Queering Dementia

Technologies, Visceral Prostheses and Embodiment

ABSTRACT

In dementia care, it is rarely questioned that the condition signals a breakdown in normative communicative competence that diminishes and finally renders the subjectivity of the sufferer beyond reach. More radical approaches may explore beyond verbal capacity to elicit a recognisable interaction through the use of music, touch, and movement, but could queering dementia offer a more flourishing scenario? In recent years there has been an upsurge in potential biotechnological interventions in the form of prostheses that claim to offer to those with dementia some tools for maintaining contact with their previous sense of self. Some of these are purely mechanical aids, such as robotic carers or quasi-animal companions, but I want to look too at the significance of some of the more organic dimensions – such as the microbiome and microchimerism – that I also class as prostheses in the sense that they augment an existing materiality. I understand dementia not as an exceptional state marked by a loss of independence, but in terms of the prosthetic nature of all embodiment. What makes that queer is that the entanglement of all bodies with an array of external *and* internal prosthetic elements is irreducible and unstable, and already constitutes the assemblage that is identified as a person.

Keywords: prostheses, bioethics, microchimerism, microbiome, assemblage

THE QUESTION OF how to address the mentally and physically anomalous states of transformation that occur throughout any life course is one that has been increasingly embedded in disability theory and policy. Moving away from the medical model that sees only the treatment of a putative

pathology as the central concern, contemporary thinking has increasingly focused on the phenomenology and affect of differential forms of embodiment without resorting to hierarchies of value. When it comes to conditions that are usually associated with ageing, however, research that steps outside the strict biomedical approach is less well-established and reflects what is almost a social taboo in the global north: our failure to acknowledge what is likely to happen as we get older. Nonetheless, elder care has become a pressing topic, in feminist thought in particular, and there are strong signs of a move to add a queer dimension to our understanding of what it means to grow older. *lambda nordica's* special issue on Queer Aging (2015) is a case in point, but as with the majority of research articles that put queer upfront, what is addressed are the experiences of LGBTi individuals and communities. In contrast, my own approach seeks to explore how the categories of supposedly failing health that focus on dementia, and the practices that emerge in institutional care as result, could be – and already are – queered, regardless of specific sexual identities.

It could be argued of course, that advancing any notion of gender or sexuality into the field of dementia studies is already to queer the terrain,¹ just as that notion once did with conventional disability studies, and that some of the material ways of engaging with people with dementia, such as through music, movement and touch, mark precisely the break with normative models that queer intends.² These are valuable perspectives that open up new ways of conceptualising the problematic and at the very least introduce relationality into the scenario of dementia, but they fail to fundamentally challenge the deficit model that implies that those affected are especially vulnerable and have a shaky hold on what counts as fully human. The point of engagement then becomes to restore human dignity and human rights (Cahill 2018; Shakespeare et al. 2019). Perhaps more promising are collaborative art projects, such as those carried out by the Artful Dementia Research Lab (Lotherington 2019), which question the distinction between self and other, or theoretical approaches such as that of Bulow and Holm (2015) who recognise vulnerability as a condition of all human becoming that cannot be expunged by the ideology of “successful ageing”. The rec-

ognition that preserving or reinvigorating a sense of selfhood in people with dementia is not the most cogent response – though the insistence on continuing citizenship (Bartlett & O'Connor 2010; Phinney et al. 2016) is a vital principle for pragmatic reasons – opens a path to alternative understandings about embodiment itself. In this article, I want to think about dementia, not as an exceptional state marked by a loss of independence, but in terms of the prosthetic nature of all embodiment. The claim that all bodies are entangled with an array of external and internal prosthetic devices is widely accepted, but it becomes queer when the technological aids on which we rely become irreducible, albeit often temporary, components of the assemblage that is identified as a person. Going further, what I am calling visceral prostheses – that is, ostensibly non-self elements that circulate in the body in the microbiome and through microchimerism – queer any corporeal status even further. Before explaining those underacknowledged processes, I will look more closely at the normative context of dementia.

For many decades now, the supposed declines associated with the embodiment of dementia and similar states has signalled a personal status of irreversible cognitive degeneration that results in an increasing inability to maintain the functions of everyday living, and in eventual death. In the absence of effective biomedical treatment, the best that can be hoped for are empathetic carers who might explore beyond verbal capacity to elicit a recognisable interaction through the use of music, touch, movement and so on. What is rarely questioned, nonetheless, is that dementia signals a breakdown in normative communicative competence that diminishes and finally renders beyond reach the subjectivity of the sufferer. In recent years, however, there has been an upsurge in potential biotechnological interventions in the form of prostheses that claim to offer those with dementia some tools for maintaining contact with their previous sense of self. Some of these are purely mechanical aids, such as robotic carers or quasi-animal companions, but I shall look too at some of the more organic interventions that I would also class as prostheses in the sense that they augment an existing materiality. The most recognised of the latter are animal-assisted interventions

by means of which those with dementia, either in care homes (Yakimicki et al. 2019) or in the community (Richie et al. 2019), are afforded access to animal companions. Such living external prostheses are less queerly inflected than robotic carers – though the scope for that analysis remains – but they also raise troubling and rarely addressed ethical concerns that go beyond the issues I want to raise here. My own alternative to mechanical scenarios is directed instead to the biological resources of the interior of the body. In the second part of this article, I will turn to the visceral mediations – both practical and existential – offered by the potential manipulation of the microbiome and by a radical appraisal of the dimensions of microchimerism – a term I will come back to later.

