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Intimate Entanglements:

**Affects, more-than-human intimacies and the politics of relations in Science and
Technology**

Joanna Latimer and Daniel López Gómez

Abstract

This paper introduces *Intimate Entanglements* by proposing three interrelated shifts that result from juxtaposing experiences with different world-making practices at the intersection of care, technoscience and theoretical engagements with affect theory and science and technology studies (STS). The first shift positions intimacy as not only relevant in STS but also as a more general epistemic concern of social scientific enquiry. The second shift is an exploration of the heterogeneous materiality of the intimate and, in particular, of its more-than-human constituencies. The third shift both reclaims and speculates about other politics of relations, including practical challenges (not only conceptual) to the way we do research. The paper shows that the beings entangled, the materialities involved, the affects conveyed and the extension of the intimate all come to matter when science and technology is critically analysed, and that they challenge the traditional limits and geographies of the intimate. It also argues that this has important political implications for science and technology, because it counters the invisibilisation of affect and all the “intimate work” usually associated with the emotional, domestic, and even infrastructural, and contests the ready-made framing of the intimate as naturally bound to the interpersonal, corporal and private, which the authors argue is a way to make visible the politics of relations that scientific and technological settings silently enact.

Keywords: affects, intimacy, more-than-human, Science and Technology Studies, care

Introduction: Arriving at the Importance of Intimacy for Science & Technology Studies (STS)

This research volume extends conversations and debates started much earlier between Daniel and Joanna, at *Un/Knowing Bodies* (Latimer and Schillmeier 2011), at *The Radicalisation of Care* workshop that took place in Barcelona 2014, and finally at a sub-plenary panel of the EASTT/4S 2016, which offered intimacy as a provocation for thinking about STS by other means. The story of our gathering ourselves together with the scholars in the collection *Intimate Entanglements* around the notions of ‘intimacy’ and ‘entanglement’ is thus complex, and in a sense enacts one expression of collaboration as ‘being alongside’ (Latimer 2013) difference in partial and intermittent connection; it is (we hope) a very productive example of becoming intimately engaged through juxtaposition and indirection.

To start with, the extent of the difference between the disciplinary bodies at work here is worth noting. For example, Daniel is trained in social psychology, which has a long history of attention to affect, and STS, which doesn’t; Joanna read English literature, was a nurse for 10 years, trained in sociology and a bit of anthropology and STS. Apart from STS, our common ground has been care, older people, ageing and ethnography. While our coalescence around the idea of intimacy brings together differently situated experiences and theoretical engagements, both our histories have exposed us to *the affective* as both sometimes acknowledged as central to world-making, and at others as unacknowledged, misunderstood, or even dangerous. This meant that both of us were unhappy with the relative absence of attention to affect and care in sociology, particularly in STS, albeit with some exceptions,

especially feminist technoscience. How each of us has evolved to become interested in intimacy illustrates some of this context.

Daniel's interest in exploring the qualities of the intimate in science and technology started in mid 2000¹, when it emerged as a deeply moving and contested terrain in the study of telecare arrangements for older people (López Gómez 2015; Sánchez-Criado et al. 2014, López Gómez et al. 2010; López Gómez and Domènech, 2008). On the one hand, the service needed these technologies to be so intimately incorporated into a person's daily-life that, in an emergency, pressing the alarm button of a pendant hung around the neck was a more natural reaction than calling a relative with whom the person had daily chats. On the other hand, despite the efforts of service providers, users ended up arranging the technology in very unexpected ways, and in many instances these arrangements were even disruptive of the "normal" functioning of the service. Tinkering with the system in everyday life was an intimate matter not only because it took place in the home, but because the way the users arranged the technology and became attached to it, was indeed a trial of the strength, of both their own aging condition and their identities beyond, as well as a way to test the suitability of their mode of living according to a different sort of moral, social and medical standard.

The material and affective were deeply intertwined in this contested territory of the intimate. Quite strikingly though, STS concepts such as domestication, appropriation, translation, co-production (Michael, 2012) turned out to be too mechanistic and were poorly equipped to grasp the ethico-political and ontological implications of studying this contested (and slippery) territory of the intimate. Drawing on the work of other STS scholars coming from social psychology (Michael, 1996; Brown and Capdevila, 1999) or working on care and disability (Schillmeier 2008; Moser, 2006), such as Myriam (Winance 2006) we wanted to approach affect and subjectivity in material-semiotic terms. This helped to expand the post-

