7 For a creative ontology of the future

An ode to love

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The universe therefore is not wide enough for the range of human speculation and intellect.

Longinus, *On the Sublime*, 35.3

But in order to seize the possible and to actualize it, we need friendship, solidarity, happiness and the ability to take pleasure in physical relations.

Franco 'Bifo' Berardi, *Futurability*, p. 99

Opening up to friendship

Philosophers have written often on friendship (for example: Aristotle, 1976; Derrida, 1997); maybe this is because we are engaged in a practice that includes the word 'love' in its name: *phílos* – beloved, love; *philosophíā* – the love of knowledge, wisdom, speculation and the pursuit thereof (Liddell and Scott, 1889). In 2018 John O'Reilly (co-editor of this volume) and I published a chapter in a book on the philosophy of design, discussing the creative value of collisions to designing (Brassett and O'Reilly, 2018a). From an account of the *clinamen*, The Swerve, in the atomist work of Lucretius (2005, 2007) we developed four possible directions designers, design agencies, studios or in-house design departments could take in order to avoid creative stagnation. These are: to map the collisions that may already be occurring in our practices; to produce diagrams of these colliding practices; to search out where randomness may be blocked in our practices; and to become fans of collisions (Brassett and O'Reilly, 2018a, p. 93). While we have known each other for some decades and have co-written other pieces in recent years (Brassett and O'Reilly, 2015, 2018b), that particular essay on collisions (Brassett and O'Reilly, 2018a) is of note both for what it argues and the actions it precipitates.

For Lucretius (writing in Rome, 1st century BCE), following the materialism and atomism of Epicurus (the Greek philosopher, 341–271 BCE), everything comes from atoms falling in a void. These follow their own paths on an incessant drop in laminar flows, which would lead to nothing were it not for the atoms being knocked slightly off course by the Swerve. They then collide, ricochet or clump to provide an otherwise sterile universe with things.

Creativity is both a consequence of and for the Swerve of all things. Here, already, is one of this chapter's important issues; indeed, one for the book as a whole: ontogenesis, or the creation and ongoing change of being. But more of this later.

For each of us, John and I, the particular configurations of the journeys we have taken as a result of our colliding (Brassett and O'Reilly, 2018a) manifest in our chapters for this book (the one you are holding now): the individual ones and those co-written. This meta-level evaluation highlights one particular manifestation of what our 2018 essay posited: that is, in terms of a fairly simplistic mapping of the trajectories of our lives as they have vectored towards collision points at particular spaces and times (for example, University of Warwick, 1988; London, 2013) and then rebounded in new directions. There is something more to be said of the swerve, collision and an emergent togetherness, however, in relation both to such issues of ontogenesis and to friendship too, for atomist Epicurus – important influencer of Lucretius – was well-known for his commitments to his friends and to friendship. According to the testimony of Cicero (a contemporary of Lucretius and a critic of Epicureanism), Epicurus says that 'of all the things which wisdom has contrived which contribute to a blessed life none is more important, more fruitful, or more pleasing than friendship' (Inwood and Gerson, 1994, p. 63). We are in good company, then, as this book coalesces around a number of material, intellectual and friendly collisions. In effect, friendship is the ethical and creative form produced from the relationality of collisions.

Though institutional philosophy, especially since the 1960s, has been given purpose in many different disciplines and contributed to the unfolding of many different debates (in sociology, politics, literature, history, architecture, design, organization and business studies, science technology and science studies, to name a few), this issue of friendship remains a little developed cog in the multiply connected engine of philosophical thinking. Nevertheless, despite, or because of, the pervasiveness of philosophy across the humanities, social sciences and design, philosophy from more recent times (for example, Derrida, 1997) has returned to thoughts of friendship. A love of wisdom that contrives friendship is developed in the work of Gilles Deleuze and Félix Guattari, notably in their (1994) *What is Philosophy?* 'These are not two friends who engage in thought', they write (1994, p. 69), 'rather, it is thought itself that requires the thinker to be a friend so that thought is divided up within itself and can be exercised' (translation modified). These philosopher friends, these lovers of wisdom and the creation of concepts, are not the originators of thoughts, not dowsers for the original springs of thinking. Rather, they are accelerators and decelerators of those thoughts and concepts that are already in motion, they are agents of the Swerve. Thinking happens and thinkers, friends, are in the middle of this happening. They can facilitate collisions or avoidances, blockages or liquefactions; or even, through some specific technique, impart some spin to generate a different type of swerve. That is, they create with concepts, even if the materials they work with are not original.

It is in this context that Deleuze and Guattari (1994) imagine friendship as a sympathetic emergence from a relational space, rather than something that is intentionally formed by any one person giving energy to inert matter in an empty void. Put this way, such an account of friendship harmonizes with philosopher and technologist Gilbert Simondon's (1924–1989) critique of hylomorphism (1989, 2009, 2013, pp. 39–51).

Matter and form

Hylomorphism is the concept suggested by Aristotle across much of his work whereby matter is inert until given form by some energetic, outside force. Aristotle's account of the relationship of form to matter is seen as one of the most important contributions of his work titled (in Latin translation) *De Anima*: on the soul, or *psuchê* in Greek (Duch, 2018).[1] What drives Simondon to critique, is the requirement in this account of relegating matter to being nothing more than an impotent stuff, which can only be given meaningful form by an outside force. For him, matter is able to form itself. Under particular conditions – notably, supersaturation and metastability – there is a mutual *modulation* of matter and form. This allows us to consider that processes of matter form themselves through a positive feedback between that which strives to fulfil itself and that which acts as resistance (Combes, 2013, pp. 3–6; Sauvagnargues, 2016, p. 69). So that clay placed into a mould modulates its boundaries through a formative relation between its movement and the edges of the mould. (This is one of Aristotle's and Simondon's favourite examples, respectively, of the definitive characteristic of hylomorphism and its undoing). Thus, we have information in both the matter and the form of the mould that work together (modulate) to make a brick. Miguel de Beistegui (2012, p. 171), in an essay on science, ontology and the relation between Simondon and Merleau-Ponty, articulates well Simondon's position on hylomorphism: 'There is no form that presides over the organization of matter; there is simply a series of processes of in-formation through which matter organizes itself'.[2] But it is just as important to recognize the materiality of the mould whose own form is set in relation to the clay-and-brick assemblage. The mould modulates and is modulated by the clay.

Just as privileging energetic form over matter can be undone in this account of mutual modulation and the multiple, complex relationships between matter, information and formation, so too can other creative constructions: not least, friendship. Deleuze and Guattari (1994, p. 3) write: 'Does [friend] designate a type of competent intimacy, a sort of material taste and potentiality, like that of the joiner with wood – the potential of the wood latent in the good joiner; is he the friend of the wood?' In designating the relationship between joiner and wood as 'friendship', there is a sense in which both the joiner and the wood can modulate and inform each other, as the potential of the wood is latent in the joiner and the potential of the joiner latent in the wood. We may, with this reading, extend the act of the realization of creative potential in this

relationship the other way, so that the joiner can become joiner only by having their potential worked out by the wood. This is an important point and can be developed in relation to design practice.