All this happens, broadly speaking, under the auspices of modernist biomedicine which, as a subset of the socio-cultural imaginary, is wedded to the idea of the singular self, who is defined ideally by the qualities of autonomy and rationality, even in the face of the multiple breakdowns of those concepts in infancy, ill-health, disability and dementia. The healthy adult life is marked by routine, self-management, predictability and a grasp of temporal affairs, all aided by an array of devices such as time-pieces, buses and cars, computers, spectacles, text messages, and authorised protocols. As such, it might be said that the normative life course necessarily co-evolves with prosthetic practices. It is already clear that the use of external prostheses raises some questions regarding the nature of individual selfhood, but I shall also suggest that internal organic prostheses more radically disrupt the modernist notion of the atomistic self who – in the case of dementia – has putatively slipped beyond communicative access. I shall look then at recent developments in both technology and biomedicine, and theorise the significance of those enhancements, in part through Derrida's concept of hospitality, before turning briefly to the Deleuzian notion of assemblages.

Robotic technologies in dementia care

I want to start my enquiry with a mode of intervention that is becoming familiar. The use of seemingly animate digital/mechanical aids has been at the forefront of dementia care for many years now, and is expected to

provide benefits not only to those with dementia – and that of course remains a contested category – but also to their families and professional carers. Robots can, for example, assist with lifting non-ambulatory patients, with negotiating simple functions like switching on machinery or picking up fallen objects, finding personal articles, responding to simple verbal instructions, and engaging in formalised greetings. Many types also have a monitoring and surveillance function that can transmit biomedical data about the status of the user with dementia to present carers or to distant clinicians. All sorts of ethical and practical considerations abound about the possible dangers of replacing human with mechanized or digital care, but for the most part, the technology is intended to supplement, not supersede, the interhuman aspect of the caring situation (Khaksar et al. 2016).

At root, much of the anxiety concerns the supposed insult to autonomous agency, but clearly for anyone with a neurocognitive condition, the question of autonomy as such already has diminished validity. What takes its place is the injunction to respect the dignity and intrinsic value of every human being whatever their physical or cognitive status (Bacaro et al. 2018). That approach has long driven much disability theory that is organised around the inalienable claim to human rights, and although it should provide a necessary layer of protection against discrimination and abuse, there are good reasons to underline its inadequacy. It is not just that the approach fails to secure the interests of those it seeks to protect – because that might be a simple category mistake rather than a flaw in the principle – but that it is grounded in an extremely limited liberal humanist understanding of what constitutes worthwhile life. The very concepts of rights, dignity, interests and so on are deeply normative and inherently reference a standard in which the human being is indeed autonomous, separate and distinct from its others, and capable of rational thought. The philosophical critique of that standard is now very long-standing, but seems to have scarcely filtered through to the practicalities of dementia care. The issue for scholars in the field is that even when care is delivered conventionally, through human-to-human interaction, the inevitable dependency of the one with dementia already problematizes her agentic

singularity and demands a degree of co-operation that is not necessarily dependent on contract. If another intervenes in my everyday decisions and increasingly comes to organise my time, direct my movement and manage my affects, then that intervention is no longer an adjunct, but more of an enveloping presence that displaces my own subjecthood. But this is by no means unusual in the duration of a life span – we were all infants; we all get ill or disabled – and feminist philosophy in particular has been insistent that relationality should trump autonomy and that we should recognise and celebrate mutual vulnerabilities (Käll 2017).

Far too often, however, advanced dementia may well evoke a one-sided relationality, but only if we think that the condition transmits nothing of value. Wherever the balance of dependency lies however, what is notable is that the interaction is between two or more human beings. In contrast, the evolving technologies of the twenty-first century demand a reappraisal not just of the interface of the human self and other, but of the boundaries between human and non-human. Any prosthetic device that augments or takes over functionality poses a challenge to the sovereign self of the western logos, but all the more so when it appears to be a living entity. What are termed emotional care robots are designed precisely to enter into not only a practical but an affective relationship with their users. Their agency – in the conventional rather than new materialist sense – is an illusion, but they do generate very real responses and effects, both emotional and somatic, and that alone unsettles and queers the confines of the human. There are many types in use, but I will look briefly at just two examples of such robots, both of which intend live interaction, albeit working in slightly different ways.

