste is naturalized as a burden of individual consumers while focusing on the end-of-pipe of consumer waste. The largest share of most waste materials, however, is generated during the production process and due to the reliance on fossil-fuelled power grids (Stoekl 2007). For digital technologies, with their dependence on highly-processed mineral and metallic components, mining wastes can still be several orders of magnitude larger (Lepawsky 2018). Therefore, it’s increasingly clear to our eyes that economic structures that stabilize excessive consumption, extraction, and energy-intensive practices must be challenged and abolished.

The example of electronic waste is a compelling one. Citizens of the world witness an ever-growing pile of hazardous materials and a complex stream of discarded electronics that are insufficiently addressed by sophisticated, yet shallow e-waste management policies (Lepawsky 2018). Faith in redemptive approaches or technology that purports to eradicate waste and adhere to an ideal of pure nature is also problematic. “Zero waste” and “net zero” are nicely packaged advertising (MacBride 2011), “greenwashing.” Not only will they not work, but in the quest for purity, impossible hopes are expressed, and harmful ideologies creep into material politics (Shotwell 2016; Balayannis and Garnett 2020). Yet it makes sense to think beyond the material streams of matter. Waste, here, can also mean emotional waste, time lost on apps, and the loss of commitment to communities that crumble when nourishing infrastructure is disrupted.

The waste generated by the digital media we consume is rendered invisible through the cloud metaphor. As J. R. Carpenter (2016) has argued, amongst many others, the “language of The Cloud is a barrier” to grappling with the actual material costs and impacts of internet infrastructures. While in the past, the

so-called Twitter ‘fail whale’ (an icon that appeared during service outages) used to at least be a proxy for Twitter’s buckling infrastructure, present-day usage is generally without interruption. Or, rather, interruptions are harder to notice. We argue that the seamlessness of the user experience is illusionary, as it covers violent infrastructural practices of material extraction at the very foundation of technological infrastructure and its sustained maintenance.

Against this backdrop, we approach the problem of the environmental footprint of social media with some caution. We want to discuss ways to waste differently: by reflecting material investments on the infrastructural level, and looking for ways to make material entanglements transparent and ethically addressable.

The sudden influx of new Mastodon users in November 2022 has challenged the limits of Mastodon’s federated infrastructure. Mastodon now has roughly 8M users logging in through more than 10k servers. A month ago, it was a fraction of this. Following this increase in users, these have to be patient, as text and other media flow more slowly through the network. However, where Twitter users were only ever able to wait out outages, Mastodon users can balance the load on the infrastructure by creating new servers/instances for themselves, reminiscent of principles of peer-to-peer networking. In this process, novices to hosting web services have to face the material and elemental aspects of social media: as user numbers increase, so do the storage requirements and operating costs. With an economic model that is independent of online advertisement, those costs fall on system administrators and become visible when they request donations from users.

The occasion presents an opportunity to reflect on the waste we generate online and to imagine social media otherwise. It shows that there are costs to running services online, and that without advertisement-reliant economic models, those costs fall on system administrators and their supporters.

We are a group that has started to meet through virtual means and builds on local ties in Europe and Canada. Our expertise is spread across media studies and science and technology studies. While many of us were active users of “the bird site,” we all started to tinker with Mastodon after the controversial acquisition and dramatic reconfiguration of Twitter by billionaire businessman Elon Musk in late 2022.

The discussions on social media (fig. 1) were followed up on Zoom and are moderated by Stefan. We document our discussions with the help of Etherpad.

Our conversations have proceeded, in part, out of a shared sense of urgency (and we recognize that repeated manufacture of a shared sense of urgency is a key operation logic of social media, and a source of its toxicity). Instead of debating the digital public sphere or digital climate emissions as an abstract or remote research question, we are moved by an ethical and practical need to both secure a digital forum for intellectual exchange and social connection and respond to the ongoing climate crisis. Twitter’s apparent meltdown, in other words, is an environmental and interpersonal matter. What seemed solid is now a ruin.

BUILDING SHARED FORA ON RUINS

With 436 million active users, Twitter is one of the biggest social networks, yet small compared to YouTube (2.5 billion) or Facebook (2.9 billion, Statista). Calling it a ‘public sphere’ is thus to overstate many possible meanings of the word ‘public.’ Still, it is a politically relevant forum in which opinions are formed and developed, and it has become a good way for academics to network internationally. At their best, Twitter conversations and contacts have proven to be excellent sources for quickly spreading research results and insights as well as for intellectual and career networking, news about academia, recommendations and references for research projects and teaching, and calling out misconduct, inviting to conferences and other events, and collegial goodwill and camaraderie. For those of us who teach in smaller universities, and in smaller research fields for whom the closest

Figure 1: Discussing environmental footprint on social media: Mastodon (left) and Twitter (right). Screenshots by Stefan Laser

Mél Hogan @mel_hogan@mstdn.ca
@mel_hogan

Question: does anyone know if (and how) the fediverse is (theoretically or materially) less computationally heavy (less polluting/energy intensive) than the ...regularverse (ie whatever we were all using before the weekend)?

2:52 AM · Nov 8, 2022 · TweetDeck

5 Retweets 19 Likes



Tweet your reply

Reply

stefan laser @stefan_laser_ · Nov 8
Replying to @mel_hogan

Had the same question, I'm quite certain that it is less heavy than Twitter, for the reasons mentioned by others. Besides, there is the option to have instances hosted by renewables; green data centres, if that makes sense. There is at least one explicitly green instance.



Luke Munn @lukemunn · Nov 8
Replying to @mel_hogan

Actually tricky AFAIK because 2 things to hold in tension at once 1) hyperscale data centers of Big Tech are massively energy intensive and polluting b/c of scale 2) moving apps/services to cloud can unlock efficiencies not available with on-prem bespoke hosting solutions.



Mél Hogan @mel_hogan@mstdn.ca @mel_hogan · Nov 8
Replying to @lukemunn

Thanks! That's what I'm wondering... We've scaled down but are less efficient bc of that scaling down? Anyway, it's interesting to think about beyond the current moment, like - where are we headed with this? I know the current moment (this weekend) is just a drop in the bucket...



Show replies

chr15 @chr15_eatOn · Nov 8
Replying to @mel_hogan and @tamigraph

not an expert but theoretically Twitter has net zero commitments with solid renewable energy sourcing:

blog.twitter.com/en_us/topics/c...

and the fediverse is more likely to come from the general grid which is more likely fossil fueled.

@garyacook might know

Tweet



blog.twitter.com
Accelerating our climate commitments on Earth Day
Read more about Twitter's sustainability commitments.

elena razlogova
@erazlogo@assemblag.es

Wondering if it is possible to calculate #environmental #carbon footprint per user of the bird app vs Mastodon. Given that one is #ai-driven and the other is not there should be a difference in Mastodon's favor, no?

7. November 2022 um 19:24

Andy K S @akstuhl@assemblag.es
@erazlogo There's gotta be, especially if you don't count advertisers as users! My pretty uninformed guess is that twitter's content delivery network - with redundancy and transcoding to optimize ad loading speeds - would be it's biggest energy eater.

christina d'ache @inquineline@mastodon.social
@akstuhl @erazlogo I'd love to know more about this too, maybe @Aepasek has thoughts

Anne Pasek @Aepasek@scholar.social
@inquineline @akstuhl @erazlogo I don't think we have the data transparency to clearly determine anything empirically, unfortunately. There'd also be some real economies of scale going in the favour of Twitter, to be fair, but I also suspect that being ad free would cinch it. Ad delivery is such a baroque thing.

christina d'ache @inquineline@mastodon.social
@Aepasek @akstuhl @erazlogo interesting - thank you

elena razlogova @erazlogo@assemblag.es
@Aepasek @inquineline @akstuhl Thank you! On the bird site @mel_hogan got pretty much the same answers on cloud efficiencies vs ads and adv/timeline algorithms. It would be great if M instances could collaborate with community-oriented green energy projects as @dawnnafus @Melf and @stefanlaser suggest. could offset growth of the #fediverse

Anne Pasek @Aepasek@scholar.social
@erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus @Melf @stefanlaser I've long contemplated doing an instance on a backyard solar-powered raspberry pi! (Though my enthusiasm for the infrastructure part is not matched with an equal passion for content moderating).

Maximilian Hepach @maximilian@zirk.us
@Aepasek @erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus @Melf @stefanlaser that would be fantastic! Something like: <https://solar.lowtechmagazine.com/>



Anne Pasek @Aepasek@scholar.social
@maximilian @erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus @Melf @stefanlaser yeah! I'm a steward with <http://solarprotocol.net> so we do have the materials part somewhat sorted...

Melf @Melf@morden.social
@Aepasek @maximilian @erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus @stefanlaser oh that's cool. Are there any initiatives supplying servers with wind energy in a similar fashion?

Anne Pasek @Aepasek@scholar.social
@Melf @maximilian @erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus @stefanlaser Not that I'm aware of. Wind is a lot harder to scale down, whereas solar is as effective however you divide it because of cell modularity.

That said, I do love the poetic idea of a community windmill server where you take your discourse to get ground into grain...

stefan_laser @stefanlaser@social.tchncs.de
@Aepasek @Melf @maximilian @erazlogo @inquineline @akstuhl @mel_hogan @dawnnafus Oh that sounds fantastic. On a more reflexive note, are you folks interested in an online workshop about the establishment of such instances and the politics of data centres?

I work in a new research centre on virtual worlds, in a project that explores the entanglement of knowledge production and planetary resources using data centres as an example. We have resources and people at our disposal to do things. #sts

collaborators and peers are often far away, and especially amid the interruptions to conference routines during the COVID-19 pandemic, the platform has become a meaningful way to maintain connections with distant and more diverse voices. This seems to be especially true for our colleagues of color (Okoye VO 2021). Additionally, as researchers look for lower-carbon alternatives to academic air travel, the platform has played a role in alternative forums for research exchange (DIY Methods 2022 Proceedings 2022).

It is anything but obvious that Mastodon can, will, or ought to provide a replacement for all these uses. For a start, let us take one step back. What kind of social media are we talking about here?

Mastodon is named after a long-extinct mammal species; the leading developer and creator Eugen Rochko admits that naming is not his strong point (see also Wray 2017 about mythologization, valorization and de-extinction of necrofauna). Mastodon has been around since 2016 and was created as an antagonistic alternative to Twitter during earlier platform anxiety (Zulli et al. 2020).

Mastodon differs from commercial social media in four ways. First, Mastodon is not centrally organized. Instead, it takes the form of decentralized, free, open-source software (licensed through the GNU Affero General Public License 3.0) that anyone can host on a server. This creates a local microblogging ‘instance’, which may, in turn, federate with other instances. It is part of a larger universe or “fediverse” of other media (e.g., alternatives to YouTube or Instagram like PeerTube and Pixelfed) that communicate via the W3C open protocol ActivityPub (2017). Second, there is no algorithm to push engagement but only feeds and lists organized by time, like on early Twitter. The algorithms at hand are only used for certain services, like transitioning between servers without losing followers. Third, instead of relying on algorithmic power and machine learning magic, Mastodon developers have invested energy in crafting content moderation tools, various options to block harmful users and entire instances, and implemented gadgets such as content warning options that improve the user experience. Both, the tools and their genealogy matter. Scrolling through GitHub history and considering critical discussions on Mastodon, we learned that these tools grew out of community protests pushed by queer folks, protests partly against the main developer who does not always acknowledge critical input (see Jon Pincus (2022) partial history of Mastodon). Lastly, Mastodon is ad-free. The software development and individual instances are supported by funding and volunteer labor. Notwithstanding these four differences, for end-users, Mastodon is functionally and practically a drop-in replacement of familiar and hegemonic social media services; the exciting difference is precisely in the ownership and governance of the infrastructure.