Modulating sympathy and friendship

In an essay on Deleuze and design, theorist Hugh Crawford (2015) accesses this distributed, entangled and cooperative version of the creative bringing into being, via the concept of 'sympathy', which he develops using the work of architect and theorist Lars Spuybroek (2011). While a discourse of *empathy* has become a cornerstone of design thinking for almost two decades,[3] designing in a *sympathetic* mode is for Crawford both an ontological process and a living, mutually respectful friendship. This is what it means to create, to be creative: the production of a capacity that opens oneself up to an originality that encourages possibilities for others to be creative too.[4] It is not located in one, special type of person, or material, or even methodology. There are no tools that can work like magic to intensify creativity, even though it can be hard work. At most, sympathy is an attitude to friendship and a mutual modulation of potential for being.[5] We come back to the future in and as potential, a latent power to become that is not always recognized but when it is, allows for an array of developmental possibilities to be welcomed into existence (Souriau, 2009a, b).

There is anticipation here. Anticipation that pulls potential into being, that creates a situation in which this potential is actualized, thereby opening the anticipator to actualizing previously un-self-realized potential. I should qualify 'potential' here a little because it is different to the teleological Aristotelian idea of something dormant that gradually flourishes on a journey to actualization, thus placing this actual as the goal of the potential's growth. The way I am using the notion of 'actualizing … un-self-realized potential' here is slightly different. It involves the anticipation of a self whose elements are exterior to it, distributed across a plane of future adaptations that theoretical biologist Stuart Kauffman (across all his work) calls 'adjacent possible' (of which more below) and, most importantly, these possibles are not goals, but waypoints. The sympathy of friendship and the welcoming of the future coalesce around anticipation and its attendant ontological creativity.

This initiates a pair of thoughts, both of which are given a particular spin by Deleuze and Guattari, and which take their own trajectories while remaining relevant to this chapter. First: 'The creation of concepts in itself [i.e. philosophy] calls for a future form, for a new earth and people that do not yet exist' (Deleuze and Guattari, 1994, p. 108). Second: 'The *diagnosis* of becomings in every passing present is what Nietzsche assigned to the philosopher as physician, "physician of civilization," or inventor of new immanent modes of existence' (Deleuze and Guattari, 1994, p. 113. Original emphasis). The first provides a specifically future orientation for philosophy, philosophical creativity and ontological genesis. The second emphasizes that the philosopher-medic,

as both experimenter and explorer, maps becomings in order to create new ontological possibilities.

Philosophy as conceptual creativity anticipates possible becomings of the people of the future and, at the same time, invents and is invented by these becomings. Importantly, though tangentially for the moment, the invention of modes of existence provides also a simultaneous account of their typologies: I am here deliberately echoing Deleuze's (1988, p. 23) definition of ethics from his reading of Spinoza: 'a typology of immanent modes of existence'.[6] Thus, future-focused creativity requires an immanent ethics – also known as sympathy – to ensure its system remains open to new possibilities for creative acts: where becoming something allows for something's becoming to take its own voyages.[7] Thinking, creating, experimenting and becoming are all actively coming into existence, are works in the process of being made, are unfolding and flourishing; and any ethics built into such a process can be either energized or closed down. 'To think is to experiment,' Deleuze and Guattari write (1994, p. 111), echoing a favourite concept of Deleuze's,[8] 'but experimentation is always that which is in the process of coming about – the new, remarkable, and interesting that replace the appearance of truth and are more demanding than it is'. Their anticipation of future existence is at once a mapping of future modes and a welcoming of these into being: a being that is never complete and is always in the process of becoming.[9]

To allow the future in, in order to recreate the present – as occurs in anticipation – is a trusting, sympathetic, friendly act. Friendship enjoys and anticipates the creation of itself through a number of relationships; and the anticipation of the modes of existence of future friends at our future funeral allows us a remodulation of our present existences.[10] Indeed, a deep and moving friendship is relayed in Derrida's (1995) eulogy for Deleuze, titled 'I must wander all alone', in the journal *Libération*. Here, as elsewhere (see Colombat, 1996 for a thorough evaluation), Deleuze's friendship is highlighted as one of his, many, traits; and, like Epicurus millennia before him, his friendship is also a philosophical event. After noting some aspects of Deleuze's work with which he never really agreed, Derrida (1995, online) writes:

> One day, I would like to try to explain how such an agreement on philosophical 'content' never excludes all these variances; that I don't know how to name or situate, even today. (Deleuze had accepted the idea of publishing, one day, a long, improvised conversation between us on this subject, and then we had to wait, to wait too long.) I know only that these differences, between us, never left room for anything other than friendship.

Even while both philosophers' works were concerned with similar issues, similar 'content', their points of divergence do not get in the way of friendship. Derrida is not sure that he can grasp the value of these differences but his wait to work them through, in friendly conversation with Deleuze, will have to last,

now, for ever. We wait and can only take our own steps in friendship, and in anticipation, of the philosophical content to come.

Genealogies of anticipation

While anticipation is a concept with some pedigree, its promotion as a discipline within futures studies is fairly recent. Riel Miller, Roberto Poli and Pierre Rossel's (2013) *Working Paper No. 1. The Discipline of Anticipation: Exploring Key Issues* – delivered as part of a UNESCO project called 'Networking to Improve Global/Local Anticipatory Capacities' and supported by the Rockefeller Foundation – is explicit in determining the power and value of anticipation as a discipline in futures studies. For them, every act of engaging with the future involves anticipation in some way, but its specific concretization as a discipline is important as anticipation is best able to cope with the production of novelty within the universe. Creativity is fundamental to anticipation, both as a contextual validator and an intensifier of its capacities. While Miller et al.'s (2013) drive to make a discipline based upon 'scientific' activities within epistemological frameworks is questionable,[11] their insistence upon anticipation as a valuable activity is important not to ignore. In addition, Poli (2010, 2011, 2017; see also: Rossel, 2010) has been crucial in locating the relevance of anticipation to life in the twenty-first century. Encompassing a range of disciplinary references – for example, from biology to philosophy, physics to engineering, social sciences to linguistics and, of course, futures studies – Poli's work is astounding and his (2010) essay, 'The Many Aspects of Anticipation' is a comprehensive overview, carried further in his encyclopædic *Introduction to Anticipation Studies* (2017). In the essay, Poli (2010, p. 8) writes: 'Behaving in an anticipatory way means adjusting present behavior in order to address future problems', adding that an 'anticipatory entity (system or whatever) takes its decisions in the present according to forecasts about something that may eventually happen'. With this, Poli is faithful to Rosen's (2012, p. 313) definition: 'An anticipatory system is a system containing a predictive model of itself and/or its environment, which allows it to change state at an instant in accord with the model's predictions pertaining to a later instant'. These are the key elements of the concept of anticipation that we need: that future possibilities create present states. Here I use 'create'. Rosen most often uses 'cause'. As do other philosophers of the future; for example, Raimundas Vidunas (2019), who in an essay on 'delegated' causality, complex systems and Chinese philosophy, notes emergent phenomena as one of many instances of the future having an impact upon the present. Vidunas (2019, p. 82) writes: 'This concept of *delegated causality* should clarify much about emergence of whole new phenomena (Clayton and Davies, 2006), spontaneous order (Kauffman, 1993), synergy (Corning, 2005), functionality (Ariew et al., 2002), purpose and intention (Dennett, 1987)' (original emphasis). We will come across the influential theoretical biologist, Stuart Kauffman, later in this chapter; but note for now that Kauffman is not so enamoured of causality as Rosen or Vidunas. What is