PARO is a small fur-covered robotic baby harp seal about the size of a human baby that can squeak or coo with pleasure, cry with discomfort, flap its flippers, open and close its eyes, react to sound, and appear to sleep. **[FIGURE 1]** Its varied responses give a strong sense of an emotional being – albeit an infant one – capable of happiness, distress and surprise, largely in reaction to the touch and voice of the human user. The point of PARO in dementia care is to stimulate the cognitive attention of users and to create a sense of interaction that can counter

problems of isolation and depression that affect many residents of care facilities (Wada 2008).³ The encounter with PARO, which mostly seems to take the form of stroking or cuddling the robotic seal, is intended to be therapeutic not just in calming and pleasing the user, but in setting up a sense in which the seal itself appears as a vulnerable being in need of care, thus provoking a response and sense of agency in the person with dementia.

Figure 1: Courtesy of AIST

Several small-scale studies have pointed to the benefits of PARO, not as an interaction between human and non-human that challenges affective boundaries, but as a utilitarian object in which success is measured in terms of how far users improve their abilities to engage in social communications – whether physical, verbal or visual – with other human beings (Šabanović et al. 2013). In an entirely and typically humanist understanding of what counts, Sherry Turkle (2011), for example, who has previously enthusiastically pioneered research into digital technologies, now feels dismayed by the lack of authenticity in what she calls

“empathy machines”. She doubts whether PARO has anything more to offer than an illusion of connectedness. Interestingly, a recent large-scale research project into the effects of using PARO was conducted in Australian care facilities where, as the authors state, over 50 percent of all residents with dementia are reported to display behaviours such as physical aggression, agitation, vocal disruption and chronic mood disturbance (Moyle et al. 2017). Such symptoms can inevitably lead to staff stress and reduced empathy with the causal condition, which in turn is reflected back in the frustration and agitation of residents which “may lead to the additional regular use of antipsychotic medication” (Moyle et al. 2015: 2). The introduction of PARO into those lives for a period of 10 weeks was intended to test whether an animate robot was more sustainably therapeutic than either an equally cuddly but inanimate Plush Toy (actually PARO with all the functions disabled) or a program of usual therapeutic care. The results were of course mixed, but the PARO group was shown to be significantly more engaged with the object on a visual level, somewhat more engaged on a verbal level, and overall experienced greater pleasure and exhibited less agitation.

Clearly, there was initially a strong novelty effect in both the PARO and Plush Toy groups, but pleasure, in particular, remained significantly raised after 5 weeks in the PARO group. The observation that PARO users also displayed increases in levels of anger was related to interruptions in activities, to other residents interfering with the robot toy, and finally to the removal of PARO after the allocated “play” period. That few sustainable effects could be discerned in the 15 week follow-up, after the final withdrawal of the prostheses at 10 weeks, is hardly surprising. While the researchers were clear that the intervention provided alternative models of communication in relation to the usual care, the hope seems to have been that the improvements would readily translate to human-human encounters. Had the human-machine sensory interactions been seen as valuable in their own right, as exchanges that queered the limits of normative human behaviour, then the withdrawal of PARO would surely constitute an ethical misstep. The engagement and pleasure that PARO – and to a certain extent Plush Toy – evoked in

residents was simply treated as a means to a definitively human-centred end, rather than as a demonstration of the restrictions of an anthropocentric outlook.

My second example, the NEC product PaPeRo, is a small but fairly heavy and bulky baby-faced human-like robot which has been widely used in aged care facilities to improve the quality of life of residents, including those with dementia. PaPeRo is decidedly not cuddly. It has many tactile sensors that enable it to converse, respond appropriately to friendly or aggressive touch, move around, recognise individual users and engage in simple games. It can also – if one is prepared to stretch the imagination – sing and dance. Like PARO, it is deployed to provide sensory stimulation, entertainment, and encouragement to social engagement with carers, family members and peer groups. It is possible PaPeRo might deliver therapeutic benefit to some with dementia, but as a “living” model it is far less convincing than PARO, even in the ultimate aim of enhancing strictly human interactions. As the authors of a major and recent study assert, the PaPeRo models they work with (sweetly named Sophie and Jack as gender balance requires) are superior to pet-like robots because although the latter “can provide entertainment and company similar to a pet for older people, the interaction of PwD with these robots is lacking” (Chu, Khosia et al. 2017: 8). Once again, we are alerted to the limits assigned to meaningful interaction. The affection and care displayed towards PARO and related prostheses, like Haribros Joy-for-All cat, and the calming of agitation that several studies have shown, simply do not count. As the PaPeRo authors continue: “From the HRI [human–robot interaction] perspective, social engagement can occur between social robots and PwD and eventually facilitate HHI [human–human interaction] in aged care facilities” (*ibid.*: 9–10).