As a result of the decentralized approach, there is a slightly higher barrier to join the network. There are new and diverse social norms and patchier outcomes for up- and response times. Like Twitter, users curate a network of friends and microblogged content within instances and broader “federated” servers (Zulli et al. 2020). What is absent on Mastodon is the ability to quote Tweet content and algorithmically organized news feeds, and so far, there is limited virality to it.

Technical properties have social consequences. In this sense, the development of Mastodon is an exciting live experiment. Per Winner (1980; for a classic critique, see Woolgar 1991), the platform is more compatible with certain kinds of social relations and not others – less clout chasing, a greater culture of image descriptions and consent, etc. Mastodon is classified as an “alternative social media” (Zulli et al. 2020) because it takes core features of platforms such as Twitter and Reddit and applies them in a non-profit-oriented way, with the result that niche communities are nurtured, content moderation can be distributed and adapted depending on the community, and, via independent and open code development, server operators are given additional design freedom to go their own way beyond the main code (for example, via their own “forkes” in which longer posts are allowed or certain features are added).

The key point for our experiment is that the decentralized approach relies on users choosing a server to log in to; there is more than one place to go. At the level of user experience, this is intentional friction, a “seamful design” (Weiser 1994; Chalmers et al 2003). Anyone with the competencies, resources and infrastructure can run a server: companies and nonprofits, individuals and communities. Using existing hosting packages and containers, both peace lovers and war makers can set up a Mastodon instance based on online instructions. Yet how it will unfold from there on will vary. This is precisely what we as STS and (e-)waste scholars are interested in.

A challenge for social media infrastructure is handling the quick and unpredictable changes in traffic. Scalability is the “value proposal” of cloud computing (Fehling et al. 2014). For example, we can predict bursts during sports events and elections. Yet, bursts also happen during environmental catastrophes, political protests and upheaval, content or influenza going viral, military attacks, etc. This cannot be foreseen. But platforms must calculate with this, and they regularly fail. For instance, although Twitter has based its service on combinations of cloud and data center solutions, and on controlling backbone and edge traffic (Hashemi 2017). It has a hidden history of outages during traffic bursts, in 2022 alone going down in January, March, July, and September (<https://www.datacenterdynamics.com/en/news/twitter-musk-layoffs-outages-server-overheat/>).

On the one hand, it is questionable if a decentralized network such as Mastodon – both in terms of technology and staff infrastructure – can ensure continuous service. On the other hand, outages that make it impossible to traffic masses of panic posts may also be an advantage to healthier public debate and quality time online. We may revise our social media-shaped desires to be online and continuously produce and consume information. These networks are shaped and challenged by use. In return, the user experience is shaped and challenged by the viability, sustainability, and resilience of its infrastructure (and what that infrastructure relies on – like electricity and water.)

We started our online exchange with the question of whether Twitter consumes more energy and has a greater hunger for powerful and up-to-date hardware and to what extent the centralized servers and data centers partially offset this through energy efficiencies. One interlocutor used the Mastodon thread to hint at a comparison of Zoom/Microsoft Teams vs. Big Blue Button, a comparison of a commercial vs. an open system, and emphasizes the benefits of the open system. Unfortunately, there are no figures available on the energy consumption of Twitter. Absent such studies, we can only assume that the dependence on advertising and machine learning demands significantly outweighs the economics of scale on the commercial platform. So there has to be a surplus. Crucially, we do not trust claims of net zero emissions, especially considering the considerable savings Elon Musk wants to make on data centers.

Critical data center studies (Hogan et al. 2022) show that energy consumption is closely related to waste practices. The drive for ever-higher efficiency in data center management leads to the rapid replacement of hardware. In contrast, embodied carbon emissions and e-waste are largely ignored, i.e., not included in the calculation of standardized ratios of the industry. In addition, there is a strong separation of hardware and software so that operators do not ask how the need for targeted and nudge-oriented advertising (often powered by machine learning) drives up energy and computing requirements. Beyond this central focus on industrial practices, wasteful routines of users also emerge, such as dialing into mobile internet networks or producing high-resolution screens. It is important to emphasize that the consequences of such waste practices are not equally distributed but are borne in particular in the global South and by minorities (Laser/Schlitz 2019). By engaging with Mastodon, we argue that infrastructures can be re-arranged and managed differently.

What kinds of worlds are not probable but *possible* from the ruins of Twitter? Mastodon might not be the next big thing. Yet it is an exciting network that many people are experimenting with and, for STS scholars, offers entry points to learn through practical engagement. Perhaps more important than Mastodon per se is the idea of *othernets* (Dourish 2017 chapter 7); the internet we have is not a necessity, and might take a very different shape and feel different based on new collectivities. If Mastodon has a less devastating impact on the environment, what else about our internet can we change, or make a case for changing?

TOWARDS A SUNNIER SOCIAL MEDIA

As open-source software, Mastodon lends itself to more-than-software-based experimentation. Our collective is interested in grappling with the practicalities and wasting practices of hosting Mastodon instances through solar energy; we desire a solarpunk Internet! This way, we follow an elemental approach orbiting around the sun. It is, in the words of Brain, Nathanson, and Piantella (2022), a form of energy-centred design that follows protocols and forms of 'natural intelligence' instead of ad-tech algorithms.

In practice, this would mean building, configuring, and maintaining servers on energy-efficient computers (such as Raspberry Pis) and an off-grid solar photovoltaic energy system. We plan to pilot this idea in Canada and Germany, creating a network that stores and serves data through the Mastodon software differently based on where the sun is shining (and, perhaps, powers down entirely in periods of darkness and inclement weather). This low-carbon method (Pasek and Piantella; Pasek 2020; see also Landa 2021; Landa and Riggelsen Gjørding 2021) would allow us to measure data flows, energy consumption and production, and relate them to user interactions and weather conditions. In this way, we can address our lack of knowledge about the energy consumption of social media by generating statistics ourselves, which can become the basis for discussions. Furthermore, this setup allows experimenting with ways of disclosure: Besides the documentation in texts like this one, a Mastodon bot is planned that feeds the data that the Raspberry Pi server digs up back into the discussion on Mastodon.

What is exciting and almost poetic about solar energy is that the energetic constraints affect the engagement of users in very different ways than the advertising-induced triggers of the commercial alternative: when the sun goes down, server's power decreases and—depending on battery strength and activity—may go offline, resulting in environmentally-determined periods of rest. Situating matters. But it is strange. We noted that since the early days of homepages, many internet consumers could not or did not have to imagine themselves as server hosts until now, and indeed were alienated from this idea. Here, too, there is a rich ethical resource for reflection and alternative world-making. Last but not least, note that our group consists of scholars from both Europe and Canada. Due to the time-space difference of almost half a day, it took negotiation to find a slot for a teleconference. But for hosting social media through solar renewable energy, it is all the more exciting that we are in entirely different places rotating around the sun and receiving its radiation.

This is actual work in progress. The question of costs and how we relate our system to administrators will accompany us, as will the question of where and in what form we want to tap and store energy – if we wish to store it at all. For example, in Germany, this has to do with regulatory and aesthetic matters: at the campus in the Ruhr area, we have to maneuver the heritage protection of the historical campus, which is not immediately compatible with setting up solar panels outside our office windows.

Our research interests, desires, and practice, therefore, bring us to a very different set of scales, challenges, and responsive behaviors than those germane to Twitter. As a form of critical making (Ratto 2011), however, the project prototypes

and prefigures many interesting dynamics with great potential to yield insights into the seemingly intractable sociotechnical problems of contemporary social media and its participation in professional academic life. As a form of critical making, it also involves our practical and affective investment in acts of exploratory discovery and maintenance. It seems to transform the problem of the scholarly commons into matters of both environmental and relational care (Puig de la Bellacasa 2017).

The notion of care invites us to think about what good forms of wasting may be. We assume that solar energy is an acceptable form of energy; we want to use equipment that we already possess (although gadgets had to be ordered, too); and we refrain from advertising to save computing capacity. But it immediately gets complicated. Setting up infrastructures is a care-full task involving questions of technology selection and division of labor, which at Mastodon extends up to the moderation team.

So what will be set up? We rely on an experimental and iterative approach. In other words, we are not starting with a large network for thousands of users, but first want to check whether and how we could get something to work in a small set-up. Growing follows birthing. We use this opportunity to document and reflect on what kind of materials we are wasting and the worlds we establish and cherish. This qualitative research approach links methods from the social sciences and humanities with critical computing. We invite others to do so, too, working with local resources, needs, and visions. And consider contributing to the discussion on Mastodon!

BIBLIOGRAPHY

Brain T, Nathanson A and Piantella B (2022) Solar Protocol: Exploring Energy-Centered Design. In: *Eighth Workshop on Computing within Limits 2022*, 21 June 2022, p. 7. Available at: <https://computingwithinlimits.org/2022/papers/limits22-final-Brain.pdf>.

Callén B and Sánchez Criado T. (2015). Vulnerability Tests. Matters of "Care for Matter" in E-Waste Practices. *Tecnoscienza. Italian Journal of Science & Technology Studies* 6(2). Available at: <http://www.tecnoscienza.net/index.php/tsj/article/view/234>

Carpenter, JR (2016) The Gathering Cloud. Available at: <http://luckysoap.com/thegatheringcloud/frontispiece.html> (accessed 28 November 2022).

M. Chalmers, I. MacColl and M. Bell, "Seamful design: showing the seams in wearable computing," *2003 IEE Eurowearable*, 2003, pp. 11-16, doi: 10.1049/ic:20030140.

Critical Studies of the Cloud / Data Center Studies (ongoing open bibliography): <https://docs.google.com/document/d/1bnbDNTXlpdbfuShMgRKWvWLFiKUKBchUkluM-MOVRkw/edit#heading=h.2bmuylggugur> and <https://www.criticalstudiesofthe.cloud/>

DIY Methods 2022 Proceedings (2022) DIY Methods 2022 Conference Proceedings. In: 2022. Low-Carbon Research Methods Group. Available at: <https://hcommons.org/deposits/item/hc:48563/> (accessed 25 November 2022).

Dourish P. (2017). *The Stuff of Bits: An Essay on the Materialities of Information*. MIT Press

Fehling C, Leymann F, Retter F, Schupeck W, Arbitter P (2014). *Cloud Computing Patterns. Fundamentals to Design, Build, and Manage Cloud Applications*. Springer Vienna.