clear from Vidunas's discussion is that his causality operates 'downward' from higher states (that is, future ones) to lower (present) states. The antipathy to a reductionist paradigm within anticipatory systems, that is so evident in Rosen's work (Rosen, 1991), appears also in Vidunas's 'downward causation'. This anti-reductionism is one of the important aspects of the theory of anticipatory systems and places it firmly within other philosophical discourses about complexity. Vidunas lists many key protagonists in his paper: for example, Prigogine and Nicolis (1977), Maturana and Varela (1980), Kauffman (1993). However, Vidunas (2019, p. 93) repeats the unproductive cliché about the 'relativism' supposedly evinced by 'post-modernist' philosophers, referencing the agendas peddled against recent francophone philosophy so profitably by Allan Bloom (1987). Some francophone philosophers *are* important however: most notably the works of Isabelle Stengers (1997; see also: Prigogine and Stengers, 1984 and Stengers and Prigogine, 1997) and Michel Serres (1977). I will turn to Serres later in this chapter but will look now to Stengers's (1997) text on emergence, because the ontological concerns that it deals with – regarding the relations between wholes and parts – have become important, with Vidunas's introduction of different levels or layers of complexity and simplicity in accounting for the relative ontologies of emergence and anticipation.

Emergence

In *La vie et l'artifice: visages de l'émergence* [Life and Artifice: Faces of Emergence] (1997), Stengers critiques both the reductionist and holistic approaches that seek to explain how we should respond to emergence. Following materialist philosopher J.K. Feibleman's 'theory of integrative levels' (1954), Stengers argues that emergence itself emerges from and into the point of view of a third position that prioritizes neither the parts (atoms or smaller) to which a whole can be reduced, nor the ends which holistically determine how a group of elements can be thought. If any system's organization can only be explained with reference to a more complex level above or a less complex level below, then both a simplistic reduction (below) and a dominating holism (above) are in themselves inadequate. This leads Stengers (1997, p. 30) to write, with a strong Feiblemanian inflection, that:

> the question of emergence never poses *itself*. It is always actively asked. Indeed, it is only from the perspective of *a third term* – *establishing* the practice of articulating the relations between ends and means, whole and parts – that we can call forth this question. (Original emphases; my translation.)

Feibleman's first law of organization (1954, p. 59), states that: 'Each level organises the level or levels below it plus one emergent quality'. Furthermore, any level *depends* upon a lower level (Law Three: Feibleman, 1954, p. 60) without being reducible to it (Law Nine: Feibleman, 1954, p. 62) and its organization is *directed* at a higher level (Law Four: Feibleman, 1954, p. 61). Interestingly,

when discussing this fourth law, Feibleman notes that while science should eschew the 'transcendental' and so avoid discussing levels or organizations 'teleologically', they can be characterized according to 'purpose'. This allows him (Law Five: 1954, p. 61) to state that 'for an organization at any given level, its mechanism lies at the level below and its purpose at the level above'; thus, providing a temporal qualification within a spatially articulated model.

'Purpose' is a curious concept and one that Feibleman feels less than comfortable using, as he feels it has an air of religiosity that belongs in a different register to science. A *driven* life is fairly common in philosophy and psychology: with notable contributions from Friedrich Schiller (1982) and Sigmund Freud (2003). Here the drives are located in the present fuelled by past experiences. A *purposeful* life, however, has touchpoints with philosophies of hope.[12] In a similar context, Whitehead has not been so squeamish about using terms recognized as religious. Across his work he makes reference to the Quaker concept of 'concern' – felt, for this religious group also known as 'Friends', as a divinely given imperative to act (Hall, 2013) – which, for Whitehead, and for Latour (2008) following him, is an important speculative philosophical concept. Purpose and concern, even without their religious tonalities, approach us from the futures in which they are articulated to the present where our responses to them can make change.

While Stengers mobilizes Feibleman's work in order to disrupt the easy qualifications of emergence as either reductive or holistic, the theory of levels plays an important part in other philosophical discussions. For example, in an essay titled 'Levels of Reality and Levels of Representation' (2004), mathematician Claudio Gnoli and futures philosopher Roberto Poli write of the relations between an ontology of levels (as we have been discussing) and epistemologies of representation, especially those dealing with the types of classificatory system used in library management. Gnoli and Poli (2004, p. 156) state that in Feibleman's analysis, levels can be regarded

> either as whole or as part. However, it is worth mentioning that the theory of levels has been intended by most of the scholars who have elaborated its details as a way to improve both the (traditional) theory of being and the theory of wholes.

Gnoli and Poli show that the relation between 'wholes' and 'parts' in the theory of levels is by no means unambiguous, indeed the ontological shift from one to the other is a key component of Feibleman's concept. For Stengers, that any level can be regarded as both a whole and a set of parts for another level, reinforces the processual relationality of the enterprise rather than thinking of either origins or goals as ideal forms. Stengers thus smooths any points of foundation or aim by smearing them through complex entanglements and multiple singularities, with the consequence that any ontological characterization of a level can fold back into itself as well as develop in relation to a 'third term'. Similarly, Gnoli and Poli find that many demands

for the mathematical organization of bibliographic classification founder on a too rigid a construction of ontological position; Feibleman's fluidity seems to stand out.

There is an obvious alignment between this discussion of wholes and parts and Rosen's attitude to reductionism: with his advocacy of life exceeding its parts, chiming with Stengers's mistrust of a reductive explanation of emergent behaviour. Furthermore, when Rosen writes of a being producing a model of the future to incorporate into its present, which creatively constructs that present, we may recognize the creation of a more complex level of organization, brought to the present, living organism in such a way that the emergent life is different to what it would have been. This gives a purposeful recreation of the present according to pressures coming from the future; with a repurposed present providing new singularities according to which futures may emerge.

Stengers returns to this topic in *Thinking with Whitehead* (2011, p. 174), writing:

> For Whitehead, the parts do not constitute the whole without the whole infecting the parts. [. . .] If the body exists for its parts, it is because its parts are infected by such-and-such an obstinate aspect of what we call the body, but which, for them, is a portion of their environment; if the parts exist for each other and for the body, it is because the respective patterns of each are highly sensitive to any modification of the environment they constitute for one another.

Stengers presents an ontology that aligns Feibleman's levels with Whitehead's speculative philosophy. We may also see here a version of Rosen's 'downward causation' of a future construct 'infecting' the present through anticipation. A passage from Whitehead's *Modes of Thought* (1966, p. 21) – which Stengers uses (2011, p. 175) – takes this further:

> For example, our bodies lie beyond our own individual existence. And yet they are part of it. We think of ourselves as so intimately entwined in bodily life that a man is a complex unity – body and mind. But the body is part of the external world, continuous with it. In fact, it is just as much part of nature as anything else there – a river, or a mountain or a cloud. Also, if we are fussily exact, we cannot define where a body begins and where external nature ends.

As Whitehead delivers it here, neither wholes nor parts dominate, neither provide any final, totalizing, ontological principle. Moreover, each has an implication and entanglement with the other in their mutual characterizations.[13] It is worth labouring this point a little, for Rosen bases his adherence to a logic of anticipation as a counterweight to the reductionist approach so prevalent in contemporary science (especially physics).