social turn to the domain of the psychological, and as a result contest some of the dichotomies that limited our questions. However, it was quite difficult to make the uncanniness and stickiness of the intimate relevant for STS. We can now do it, however, as a result of important contributions: firstly, studies of care such as Joanna's (2000), beyond and within STS (for example, Pols 2012; Mol, Pols and Moser 2010; Mol, 2002), started shifting the material-semiotic repertoire to make it appropriate not to follow engineers and scientists, in constant dispute, but to appreciate care practices (López Gómez 2019); secondly, because affect became an important issue in following the composition of human and non-human assemblages in knowledge-making (for example, Gomart and Hennion 1999; Latour 2004; Latimer and Miele 2013); and thirdly, because care came to matter as a political and material performance in science and technology (for example, Puig de la Bellacasa, 2011, Puig de la Bellacasa 2012, Martin et al., 2015, Pols, 2015). For Daniel, this volume is in fact a way to keep enriching this tradition in STS, but also an opportunity to confront it with the "old" and still too elusive question of the intimate. In doing this, the hope is that the "uncanniness" and "stickiness" of the intimate can indeed contribute to unsettling some of the normative shortcuts that the current turn to care is producing and push us to think not beyond, or together with, but, as Joanna has suggested (Latimer 2013) along-side multiple and troubling Others.

For Joanna, 'intimacy' emerges in relation to the intimacy of reading and studying literature, as entry into the other worlds and lives that poems, plays and novels draw us through, and in which the affective dimension is made to matter. It also emerges as an epistemological problem in the contrast between her experience of being a 'practitioner' - first as a nurse and then as a sociologist – and representations of how practitioners 'know' and 'understand' in these domains. Specifically, she has been concerned with how 'care' and knowledge-making are both subject to continuous and far-reaching attempts to disrupt

possibilities for the affective, the embodied and the relational to be seen as essential to how knowledge is accounted for, or even as critical to, the very institutions that have a duty of 'care'. Here, institutions do not just include the obvious ones - medicine, nursing and health care services - but universities, research institutions, disciplines, science itself – institutions with a responsibility to care for truth, justice, and freedom. Thus, for Joanna, knowledge-making and care go hand in hand – curiosity, as Foucault (1989) argued, *is* care:

To me it suggests something altogether different: it evokes 'concern'; it evokes the care one takes for what exists and could exist; a readiness to find strange and singular what surrounds us; a certain relentlessness to break up our familiarities and to regard otherwise the same things; a fervor to grasp what is happening and what passes; a casualness in regard to the traditional hierarchies of the important and the essential.

Yet in her early experience of nursing, of learning sociological argument, and of medicine and the 'natural' sciences, intimacy was confined to the sexualised, the domain of private life, to the sensuous domain of the body and its affects, and was seen as outside of knowledge-making, or at most as 'technologies' of intimacy – or constituted as a relationship to be claimed by nurses in the fight for recognition as professionals with a knowledge base (Savage 1995). Giddens (1992), emphasising the emancipation of women and the emergence of 'sexual plasticity', locates intimacy in dyadic relationships between individuals as a part of the self-reflexive project characteristic of late modern de-traditionalised, global risk societies, the space of retreat through which to accrue some sense of self-identity. But this bracketing of intimacy has, historically, made it difficult for intimacy to be a subject of importance in professional and scientific lives. Menzies Lyth (1960), a Kleinian psychoanalyst and co-founder of the Tavistock clinic, in her study of a nursing service in late 1950s, showed how the intimate aspects of nurses' and patients' work together were intensely problematic, with emergent forms of organisation aimed at repressing rather than confronting the intimacy

afforded by doing nursing and being nursed. Organisational arrangements such as task orientated work-allocation, depersonalisation, categorisation and denial of the significance of the individual, detachment and the denial of feelings, were all mechanisms understood by Lyth as a 'social system' that had arisen as a 'defense against anxiety', the anxiety arising from the profound affects of the intimate aspects of nursing and being nursed. This repressive regime had many negative consequences, including inefficiencies in service as well as the intensified levels of tension, distress and anxiety experienced by nurses and patients alike. What Lyth in these early days did not capture was how, in the processes she describes, it was intimacy that was being organised out – that intimacy as an effect of how relations between persons, bodies and things are done is itself being denied any life; and what Giddens, amongst countless others, does to intimacy by locating it in dyadic, sexual and love relations between individuals is to drain it of its broader importance. This may account for the absence of the affective dimension from mainstream STS.