For all the hype, PaPeRo is rigid, very slow to move and respond, and – if intended to mimic human behaviour – entirely unconvincing. I am not used to my companions breaking into song or dance, and would be slightly alarmed should they do so. Either the conditions of dementia genuinely infantilise, or that assumption is the only way for those who provide care environments to make sense of the changed affects

and capacities associated with the “disorder”. That depressing resort to normative categories is fully exemplified in the study observation that everyone liked to play bingo with Jack, and that “Sophie is able to make people smile and laugh as well as causing them to be open to talk and interact with robots and/or people around them” (*ibid.*: 15). The problem is not that PARO, Joy-for-All Cat, Aibo, PaPeRo, Nao and all the other therapeutic robot prostheses fail to deliver beneficial psychological, physiological and social effects, but that they are being assessed against an inappropriate standard. Above all, dementia signals changes to the sense of self that are ongoing and destabilising within normative conventions, so rather than focusing on efforts to retrieve the self, we might instead look for the opening up to different and positive perspectives that such transformations provide. The use of various robotic forms that at the very least simulate life, indicate that human interaction is not the limit of what might constitute living well. As Amelia DeFalco (2017) and Nick Jenkins (2014, 2017) among too few others have recognised, robot care prostheses pose a fundamental challenge to human exceptionalism. If the technology that drives robots is itself an irreducible facet of our posthuman world, then we should surely ask how far that demands a posthumanist ontology, epistemology and ethics.

At the simplest level, our faith in the stability of being gives way to the transmutations of becoming always in the context of multiple others; what we know and understand is slippery, impermanent and irreducible to single truths and how we should act depends on our immersion in an expansive field of inter- and intraconnections that yield no universal ethical principles or protocols. The contestation of the category of human itself is underway, and robotic forms are just one instance of the breakdown of normative boundaries. DeFalco seems to have mistaken PARO for a dog, but it matters little when she writes that animal robots “raise the spectre of queer, destabilising intimacies that cast doubt on the very condition of the human” (2017: 5). It is precisely with that insight in mind, that I want to offer a theoretical expansion of the significance of our human entanglement with what I am classing as prosthetic others – first as external entities in the forms already referred to, but also as

the visceral presence of otherness within, not simply as a philosophical exposition, but as a biological, naturally occurring phenomenon. Where success in conventional dementia care appears to devolve on how far an originary self can be protected or recovered, the question I address is whether we can conceptualise the body – and the embodied self – as a dynamic ecosystem to the extent that it can never be thought as having a foundational or atomistic form. My next step involves a change of register to what I call visceral prostheses, and the claim that in theorising dementia we should not ignore developments in the bioscientific understanding of the multitudes of non-self cells that circulate in the human body.

Visceral prostheses: the microbiome and microchimerism

Of crucial relevance to queer theorists is the ongoing research on the human microbiome and the rethinking of biological orthodoxies, particularly those proposing a singular genetic signature of what counts as human. Together bioscience and biophilosophy now contest both the thresholds of supposedly singular life and the very notion of species boundaries. The growing acceptance of the genetic diversity of each individual decisively challenges the distinction between self and non-self, but how is what follows from that failure of distinction relevant to the question of dementia? At the very least we are compelled to reassess the apparently simple linear temporality of birth, life, death, and ask whether augmentation itself – manifest variously through robotic prostheses or cellular life – already radically destabilises and disorders the notion of an enduring self. Once the teleology of the life course is contested, the apparent degeneration of old age and death itself are no longer an insult to being, but simply registers within a greater sphere of the enduring vitalism of becoming. The bioethics, and still less the practical consequences, of such a conception are yet to be thought, but on an existential plane the move is one away from the pressing imminence of decay and death to a more affirmative mode that concerns itself with the persistent vitality figured by dynamic augmentation.

In recent years, the dimensions of the human microbiome have become a familiar trope to the lay public, and the focus of intense bio-

scientific research associated with the Human Microbiome Project. The publicly stated aims of the project concern how changes in the microbiome affect human health and disease, but there are always more radical and largely unspoken implications that could paradoxically disrupt the very sovereignty of human beings. Dementia has been high on the list of conditions thought to be related to the status of the microbiome. It is too early to talk about established causal effects, but research indicates a high degree of association. For several weeks in 2019, *Medscape* (Syrek 2019) listed gut bacteria and the brain as the top trend in biomedical searches. What research on the microbiome tells us is that the human body is no longer identified with a unique and singular genome that distinguishes it from other organisms, but consists in a complex admixture on a cellular level of bacterial, fungal, parasitical and viral elements, the majority of which carry their own DNA. Briefly – and the implications are clear – there are estimated to be around 10,000 microbial species alone living in and on the body, concentrated in the gut (2015 NIH Human Microbiome website) such that strictly human cells – or “human” as previously understood – are greatly outnumbered. As Tauber notes: “Animals are not individuals anatomically, and microbes, by cell number, constitute approximately 90% of human bodies” (2016, np). That percentage has undergone much revision, but the overriding point is that we are embodied as genetically multiple. There is no fixed genetic template; each individual interacts constantly both with external environmental agents and within the body where different microbial communities are in a state of cohabitation.