- Hashemi, Mazdak (2017) *The Infrastructure Behind Twitter: Scale*. https://blog.twitter.com/engineering/en_us/topics/infrastructure/2017/the-infrastructure-behind-twitter-scale
- Hogan M., Edwards D., & Cooper Z. G. T. (2022) 5 Things about Critical Data Center Studies. *Commonplace*. <https://doi.org/10.21428/6ffd8432.af5934aa>
- Landa L (2021) Ecological Thought and Digital Technology What can be learned by following a “hands-on” approach to sustainable IT? *ETHOS Lab blog* Metadata. <https://ethos.itu.dk/ecological-thought-and-digital-technology-what-can-be-learned-by-following-a-hands-on-approach-to-sustainable-it/>
- Landa L and Riggelsen Gjørding M (2021). Why Our Website Will Not Always be Accessible... on *ETHOS Lab blog* Metadata. Accessed on 29 November 2022). <https://ethos.itu.dk/why-our-website-will-not-always-be-accessible/>
- Laser S., & Schlitz N. (2019). Facing Frictions: Waste and Globalised Inequalities. *Journal for Development Studies*, 35(2), 5–32. <https://doi.org/10.20446/JEP-2414-3197-35-2-5>
- Lepawsky J (2018) *Reassembling Rubbish: Worlding Electronic Waste*. Cambridge, MIT Press. DOI: 10.7551/mitpress/11111.001.0001.
- Gille Z, & Lepawsky J (Eds.) (2022) *The Routledge handbook of waste studies*. Routledge, Taylor & Francis Group.
- Liboiron M, & Lepawsky J (2022). Discard studies: Wasting, systems, and power. <http://mitpress.mit.edu/9780262543651>
- Okoye VO (2021) Black digital outer spaces: Constellations of relation and care on Twitter. *Transactions of the Institute of British Geographers* 46(4): 806–809. DOI: 10.1111/tran.12495.
- Pasek A. (2020) Low-Carbon Research: Building a Greener and More Inclusive Academy *Engaging Science, Technology, and Society*. <https://doi.org/10.17351/ests2020.363>
- Pasek and Piantella. Low carbon methods. <https://lowcarbonmethods.com/local/zine.html> (failed to access on 29 November 2022)
- Puig de la Bellacasa M (2017) *Matters of Care: Speculative Ethics in More than Human Worlds*. Minneapolis; London: University of Minnesota Press.
- Pincus J (2022) Mastodon: a partial history (DRAFT). <https://privacy.thenexus.today/mastodon-a-partial-history/>
- Weiser M (1994) Creating the invisible interface: (invited talk). *ACM Conf on User Interface Software and Technology (UIST94)*.
- W3C Social Web Working Group. ActivityHub (2017). <https://www.w3.org/TR/activitypub/>
- Winner L (1980) Do Artifacts have Politics? *Daedalus* 109: 121–136.
- Woolgar S (1991). “The Turn to Technology in Social Studies of Science.” *Science, Technology, & Human Values* 16, no. 1. 20–50. <http://www.jstor.org/stable/690038>.
- Wray B. (2017). *Rise of the Necrofauna: The Science, Ethics, and Risks of De-Extinction*. Greystone books.
- Zulli D, Liu M., & Gehl R. (2020) Rethinking the “social” in “social media”: Insights into topology, abstraction, and scale on the Mastodon social network. *New Media & Society*, 22(7), 1188–1205. <https://doi.org/10.1177/1461444820912533>

We are a new transatlantic collective that found each other through free exchange on social media. We engage with the creation and deployment of social media addressing environmental and energetic concerns. We host Mastodon with renewable energy and reflect on our learning and building process.

Stefan Laser is a postdoctoral researcher at the Collaboratory Research Centre Virtual Worlds (Ruhr-University Bochum). He researches the entanglement of knowledge practices and planetary resources and moderates this collective experiment. Stefan has a background in sociology and STS and publishes on methodological matters, economic and political sociology, waste, energy and valuation studies. <https://stefanlaser.net/>

Anne Pasek is an Assistant Professor and Canada Research Chair in Media, Culture and the Environment at Trent University. She studies how carbon is communicated and contested within different social formations, including climate denialism, the tech sector, and the arts. She also directs the Low-Carbon Research Methods Group and the Experimental Methods and Media Lab.

Estrid Sørensen is a Professor of Cultural Psychology and Anthropology of knowledge at the Ruhr-University Bochum (Germany) and Head of the RUSTlab. Her STS and ethnographically informed research focuses on data practices, data infrastructures, data centres and experimentalist data studies: <https://www.sowi.ruhr-uni-bochum.de/cupak/> <https://rustlab.ruhr-uni-bochum.de/>.

Mél Hogan is the Director of the Environmental Media Lab and an Associate Professor, Communication, Media & Film, University of Calgary (Canada). Her research focuses on data centers and digital humans – each understood from within the contexts of planetary catastrophe and collective anxieties about the future. <https://www.melhogan.com/>

Mace Ojala (Ruhr-University Bochum). A software studies scholar.

Jens Fehrenbacher is an associated researcher at the Virtual Humanities Lab at Ruhr-University Bochum and a media artist. He is working on aesthetic forms of negotiation within new media using experimental setups and artistic research.

Maximilian Hepach is a postdoctoral researcher with the Weather Reports project. His research focuses on applying phenomenology, media theory, and cultural geography to questions of air, weather, and climate.

Leman Celik is a doctoral researcher at the Collaboratory Research Centre Virtual Worlds (Ruhr-University Bochum). Her research interest focused on STS studies, including knowledge production, ethnography of science, and databases to understand what counts as data and how researchers work with data.

Koushik Ravi Kumar is a student at Technical University of Munich, currently pursuing a graduate degree in Science and Technology Studies. He is a software engineer by profession, and keenly interested in studying the intersection of technology and society. He is an intern at RUSTLab, focusing on data centers and their impact on sustainability.

BEYOND PLASTICITY

Tridibesh Dey

Plastics are everywhere, and plasticity is a concept frequently deployed to think of/with plastic's material and more-than-material possibilities. As the specter of plastic and its debris loom upon populations and environments, this review ponders upon the limits of plasticity.

Jajiwāl is a village by the river, where agrarian work was practised for generations. Now situated at the peripheries of the rapidly expanding Jodhpur city in the western state of Rajasthan, India, the narrow river flowing through Jajiwāl has run dry. With the uncertainty and unruliness of monsoon, farming cycles have reduced, and most landed families have given up on agriculture. Sons and daughters have left the village in pursuit of alternative careers or moved by marriage. A state highway cuts through the village and connects it to centers of industry and commerce. Staple food – grains of wheat, bajra (pearl millets), *daal*, rice, oil, and spices – now come to the village neatly packaged in plastic. As drinking water is increasingly difficult to source, women walk hours on desert sand to distant deep wells. Families who can afford it, buy water in bulk containers made of polythene terephthalate – PET, readily available from neighbouring shops. Upper caste residents, typically landowners, have started running retail business in their premises, while the landless – typically, Dalits (former untouchables and socially outcast) – find precarious underpaid work in a radically altered agrarian economy. They work in shops, carry heavy merchandise, clean shops, and the residential premises of patrons, removing and burning plastic waste. Plastic packaged commodity pour in regularly by the highway to replenish and sustain the village economy.

When I visited Jajiwāl eight years ago, as an engineer, invited by a local activist group to advise on plastic waste management technology, discarded plastic packaging and their residues were a common sight in and around the village, as everywhere else along the way. The panchayat – village-level government – lacked resources to clean up, without state subsidy or financial support from the industry. Left to fend for themselves, human and more-than-human residents in the landscape were left sinking in a downstream plastic sink, becoming part of, trying to make sense of, the open-ended history of this persistent material.

Jajiwāl enables us to appreciate the scale and complexity of the plastic problem. Indeed, plastic packaging protects food items, ensures secure transport and steady supply at a time of ecological precarity and reduced scale and quality of local production. Plastic enables, alongside, a commodification of essential items as part of a wider network of production, labour, quality control, valuation, and profit, which are in most parts distant and removed from Jajiwāl. Residents at Jajiwāl, in turn, are turned into consumers, dependent on these obscure supply chains, vulnerable to abusive price rise and low-quality staples. Poorer residents, especially those without strong social support like marginalized Dalits, are rendered even more precarious and vulnerable, often in the absence of regular state subsidy. Last, but not the least, there is the issue of accumulation of plastic discard and its physical-chemical residues over the landscape, open to bodily exposure.

Plastic is not a single material. Plastics are necessarily multiple, complex materials constituted by thousands of chemical compounds. They have a main skeleton based on chains – polymers – of various hydrocarbons, an abundant class of organic compounds, present in the bodies of the living and the dead, fossilized in the layers of the Earth's crust. There are other constituent chemicals, including

additives like phthalates, bisphenols and dyes added to impart specific capacities to the material, besides residues and accumulated substances. Most present plastics are synthetic – produced industrially at scale, especially post World War II. A darling of the petrochemical industry, plastics enjoy an unlimited supply of chemical raw materials, privileging power over markets and lobbies. Plastic is indissociable from profit.

“Plastic”, a Union Carbide employee, A. A. Boehm, writes in 1968, “is the commercial form of a polymer, ..., modified to make them more perfectly suit the needs of a specific application”. Unlike naturally occurring materials like wood or metals, plastics are materials by design, custom-made for purpose, molecule by molecule (Bensaude Vincent, 2013). Material and product conceived together, plastics can be made into anything in theory, mimic any material quality and subvert natural resistances upon design. Roland Barthes penned an exuberant ode to the material in the 1950s. Plastic, he proclaims, is “the very idea of ... infinite transformation; as its everyday name indicates, it is ubiquity made visible... less a thing than the trace of a movement”. Plastic’s “scope of ... transformations”, Barthes adds, “gives man the measure of his power, the very itinerary of plastic gives him the euphoria of prestigious free-wheeling through Nature.” (Barthes, 1971: 110)

Quintessential, therefore, to a modernist vision of unbridled progress in capitalism and consumption, plastic does promise a certain social and economic democratization. Historian Jeffrey Meikle elaborates (1995), plastic enabled the masses to buy and use products once unaffordable, and to indulge in practices once purely aspired across class divides. In India, as in many countries of the developing world, plastics came in later – typically near the end of last millennium, but firmly caught on to industry and cultures of industrial consumption. Cultural historians Doron and Jeffrey write how plastics helped introduce items in India such as toothbrushes, kitchen white goods, cars, and how these items have been attuned to be more accessible, thus driving aspirations, helping create and sustain a burgeoning middle-class and lower-middle class into prominence (2018). Plastics are also key in developing ‘market devices’ that help create and expand markets (Muniesa et al., 2007; Hawkins et al., 2015; Dey, 2021). For example, plastic carrier bags enabled more purchasing, setting up convenient links between commerce and consumption. For women doing grocery, it engendered new freedoms in movement and socialization. For subsistence economies, different sized carrier bags enabled portioning, buying according to one’s means. The cheap procurement and re-use of durable packaging items also led to residual forms of consumption, favouring subsistence living and gendered caste experience. Plastic’s material mutability makes possible the design, batch-production and marketability of products and variants at scale, suitable to context and need, even enabling limited reuse (Dey, 2021).