In contrast, as she grew up in the 1960s and 70s, Joanna was exposed to shifts in disciplinary possibilities, and the problematisation of the dominant. Her work attempted to show that how care is conducted includes the marginalisation and invisibilisation of the affective and embodied dimensions of care, including knowing and understanding, because they are so easily rendered as merely 'subjective', 'private', 'unscientific', 'unprofessional', and as such, hard to account for. Through her collaboration with other scholars concerned with care and affect, including Daniel and some of the other researchers in this volume, she has become increasingly confident that exploring the affective dimensions of care and of the scientific life are important for sociology, precisely because they *are* dangerous: the association of the affective, and especially the intimate, with emotion and bodies means that a focus on the intimate dimensions of how care and science are done can disrupt and even perhaps transform the very relations that position the affective dimension as unprofessional

and ‘subjective’, as not really relevant to how knowledge, care and science are done. As she discusses in her conversation with Marilyn Strathern (this volume), this includes helping sociology to find new ways to argue and to write, as well as to know, that are not simply routed in the oppositional. Thus, her hope is that attending to the intimate in how care, knowledge-making and science are done may even be able to help transform the politics that entangle care, science and research, and even STS itself. This is not to suggest for one moment that the intimate has only a positive value – rather it is to ask the question ‘how can the intimate become both topic and resource for sociological research’? Here, she has in particular thought about the ordering of relations in care, science and medicine in terms of relational extension as attachment and detachment between persons and things, the human and the non-human. This has helped her situate care, medicine and science as as much a part of life as anything else we make or include and exclude (see for example, Latimer 2007, 2009, 2011; Latimer & Munro 2006)

Our current project creates a new opportunity to bring these questions into play in thinking about how to do STS by other means. Asking them in relation to other literatures, cases and problems within and beyond STS has led us to consider that the epistemic and ethical-political dimensions of the concept are the most crucial. This volume is thus an attempt to collectively respond to two interconnected challenges.

The first could be described as a shift that begins with an attempt to make intimacy relevant to science and technology and ends with an exploration of the socio-material constitution of intimacy and its more-than-human constituencies. It is thus an ontological challenge.

The second challenge is to reclaim and reinvent the politics of relations that the making of intimate entanglements in science and technology embeds and reproduces. It is

thus an ethical, political and epistemic response to these politics of relations, and therefore poses not just conceptual but also practical challenges to the way we do research.

Making intimacy relevant: from affects to more-than-human intimacies in the co-production of science and technology

The scientific ethos reproduces the differentiation between public and private spheres, and relegates intimacy to the private sphere, locating it as something that can potentially jeopardise scientific settings. Due to this positioning of intimacy, the space of affectivity we call intimacy has been generally obliterated and dispossessed of epistemic relevance in the study of science and technology. For a sociologist, it might be worth studying as a way to explain the social origins of scientific and technological pitfalls, but would hardly explain technoscientific breakthroughs. This is partly due to the Mertonian sociology of science, which Bloor (1991) characterised as the sociology of error, that defined science as a highly scrutinised and protocolised activity that must be rendered accountable and transparent to a community of peers in order to prevent any form of intimacy that could either introduce subjective and uncontrolled biases or lead to unethical doings.

In response to this sociological approach to science and technology (S&T), ethnographers and ethnomethodologists of science and technology (e.g. Knorr Cetina & Mulkay, 1983; Latour & Woolgar, 1986; Lynch, 1985; Pickering, 1992) have long held that there is a need for first-hand experience of the intimacies of these social worlds, and for immersion within them if their rationales and their social significance are to be understood. And yet there was in this work a lack of attention to the embodied and affective dimensions of how world-making in S&T is possible (Blackman and Venn, 2010). For

example, in the early work of Actor Network Theory research, despite efforts to be symmetrical, affect plays a minor role in accounts of doing science and technology. The picture of science presented is usually dominated by strategies of *interessement*, which operate as an agonistic but disaffected struggle amongst different stakeholders (Star, 1990). Moreover, despite the de-scription of the dynamics of science in action challenging the idea of a neutral, non-affected, and non-situated science, intimacy seemed not to be seen as a relationship with methodological value. The agnostic ethos, overwhelmingly adopted in STS, could indeed be seen as a precautionary measure against the epistemic pitfalls of becoming too intimately entangled: that is, to reproduce, perhaps unwittingly, the repertoire of actors to which the analyst might be *too* attached (López Gómez, 2019).

It is in the tradition of feminist studies of technoscience (for example Davies, 2013; Despret, 2013; Haraway, 1988; Latimer and Miele, 2013; Martin, 1987; Pratt and Rosner, 2012; Puig de la Bellacasa, 2011; Star, 1985; Stengers, 2010; Stone, 1996; Suchman, 2000) that intimacy has become relevant, and embodiment and affect acquire a central value. For example, in her biography of Barbara McClintock, Evelyn Fox Keller (1983) shows how doing scientific research in cytogenetics is partly about establishing an absorptive, sensitive attachment to the materials of inquiry, what McClintock called “a feeling for an organism”.