The figure of Rosen

In *Life Itself* (1991), and its follow-up *Essays on Life Itself* (2000), Rosen poses that the question of life cannot be answered through reduction: life *qua* life, belongs to a higher order, a more complex system than that of the networked atoms (or smaller) that a reductionist account would explain. Such an approach appears obvious for someone schooled in 'relational biology'; which A.H. Louie describes as: 'the study of biology from the standpoint of "organization of relations". It was founded by Nicolas Rashevsky in the 1950s, thence continued and flourished under his student Robert Rosen. And I was Rosen's student' (Louie, 2016, p. 165; see also: Tuomi, 2019). Rosen, an accomplished mathematician and biologist, develops both through relational biology to infuse a doctrine as apparently absurd (to both everyday and scientific thought) as 'the future causes the present'.

An example of his position runs as follows: 'The physicist perceives that most things in the universe are not organisms, not alive in any conventional sense. Therefore, the physicist reasons, organisms are *negligible*: they are to be ignored in the quest for universality' (Rosen, 1991, p. 12; original emphasis). In *Anticipatory Systems* (second edition 2012; originally published 1985) Rosen is more conciliatory: a future-caused anticipatory present 'extends (but does not replace) the "reactive paradigm" which has hitherto dominated the study of natural systems, and allows us a glimpse of new and important aspects of system behaviour' (Rosen, 2012, p. viii). Nonetheless, the commitment to anticipation led Rosen to experience isolation from the scientific community. His foreword to the first edition of *Anticipatory Systems* (2012, p. v) tells that this:

> manuscript was written during the months between January and June in 1979. The writing was done under difficult circumstances. At that time, I had some reason to fear that I would no longer be able to personally pursue a program of active scientific research.

These 'difficult circumstances' anticipation scholar Mihai Nadin (2012a, pp. xviii–xxii; see also: Nadin, 2015a) outlines in more detail. They appear to revolve around the scientific community's disregard of the controversial aspects of anticipation – notably, the future entailing (or even causing) the present (Poli, 2010, p. 8; Louie, 2011, p. 25; Rosen, 2012) – and Rosen's adherence to his position.

The issues of friendship, even love, become foregrounded in this example, with Rosen's anxiety at losing his place within the community of scientists having a negative material impact upon his scientific creativity. Yet it is striking that a key group of friends, ex-students and family members – his daughter, Judith, participates in delivering the second edition of Rosen's book on anticipatory systems, as well as writing the Preface (Rosen, 2012, pp. xi–xiv) – work together in representing his work, as well as in taking it further: both within biology (for example: Louie, 2011) and outside (many of the researchers already listed in terms of futures studies, but also Nadin, 2010a, b, 2012a,

b, 2015a, b and 2016). While we may not all have been friends with Robert Rosen, we may be (or are on the road to becoming) 'friends' of the concept of anticipation and of the potential it has for creating new relations, between future and present of course, as well as between different disciplines.

When discussing sympathy and friendship above, we encountered Deleuze and Guattari, from their final work together *What is Philosophy?* (1994, p. 3), writing:

> It is even more difficult to know what *friend* signifies, even and especially among the Greeks. Does it designate a type of competent intimacy, a sort of material taste and potentiality, like that of the joiner with wood – the potential of the wood latent in the good joiner; is he the friend of the wood? (Original emphasis)

Our friendship with anticipation, as a concept (the *material* of philosophy according to Deleuze and Guattari), can allow us insight into the potentials it has to develop new creations. But this also asks us to wonder about the role of anticipation in friendship, as the recognition of the sets of relations according to which it (friendship) can be constituted (that is, in anticipation). Maybe friendship, even love, needs to be pulled into being by a future construction of all the material relations that its organization requires? For to anticipate isolation and loneliness as a philosopher, biologist or simply as someone alive, is no future at all. The section that follows will look into these aggregates of love, anticipation and creative ontologies further, with special – but not exclusive – focus on the works of Lucretius and Michel Serres.

Love and war

The inexorable fall to death of atoms in the atomist ontology is the promise of identity as a fatal uniformity. This is one of the conclusions from Serres's (1977) examination of Lucretius: I will go into this in more detail soon. It is important to recognize here that Lucretius's creative ontology – and Serres's arrangement of this alongside more contemporary theories of nonlinear dynamics and complexity theory – requires both love and turbulence. These are indeed troubling yet productive and joyful collisions. Without love and turbulence there is no life, only atoms falling, falling, staying the same. There is nothing in these atoms that speaks of life. Or, thought another way around: as life becomes reduced to atoms it is gradually extinguished. This is very important for Lucretius in his quirky, deep and turbulent poem of creative ontology; just as we have seen with Rosen and Stengers. It is important also for Serres who castigates Western science's close association with war. Here, in this section we will encounter both of these positions in order to map an anticipatory account of a lovely, lively future/present.

There is much going on here. The issues of affective (generating collisions) and affected (collided) ontology are reminiscent of Spinoza (1996) and the

ethics he draws from such relational processes. Here, we could also access the work of Deleuze, on his own and in collaboration with Guattari, in which relational ontological ethics are used to develop not only a critique of identity, representation and Being (Deleuze, 1994, 2001; Deleuze and Guattari, 1984, 1988; Guattari, 1989), but also to advocate a processual, politics of becoming (Deleuze and Guattari, 1988).[14] Still, important as these are, we can only take a little bite of them here. To take measure of creative ontology in Lucretius is to be interested in the ways in which love, nature and existence interrelate; and this necessitates looking at the opening of the first book of Lucretius's poem, 'Matter and Void':

> Life-stirring Venus, Mother of Aeneas and of Rome
> Pleasure of men and gods, you make all things beneath the dome
> Of sliding constellations teem, you throng the fruited earth
> And the ship-freighted sea – for every species comes to birth
> Conceived through you, and rises forth and gazes on the light.
> [. . .]
> Then beasts, the wild and tame alike, go romping over the lush
> Pastureland and swim across the rivers' headlong rush
> So eagerly does each pant after you, so do they heed,
> Caught in the chains of love, and follow you wherever you lead.
> All through the seas and mountains, torrents, leafy-rooted abodes
> Of birds, and greening meadows, your delicious yearning goads
> The breast of every creature, and you urge all things you find
> Lustily to get new generations of their kind.
> Because alone you steer the nature of things upon its course,
> And nothing can arise without you on light's shining shores,
> And nothing glad or lovely can be fashioned, I invite
> You Goddess, stand beside me, be my partner as I write
> *The Nature of Things* [. . .]
>
> (Lucretius, 2007, pp. I.1–25)[15]

Some Lucretius scholars have wondered why such a philosopher – atomist and Epicurean – should have such an opening. Especially as he writes, just over 75 lines later of Agamemnon's sacrifice of his daughter Iphigenia, 'So potent was Religion [*religio*] in persuading to do wrong' (Lucretius, 2007, p. I.101).[16] That an anti-religious philosopher such as Lucretius opens with a call to a religious figure, speaks neither of a hypocritical attitude to religion nor of a simplistic adherence to poetic convention. The symbolism of Venus as love and procreation allows Lucretius a poetic intervention into the atomist and (Serres will say, 'complex') philosophic position. The ontological creativity encompassed by the term 'Venus' is projected through turbulence as, we know, she is born in the breaking waves of the sea. The collision of the poetic and the philosophical is thus a singular expression and materialization of them both, in their emergent entanglement. 'Because alone you steer the

nature of things upon its course' Lucretius emphasizes (2007, p. I. 21). The nature of things *is* (because of) love. But if this deals with a loving, fecund present, what of the future? For this we must turn to the concept of strategy and Serres's critique.