In India, plastic’s infinite mutability has powered a socio-economic transition, like in other countries. After the relaxation of industrial and trade regulations in the late 80s, opening up economy to globalized capital and liberalized world orders, India gained status as an economic superpower. This is despite critiques of inequity, poor quality of life and lack of access to basic infrastructures. The country is among the fastest growing plastic producers, at par with China. Reliance Industries, a private company and India’s foremost ‘virgin’ plastics manufacturer and importer, is among the biggest manufacturers in the world (PlastIndia, 2022). Jajiwala village of the early 21st century bears witness, however, to the paradoxes of a plasticated capitalism.

Scholars have developed the concept of plasticity across practical contexts to denote a certain malleability of form and function, diversity of cultural and affective relations with matter, sometimes a potentially limitless amenability to change, regeneration, and effectuating utopian visions of mutability – material, practical, social, and political (Star, 1989; Malabou, 2005; Bensaude Vincent, 2013; McKay et al., 2020). But the concept of plasticity of plastics beseeches urgent revision. Here is why:

One of the obvious counterpoints to the imagination of infinite mutability is the specter of immutability which characterizes the phenomenon of plastic waste. More than 9 billion tons of plastic matter have been manufactured globally, all of these linger in the environment in some form, more than 13 million tons of plastic matter end up in the oceans each year. With stable basic chemical bonds, massive scale, ubiquity, and speed of environmental proliferation, plastic material accumulates, sometimes in the order of thousands of years. Plastic is not *plastic*, in most cases, and plastic accumulation is a prominent narrative, increasingly current within concerned constituencies, globally.

But immutability does not cut through the twisted complexity of the plastic question. Indeed, post-use plastics are routinely mutated – for instance, into fuel, recycled into new products through ingenious, often-informal, enterprises. These mutabilities are key to waste remediation and must be acknowledged, not least for the mitigation of technical difficulties and biological hazards involved in socio-ecological harm reduction from plastic waste (Gill, 2009; Dey and Michael, 2021a, 2021b).

Furthermore, despite an apparent stability, plastic materials continue to leach, combine with other matter – including heavy metals, and compound into chemical cocktails, biological agglomerate ecologies and uncanny geological forms. As molecules from a once-bottle, a once-bag move and mingle in a living and changing earth, these constitute a dense undergrowth of mutabilities occurring ceaselessly, often imperceptibly, unknowably (Liboiron, 2016).

While these are open-ended transformations, many of these mutabilities may involve relative forms of muting. That is to say, they serve disabling functions, closing down possibilities for certain agents and ecologies, performing iterations of injustice. Think of petrochemical spills, leachates, fumes, and residues entering bodies in doses potent enough for endocrine disruption and a suite of long-term and generationally reproduced health issues. More durable plastic debris stick to body parts, organs, tissues, block circulation, weigh down bodies, literally choking, gagging, forms of life. Plastic debris slow down rivers, alter landscapes, cause floods, disrupt livelihoods, tourism. Muting capacities of plastics and its suite of chemicals are multiple, unfolding in diverse ways, progressively felt, and known.

The muting capacities of plastic materiality may be assembled in complex, networked ways. Plastic theorists and sociologists of Science and Technology Studies have drawn on the geometrical notion of topology, a non-Euclidean conception of space and time, where relation between points are immanent and emerging, not necessarily fixed or linear along pre-defined orders (Gabrys et al., 2013). For example, it is instructive to observe how plastic wastes immutability is not simply a failure of downstream waste management. On the contrary, immutability is a synthetically induced capacity, as Gay Hawkins and co-authors note (2015). Indeed, most plastic materials are durable because they are made to maintain integrity against trials of strength and a range of physico-chemical affinities under worldly conditions. These very qualities that make plastics valuable as/in specific products and devices also make them immutable in the environment, post-use.

Process philosophies, say after A. N. Whitehead (1929), or recently after Manuel de Landa (2011), tend to view matter and materiality as enactment of processes. According to STS theorist Mike Michael, plastic's mutability is, therefore, conditional. The material capacities for change would draw on a variety of relations, for instance, from materials being deployed, their supply conditions, processing site, equipment and technical affordances, environmental and thermodynamic conditions, to knowledge relations, expertise, labour, incumbent legal environments, lobbying power, marketing, demand, etc. As such, plastic's infinite mutability may only be a specific enactment of plasticity, where the topological relations between diverse elements of processes are consequential. Plasticity, as a concept, is therefore, plastic, its content and form vary across site and context, Michael argues

(2013). Accordingly, even immutability, say of waste plastic debris, or limited mutabilities – say, of domestic plastic repurposing, would be specific enactments, unfolding relationally over processual contexts.

There are reasons to consider plastic's potentials to mute as preconditional to conceptualizing plastic's ontology. Of the key constituency of thousands of chemicals that are added by producers to make plastic matter suitably mutable for commerce, some 2,400 are classified as potentially toxic; some documented to have far-reaching health consequences for humans and non-humans, across generations, even at small doses (Dey et al., 2022). Plastic is not plastic without these chemicals, which leak, interact with other substances, and become complex chemical cocktails across plastic's life cycle – from resource extraction to production, use situations, states of disposal and attempts of recovery. Potentials for toxicant exposure and harm are, therefore, ubiquitous as these chemicals persist.

There is again the need to address colonial land relations, processes of extraction – of labour and oil, and rights to expose and pollute, always already embedded within practical calculations and infrastructures that enact industrial plastics today, their abundance, and unfolding plasticity. Plastics are thus inextricably commercial and colonial (Liboiron, 2021).

Thinking topologically, the socio-material relations of violence enacting plastics go back to fossilized deep time, to colonial geopolitical and economic relations in the pasts but persist in the present. Environmental historian Rebecca Altman recounts how deep-sea copper telegraph networks – key to the British colonization project, needed to be insulated with gutta-percha, resulting in the clearing of gutta forests across South-East Asia in the late 19th century. Early plastics were produced with cheap, often bonded labour, disproportionately exposed to physico-chemical hazards in the factory (Altman, 2021). Workers continue to get exposed even today, with the range and scale of hazardous plastic chemicals having increased (Hardin et al. demonstrate this in an upcoming article). The predominant petrochemical sourcing of present plastics continues legacies of toxic exposure, starting right upstream, as evident, for instance, in Louisiana's Cancer Alley, home to predominantly Black and ethnic minorities with lineages in local plantations of the past (Ghosh, 2021; Davies, 2022). The lower Mississippi valley, is home now, of course, to the world's largest plastic producers and petrochemical polluters. Present-day plastic production continues accelerated, with false promises of downstream remedy. In reality, containers full of plastic waste continue to be shipped to historically impoverished communities to clean up, an arrangement bound up for failure, leading to uneven redistributions of waste and unjust proliferation of potentially toxic chemicals. Waste importers tend to be once-colonized nation states, and those handling residues as a livelihood enterprise, working night and day, against meagre pay, are lower-caste, impoverished workers, often women and children (Altman and Dey, 2022).

Muting is a process often caked into structured social relations, yet their elaboration necessitates a nuanced expression, not the least of agency, as the example of commerce in plastic-packaged essentials at Jajiwai underscores. Here, vulnerability and environmental degradation are nested within a politics of necessity and choice, which in turn, furthers a broader politics of subjecthood to techno-commercial hegemony and reduction of choice.

As world leaders negotiate terms for a global plastic treaty – also to be enforced locally, policies across scales will need to acknowledge and address the vulnerabilities posed but also needs met within societies and economies by plastics. Who – which actors involved in plastic life cycles or within political structures – need to or are able to act is another key debate within a just and restorative responsibility politics. Any policy addressing the problem must take stock of violence and vulnerabilities, topologically, with critical historical awareness. To consider plastic's relative capacities for muting, alongside transformative potentials, will be an ontological problem key in addressing the politics of plastics.

And we need better words and concepts to begin with, in preparation for a more just plastic politics. To address inherent, already incumbent relations and (im)possibilities at stake, words will matter. Plasticity may be too general, conveniently vague, and docile a terminology to describe and address a set of multiple materials and processual relations that preclude the rights to pollute, and to mute in their free-wheeling proliferation through natures and worlds.

ACKNOWLEDGEMENT NOTE

Research was funded by the University of Exeter International Excellence Doctoral Scholarship. Writing up was conducted at Aarhus University, during a postdoctoral fellowship under the Project “Plastics and the Anthropocene” funded by the Carlsberg Foundation.

BIBLIOGRAPHY

Altman R and Dey T (2022) The World Has One Big Chance to Fix Plastics. *The Atlantic*, 15 March. Available at: <https://www.theatlantic.com/science/archive/2022/03/plastic-pollution-treaty-un-environmental-assembly/627066/>

Altman R (2021) The Myth of Historical Bio-based Plastics. *Science* 373(6550): 47-49.

Barthes R (1971) *Mythologies*. Paris: Seuil.

Bensaude Vincent B (2013) Plastics, Materials and Dreams of Dematerialization. In: Gabrys J, Hawkins G & Michael M (eds) *Accumulation: The Material Politics of Plastic*. Oxford: Routledge, pp. 31-43.

Davies T (2022) Slow Violence and Toxic Geographies: ‘Out of Sight’ to Whom? *Environment and Planning C: Politics and Space* 40(2): 409-427.

De Landa M (2011) *Philosophy and Simulation: The Emergence of Synthetic Reason*. London: Bloomsbury.

Dey T and Michael M (2021a) Caring for the Multiple Cares of Plastics. In: Farrelly T, Taffel S and Shaw I (eds) *Plastic Legacies*. Athabasca, AB: Athabasca University Press.

Dey T and Michael M (2021b) Plastic Possibilities: Contrasting the Uses of Plastic ‘Waste’ in India. *Anthropology Today* 37(3): 11-15.

Dey T, Trasande L, Altman R et al. (2022) Global plastic treaty should address chemicals. *Science* 378(6622): 841-842.

Dey T (2021) Plastic Mut(e)ability: Limited Promises of Plasticity. *Worldwide Waste* 4(1).

Doron A and Jeffrey R (2018) *Waste of a Nation*. Cambridge, MA: Harvard University Press.

Gabrys J, Hawkins G and Michael M (2013) *Accumulation: The Material Politics of Plastic*. Oxford: Routledge.

Ghosh A (2021) *The Nutmeg’s Curse: Parables for a Planet in Crisis*. Chicago, IL: University of Chicago Press.

Gill K (2009) *Of Poverty and Plastic: Scavenging and Scrap Trading Entrepreneurs in India’s Urban Informal Economy*. New Delhi: Oxford University Press.

Hawkins G, Potter E and Race K (2015) *Plastic Water: The Social and Material Life of Bottled Water*. Cambridge, MA: MIT Press.