In this respect, the work of Despret (2004) also challenges the idea that affective relations are a source of bias and error, rather, she shows how they can be the source of truthfulness and relevance. To remove intimate attachments from the equation of science is, according to Despret, to misunderstand what experimental knowledge means, or what the value of objectivity is. For her, what experimental sciences are good at is building relations of trust and co-becoming in the experimental setting. There is an ethics of knowing which is

fragile but crucial for ensuring that questions are made relevant not only to the scientists but also to the objects of inquiry, be they subatomic particles or laboratory mice.

Thus, technoscientific world-makings are not just socio-material practices, but affective and embodied processes, filled to the brim with moments of ‘being moved’ and ‘moving’. Moreover, as a quality and an effect of the ‘force or forces of encounter’ (Seigworth and Gregg, 2010, p. 2) intimacy in knowledge-making work involves more than human actors becoming attached, and more importantly mutually transformed (Candea, 2013). Natasha Myers (2015), discusses the way that research aimed at knowing and representing molecular processes involves bodies, human and non-human, as well as digital programs for modelling proteins. Illuminating the socio-material interactions necessary for molecular knowledge to happen, Myers describes the work of one scientist-modeller (Diane) as:

“actively handling the model through interactive molecular graphics programs that she can project herself “inside” of and figure out “where she is” with the structure. She achieves this intimacy with the model by dilating her corporeal schema to meet its form. Indeed, it seems as if she is able to morph the perception of her body enough that her own limbs become effective proxies for chemical structures.”

By reclaiming the epistemic value of affectivity, sensibility and embodiment in science and technology, scholars such as Natasha Myers are helping make intimacy a *necessary* affect of how science happens. For Myers (2008), scientists’ bodies are “excitable tissue for gathering up the energetics and movement of the world”, manifesting these “as perception, affect, and action”. Intimacy as affect and effect thus gains relevance not just as an *object* of but also as a *means* of inquiry.

Making intimacy central to inquiry, as both object and means, as Mariam Fraser and Normal Puwar (2008) argue, allows the sensory, emotional and affective relations

underpinning research processes to become an “academically respectable” subject rather than something that needs to be edited out of discussions of knowledge-making. For them, the notion of intimacy reveals the “affective properties of research labour” (Fraser and Puwar, 2008), which it then becomes imperative to analyse because they “inform the making of knowledge”, “shape power relations”, and “enable or constrain the practical negotiations of ethical problems” (Fraser and Puwar, 2008).

Aligned with the aforementioned lines of inquiry, the articles in this volume discuss how intimacy (for good or bad, intended or unintended) is a neglected affect of many different kinds of socio-material relations, in particular science and technology world-making practices. The chapters engage with particular modes of doing science and technology with others: in ethnography, participatory research, scientific activism, interdisciplinary collaborations, and art-based and design-based research. Most of the authors have been involved in situations where science and technology is co-produced together with a wide array of actors: scientists of different kinds, technicians, architects and designers, artists, and various publics, from activists to users and patients. What the chapters clearly show is that in these modalities of scientific and technological collaboration, the mobilisation and organisation of affects can be easily acknowledged by the majority of actors as a salient and troubling issue. In line with what happens in Menzies Lyth’s study of nursing discussed above, in these new technoscientific scenarios, setting out intimate entanglements is not only part of the job –if something relevant is expected to come from them–but it is in how this is organised that the politics of knowledge are played out. Thus, one might think that the less disciplined and more open the knowledge-making process in which we are involved, the more important, visible and challenging seem to be the intimate entanglements. That would explain why in contexts where disciplinary and academic knowledge is displaced, in favour of more open science and innovation systems, the epistemic values of friendship,

trust or care are revealed as more crucial, but paradoxically are almost extinct and need to be reclaimed, as Latimer's and Ramírez-i-Ollé contributions clearly show.

The second important aspect, however, is that while they preserve a sense of the potency of 'intimacy' as unsettling, subversive and even dangerous, the explorations in this volume show how intimacy emerges as an effect of how relations are materially done and get done, and how these affective relations are actually ordinary and even essential to different kinds of world-making. The chapters clearly express the need to turn the taken-for-granted framing of intimacy as naturally bound to the interpersonal, corporal and private, into a contested issue; to open up what we usually think of as intimacy to other nuances, attributes, dimensions and constituencies. They show that the beings entangled, the materialities involved, the affects conveyed and the extension of the intimate not only come to matter when science and technology is critically analysed, but that they all challenge the traditional limits and geographies of the intimate. For this reason, this volume centralises 'intimacy' not as a prefigured property of relations among the actors mentioned, but as an effect of material entanglements that may cross and reshape differences of kind.