The discourse around the microbiome utilises highly oppositional metaphors, such as “competing armies”, but the bioscience could better be read in terms of co-operation and usually mutual benefit. At the same time, imbalances in the microbiome are implicated in a range of conditions: diabetes, depression, lupus, dental caries, obesity, as well as dementia (Hill, Clement et al. 2015; Alkasir, Rashad, Jing Li et al. 2017). It is now believed that many microbes cannot survive outside the body, and that human beings rely on active microbial viscera for their own adequate development to the extent that the genetic composition

of microbes contributes more to human survival than do humans' own genes. The naturally occurring assemblage of the normatively identified human host and the myriad of other species living in or on it, constitute a distinct ecological entity referred to as the holobiont (Simon et al. 2019). There is no genetically predetermined microbiome fixed from birth, but rather life-long genomic fluidity, with older people having somewhat different genomes to their younger selves. Strictly biomedical research on the microbiome already indicates ways in which the onset of dementia could be avoided, or an existing condition ameliorated, by effecting change in the microbial composition of the holobiont, but what queers our understanding is the recognition of an embodied and entangled hybridity that goes well beyond such empirical considerations. Moreover, although some specific conditions, like dementia, appear to destroy a supposedly stable state, biophilosophy makes clear that the sense of self is always insecure.

In a further complication, I now turn to a second type of visceral prostheses – chimerism and microchimerism – whose basic concepts amplify the sense in which we must think of ourselves as hybrids. Conventionally, chimerism – derived from the Greek myth of a creature that overturned species boundaries by combining features of a lion, a goat and a serpent – denotes a synthesis of forms that nevertheless preserves morphological, and certainly genetic, distinctions within one body. In everyday parlance, chimerism references whole bodies, but far more ubiquitous is the existence of microchimerism at the cellular level, which has little visible impact on morphology. In a chimera – unlike in a hybrid, where each cell consists in an assimilation of genes – each cell holds genes from just one of the originating organisms, such that the tissues of a chimera encompass cells that are genetically distinct from one another. Chimerism, then, both maintains and contests the separation of self/non-self, and overturns the doxa of genetic singularity. Strictly speaking, microchimerism indicates that no more than 1 in 1,000 cells is genetically distinct from the majority, but in some cases such cells, as well as circulating in low numbers throughout the body, may come to predominate in a particular organ. In human beings both

iatrogenic and natural chimeric states exist, with interventions such as organ or stem cell transplantations constituting the former, while the latter includes the fusion of dizygotic twins in utero; and the more common incidence of foetal cell engraftment into the maternal body, and vice versa. Whatever the provenance, such transformations challenge the familiar dogma of genetically homogenous entities.⁴

Explanations of chimerism and microchimerism are disputed, but the implications for any conventional model of distinct biological objects, including ourselves, where each organism is coincident with a single genome, are transformatory. What is particularly challenging is that unlike the microbiome, which indicates the entanglement of human beings and multiple other species, microchimerism – at least at this stage of research – focuses on how our bodies host genetic material from other human beings, both parental and non-parental, that is entirely different to inherited genes in the form of XX or XY sex chromosomes. At the very least, the genetic basis to human flourishing, life and death is profoundly challenged. As Lappé and Landecker put it: “(a)s genomic instability becomes an area of increasing focus for life scientists, it opens up a new landscape of genomic multiplicity and temporality in health and disease” (2015: 161). Microchimerism suggests a radically new insight into *intracorporeal* diversity, and a recognition that genetic origins are far from secure. The result is that the bioscience, even more the biophilosophy, of microchimerism is already queer. The conventional narrative of a relatively simple and fixed genetic identity established at conception and secure until death begins to disintegrate. In philosophy, the illusion of undivided individuality has long been critiqued and now the growing understanding of genomic variation – the result of much sustained empirical research – provides further incentive to explore the concept of posthumanism.