- Liboiron M (2016) Redefining Pollution and Action: The Matter of Plastics. *Journal of Material Culture* 21(1): 87-110.
- Liboiron M (2021) *Pollution Is Colonialism*. Durham, NC: Duke University Press.
- Malabou C (2005) *The Future of Hegel: Plasticity, Temporality, and Dialectic*. London: Routledge.
- McKay D, Stanes E, Githua N, Lei X and Dixon S (2020) On Global Plasticity: Framing the Global Through Affective Materiality. *New Global Studies* 14(3): 307-326.
- Meikle J (1995) *American Plastic: A Cultural History*. New Brunswick, NJ: Rutgers University Press.
- Michael M (2013) Process and Plasticity: Printing, Prototyping and the Prospects of Plastic. In: Gabrys J, Hawkins G & Michael M (eds) *Accumulation: The Material Politics of Plastic*. Oxford: Routledge, pp. 44-60.
- Muniesa F, Millo Y and Callon M (2007) An Introduction to Market Devices. In: Muniesa F, Millo Y and Callon M (eds) *Market Devices*. Oxford: Blackwell, pp. 1-12.
- PlastIndia (2022) *Plastic Industry Status Report 2021-2022*. New Delhi: PlastIndia Foundation.
- Star S (1989) *Regions of Mind: Brain Research and the Quest for Scientific Certainty*. Palo Alto, CA: Stanford University Press.
- Whitehead A (1929) *Process and Reality: An Essay In Cosmology*. New York: The Free Press.

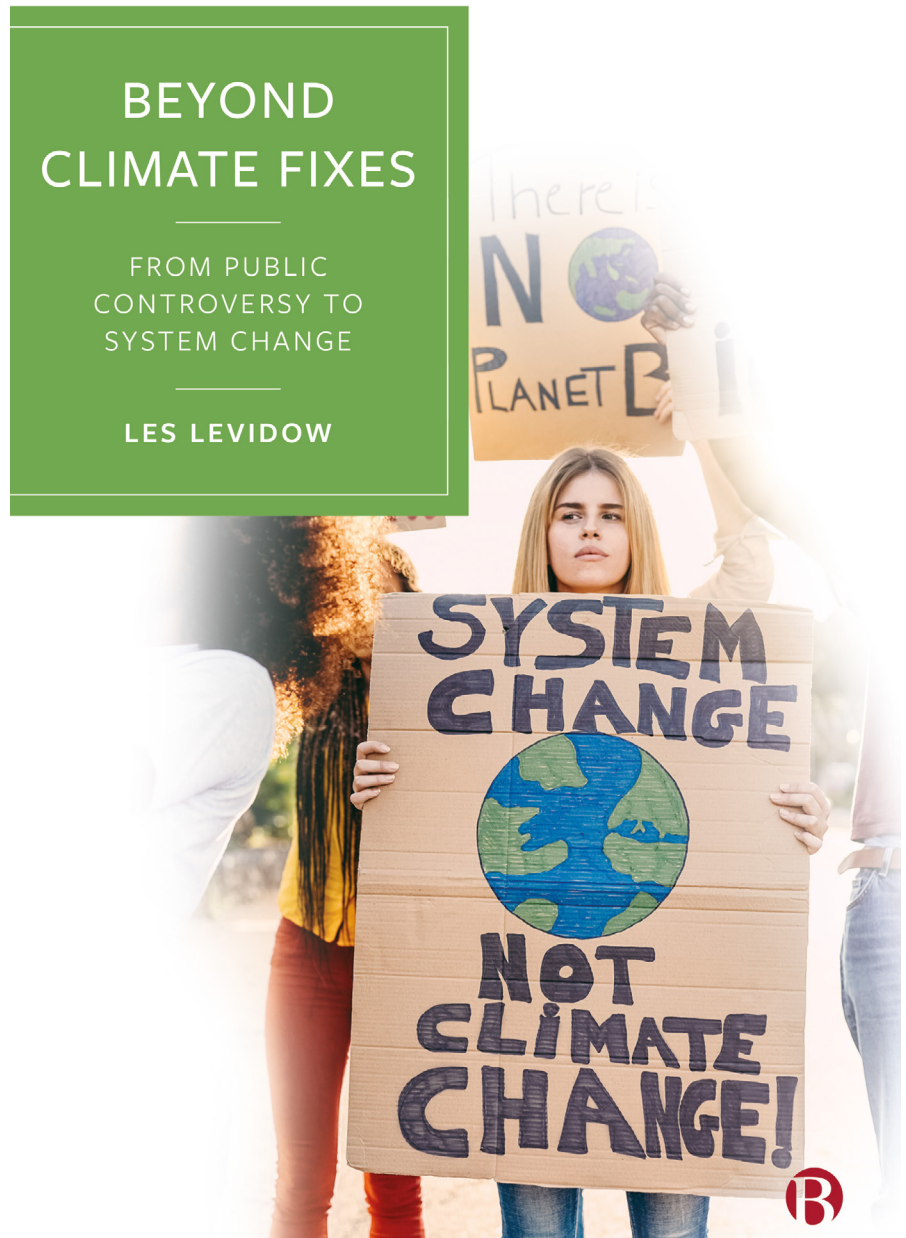
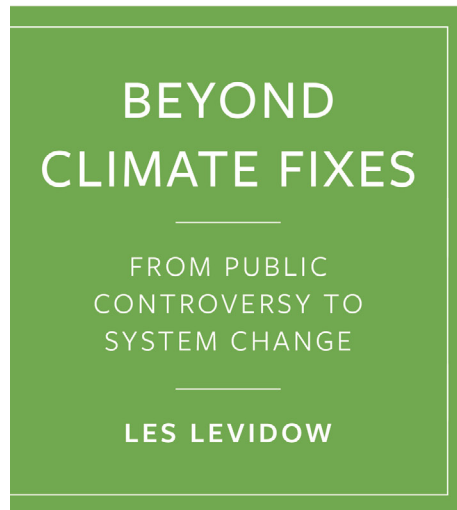


Dr. Tridibesh Dey (he/him) is an engaged anthropologist of science and technology, and a former systems engineer. He has been thinking and tinkering with plastics and the tangled socio-political worlds of plastic pollution for a while, struck by wonder and anger the deeper he digs into the problem. Growing up with plastic waste in South Asia and learning about plastics as much from informal waste-workers, recyclers, and craftspeople as from scholars and 'expert' practitioners, Dr. Dey is a feminist, anti-colonial, and trans-disciplinary scholar, treating plasticity as an epistemological and ontological problem, full of perils and potentials for socio-economic justice. Having completed his PhD at the University of Exeter, Dr. Dey is presently a post-doc at Aarhus University.

CHERISH, NOT PERISH

BEYOND CLIMATE FIXES: FROM PUBLIC CONTROVERSY TO SYSTEM CHANGE

Les Levidow



The climate and ecological crisis cannot be solved without system change.

Greta Thunberg, UN Climate Action Summit, 2020

'System change, not climate change' is not a request we make to the current institutions.

Ecosocialist Encounter, 2022

BOOK INSPIRED BY KNOWLEDGE CO-PRODUCTION

A few years ago I began to plan a book on climate change, specifically on conflicts around false solutions versus grassroots alternatives. Although authored by me alone, it draws on knowledge co-production processes over the past decade or more.

My idea began from a political lacuna, namely: Despite greater demands for climate action and elite promises to reduce carbon emissions, fossil fuel usage was set to rise indefinitely (and now even more so since the Russia-Ukraine-NATO war). What has driven or facilitated the rise? What has been the role of false solutions for climate change?

Many insights have come from critical books on energy decarbonisation – actual, hypothetical or promised, often dependent on techno-optimistic solutions. This focus misses Greenhouse Gas (GHG) emissions from wider production systems, where putative fixes likewise depend on promissory scenarios. False solutions often have provoked protest linking many issues and societal groups, especially those most harmed by environmental problems (see Table 1). Such multi-stakeholder alliances would be necessary to drive a socially just decarbonisation agenda. Given the many political campaigns against such fixes, what can be learned from their strategies and outcomes? For academic research, political campaigns, and their linkages?



Figure 1, 2: Agrofuels as oil addiction and a carbon-emissions time bomb

Credits: Biofuelwatch; Anthony Turner, CEO Visuals.



These questions led me to engage more with Climate Justice (CJ) perspectives on 'system change'. Over the past decade I have participated in CJ activists' discussions, involving knowledge co-production between activists and academics, some personifying both roles. These discussions analysed prevalent NGO strategies, their limitations, the elite's false promises, and means to undermine them, especially by contesting the systemic causes of climate change.

As I further reflected, my long-time research on wider techno-fix controversies likewise involved civil society groups in knowledge co-production, sometimes more formally as Participatory Action Research. Our joint discussions diagnosed systemic causes of environmental problems, putative fixes evading those causes, and political strategies for contesting them. Such fixes were meant to be stimulated by market-type policy instruments.

They made promises about technoscientific advances, avoiding or overcoming negative effects of previous technologies. Sooner or later, advocates claimed that similar fixes would offer climate solutions. Examples include: 'climate-smart agriculture', claiming to sequester carbon through GM crops; 2nd-generation (or advanced) biofuels, claiming to reduce GHG emissions by replacing for oil; Advanced Thermal Treatments of municipal solid waste, claiming to reduce GHG emissions from landfill and through bio-based fuel products; and Carbon Capture & Storage (CCS), claiming to decarbonise fossil fuels (see Table near the end).

Those climate-mitigation claims provoked further controversy and critical analysis. Over two decades, my research benefited from such interchanges. So my book plan likewise has drawn inspiration from the collective insights gained.

To link all those aspects, I saw the need for a big picture. This could inform more effective campaign strategies against false solutions, while counterposing means towards system change. Such a framework could attract a diverse readership – researchers, NGO staff, wider activists, civil servants, etc. I obtained advice from many such people on my preliminary plan. That process shaped my book's title, *Beyond Climate Fixes: From Public Controversy to System Change*.

This article conveys how my framework links CJ perspectives with academic ones from the STS and social movements literature.

CLIMATE JUSTICE VERSUS TECHNO-MARKET FRAMEWORK

The prominent slogan 'System Change Not Climate Change' has sharpened public debate about the societal changes that are necessary to avoid climate disaster in ways creating an environmentally sustainable, socially just future. The demand for 'system change' directs attention at profit-driven high-carbon production systems which cause climate change, other environmental harms, resource plunder and social injustices, along with policies which perpetuate them. The slogan originated in the Climate Justice movement, especially in the run-up to the 2009 Copenhagen COP. It became more prominent in the 2019 School Strike for Climate and then the Fridays For Future protests. This agenda has overlapped with some Just Transition agendas (likewise Green New Deal agendas) for a socially just, low-carbon future.

Nevertheless, GHG emissions have continued to rise, alongside overall energy usage and renewable energy, which thereby complements system continuity rather than system change. This trend has been facilitated by techno-optimistic promises for low-carbon solutions. These have envisaged smooth pathways to decarbonisation, have encouraged a passive public to accept or await such fixes and thus have depoliticised or pre-empted societal choices about potential futures.

Indeed, some proponents have idealised future technologies as 'climate fixes' which would avoid the need for major societal change and so be more feasibly implemented. To reach the target of near-zero carbon emissions, 'I am told by scientists that 50% of the reductions we have to make by 2050 are going to come



Figure 3: Carbon Capture & Storage (CCS) remains elusive, meanwhile justifying lucrative fossil fuels.
Credit: Cathy Wilcox.

from technologies we don't yet have', said the US government's climate envoy John Kerry. His wishful expectation revealed the elite's long-term alibi, namely: awaiting hypothetical fixes, and perhaps funding them, meanwhile continuing high-carbon production and consumption systems.