Intimacy is thus revealed as a site of connection through which a sense of belonging and alterity might arise in relation to human and more-than-human others. Some of the papers explore intimate entanglements with a wide array of living beings, such as dogs (Motamedi-Fraser), mice (Frieze), nematodes, seasquirts and crustaceans (Latimer), hookworms, bed bugs and antibiotic resistant microbes (Giraud, Kershaw, Helliwell and Hollin); and with earthly elements such as (polluted) air (Calvillo and Garnett) and soils (Puig de la Bellacasa). Other papers revolve around intimacies with "technical aids" such as wheelchairs (Winance) or DIY ramps for disabled people (Sánchez-Criado), or objects to which we are attached but are on the verge of throwing away (Callén and López Gómez). Spaces such as psychiatric wards (Kanyeredzi, Brown, MacGrath, Reavey and Tucker) or digital data (Calvillo

and Garnett) are also aspects of the intimacies the volume analyses. In contrast to the chapters about animals, artifacts and objects, what becomes intimate in the chapters on spaces and ecologies is more elusive: they are atmospheric and ecological forms of relatedness that go beyond the *hic et nunc* as they incorporate the potential, eventful and global.

In these explorations of the socio-material and more-than-human constituencies of the intimate, the authors are equipped with concepts such as abyssal intimacies (Friese, drawing on Schrader 2015), word encounters, multi-species abundance, data intimacies, animatedness, and atmospheres, to highlight, first, the materiality, affectivity and aliveness of the intimate entanglements with these more-than-human others; second, to reflect upon the kind of collectives we form with them; and lastly to raise epistemic and ethico-political concerns about contemporary techno-science that would not be possible with traditional imaginaries of the intimate.

Reclaiming the heterogeneous materiality of the intimate – intimacy is made of and with multiple entangled materialities – has important political implications in the context of science and technology because it not only counters the invisibilisation of affects and all the “intimate work” usually associated with the emotional, domestic, even infrastructural (Star and Strauss, 1999), but also contests the ready-made framing of the intimate as naturally bound to the interpersonal, corporal and private, which is a way of making visible the politics of relations that scientific and technological settings silently enact. Bringing to the fore the more-than-human intimacies that configure the current modes of doing science and technology, we believe, is also a way to politicise them and even to offer a mode of resistance to the entanglements that emplace and position them.

Entanglements: displaying and doing the politics of relations in science and technology

This new situation doesn't signify that the other questions (pollution, inequalities, etc.) move to the background. Instead they find themselves correlated, in a double mode. On the one hand, as I have already underlined, all call into question the perspective of growth, identified with progress, which nonetheless continues to impose itself as the only conceivable horizon. On the other hand, none can be envisaged independently of the others any longer, because each now includes global warming as one of its components. It is indeed a form of globalization that it is a matter of, with the multiple entanglements of the threats to come (Stengers 2015, p.20).

Entanglement, as this citation from Stengers suggests, stretches the notion of the relational to incorporate a sense of how world-making – especially acts of taming, excavating, transforming, intervening, mining, colonising, growing, domesticating, clearing, building, enhancing – are each already entangled in and by alignments between politics and capital, science and technology, with each having their affects and effects on lives and the capacity to be alive, because of who, what and how they entangle. In this light - shifting towards spaces of affect which are deemed “ordinary” (Stewart 2007) but which usually occur in time/spaces that are ‘in-between’, either concealed from public scrutiny or recalcitrant to private appropriation, including sites of alterity and resistance - intimacy denotes being and becoming entangled, in and by socio-material relations.

Where entanglement emplaces persons and objects in dominant power relations, practices of resistance that organise intimacy in as a critical means of knowing, can transform understanding and affect and even change these entanglements (e.g. Kraeftner and Kroell, 2009; Tironi and Rodriguez 2016; Tironi 2018). As well as examining how technologies of governing attempt to *organise intimacy out* in ways that are dysfunctional (as

Menzies Lyth's work, discussed above, showed), intimacy as an affect of particular socio-material distributions, attachments and detachments, can recover something of what animates the assembling and reassembling of the social.

Berlant (2011), exploring the capacity for attachment to objects of desire to disrupt the depressing political ecologies of contemporary lives, suggests that such attachments can assert an alternative promise in the face of dominant versions of reality. Yet she stresses the cruelty of such attachments, in which promise and hope emerge not as lines of flight, but as what winds back to specific "institutions of the intimate" (Berlant 1998), those institutions that mould the force and aesthetics of our attachments with "tacit fantasies, tacit rules, and tacit obligations" (Berlant 1998: 287).