Both the microbiome and (micro)chimerism signal modes that open up the terrain and speak directly to the inherent ambiguity of visceral prostheses. They indicate that there is no original fixed corporeality. So, what is at stake in our being *unable* to identify a singular genome? Some would object that the miniscule cellular nature of the microbiome and

microchimerism position them as being of theoretical interest only, but we need only consider the status of equally unseen DNA – which has played a huge part in everyday self-perception – to realise that eventually the impact of such knowledge must disorder the socio-cultural imaginary of the autonomous, clearly defined individual. Such changes will be slow, but in the meantime the microbiome has already entered public understanding, and pressing practical issues of health and disease – including our response to dementia – may need to be rethought. If dementia can be shown to be related to a *microbiome* deficient in particular organisms, then potential treatments might include dietary manipulation, or the emerging field of faecal transplants. But it is equally likely that dementia and its related conditions are intertwined with the *microchimeric* nature of the body, particularly through cellular transmission initiated in pregnancy. To explain this more fully, it is necessary to consider the concept of immunity, which despite its superficially antagonistic links with chimerism nevertheless may be working with it to suggest a new understanding of dementia.

Where the existence of both the microbiome and microchimerism contest the binary and hierarchical nature of self/other, the standard understanding of immunity – in biology, politics and everyday speech alike – explicitly instantiates self/non-self discrimination. In biomedicine specifically, immunity signals protection against threats to the integrity of the body and a belief in the apparently natural antagonism of the self/non-self cellular relation. In other words, it speaks to the maintenance of the boundaries between the supposedly normal self and the pathological other. Donna Haraway (1989), Emily Martin (1990), Lisa Weasel (2001), and more recently Susan Kelly (2012), have all commented on the embattled self-defence model of immunology that still holds sway. The inclination is to see the otherness of microchimeric cells as a threat that is properly countered by the body's immunological system, and many clinical researchers insist that such cellular incursions are linked to pathologies, as they would be in the case of bacterial infection, or a carcinoma. There is growing evidence, however, that microchimerism – like the microbiome – may have a beneficial effect, and what is

emerging equally across biology and immuno-politics, is a shift from the notion of life-long corporeal closure – both external and internal – to permeable and leaky bodies. It is not just the simple defensive operations of the immune system that must be rethought, but the whole normative context in which the presence of clear boundaries between self and other is taken as a given. The recognition of the enduring microchimeric co-existence of foetal and maternal material in any body, the circulation of non-identical DNA after transplantation, and the structural transformations that chimerism can entail, suggest not simply intercorporeality – still less simple augmentation – but the irreducibility of embodiment to singular modes. *We are not identical to ourselves*. In short, cellular translocations of microchimerism signal a different model that undercuts the modernist privileging of unified forms of human being. The significance is that once self and other are no longer distinct, and the very rigidity of those terms intimates a flaw in the modernist imaginary, then the boundaries of the biological body and of embodiment are no longer stable. Perhaps a subtle shift is underway in the imaginary itself.

This may seem too abstract for the issue of dementia, but those with the condition – and their carers – may have strong feelings that they are no longer singular selves (Kontos 2005). Dementia is a good testing ground in that it may exemplify one outcome of the operation of the immune system in conjunction with what is likely to be maternal-fetal source of microchimerism (Kelly 2012). Clinical research suggests that pregnancy reduces the risk of Alzheimer's disease. As Molly Fox explains: "evidence for pregnancy-induced long-term improvements in immunoregulation comes from studies of fetal microchimerism. Fetal cells are semi-allogeneic to the mother's genetic identity, and after a pregnancy, fetal cells remain in the mother' (Fox et al. 2018: 523). It has long been known that pregnancy protects against many autoimmune disorders due to temporary hormonal changes, but with microchimerism, the result may be that later in life, that mother is protected against developing Alzheimer's disease. In previous research, Chan et al. (2012) had already demonstrated that there is a higher prevalence of microchimeric cells in the brains of women *without* Alzheimer's disease than in

women who develop the condition. On the conventional level, the effect is unexpected: the immune response signals a self-defensive *rejection* of “foreign” intrusion and is activated to eliminate the putative threat of otherness whenever the body encounters alien antigens, whereas microchimerism indicates the co-existence of self and other. Does microchimerism portend, then, an unexplained failure in the immune system, or could the two systems be thought in positive concurrence as delivering beneficial effects? It is helpful to look more closely at these issues through the concept of autoimmunity, which is where the conjunction of immunology and chimerism appears most exposed.

The implications of autoimmunity

What is conventionally believed to happen in the field of autoimmune diseases – like lupus, diabetes, inflammatory bowel disease, many familiar forms of disability, and most probably dementia⁵ – is that the immune response is mobilised not against supposedly intrusive antigens, but against the body’s own organs and tissues. In recent years, however, microchimerism has been newly named as a potential explanation for autoimmune disease on the grounds that the body’s immune system is not mistakenly attacking its own cells, but responding to the non-self cells within. On that view, microchimerism comes at the cost of exposing the self to the potential destruction of autoimmunity, but that reading simply reflects a wholly modernist way of understanding the biological constitution of the human body in which self and other are oppositional. For clinical researchers who believe microchimerism to be pathological, the discovery of a significant incidence of non-self DNA at the site of lesions supports their perception, while for others, the same evidence indicates that non-self cells gather at sites of disruption to multiply the protective immunological responses. Dementia, for example, is strongly associated with inflammation, and microchimerism may enable a greatly enhanced response. Although autoimmunity has long been seen as an intrinsically self-destructive phenomenon, growing research suggests that in addition to some pathological outcomes, it may also be necessary to the body’s homeostatic balance. The biophilosopher