A key instrument has been market-type incentives. More than simply an instrument, this policy framework promotes a specific social order of market competition, often undermining cooperation. The concept 'techno-market' fix, already in the STS literature, seemed apt for naming the dominant policy framework of global policy elites.

A techno-market framework seeks to create new markets whose competitive forces will stimulate eco-efficient technological solutions. This policy framework arose from merging two antecedents, ecological modernisation and neoliberal environmentalism. Political responsibility for outcomes can be conveniently displaced from states to anonymous market forces and/or to technological barriers: no one can be held accountable for failure.

For a long time, a techno-market policy framework has been elaborated through carbon credits and trading, especially under the 1997 Kyoto Protocol of the UN Climate Convention. The European Union likewise has a long history of techno-market frameworks. EU policy more generally has anticipated and promoted technoscientific development as central to societal progress, thus depoliticising policy choices and responsibility for them. The promised environmental remedies have served to perpetuate GHG emissions. Both institutions remain complicit in climate change, despite their pretensions to global environmental leadership.

Nevertheless recurrent public dissent has often re-opened technical and market issues as political ones, pressed state bodies to defend their versions of the public good and counterposed rival futures. This analysis provides a rationale to identify a non-state social agency, at least in the global North.

SOCIAL AGENCY: COUNTER-PUBLICS ALIGNING CRITICAL FRAMES

Given frequent controversy of techno-market fixes, this has opened up greater opportunities to promote low-carbon, lower-energy alternatives. Yet there seemed a lacuna in social agency, i.e. a political force with the political will, collective capacities and necessary resources to implement solutions. Such an agency would need to link diverse socio-political forces much broader than the climate movement per

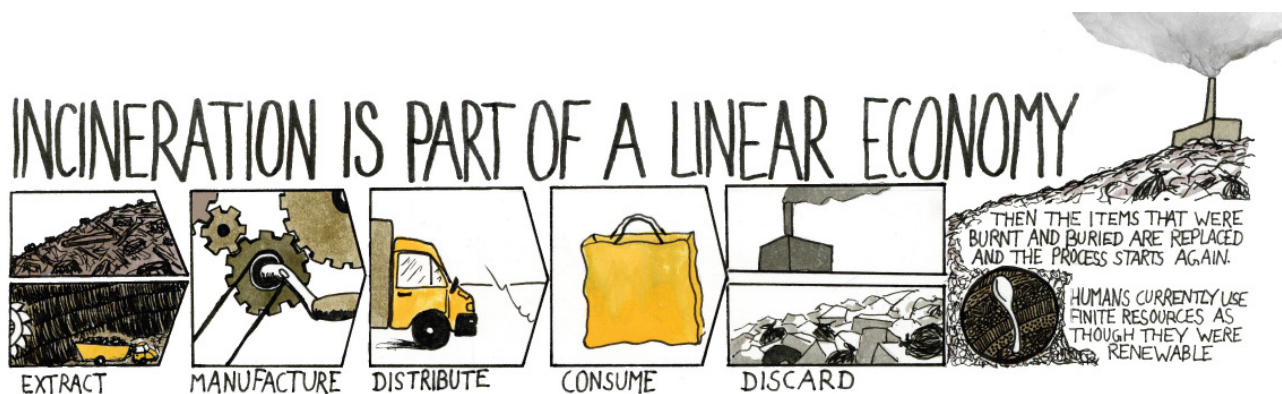
se. So I looked back at various techno-market fixes, political strategies for promoting them, and multi-stakeholder strategies for undermining them, likewise various alternatives being promoted.

Alternative agendas have come from multi-stakeholder citizen-expert alliances. Together they have contested official knowledge-claims about benefits of the dominant innovation agenda. Such opposition has drawn on knowledge from socially excluded groups (e.g. service users, patients, low-income groups, small-scale producers, etc.), facilitated by NGOs and social movements. These 'mobilised counter-publics' have stimulated public controversy over dominant agendas, prevented public consent and counterposed alternative futures (as theorised by David Hess, Scott Frickel and colleagues).

Criticising dominant policy assumptions, such counter-publics have moreover highlighted the anti-democratic basis of technicized decision-making. Counter-publics identify 'undone science'; they demand or generate resources for new knowledge which could serve a broad public benefit rather than private interests. They mobilise resources to fill the knowledge gap, sometimes for alternative solutions such as grassroots inclusive innovation. This involves solidaristic commoning, i.e. creating communities that defend commons or devise new ones. These forms contribute to eco-localisation agendas; they can build more enjoyable lives by creating lower energy forms of livelihoods and localising production-consumption circuits.

Counter-publics often emerge from social movements, whose participants bring diverse framings of a societal problem, e.g. environmental or health threats, socio-economic inequity, resource degradation, etc. Effective action depends on integrating all those issues for and through common action. As a feature of social movements, 'frame-bridging' aligns 'two or more ideologically congruent but structurally unconnected frames regarding a particular issue or problem' (as theorised by David Snow and Robert Benford).

Figure 4: Incineration facilitates a wasteful, destructive linear economy. Credit: UK Without Incineration (UKWIN)



In climate-fix controversies, alongside counter-expert critiques, opponents have framed false solutions in pejorative ways linking several issues. For example (see the Table):

climate-resilient agriculture with GM herbicide-tolerant crops as 'corporate-smart greenwash' which degrades the soil and monetizes Nature as financial capital;

biofuels as industrially produced 'agrofuels', whose land-use changes generate 'a carbon-emissions time bomb';

advanced waste treatments as 'incineration in disguise', and incineration generally as a 'use-and-dispose linear economy' wasting resources and harming nearby communities.

Such frame alignments have strengthened the basis for jointly undermining dominant agendas and advocating socially just, low-carbon alternative futures.

CLIMATE FIX CONTROVERSIES

Techno-market fix	Climate promise	Pejorative frame from counter-publics	Opponents' alternative
Climate-smart agriculture, eligible for carbon credits as an incentive	Carbon sequestration from no-till methods with GM herbicide-tolerant crops	'Corporate-smart greenwash'. 'Monetizing Nature.'	'Agroecology feeds the people and cools the earth.' Food sovereignty.
2 nd - generation (advanced) biofuels from a mandatory market	Lower GHG emissions due to biomass (from 'marginal land') replacing fossil fuels	'Agrofuels: no cure for oil addiction'. 'Carbon-emissions time bomb' will come from land-use changes.	Better public transport, mandatory fuel-efficiency, electric vehicles from renewable energy, etc.
Advanced Thermal Treatments (ATT) of waste with competitive subsidy	Waste-to-Energy conversion for high-value products such as vehicle fuel	'Incineration in disguise'. High-carbon 'use-and-dispose linear economy' wastes resources.	Circular economy through re-usable components, greater recycling and Materials Recovery Facilities
Carbon Capture and Storage (CCS) with state subsidy.	Decarbonisation of fossil fuels, e.g. converting natural gas into hydrogen fuel.	CCS diverts resources and extends dependence on fossil fuels while awaiting an elusive fix.	Energy reductions and substitutes from truly renewable-energy.

ACADEMIC-ACTIVIST KNOWLEDGE CO-PRODUCTION: STRATEGIES FOR SYSTEM DIAGNOSIS AND CHANGE

For elaborating such strategies, a method has been academic-activist knowledge co-production, sometimes formalised as Participatory Action Research (PAR). Put simply, this means research with people rather than on them. PAR brings together researchers with practitioners, initially to identify practical problems and analytical questions that warrant joint research. Through PAR, participants should become empowered to play the role of change agents.

Environmental technofixes are generally capital-intensive innovations which supposedly bring eco-efficient solutions for decarbonisation or environmental protection more broadly. As counter-publics raised risk or sustainability issues, state bodies have framed them as direct biophysical effects of a product or technology. This frame has often channelled dissent into specialist issues, thus obscuring systemic drivers of harm. Regulatory procedures have evaluated potential effects through implicit normative assumptions as regards what potential effects may be relevant, acceptable or worse than some standard, as if these norms lay above politics.

Counter-publics have questioned such normative criteria, often disguised as 'science', thus extending public controversy to regulatory expertise. Moreover, they have highlighted how political-economic interests and institutional commitments drive the fix, while excluding beneficial alternatives. Through Participatory Action Research (PAR) methods, researchers and civil society partners have jointly deepened a systemic perspective on climate fixes, as a basis to undermine them more effectively and to counterpose alternative futures.

PAR has two levels: researchers intervene in stakeholders' practices, at the same as they jointly intervene in a wider context. Through this collaborative relationship, participant groups can gain a better collective self-understanding of their problems and opportunities, as a basis for more effectively addressing them. This process can strengthen social agency for transformative aims. This book brings together many collective contributions, to be cherished as a collaborative process for lesson-drawing.

Overall the book elaborates a big picture of transformative mobilisations for climate justice. These need to combine four main elements: counter-publics, eco-localisation, grassroots innovation and solidaristic commoning. Together these can help build an effective social agency for system change. The big picture is elaborated through case studies such as GM crops, biofuels, waste incineration and Green New Deal agendas.

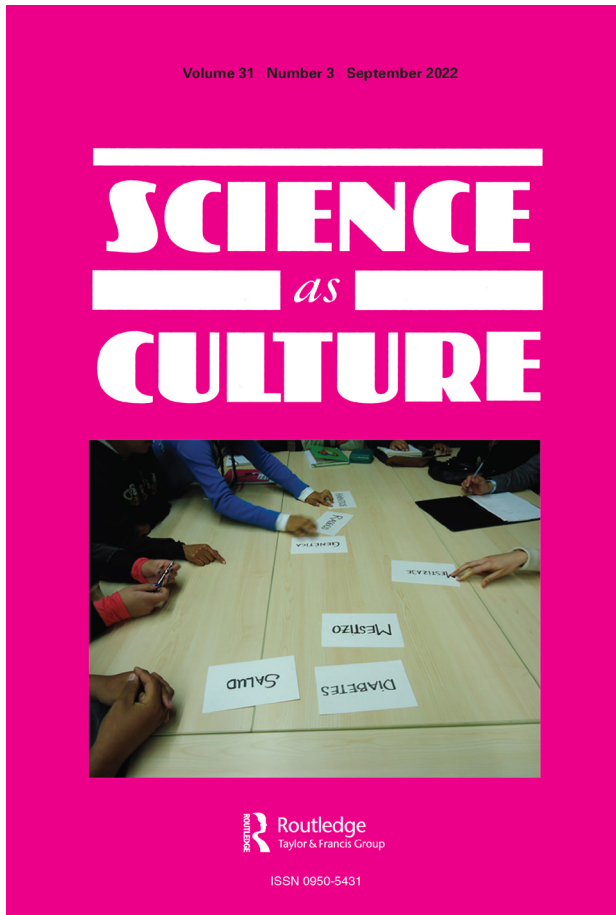
Les Levidow's book, *Beyond Climate Fixes: From Public Controversy to System Change* will be published in spring 2023, <https://bristoluniversitypress.co.uk/beyond-climate-fixes>



Les Levidow is Senior Research Fellow at the Open University, UK. There he has studied agri-food-environmental issues, especially technofixes, public controversy and alternative agendas from civil society networks. A long-time case study was conflicts over agri-biotech (transgenics) in the European Union, USA and their trade conflicts. He has researched agroecology as a transformative agenda, initially European networks, and more recently South American agroecology agendas for a solidarity economy and food sovereignty. Some projects developed knowledge co-production with civil society groups. He is Co-Editor of Science as Culture. More details at <http://fass.open.ac.uk/people/ll5>

CALL FOR PAPERS

SCIENCE AS CULTURE (SAC): THREE CALLS FOR PAPERS



<https://www.tandfonline.com/journals/csac>

SaC mission statement: Our culture is a scientific one, defining what is natural and what is rational. Its values can be seen in what are sought out as facts and made as artefacts, what are designed as processes and products, and what are forged as weapons and filmed as wonders. In our daily experience, power is exercised through expertise, e.g. in science, technology and medicine. *Science as Culture* explores how all these shape the values which contend for influence over the wider society.