Thus, intimacy as both topic and means presses the political dimensions of knowledge-making to incorporate what is so easily othered. Raffles (2002) suggests that this othering is achieved partly by the way intimate knowledge has been "parochialised", that is, "defined in contrastive relation to something that is supra-local", universal and scientific. This has important consequences because "the place and the people bound to it both index and are reduced to signifying a particular phenomena". What is lost in figuring 'intimate knowledge' as localised is precisely the situatedness, relatedness, affectivity and embeddedness of the intimate in knowledge-making:

There is no universal against which intimacy is parochialism. It speaks symmetrically of researchers, field assistants, trees, and loggers. It insists both on the importance of the time and space of encounter (between people, and between people and non-humans), and on the decisiveness of the embodied, situated practices that take place there. It points to the ubiquity of affect as a mediator of rationality. And it draws attention to the embeddedness of social practice in relations of power. (Raffles, 2002, p. 332).

Thus, according to Raffles, intimacy can be foregrounded as a site for the social production of knowledge across the social, human and life sciences, as doing the political work of disentangling what dominates, especially through reworking human/nature and socio/technical boundaries. In addition, Raffles' emphasis also makes visible, as well as overcoming, some of the embedded hierarchies of division which usually characterise the ways research and knowledge-making are performed and presented: not as co-production but as the effects, and critically the property, of some persons rather than others.

In this sense then a focus on intimacy as a quality of the way world-making is done and gets done is not a mere exercise in deconstruction. Rather, the relations that enact and co-create socio-material assemblages can also help collapse the divisions between objects and subjects, as a way to foreground the fragile nature of agency as an effect of human-non-human association, and avoid othering those Others whose associations deny agency, however emergent (Lee and Brown, 1994). This is important to help reveal the power dynamics in the making of science and technology; whose knowledges, for example, are being translated without their voices being heard (Star, 1990)? As Raffles suggests, paying attention to the intimate, is also a way to make visible what is rendered invisible in science and technology - the work of the delegates of science, secretaries, laboratory technicians, lab animals, and all sorts of "domesticated" inscriptions whose work is almost naturally attributed back to the central figure of the scientist, the author and the thinker (Star, 1991). By putting affect in the centre of our methodological devices, this neutrality is challenged and the violence that these "translations" and enrolments imply is not only perceptible but impels the researcher to a response (López Gómez, 2019).

Hence, the focus on intimate entanglement is a way of unconcealing the ethics and politics of relations (Martin, Myers and Viseu 2015). Through a situated and sensitive account of the various elements comprising intimacy as both subject and means, the authors

make vulnerability, unknowingness and openness inescapable if entanglements are to be made visible. The articles also pose vital questions about how we become attached and even responsible for entangled human and non-human others, and explore what a “good” response might be. In summary, a focus on intimacy as an emergent quality of relations that entangle and disentangle can privilege ‘subjugated standpoints’ (including the standpoint of embodied vision, care and affect), build “webs of connections”, and tell stories that help (Haraway, 1988, 584).

Each of our articles, as expressions of caring for and about what is usually concealed, offers examples of how a dominant politics of knowledge can be undone. Strathern discusses writing, thinking, and researching as an effect of being formed and reformed by her entanglement with diverse others, but also as *care*. It is this care that enables a way to reveal and reimagine those concepts and ideas that underpin and dominate thought, and the practices and relations that flow from how things are thought, to see how the dominant politics of knowledge and relations can be undone. The condition of being always partially formed by others’ parts is indeed a way to reclaim a politics of relations that is usually elided in science and technology.

In her critique of recent policy drives towards interdisciplinarity and responsible research and innovation, Latimer reflects on the ethics of knowledge-making in the contemporary moment of science under siege. She reveals how both life and social scientists resist, or coexist, with the twin strategies of the industrialisation and managerialisation of knowledge. Latimer tells us how social scientists and life scientists gather together around their intimate attachments, in this case to animals and “ethical doings”, to come alongside each other, partially and intermittently. The paper tells how such intimacy can both contribute value and protect what both social and life scientists care for and about: immersion, contemplation and collective endeavour. Specifically, she elaborates the idea of

intimacy as a way to rethink interdisciplinarity and collaboration from the perspective of ‘being alongside’ (Latimer 2013), as a counter-politics of knowledge and as a way to care for the tensions between them as ‘openings’ into each-other’s worlds.

Sánchez-Criado’s, Ramírez-i-Ollé’s and Frieze’s papers also explore and extend ideas about how ‘being alongside’ can help open up different forms of relatedness with research participants, in ways that create openings for new understandings. Becoming intimately entangled with scientists, Ramírez-i-Ollé’s ethnography of a group of dendroclimatologists contests the image of science as disinterested and disengaged. She elaborates friendship in scientific methods and asks how academic friendship and being alongside are possible if intellectual work does not acknowledge and relate to contagion and mimesis and only prizes originality, authenticity, novelty and singularity? As Chiew and Barnwell (this volume) suggest, doing science alongside others, through epistemic friendship, as Ramírez-i-Ollé would put it, demands that these values so deeply ingrained in modern intellectual work are unsettled. Moreover, it requires, as Motamedi-Fraser (this volume) insists, consideration of the very practice of thinking as a collective achievement that overcomes any anthropocentric enclosure. For instance, she shows that as human-dog encounters with words are spaces where thinking is re-distributed creatively, accounts in animal studies should also do justice to this situated distributedness and overcome “linguagism”, the idea that dogs do not have language as humans do because they have no abstract symbolic capacity. In academic work, as Strathern says in this volume, we need constantly to remember the condition of being always partially formed by others’ parts: an endless exchange through which we are forever in debt. This is a condition of academic work but also of intimate entanglements with more-than-human others.