In the multiplicitous world of designing (encompassing many practices and theoretical standpoints), strategy has become an increasingly important term (see, for example: Lockwood and Walton, 2008; Calabratta et al., 2016). This has coincided with the dominance of design thinking discourses since early in the twenty-first century (Brown, 2009; Martin, 2009. With comprehensive critical evaluations by Kimbell, 2011, 2012 and Johansson-Sköldberg et al., 2013) and its structural and evolutionary values axiomatized in the Danish Design Ladder (for example, Doherty et al., 2014; Whicher et al., 2015). This ladder seeks to show that for design to be used in the most mature ways possible, requires it to progress from lower ranking operations such as styling and move towards the more advanced forms of strategy and policy. Design comes of age when its practitioners and their services enter into C-suite boardrooms. To be strategic, the argument continues, is one way of displaying one's maturity. A fuller critique of design strategy, design thinking and related concerns deserves more than one chapter – indeed, John and I have embarked on such in previous work together (Brassett and O'Reilly, 2015) – however, I shall move to locate a loving critique of strategy in another way. And Serres will lead.

Loving complexity

To engage with strategy in this chapter is to question its easy acceptance by creative disciplines unused to, or not bothered by, its military values.[17] Crucial in achieving this is Serres's (1977) examination of the qualities of Lucretius's science that align with complexity theory and nonlinear dynamics, that he develops in a book titled *La Naissance de la physique dans le texte de Lucrèce. Fleuves et turbulences* (literally, 'the birth of physics in the text of Lucretius. Flows and turbulences').[18] For Serres, the dismissal of Lucretius's work as either quaint or wrong by generations of Western scientists, overlooks some of Lucretius's most important contributions; most notably, its presaging of complexity in discussing flows, turbulences and vortices (Clucas, 2005, pp. 72–73). But this ignorance of the truly creative properties of Lucretius's work is not the only problem here: not only has he been overlooked by Western science but shunned. Serres writes (1977, p. 135), with a sense of shame[19] that is palpable:

> It turns out that Western science has never ceased to choose otherwise than Lucretius; and there is nothing I can do because I am its slave. To opt for war, the plague. Blood, the fight and the bodies[20] on the bonfire. From Heraclitus to Hiroshima, Western science has never known anything other than martial nature. (My translation)

Like Lucretius, the collision Serres initiates of the poetic and the philosophical is the opening for creation. It is the opening and creation of 'Michel Serres' as the researcher and thinker of 'science' and 'literature'. Serres is already too late to remove the bloodstains of the battlefield from his hands, complicit, as he is, as a participant in the lists of science: as he has moved from mathematics to science to philosophy (and literature and culture) throughout his career (Serres and Latour, 1995, pp. 11–12). But while he is too late for the past, maybe Serres can be in time for the future? The 'gun-shy', ex-member of the Naval Academy – who says that he 'resigned from the navy because I didn't want to serve cannons and torpedoes. Violence was already a major problem – has remained so, all my life' (Serres and Latour, 1995, p. 7) – dismisses the principles of war and the generals and admirals, and all beholden to them, from the future; and thereby, we may add, from the present through anticipation.

It is here, at this moment where future and present involve one another, that Serres and Lucretius and Rosen converge: with creativity and love, future and present becoming one another in anticipation, in life. This is a life that is wrenched from the issues of war to be wrapped in the arms of loving creativity, where Mars slumbers and strategists are rendered impotent. For Serres, the disarming of Mars also shows a movement away from a repetitive reductionism that seeks only to find order and identity. He writes:

> The order of reasons is repetitive. Knowledge sequenced in this way, infinitely iterative, is only the science of death. A science of dead things and a strategy for putting to death. The order of reasons is martial. [. . .] The laws are the same throughout, they are 'thanatocratic'. There is nothing to know, to discover, to invent in repetition. It falls in the parallel of identity. Nothing new under the reign of the same. It is informational zero, redundancy.
>
> (Serres, 1977, p. 136. My translation)

Serres here bemoans the dominant rational scientific tendencies to shackle their systems to the dead weight of warlike futures past, driven to entropic stagnation by the dull motor of history either through a stifling path dependency or the reduction of everything to well-understood, thoroughly determined systems. 'The order of reasons is [. . .] "thanatocratic" [. . .]. Nothing new under the reign of the same': otherwise known, in design, business and organizations, as 'best practice'. His earlier, more plaintive cry – 'there is nothing I can do because I am [Western science's] slave' – giving way to something more insistent, more intense. Why should the 'thanatocratic' drive to death be an option? Why is a martially organized future-present even on the same page as one driven by love, creativity and friendship? Lucretius's opening ode to Venus is neither simply formalistic nor trivial: it is calling out to us – his future – as if we were there with Lucretius himself. *We* are his hope alive in the present (Nietzsche, 1997, p. 95[21]); we are with him to clear the ground for a different, more creative possibility. Lucretius and Serres produce the reader who is

ready to anticipate, research and experiment, and the friends and lovers that will collide.

Law and treaty, physics and ethics

However, the relationship between Venus and Mars is not as simple as of her overcoming him with love. Indeed, Classics scholars are in dispute over whether Lucretius's Venus is triumphant (for example, Asmis, 1982) or whether they rule together (for example, Moorman, 2009). Venus has always found him attractive, enticing. She is one of the few deities in the pantheon not to regard Mars as objectionable with their affairs and sexual encounters causing strife among both their fellow gods and humans (Fairbanks, 1907; Graves, 2011). The mythology tells us that from the union of Venus and Mars issues Concordia, whose own mythos links her with order, peace and harmony.[22] Yet such a *Pax Concordia* is not entirely positive. Order may well happen by force, imposed by threats of violence if not respected; it looks as though Mars won after all and we were never vigilant enough to live without conquest. Maybe there is hope for us yet, in anticipation.

This brings us to an aspect of Serres's discussion that is more common in Lucretius scholarship: an examination of the roles of *fœdus fati* and *fœdera naturae*, fateful or natural treaties. (My use of 'treaty' undermines in particular the authority of what might commonly be called a '*law*' and the range of people and actors who act in accordance with it. I will return to this in more detail below.) Serres writes:

> Then Mars governs the world. He cuts bodies into atomic pieces and makes them fall. It is the *fœdus fati*: it is the law in the sense of physics – this is the case. It is also the law in the sense of dominant legislation – this is how they want it to be. Mars chose this physics: the science of the fall and of silence. This is the plague.
>
> (Serres, 1977, p. 137. My translation)

This fateful law sends atoms to their death in laminar flows, with no disturbance, presided over by the law of identity, of the same, without birth only death: the fateful urge of thanotocratic rationality. Serres continues:

> Nothing new under the reign of the same and under the same reign, conserved. Nothing new and nothing born: not of nature. It is death: eternally. The putting to death of nature, its birth repulsed. The science of this is nothing; it is calculably nothing. Stable, immutable, redundant. It recopies the same writings, with the same atom-letters. The law is the plague. Reason is the fall. The cause is iterated: death. Repetition is redundancy and identity is death. Everything falls towards zero: the nullity

of information, the nothingness of knowledge, non-existence. *The Same
is Non-Being.*

<div align="right">(Serres, 1977, p. 137; original emphasis. My
translation)</div>

This scientific rationality of violence, of reductionism, of order and identity
gives birth to nothing, certainly to nothing natural. Luckily, we have pockets
of creative generation that erupt from these constraints and provide possibili-
ties of escape, joyous flight into the arms of Venus. For Serres, from Lucretius,
we have the *fœdera naturae*, the natural alliances that bring together those once
trapped in identity to form the universe anew: vital and vibrant.