SaC has three Calls for Papers, each one with a literature review. Contributors should engage with the STS concepts there. So you will need to obtain the full CFP, as below.

SaC SPECIAL ISSUE: "INTERDISCIPLINARY RESEARCH ON SOCIETAL CHALLENGES"

Guest editors: Antti Silvast, Jaakko Taipale, Mikko J. Virtanen and Terhi Esko

Full CfP: https://think.taylorandfrancis.com/special_issues/science-culture-interdisciplinary-research

This SaC special issue invites contributions that analyse how interdisciplinary research collaboration relates to societal challenges. We welcome contributions that deal with the following questions:

- How does interdisciplinary research frame the societal challenges that it addresses?
- What choices and judgments are involved in such framing?
- What consequences does the policy-based interwovenness of interdisciplinarity and societal challenges have for research collaboration and relationships with stakeholder groups and their perspectives? For example, are new strategic partnerships created? What are the related trade-offs?
- Given the policy interest in interdisciplinary research around societal challenges, how does this affect the knowledge that is produced by academics who gain the respective funding?
- How does such research address (or not) the original policy drivers?

Submission Details

Deadlines

- Abstracts: 1 February 2023
- Full papers: 1 June 2023

All SaC research papers must follow the SaC editorial guidelines, especially the structural-conceptual features on the first page, https://www.tandf.co.uk/journals/authors/csac_edit_guidelines.pdf

Queries to the guest editors:

Antti Silvast, aedsi@dtu.dk and Jaakko Taipale, jaakko.taipale@helsinki.fi

SAC FORUM: "FUTURES OF STS ACADEMIC PUBLISHING"

Guest editors: Wolfgang Kaltenbrunner, Maria Amuchastegui and Kean Birch

Full CfP: https://think.taylorandfrancis.com/special_issues/science-culture-academic-publishing/

This SaC Forum invites contributions that critically reflect on current STS publishing, review and editorial practices, especially how they might develop in the future. As guiding themes, we propose the following questions:

- How are STS publishing, review and editorial practices affected by competition for jobs, funding, and publishing space, and what does this mean for the kind of knowledge produced?
- How does the changing political economy of publishing affect STS publishing practices, for example as regards the ownership structures of the publishing industry and the role of journal metrics?
- How do experiences of STS publishing practices vary across different levels of the academic hierarchy and different parts of the world?
- What alternative forms of STS publishing, reviewing and editing exist or can be imagined, for example, collective forms of editorship or collective writing?
- What can be done to ensure that STS publishing welcomes diverse intellectual traditions and concepts, as well as diverse forms of writing and publishing?

Submission Details

- Deadline: 1 May 2023.
- Length: Forum articles are flexible, ranging between 2k-6k words.
- Queries and articles to the guest editors: Wolfgang Kaltenbrunner (wkaltenbrunner@gmail.com) or Maria Amuchastegui (mamuchas@yorku.ca).

SAC FORUM: "PARTICIPATORY KNOWLEDGE CO-PRODUCTION"

Guest editors: Jennifer Carrera and Les Levidow

Full CfP: https://bit.ly/Participatory_Knowledge

https://think.taylorandfrancis.com/special_issues/science-culture-sac-forum/

Academic researchers have a long experience in co-producing knowledge with practitioners. This has often aimed to contest the dominant expertise, to shift power imbalances and thus to empower groups of many kinds. These encompass subaltern groups contesting various inequities (of race, class, gender, etc.). In such ways, participatory knowledge co-production has sought to promote societal transformation.

Our Forum invites articles that address some of the following questions:

- How have researchers co-produced knowledge with practitioners to inform their collective action to shift power? for resisting oppressive arrangements and/or building liberatory alternatives?
- How has this process facilitated or strengthened practitioners? as a collective subject of strategic action?
- What internal tensions have arisen between researchers and practitioners? e.g. in scientizing dissent? Or in highlighting the implicit politics of knowledge?
- What have been the strategies to shift epistemic authority and institutional power?
- How have such efforts promoted social learning from outcomes, towards more effective strategies?

Those questions arise from concepts in the literature survey; articles should engage with them. Contributors are welcome to write personally about their own experiences.

Submission Details

Deadline: 1 May 2023.

Length: Forum articles are flexible, ranging between 2k-6k words.

Guest editors: Queries or submissions to Jennifer Carrera jcarrera@msu.edu and Les Levidow, les.levidow@open.ac.uk

STS EVENTS

STS IN CONTEXT: PROVINCIALISING STS FROM CENTRAL EUROPE

Sarah R Davies, Tereza Stöckelová, Fredy Mora Gámez, Roos Hopman, Patrick Bieler, and workshop participants

STS's central area of study is the nature of knowledge production itself. While the 'fact factories' (Knorr-Cetina 1995) of natural science have been its primary focus, it also seeks to incorporate reflexivity regarding its own methods, findings, and modes of representation. How is our knowledge situated (Haraway 1988)? What 'method assemblages' are used, and what worlds do these enact or render other (Law 2017)? What new ways can be found to articulate academic arguments (Downey & Zuiderent-Jerak 2017; Mol 2002)? In recent years this reflexivity has been honed and developed through feminist and postcolonial approaches, which have further emphasised the situatedness and non-innocence of academic knowledge and practices. Abandoning historical assumptions concerning centres and peripheries of knowledge production, and expert compared to 'local' knowledge, such scholarship has argued that, ultimately, all knowledge is localized, with deep onto-epistemic and political implications. All (STS) scholarship is shaped by the contexts in which and actors by whom it is produced.

It was this idea that was the starting point for a recent workshop, held in Vienna but involving participants from institutions in Berlin and Prague (though framing us in terms of our institutional affiliations is, of course, a simplification: we all come from different countries – within and outside Europe – disciplines, and career points, and have different kinds of relations to the institutions in which we are currently located). The aim of the workshop, titled 'STS in context: Provincialising STS from central Europe', was to build on prior work that has sought to characterise how the institutional, geopolitical and other contexts in which we work shape our academic practices, and to discuss how we can and should intervene in these. Funded through [a network of 'central European universities'](#), the workshop organisers (Patrick Bieler, Roos Hopman, Fredy Mora Gámez, Tereza Stöckelová, and Sarah Davies) saw the event as an opportunity to build connections and relationships between ourselves and the sites at which we are based, whilst also reflecting on how the contexts in which we work are helping to constitute both the knowledge we produce and our experiences of academia. A central goal was to get to know each other, and to see what emerged from these new associations.



Figure 1: Workshop participants in Vienna

From the start we resisted structuring the event through a traditional workshop format. It should be low effort (in terms of preparation), explicitly anti-hierarchical, and consistently interactive. We therefore avoided long presentations, starting the first day (of two) with 5 minute lightning presentations where each participant reflected on the questions we used to frame the event:

What institutional homes do we come from, and what does STS look like in these sites? What geographic, disciplinary, and other hybridisations are forming our academic identities and practices? What new practices - from experiments in interdisciplinarity to new ways of caring - can or should we invent to do STS otherwise?

These lightning presentations were interspersed with reflections on the histories and current configurations of STS in Germany (Patrick Bieler), Austria (Max Fochler), and Czechia (Tereza Stöckelová) - a discussion which raised fascinating differences and similarities between these national contexts. Why does Czechia have no formal STS university department, while Germany has multiple different national associations? How has the rise of new public management in universities allowed for the possibility of distinct STS departments? Why, indeed, do national associations continue to be so prominent at a time when nationhood is ambiguous, and research not clearly tied to particular countries? In addition to discussing such questions, the first day closed with a guest talk from Prof. Olga Restrepo Forero, Universidad Nacional de Colombia, titled 'Asymmetries, margins, and traces: reflections from a career in STS'. In generously sharing her experiences of an international career in STS, and of her work at the Universidad Nacional de Colombia, Prof. Restrepo Forero offered inspiration to us for thinking about the localness of STS in different sites, whether South America or Central Europe.

'Figure 2: Unconferencing' in action



The second day was structured through an ‘unconference’ format. We started by gathering topics, shared interests, and activity ideas on whiteboards, clustering these so we could see emergent themes in what had struck or moved participants in the discussions so far. We ended with four broad and overlapping sets of ideas for further discussion: 1. questions of care, and how to produce caring, non-toxic institutions in our different contexts; 2. how to engage with and think about interdisciplinarity; 3. what it would mean in practice to decolonise and recognise the regionalisation of STS; and 4. intersections between art, STS, and innovative forms of making and doing. The unconference then continued with a ‘walkshop’: across two sessions, we met in four groups to discuss one of the emergent themes, doing this as we moved around the city.

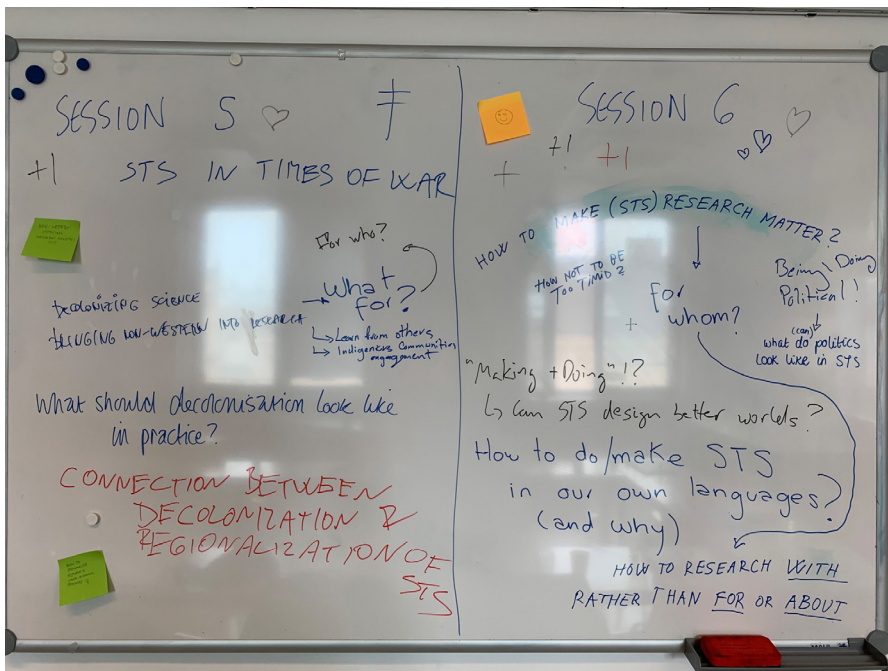


Figure 3: Gathering topics for the unconference workshops

Coming back after these periods of movement and reflection, we shared what had struck us, discussing topics from the affordances of the German and Czech languages for talking about care to the ways that regional geopolitics are shaping our work and what it means to be ‘inter’ - located between different knowledge practices, languages, and spaces. We repeatedly found ourselves caught in binds: in trying to deconstruct certain categories (North and South, centre and periphery, disciplinary boundaries, for instance), we ended up mobilising and thereby somehow reifying those ideas. Similarly, words (in whatever language) often failed us in trying to explain lived, embodied experiences. We thus also discussed the inconvenience of primarily using one language in STS (English), and how important it is to gain a better understanding of each other’s linguistically-shaped experiences of STS and academia in general.