The contributions in this volume demonstrate that the politics of relations is not just an issue for scientists and academics. Borrowing Sánchez-Criado’s (this volume) expression,

we could say that the ‘how-to relate’ problem that the exploration of intimate entanglements in science and technology eliminates is also a crucial problem for all the actors implied in the co-production of science and technology. In this regard, the contributions can also be seen as attempts at doing environmental politics and politics of the social *otherwise*. Most of the contributions in this volume aim to elaborate the material-semiotic conditions under which environmental and social justice is possible, because they frame the way that issues such as soil exhaustion, air pollution, waste production, ageing societies, biodiversity or ableism become public concerns and how it is possible to politically intervene at a grassroots and institutional level and at different scales.

For instance, Calvillo and Garnett show that when air pollution is mostly addressed as a technical problem, knowledge practices can reduce the possibilities for political action. They demonstrate how public involvement, based on a means to reveal a body-person intimate entanglement with pollution, actually produces better and more accurate numerical data and makes this data more accessible and open, increasing the possibilities of raising awareness and supporting political action. Similarly, while dominant ways of doing ecological science stress the demise and extinction of diversity, Eva Giraud, Eleanor Kershaw, Richard Helliwell, and Greg Hollin invert this relation to focus on interspecies intimacies of abundance to reveal the consequences of previous strategies of eradication, as well as the proliferation of these interspecies entanglements as the effects of social inequalities and injustices. Furthermore, Ava Kanyeredzi, Steve Brown, Laura MacGrath, Paula Reavey and Ian Tucker show that if the lived-experience of a ward is assumed to be governed by environmental and interpersonal factors, the moods and feelings attached to the place are disregarded and the politics of daily life in these institutions is reduced to the logic of domination and resistance.

Thus, the authors situate their political and ethical concerns in the politics of daily life, especially in processes of attachment and detachment, inclusion and exclusion, and the entanglements of production, consumption and disposal. They are posing critical questions to the hopeful meta-narratives of resurgence, communal belonging, multi-species entanglements, sustainability, social inclusion and inclusive design, as well as to their apocalyptic counterparts. In addition, each paper points to the uneven and troubling consequences intimacy brings about.

Ramírez-i-Ollé's ethnographic experience clearly reveals that the kind of intimate entanglement we call friendship can become a site of potential misunderstandings and disappointments, and therefore something to be cautious about, but also a method of curiosity-driven flourishing. Friese illustrates this, by paying attention to the replaceability of laboratory mice and animal technicians, elaborates caring-about relations that might be otherwise disregarded, and which can unsettle animal rights activists' consideration of technicians as torturers. Similarly, a closer analysis of the way in which the ecology of elements around a wheelchair, or the feelings, objects and spaces of a ward, become attached and detached, displaces the usual narratives of power in which the deployment of prostheses, the design of environments for habitation, and the production of objectual attachments shape subjects in an agonistic tension between power and resistance. Ava Kanyeredzi, Steve Brown, Laura MacGrath, Paula Reavey and Ian Tucker show how, in a psychiatric ward, certain attachments can become atmospheric sensors or atmospheric transducers that transform the ward into something threatening and uninhabitable or a good place to live. As a result of this, they propose the notion of an 'ethosphere', to appreciate the ethical work undertaken by patients of attuning to atmospheres to enact and contest certain values. Similarly, Winance's paper shifts from describing the practices of adjustment conducted by disabled people and occupational therapists in wheelchair test centres, to describing the

relational modalities that entangle them. Based on this, she shows how a wheelchair can be a prosthesis or an intimate and embedded part of oneself, with different normalising or abnormalising and enabling and disabling effects. Sánchez-Criado's ethnographic account of *En torno a la silla* (ETS) shows how the production of these heterogeneous assemblages of dis/ablement are not only processes of “habilitation” but of political contestation of the very idea of difference and inclusion in accessibility. Through a re-description of ETS, an activist collective that performs disability politics through *making*, Sánchez-Criado shows how the very possibility of a relation is what is at stake in their technical experimentations.