Thomas Pradeu (2012) suggests an ecological model of mutually co-operative elements that both autoreact to internal and external stimuli, *and* exhibit high levels of immuno-tolerance. His aim is “to open up the immune system to its environment instead of viewing it as exclusively self-centred” (2012: 204). This fits too with the now recognised function of the microbiome: Pradeu’s radical view of autoimmunity as routinely beneficial reflects similar insights about microchimerism and about the now accepted beneficial function of the microbiome.

The concept of autoimmunity has become a powerful tool in the conjunction of philosophy, politics and biology, particularly in the work of Derrida (2003). Although he still theorises it as a process of turning against the self, he is clear that autoimmunisation is destructive precisely because of the failure to accommodate otherness at any level. Derrida does not consider microchimerism, but his ubiquitous concept of the “other within”, and his appreciation of the dynamic relation between host and guest in his work on hospitality (1999, 2005), models the self as never finally secure or complete. As he puts it: “to protect its life... [the self] is necessarily led to welcome the other within” (1994: 177). Moreover, in his analysis of the logic of the supplement – and that could apply equally to external prostheses like empathy robots or to the viscosity of microchimerism and the microbiome – the very possibility of supplementation indicates an embodied self that has never been whole and integrated. Paying heed to Derrida, we could say that a prosthesis “has not simply added itself, from the outside or after the fact, as a foreign body...this foreign or dangerous supplement is ‘originarily’ at work and in place in the supposedly ideal interiority of the ‘body and soul’” (Derrida 1995: 244). In brief, any form of supplementation (1973, 1974) precisely constructs that which it purports to augment. The unity and integrity of an originary self is simply an illusion. I won’t pursue the details of this argument further here – but return to my own focus on the disruptions occasioned by microchimerism as an innovative mode of thinking visceral prostheses.

Biomedical discourse uses precisely the same kind of metaphors as conventional philosophy, but consider how Derrida does not see auto-

immunity as wholly negative with death as an implacable end. Autoimmunity, in Derridean terms, is unavoidable but it serves to open not simply the present issue of alterity within the self, but the very possibility of futurity, the *a-venir* where we cannot know who or what will come. As Derrida sees it, the ethical imperative is to offer absolute hospitality with no limiting provisos as to whom or what the thresholds of the self should be open. We must take the risk, and that means welcoming not just conventional guests, but also the monstrous *arrivant*: the refugee who may turn out to be a terrorist, intent on bombing our city centres or murdering us in our homes, or I would argue, the non-self cellular material that circulates in our bodies. The paradoxical point, as Derrida contends, is that absolute hospitality is both necessary and impossible; our horizons of aspiration are undecidable and therefore both potentially destructive, *and* the point of positive expectation. What follows, then, if we are compelled to reject the distinction not simply between one embodied self and another, but between a body that would be foundational and its augmented form? The cogent question then becomes: is putative degeneration and death a disaster? At a personal level it may be experienced as such, and biomedicine will continue its efforts to prolong health and life, which is precisely what drives the research on the microbiome, immunity, microchimerism, and dementia itself. Under the sway of the western logos, most of us understand death as an end, and we are fully immersed in the human exceptionalism that mortality implies. But, as I have asked elsewhere, “what does it signify for death if the materiality, the viscosity of our own bodies is inherently and irreducibly multiple” (Shildrick 2019: 20)? Is it possible that the temporal predictability of a human life span could be displaced by a non-sequential mode of becoming? And it is here that a turn to Deleuze is at its most effective.

Biophilosophy and dementia

Deleuzian philosophy makes a decisive break with the notion of the sovereign subject of modernity who exercises freedom, choice, rationality and individual agency, but also recognises the inevitability of pain, suffering and dissolution. In place of “being”, Deleuze proposes a state

of becoming, a process of unravelling (Deleuze & Guattari 1984, 1987) in which the vulnerability of any subject position is clear to see. In itself, the process is impersonal, neither good nor bad, simply a continual transformation. Every one of us is entangled in what Deleuze calls assemblages: those multiple and shifting webs of interconnections, both organic and inorganic, that constitute life itself. As Guattari puts it: “[Assemblages] do not recognize distinctions between persons, organs, material flows, and semiotic flows” (1996: 46). In taking account of multiple heterogeneous orders, Deleuzian thought is concerned with an irreducible hybridity of form and with the effects of mutual interactions. It is not that normative elements play no part, but that they no longer occupy a hierarchical position of dominance, such as autonomy being seen as more valuable than dependency. Instead of pre-existing epistemologies determining the nature of its possible connections, in an assemblage, the dynamic is reversed with the interconnections themselves generating meaning.