We therefore found few answers in these discussions; rather, more and more questions were opened up. Our collective sense was that, in discussing and working on the question of how we do, and should, live and work in academia, it takes significant time to build trust, find common themes and interests, and develop substantive foci for further reflection. We thus see the workshop as a first step in a series of conversations in which we can interrogate some of the themes that emerged - the nature and affordances of interdisciplinarity, thinking STS in different languages, the value of liminal spaces such as ‘central Europe’, the urgency of finding new ways to care - in more depth. Such engagements also speak to our interests in moving forward in academia in ways that are sensitive to ongoing

climate and ecological crises, and in finding ways to be 'international' without the carbon emissions of excessive air travel.

While we met our aims of connecting, reflecting on our contexts, and building new relations between them (and of enjoying our time together), we plan on the workshop being a starting point, rather than a final outcome. Most immediately, some of us will meet in Czechia before the end of the year to continue reflecting on the potential and generative intersections between STS and various forms of art, and want to invite any other EASST members from the region who are interested to participate in these developing discussions. Just get in touch.

"For me, the workshop in Vienna was the first in person engagement outside of my institution after a hiatus of more than two years due to the Covid-19 pandemic. In this regard, it reminded me of the power of face-to-face conversation and the importance of felt experience and embodied, physical presence when communicating with others."

"It will not be an exaggeration to say that the Vienna workshop was a transformative experience for me as a scholar. Being a part of this network is a great opportunity not only to build connections throughout universities and countries, but also to create a (stronger) connection to my own researcher's identity."

"Es revelador e inspirador poder continuar algunas de las conversaciones sobre decolonialidad y localidad de los ESCT (STS) en las que he participado en el pasado, pero ahora en un lugar totalmente distinto para mí. Este taller ha sido también una oportunidad para contrastar algunas de las discusiones sobre centros-periferias que han tenido lugar en otros contextos. ... Escuchar las experiencias de varias colegas, en especial de Praga, ha sido estimulante y revelador sobre la multiplicidad de condiciones y visiones de los ESCT, incluso dentro de Europa (como región) y de Europa Central (como localidad)."

BIBLIOGRAPHY

Downey, G. L., & Zuiderent-Jerak, T. (2017). Making and doing: Engagement and reflexive learning in STS. In U. Felt, R. Fouché, C. Miller, & L. Smith-Doerr (Eds.), *Handbook of Science and Technology Studies* (4th ed., pp. 223–250). MIT Press.

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14(3), 575.

Law, J. (2017). STS as Method. In U. Felt, R. Fouché, C. Miller, & L. Smith-Doerr (Eds.), *The Handbook of Science and Technology Studies* (pp. 31–57). MIT Press.

Knorr-Cetina, K. (1995). Laboratory Studies: The Cultural Approach to the Study of Science. In S. Jasanoff, G. Markle, J. Peterson, & T. Pinch (Eds.), *Handbook of Science and Technology Studies* (pp. 140–166). SAGE Publications, Inc.

Mol, A. (2002). *The Body Multiple: Ontology in Medical Practice*. Duke University Press.

Sarah R Davies (University of Vienna), Tereza Stöckelová (Institute of Sociology of the Czech Academy of Sciences and Charles University), Fredy Mora Gámez (University of Vienna), Roos Hopman (Humboldt University Berlin and Natural History Museum Berlin), and Patrick Bieler (Humboldt University Berlin) are co-organisers of the workshop 'STS in context: Provincialising STS from central Europe'. This text has been written by them with additional comments from other workshop participants.

NEWS FROM THE COUNCIL

CALL FOR NEW EASST REVIEW EDITORS

The EASST Review is the quarterly of the European Association for the Study of Science and Technology (EASST). Since its creation in 1982, the EASST Review has played a crucial role in the constitution of the field of science and technology studies in Europe and beyond. As a community-building knowledge infrastructure, the EASST Review has provided a heterogeneous space for learning about each other, debating about matters of common concern, and experimenting with other forms of writing. You can visit it online here: <http://easst.net/easst-review/>

In the last decade, the EASST Review has only begun to feature the work and stories of STS groups and/or departments based in Europe (section STS Multiple), tell the stories of different STS-related publication outlets (section Cherish, not Perish), stage debates about pressing political issues (section STS Live), as well as publish reports from STS and EASST-funded events in Europe and around the world. Currently, the Review comes out three times per year both as an online publication and in a downloadable PDF version. One important challenge for the EASST Review in the future is evolve its digital infrastructures, presence and identity.

EASST Council is looking to appoint new editorial team members in the upcoming year, serving for an initial period of three years with possibilities to prolong. The editorial team (currently 3 members) is supported by an editorial assistant and a graphic designer.

The main tasks of the editorial team include:

- Reaching out and communicating to potential authors of contributions to the different sections
- Reviewing and copy-editing submitted contributions
- Coordinating with EASST Council the publication of EASST announcements, reports on EASST-funded events, as well as reports on EASST biannual conferences
- Coordinating and managing the publication process.
- Participating and reporting about the EASST Review in the EASST Council meetings.

If you are interested in becoming an editor of EASST Review, please submit an 'expression of interest' by February 1 to the following email: review@easst.org Your expression of interest should include a CV (including a list of your participation in EASST related activities), as well as a one-page statement delineating your motivation and vision for the EASST Review.

MAKING STS BETTER

Dear Members of EASST

Over the last couple of months there have been messages in social media and other places about abuse and sexual harassment within the STS community. In the EASST Council we take these messages seriously and are working to create an ethics and code of conduct policy for EASST. We appreciate and are inspired by the work 4S has already conducted. At the same time, we are aware that cultural contexts differ, for example, between the US and Europe and that we need to consider how we formulate our aspirations in the EASST setting.

From a personal point of view, and as President of EASST, I want to express my respect for the courage it has taken to raise issues of harassment as well as more nuanced questions of appropriate professional conduct and abuse of power, and send my sympathy and solidarity to all who have experienced harm. It is utterly important to me that our community is a respectful, generous and friendly space. I want all of us to treat each other in a helpful and supportive way, whether we are early career or very experienced, have tenured positions and many citations or have just embarked on a PhD study.

A good friend and colleague advised me to say a little about my own positionality. I am a senior white woman (I simply cannot find a way of calling myself powerful, although others might) in Denmark. I have experienced my share of sexism, harassment and hard criticism in academia, and I dealt with it by gritting my teeth, ignoring the worst and working harder. I don't necessarily think that was the right thing to do. However, when I was younger, it seemed the only way. Against this backdrop, I welcome that younger generations might have other ideas about what is acceptable behaviour in academia and how we should deal with abuse. I want to listen and learn. But I am myself struggling to make sense of it all.

Even with the best efforts, it is likely that there will still be situations in which harm occurs. As we know well in STS, science is not a place outside of society, and our societies are still significantly structured by multiple forms of oppression, such as sexism, racism, homophobia, gender normativity, and ableism, to name just a few. Of course, clearly illegal and violent behaviours such as sexual harassment have to be dealt with according to the law and to the rules of the institution in which they happen. However, when it comes to the more subtle forms of possible misconduct, I know from my long experience as a manager in a university that people seldom agree on how a particular situation should be interpreted. These are often complex histories – usually more complex than can be communicated in tweets or blog posts. While social media can be useful for getting a debate going, they are often not the right place to have nuanced discussion and make sure that all voices are being heard. While it is easy to assign blame or voice calls for exclusion on social media, it is more difficult to engage in mediation or restorative processes to address harm and repair relations.

It is vital to me to acknowledge and respect people's experiences. At the same time, it is essential for me to ask how our STS community can become a space that does not address harm through exclusion and punishment alone, but that also fosters learning, remediation and growth, particularly when we are discussing more nuanced questions about what constitutes appropriate academic conduct. Since academic scholarship is built on organized skepticism and constant review of our work through peers, there will always be moments that are tough. Getting a paper rejected, or being met with hard criticism after a conference presentation hurts – whether you are a PhD student or a full professor. Being an academic community, we cannot disallow criticism, as this is foundational to how we develop knowledge. Sometimes academics disagree on the merits of a piece of work and that has to be ok.

I do believe, however, that we have much to learn in terms of how we formulate criticism, how we decide what to cite, and how we praise or ignore certain kinds of work. Certainly many of us (me included) would do well to apologize more often if someone has been hurt by our actions and become more attentive to how power differentials influence the way people are being affected by our actions.

Our goal should be to foster a supportive community in which we help each other to acknowledge our shortcomings, grow and affect positive change in our community and beyond. This goes for PhD students as well as full professors. Let us work together for positive changes and acknowledge that we need each other to help us become better as scholars but also as people.

As I said above, these are my personal thoughts at the moment. I do think we need to talk much more about these issues. And I want to listen as well as share my own views. I therefore welcome your thoughts on these crucial matters in the months ahead.

I wish you and your loved ones a happy and peaceful holiday. I hope you will all contribute to making STS into a better community in the future.

Maja Horst, President of EASST



european association for the study
of science and technology

EASST Review (ISSN 1384-5160) is published quarterly and distributed digitally to all EASST members.

EDITORS

Sarah Maria Schönbauer (MCTS, Technical University of Munich)
sarah.schoenbauer@tum.de

Niki Vermeulen (Science, Technology and Innovation Studies, University of Edinburgh)
niki.vermeulen@ed.ac.uk

EDITORIAL ASSISTANT

James Besse (University of Edinburgh)
J.W.Besse@sms.ed.ac.uk

LAYOUT

Anna Gonchar
anna_gonchar@gmx.de

EASST Review on the Web: <http://easst.net/easst-review/>

Past Editors: Ignacio Fariás, 2015-2020; Ann Rudinow Sætnan, 2006 - 2014; Chunglin Kwa, 1991 - 2006; Arie Rip, 1982-1991; Georg Kamphausen, 1982.

The Association's journal was called the EASST Newsletter through 1994.

Cover photo courtesy by Joakim Lloyd Raboff.