It is worth staying with the Latin term *fœdus* for a moment, for the direc-
tions it takes us in move away from Serres's use of 'law' (*la loi*, *le statut*). Classics
scholar Elizabeth Asmis (2008, p. 141) chooses to focus upon this term in
Lucretius's work as a way to bring together what had been two different sys-
tems in Epicurus's teaching: ethics and physics. She argues that, for Lucretius,
fœdus indicated not a law but rather a treaty, a pact or compact. To say 'natu-
ral *law*' in the sense that we, today, have of 'the *laws* of physics' is somewhat
wide of the mark when thinking of *fœdus*. To show this, Asmis (2008, pp.
142–143) provides four key characteristics of a treaty as the Romans would
have understood the term: 'an agreement between self-governing states'; a
pact 'designed to end conflict or promote cooperation'; as setting out 'condi-
tions according to which different parties should act', often in terms of setting
boundaries or limits within which actions should be constrained; and, finally,
'a treaty must be respected'. The second of these – ending conflict – is clear
within Serres's work. The third – working within limits – is also apparent in
Lucretius, especially when he discusses the immutability of individual atoms
and their inability to change their character in themselves (see, for example,
Lucretius, 2007, pp. I. 584–598 and II. 299–302; discussed by Asmis, 2008, pp.
144–146). The fourth point – that a treaty must be respected – Asmis uses to
highlight an important difference for the Romans between a treaty and a law.
She writes: 'The term "law" suggests the necessity to submit to constraints; the
term "treaty" suggests a flourishing of powers within limits' (Asmis, 2008, p.
146). Treaties are respected but laws must be obeyed (Asmis, 2008, p. 143);
treaties deal in trust and good will and give each party making the pact, agency.

This is an important intervention in the argument I have been developing
with Serres. For the ways in which natural treaties allow for the possibilities of
multiplicitous, creative diversity, albeit within specific boundaries, are shared
with *fœdera naturae* from Lucretius to Serres. It is as if, notwithstanding two
millennia of distance, a pact can be made in the name of a more creative sci-
ence or philosophy; or, indeed, a more creative life itself.

Asmis's outlining of the ability of the natural pact to promote flourish-
ing within limits is apparent in Gilles Deleuze's essay 'Lucretius and the
Simulacrum' (2004, pp. 303–3320). Deleuze writes (2004, p. 315): 'From
Lucretius to Nietzsche, the same end is pursued and attained. *Naturalism makes*

of thought and sensibility an affirmation', (emphasis added). The flourishing, life-affirming, nature characterized in Venus is part of a compact that the physical world has with its future. (Which is how Deleuze can say (2004, p. 308), echoing Whitehead (2004), that 'Physics is Naturalism from the speculative point of view'.) In a passage which brings a discussion of nature, Nature and the imposition of totalizing powers upon creativity in the name of Being together with our earlier passages on the excessive relations between wholes and parts, Deleuze writes (2004, p. 304):

> We shall find no contradiction between the hymn to Venus–Nature and to the pluralism which was essential to this philosophy of Nature. Nature, to be precise, is power. In the name of this power things exist *one by one*, without any possibility of their being gathered *all at once*. Nor is there any possibility of their being united in a combination adequate to Nature, which would express all of it *at one time*. Lucretius reproached Epicurus' predecessors for having believed in Being, the One and the Whole. These concepts are the obsessions of the mind, speculative forms of belief in the *fatum* [destiny], and the theological forms of a false philosophy. (Original emphases.)

From identity to the One, the violence of order and a law that orders reductive obedience, to Serres and Deleuze and the creative power of diverse and heterogeneous love: we have almost everything we need from Lucretius. As always, there is something extra. Another relation noticed by Rosen and born from friendships that span and exceed given 'laws of nature'. Where 'Life', just as with 'Nature' in the passage above, is more than all its little pieces 'gathered all at once'.

From laws to life

Philosopher David Webb's (2017) 'On Causality and Law in Lucretius and Contemporary Cosmology',[23] draws attention to the cosmological urgency of friendly treaties, ontological creativity and the relations between anticipation and life. For this, Webb ranges Lucretius alongside cosmological philosopher Roberto Mangabeira Unger and physicist Lee Smolin's (2015) *The Singular Universe and the Reality of Time*. This book is not so much written cooperatively as written atomically, the parts of which are put into collisions, sometimes coalescing and at other times rebounding. Unger and Smolin's work together, spanning almost a decade, is as open with its moments of nonalignment as with its togetherness. They write in a way that stylistically manifests their theoretical concerns: notably, that there are no immutable laws that are identical across the whole range of the universe, rather evolving, local treaties that develop along with their local region, leaving a universe that is uneven.

One of the most important aspects of confluence between Lucretius, Unger and Smolin, even across two millennia, Webb shows, is a joint perspective on

the relationships between the 'laws of nature' and nature itself. As currently considered by most scientists (but not the ones focused upon here) these laws seem to be developed in order to understand specific phenomena, while the initial conditions according to which such phenomena are generated 'are not themselves explained by those laws' (Webb, 2017, p. 256). Webb shows that Lucretius, Unger and Smolin offer a universe in which the laws governing its behaviour are as changeable and emergent as the universe itself and its parts. Webb (2017, p. 258) articulates the rather surprising position that they all reach, thus: 'Rather than moving from a strongly determined universe to one without meaningful laws, Unger and Smolin argue that laws and the phenomena they govern develop in tandem, their difference being more one of degree than of kind'. Whitehead (1978) calls such a process 'immanent'; and the 'transcendental empiricism' Deleuze (Sauvagnargues, 2010; Rölli, 2016; Heaney, 2018) develops from reading Whitehead and William James operates in the same manner. The conditions according to which any system exists and develops are coexistent with, and affected by, the modes of existence that they regulate;[24] and all in such a way that there is no necessity for these to be evenly, equally or identically distributed. Any system's relationship with its edges and outside possibilities – and so also that system's relationship to the future – becomes of crucial importance. This is evident in a passage from Unger and Smolin (2015, p. 27; quoted by Webb, 2017, p. 258) who write:

> Natural phenomena present themselves, according [to the conception represented in the Aristotelian tradition, through Galileo and Newton to today], within a limited range of parameters of energy and temperature. The penumbra of the adjacent possible around each phenomenon – what it can become next, given what it is then – remains restricted or thin. The laws of nature – both the effective laws operating in particular domains, and the fundamental laws or principles cutting across domains – are clearly distinct from the phenomena that they govern. It is only a short step from these conceptions to the idea that changing states of affairs are governed by unchanging laws.

Such an equally tempered universe allows for neither specific differences in behaviour nor any local immanent, regulatory frameworks that may emerge therein; and therefore enforces a natural law as statistical mean to deliver homogeneity across all cosmological reaches. Clearly, for Unger and Smolin, the present universe appears very differently. And in such a presentation, where singular regions can exhibit relations to specific sets of natural laws, the boundaries between regions within the cooled-down universe can proliferate and become ontologically important through multiplicity and difference. The beings (living or otherwise) possible in any region will be determined differently, if they can be determined at all.