The harm and the good of intimate entanglements can also be seen when we move from the politics of the social to environmental politics, where care is situated as an ethical doing in ecological crises. Eva Giraud, Eleanor Kershaw, Richard Helliwell, and Greg Hollin look at the threatening abundances that certain intimate entanglements may produce for human life, which contrasts the focus on loss or the resurgence of life and ecological resilience commonly used to frame the consequences of the Anthropocene. Closer to these repertoires, Puig de la Bellacasa, Callén and López Gómez, and Calvillo and Garnett focus on intimate entanglements with soils, clutter and air – usually invisibilised and de-materialised as inert or manageable resources – as having the potential to “reanimate” them and articulate new forms of communing with them. Callén and López Gómez, even, envisage a re-materialisation of waste management policies based on the idea of cultivating attachments with objects. However, as pointed to by Giraud et al. and Puig de la Bellacasa, these chapters also acknowledge that these intimacies, despite their resurgence potential, can also lead, as has happened several times, to the emergence of localist, extractivist and exclusionary forms of belonging.

Thus, the exploration of intimate entanglements is a means for each author to challenge dominant assumptions and come up with an alternative politics of relations. By

exploring forms of communing with hard-to-appropriate others, such as Puig de la Bellacasa's re-animated soils, or developing how-to relations that question and construct non-assimilationist forms of accessibility, such as Sánchez-Criado's technologies of friendship, the authors here aim to respond to the harmful consequences of industrialism, human exceptionalism, speciesism and ableism. They cast political action as the production of new material-affective attachments that animate entanglements with other non-human beings. This politics of relations not only leads to the articulation of hybrid collectivities but endows them with atmospheric and topological qualities. The result is forms of communing that are not grounded in exclusionary processes of belonging but of 'being alongside different kinds' (Latimer 2013), where the problem of relating, as Sánchez-Criado suggests, is confronted "at the hinges of unrelatability".

Conclusion: Practical Propositions

The chapters are practical propositions that take the form of expositions, performances, artistic pieces, drawings, methodological innovations, writing styles, new scientific gatherings and forms of collaboration. In fact, some of the papers are indeed material interventions. For instance, the paper by Calvillo and Garnett is derived from a design-based ethnography as they use the installation of an urban infrastructure designed by Nerea Calvillo as an ethnographic device to study how publics engage with air pollution. Similarly, the chapter by Callén and López Gómez on intimate objects draws on materials collected in an art-based research project, *Objections*. For them, what turns out to be a methodology to explore practices of discarding is in fact a form of intervention that seeks to cultivate new and reanimate old intimate attachments with about-to-be-discarded objects. In Sánchez-Criado's paper, *En Torno a la Silla (ETS)* is a methodological apparatus and an activist and

maker collective. It is in the design process and testing of DIY technical aids that assimilationist imaginaries and *ableist* urban scripts are contested, while the relational conditions of these designs, the how-to-relate problem, is foregrounded as a relevant technical and anthropological problem for collectively thinking through.

In order to comprehend the role of intimacy in science and technology, but even more importantly, to get into the politics of relations that this entails, social scientists and their methodological apparatuses are repositioned by the chapters in this volume. For this reason, most of the reflections arise from deeply personal hands-on involvements in domains of practice that are intensely moving, compelling, controversial and even against the principles and values of some of the authors. Friese's ethnographic engagement with animal technicians in a biological service unit is a very good example. Her analytical approach, the relationships she builds with some of the technicians and her own engagement in animal rights activism is unsettled when the replace-ability of animal technicians becomes intimately connected with the interchangeable and vulnerable life of the laboratory mice. The authors in this volume do not unfold the complexities of situations in a detached way, as if they were observing from outside, nor do they stick to stable epistemic or normative stances. They are intimately entangled with things that are troublesome and unstable. That is why these entanglements force the authors to hesitate, and impels them to explore other forms of relatedness. They are pushed to consider other ways of intimating, maybe according to different, and possibly new, politics of relations. As we have seen, in these situations, wondering how the beings we encounter in our research come to matter to us, what are the relevant questions, and for whom and how they matter, not only entails questioning rooted epistemic enclosures. It is also necessary to intervene in the production of the intimate entanglements in which we are caught when we do science and technology. For this reason, these contributions are not only

ethico-political digressions that aim to reclaim the role of affect in the making of knowledge, but are indeed practical propositions for doing science and technology.

Whether through design or art-based materials, or through ethnographic relations, the chapters engage in different modes of doing science and technology with others, and therefore become experimental attempts to cultivate and test friendship, animation, sensibility and even an art of the encounter as part of the ethos of the field. In doing so, what they attempt to do is to contest and reinvent the politics of relations that our intimate entanglements materialise in the way we engage with science and technology.

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