DeleuzoGuattarian theory may appear abstract, but it produces wholly material and political effects. It signals that when a body is produced as debilitated – as in dementia – it does not stand alone, and nor do the conditions of production remain static. The medical humanities have only recently begun to appreciate the Deleuzian style, but assemblages are highly significant in enabling us to think differently about embodiment in ways that reclaim devalued bodies that have been declared incapable (Shildrick 2009, 2015a). For Deleuze, in any case, what is at stake is not functional efficacy, or the expectation of a singular life prolonged. Dementia, remember, is a terminal condition, but a Deleuzian approach points beyond to an incorporeal impersonal vitalist force towards which my own experiences merely contribute. Temporally I am not insignificant, and my own sustainability matters, as it encompasses not simply pleasures, but the endurance of breakdown, distress and suffering, but the singular life is not an end. In contradistinction to modernist societies that regulate what is deemed appropriate to any given body, the Deleuzian approach advocates pushing to the limits of what is possible, embracing uncertainty and radical change, and sustaining becoming,

however that plays out, even in the face of disease, disability, dementia, and impending death. Flourishing does not simply refer to the conditions of living, but has a wider meaning in which the event of death enables life itself to recompose under new relations of sustainability.

On the level of theory, the traditional goal of the philosophy of biology has been to identify the essence of life, but contemporary biophilosophy is more directed towards the things that transform life (Shildrick 2015b). Perhaps that is precisely the template to employ when we think about dementia. The condition could be understood as a network of relations that supersede the closed boundaries of the conventional life course in which the concept of prostheses – both mechanical external and viscerally organic – could be reimagined as constituting an assemblage that offers an alternative to individual and fully human selfhood. If the markers of agency were not dependent on the normative structures of the western logos, life could be thought in terms of an atemporal coexistence rather than as a series of parallel or *successive* existences, each moving towards its own expiration. Rather than approaching individual dissolution and death with anxiety, the adoption of an affirmative biopolitical lens could help us embrace the event as potential. Specifically, a postconventional perspective on dementia that rethinks robotic technologies, and recognises the multiplicity of the microbiome and the genetic diversity of the microchimeric body, entails a radically different biophilosophical approach that actively seeks to “enter into modes of relation with multiple others” (Braidotti 2015: 34). Our possible futures can never be fully certain, but in the face of “pain, horror, or mourning”, we should heed Braidotti’s insistence that “(w)hat is positive in the ethics of affirmation is the belief that negative affects can be transformed” (2006: 51).

In summary, the biomedical context of dementia is focused on the human body, but the trajectory of posthumanism is inexorably underway and suggests a new ecology of life that embraces non-human others. Unless we move beyond the illusory singularity of embodiment and reimagine temporality, we are trapped by the somatic status of dementia as a terminal condition, but our expectations need not close

down there. The possibilities of transformation, of continuous augmentation, through the medium of external and internal, mechanical and organic prostheses, represent not so much positive choices but rather the queer ecology of life, whether human or otherwise. The vulnerability of everyday living and the ruptures that mark a personal life span are inescapable, but we cannot simply choose interdependence; it always already epitomises the chimerical ambiance in which we live. As we engage with posthumanism, the productive entanglements between corporeality and time within and across species switch attention from static being to unceasing becoming. And in opening up the parameters of the augmented self, dementia signals not an end to life, but a release from the rigidity of the sovereign self and an affirmation of continued becoming.

MARGRIT SHILDRICK is guest professor of Gender and Knowledge Production at Stockholm University, and adjunct professor of Critical Disability Studies at York University, Toronto. Her research covers postmodern feminist and cultural theory, bioethics, critical disability studies and body theory. She is the author of *Leaky Bodies and Boundaries* (Routledge 1997), *Embodying the Monster* (Sage 2002) and *Dangerous Discourses of Disability, Sexuality and Subjectivity* (Palgrave Macmillan 2009), several edited collections and many journal articles. Her new book (*Visceral Prostheses: Biotechnologies and Posthuman Embodiment*) about the biophilosophical and embodied conjunction of microchimerism, immunology and corporeal anomaly will be published in early 2022.

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NOTES

1. Queer research includes Linn Sandberg (2018), Andrew King (2016) and Sue Westwood (2016), while Kontos *et al.* (2016) explore sexuality more generally.
2. Examples include Annelieke Driessen (2018), and the work of the Artful Dementia Research Lab (see Lotherington 2019).
3. It is estimated that PARO is in use in 80 percent of Danish care institutions.
4. For a fuller account of microchimerism, see Shildrick (2015b, 2019).
5. See Wotton & Goldacre (2017) and Long & Day (2018).