Adjacent possibles

Unger and Smolin's use of theoretical biologist Stuart Kauffman's 'adjacent possible' emphasizes further a living relationship to the future. This is an important concept for Kauffman who uses it across much of his work, from the last 30 years or so, to delineate the different areas around any living system into which it can evolve. At any moment, life includes a 'penumbra' of future states that may manifest different lines of its becoming. None can be determined by the current state and, for Kauffman, neither can they be caused. This represents a major difference between Kauffman's and Rosen's approaches to theoretical biology: even while they both remain biologists committed to relational ontologies, close to theories of complexity and critical of the reductive physics characteristic of the dominant strands of Western science as least since Newton.[25] For Rosen, causal entailment – what is entailed necessarily follows from a prior event that can be recognized as its cause – is essential in developing his position on anticipation, allowing him to posit a future cause for the present. Kauffman (2016a), on the other hand, will not even admit of entailment between a present system and an emergent future one, let alone a causal one. Rosen's position is one that he relies upon in order to advocate for a present, living system being able to *model* a future for itself as an anticipatory act. The difficulty that he finds with his contemporaries unable to accept his perspective, revolves around his assertion of an anticipated future *causing* the present (Rosen, 2012). Yet, if we follow Kauffman's recent thinking – and its alignment with the speculative metaphysics of Whitehead, as shown particularly in Chapter Four, 'A Creative Universe. No Entailing Laws' (Kauffman, 2016a, pp. 64–82)[26] – the future states afforded by actual occurrences will not necessarily be 'prestatable' (predictable) by any articulation of the present system. 'We are radically free,' Kauffman (2016a, p. 76) writes, 'and radically emergent and radically co-creative. [. . .] Indeed, we are "sucked into" the very adjacent possibilities we, largely unknowingly, create.' For Kauffman, the intensification of and movement into an adjacent possible is a necessary characteristic of creative evolution. That is, there are multiple future ontological possibilities available to any actual entity's configuration, before any particular one is actuated. It is the specific arrangement of an actual entity that articulates the possibles within its 'penumbra'; with evolution happening when this entity is 'sucked into' one of the adjacent possible states and thereby activating its own creative, becoming actual.[27]

Nietzsche (1997) asked the creative philosopher to 'clear the ground' in order to build a present alive in a hopeful future.[28] The surface prepared here, in this chapter, has shown a wide variety of creative, loving and anticipatory adjacencies: emerging 'new Actuals' (Kauffman, 2016a, p. 76); various singularities and their attendant (emerging) natural treatises; the shifting boundaries determined by the constant inter- and intra-constraining relationships that constitute all actuals (new and old). The living, creative, present requires anticipation to exist.

Rosen's work has directed our attention to biology and to characterize an anticipatory life set free from reductive homogenization; and Lucretius and Serres have allowed us to add love to our concoction of the creative complexity of becoming. Which brings us back to the beginning of this chapter, to friendship and sympathy, where a society of friends gives birth to concepts from the depths of their concerns for life. As we saw, a creator's sympathetic working of a new form is a simultaneous modulation of processes of forming and mattering distributed, at least, across the maker, materials and shapes required and, at most, across a much wider social, cultural and maybe even cosmological array of interacting contexts. In an emergent universe, the pacts and treaties needed to develop what might become are locally and immanently created; as if the mutual modulation of 'law' and mode of existence possible in any place are mutually sympathetic in love and a friendship.

Last remarks

To start to close this chapter, in the first instance, I return to Serres and the dynamic, complex approach to life he develops with Lucretius. Serres (1977, p. 139) writes: 'Turbulence is a deviation from equilibrium. And the beginning of the vortex is the minimal angle of declination. That living things trouble the order of the world means, literally, that living things are primarily turbulence'. Imagine, then, an incidental moment of deviation in the present delivered by a particle hurtling in from the future, with this deviation providing a point at which the portrayals of living things as turbulence (Serres, Lucretius) and anticipatory systems (Rosen) are mixed. A turbulent life that complexifies and creates. As Serres recounts it (1977, pp. 135–139), there are two types of physics, two natures: the martial and the loving. One leads to stagnant death and the other to fecund life.

> Immanence: the world is traversed by laws; it is, without deviation, the place of reasons. But, before developing verses, we must choose between two laws. The law of Eros, the law of death. Spring or the plague. Birds, dead bodies. The wound of love or decomposing limbs.
>
> (Serres, 1977, p. 135)

To move against strategy, then, is to move for love, for pacts and alliances, treaties and friendships. This is to be on the side of life, of life itself. Influenced by Rosen (and the other biologists mentioned above), we may regard Serres and Lucretius's Venus-infused works as 'natural philosophy' that deals in the ways in which being becomes more than itself, becomes creative. Where a lifeline to this 'more than itself' is provided by anticipation, vectoring in from the future. Here, with this 'becoming more', we have a gesture of love and sympathy for a future that also includes us. This is the anticipation where 'what-more-may-become' is able to remodel the present.

It is impossible, now, to write these words without each word preparing treaties with all the others written here. Each of this chapter's key concepts

– friendship, love, anticipation, creativity, ontology – caresses another; to finish with them, here in these final remarks, involves putting them all into motion. Again. Maybe this is the best way I can think of to characterize the recursive entailment that Rosen (1991) finds so important for life, that the words I deliver and have delivered will form the content of the works made and to come. And this done with love, anticipating ties of friendship rather than strategies for defeating enemies.

Friendship as an entity, then, can be a society of friends, an ecology of a people, to be anticipated and created from its latent potential. A friend I can become and by so being, the nature of 'friend' changes. And so on. Friendship can also be the becoming friend in the present that welcomes friendship into existence and allows it – and the elements constitutive of its society, its ecology – to develop along its, their, own lines. A friendship occurs when its possibilities for creative development – in itself and in each friend – are amplified and welcomed, encouraged and cultivated by every friendly action. A friendship anticipated and emergent, hoped for and welcomed, mutually and sympathetically created and modulated.

And love? What might it provide us in the future? Can an anticipated love provide the model according to which the actual occurrence doing the anticipating expresses its life? This must be possible, an 'adjacent possible' maybe. A penumbra that surrounds any actual life, which can coalesce around an actual life as it becomes characterized by the future, if only one has the openness to anticipate and then to welcome oneself into that space.

Acknowledgements

Notes

1 Aristotle (1986) presents hylomorphism in terms of the relations between matter and form. To delve into this fully, here, would be something of a digression into Aristotelian avenues that would take us to his theories of change and causality. However, there is a sense in his work that matter is inert until it is formed. Ingold (2012) gives a good overview of work that is close to the one I'm producing here. For articles addressing Aristotelian 'hylomorphism' of tangential importance to this chapter, see: Johnston (2006) – in terms of the relation between wholes and parts (mereology); Manning (2013) – on the history of the concept. Simondon's work bears some debt to Étienne Souriau's (Haumont, 2002), which is somewhat paid by Deleuze (1994, 2004). On the

relationship between Deleuze and Simondon see Bowden (2012) and Sauvagnargues (2016).

2 This is developed further in materialist work such as Barad (2007), Bennett (2010), and Connolly (2011).

3 There are so many works placing empathy at the heart of design and design thinking that it has become cliché. Influential works on design thinking (also design-driven inno- vation, or design for business) are: Cox (2005), Brown (2009), Martin (2009), Verganti (2009) and Johansson-Sköldberg et al. (2013). On the importance of empathy in these disciplines see, for example: Kimbell (2011), Köppen and Meinel (2015), Dalton and Kahute (2016). Empathy in these contexts is regarded as putting oneself in someone else's emotional (among others) perspective. This is different to sympathy, as the opening up of oneself to the emotions of others as an act of self-changing friendship.

4 This aligns not only with the ways that complexity biologist Stuart Kauffman discusses the catalysis of complex evolution (1993) but also with Deleuze and Guattari's own work on becoming. It is clear, in their (1994) *What is Philosophy?* that any act of becom- ing something should allow that something to flourish in its own becoming (see, for example, Deleuze and Guattari, 1994, p. 109). Similarly, Kauffman (1993, 2008) high- lights that the catalysis of complex bio-chemical entities needs to ensure the possibilities for future creative catalysis for evolutionary change to ensue and proliferate. I discuss these issues further in Brassett (2015).

5 Donna Haraway's recent *Staying with the Trouble* (2016) develops some similar concerns. Chapter Three 'Sympoiesis' (pp. 58–98) is particularly relevant, with its disruption of the self-obsessed *autopoiesis* in favour of a more communal, sympathetic, mutual modulation afforded by *sympoiesis* into existence.

6 I discuss this in relation to design ethics and social design in Brassett (2018, 2019).

7 This enters into proximity with what John O'Reilly argues about the creative power of the 'other-wise' in this volume.

8 See Deleuze (1995, p. 87) where – in an interview on Foucault in *Libération*, collected in *Negotiations 1972–1990* under the title 'Breaking Things Open, Breaking Words Open' – he exhorts: 'Never interpret: experience, experiment'.

9 There are other philosophical traditions that deal with ethics and future populations; most notably, 'population ethics' (e.g. Blackorby et al., 1995; see also: Brassett, 2018) and 'intergenerational justice' (e.g. Sanklecha, 2017). In examining and critiquing the ethical assumptions of intergenerational justice, Sanklecha (2017, p. 230) states: 'in order to care about the future it is necessary that there *be* a future' (original emphasis); and (p. 240) 'for the present to matter, it is necessary that there is a future'. Both of Sanklecha's comments are resolutely anticipatory and a full investigation of the possible interactions between these traditions and those developed in this chapter would benefit future research.

10 Derrida (1997, p. 5) notes: 'A memory is engaged in advance, from the moments of what is called life, in this strange temporality opened by the anticipated citation of some funeral oration. I live in the present speaking of myself in the mouths of my friends, I already hear them speaking on the edge of my tomb'.

11 Which is something for another time, as it lies outside of the scope of this chapter.

12 Poli (2010, 2017) works closely on this aspect of Ernst Bloch's philosophy. Editors' note. See also Barron in this volume.

13 It is not without significance, I think, that this passage comes at the beginning of Chapter Two, 'Expression' (Whitehead, 1966, pp. 20–41). The relational ontology of Spinoza (1996) also connects with concepts of wholes and parts, bodies and elements and their affective and expressive qualities. I discuss these in terms of developing a relational ethics of design in Brassett (2018, 2019).

14 Such concepts as 'process' and 'affect' recall the writing of Souriau (2009a, b) and Whitehead (1978). For Souriau, existence – differentiated into multiple modes each on their own journeys of becoming – is not given in advance but needs to be created into constantly dynamic, endlessly varying beings. What these thinkers have in common, even

while they diverge into so many directions, is a sense of welcoming, of friendship; even of love.

15 The convention in citing passages from Lucretius's poem is to give the book number in Roman numerals, followed by line numbers.

16 In the prose translation Latham uses 'superstition' for *religio*: 'Such are the heights of wickedness to which men have been driven by superstition [*religio*]' (Lucretius, 2005, p. I.101). The poetry translator, Stallings, in her notes, remarks that she uses Religion and Superstition interchangeably (Lucretius, 2007, p. 240, n. 9).

17 Coming from the Greek *stratēgōs*, the head of the army (Liddell and Scott, 1889), strategy is a concept that is deeply embedded in war (von Clausewitz, 1984), with other uses outside the military context occurring only recently. Burnes (2018, p. 226) writes: 'It is commonly believed that our concept of strategy has been passed down to us from the ancient Greeks. [. . .] The concept remained a military one until the nineteenth century, when it began to be applied to the business world, though more writers believe the actual process by which this took place is untraceable [. . .].' In my presentation at the *Anticipation 3* conference in Oslo (2019), I showed a slide of the front cover of *Harvard Business Review* (2010). The image is a photograph by Jeremy Lock of a group of Australian soldiers, taken on 26 June 2007 as they train prior to deployment in either Afghanistan or Iraq. The headline reads: 'Leadership Lessons from the Military. Extreme conditions in Afghanistan and Iraq have become a testing ground for adaptive management skills that every CEO should understand' (front cover).

18 I will refer mainly to this text, providing my own translations. The English translation, Serres (2000), I will refer to when necessary.

19 Serres's description of his formative childhood and early adult years, in conversation with Bruno Latour, is extremely evocative of the violence he experienced, from the age of six (in 1936) and the Spanish Civil War, to the French colonial wars of the 1950s and 1960s, via Occupation, Liberation, Auschwitz and Nagasaki (Serres and Latour, 1995, pp. 1–42).

20 Serres's word here, '*les corps*', is also corps as in a military unit.

21 Editors' note. See Chapter 10 in this volume for more on Nietzsche and the untimely in relation to anticipation.

22 I am indebted to an audience member – in the session in which John and I test-drove some of the aspects of our work here, at the 3rd Anticipation conference, Oslo, 2019 – for remarking upon this aspect of the mythology. (I never caught their name.) In the Greek tradition, Hesiod (1988, pp. 30–31) explains: 'To Ares [Mars] the piercer of shield-hides Cytherea [Aphrodite, Venus] bore Terror and Fear […] and Harmonia [Concordia], whom proud Cadmus made his wife.' While Roman mythology drew upon Greek, it was not a simple copying: as Budin (2004) explains with regard to the earliest syncretic relationships between Mediterranean (Cypriot and Cretan) and Near Eastern (Egyptian, Levantine and wider Semitic) deities. In relation to later Greek-Roman mythologies, it appears that the Roman versions of the shared deities were more serious, less capricious, seemingly to emphasize the greater maturity of Roman culture. Such is the difference between Mars and Ares in Roman and Greek cultures respectively: the latter almost universally despised by gods and mankind alike; the former worshipped as a serious warrior.

23 Webb's work (2006, 2017) has been of great value to my encounters with Lucretius and Serres; especially Webb's ability to encounter creatively both philosophical and scientific concepts. There is more to this, which is relevant to the terms of this chapter. You see, David Webb, John O'Reilly and I shared a house and friendships while working on our PhDs at the University of Warwick, UK in the late 1980s and early 1990s. I write this as a form of intellectual honesty and to locate an openness and sympathy to concepts in moments of collision and swerve.

24 'Regulate' is a term that Webb offers instead of 'law' (2017, p. 260) following Unger and Smolin (2015), which avoids any sense of dominance of law over the legislated. It would be interesting to examine further the territories opened up here, where issues of power, force and control are lively. Useful would be the work of Giorgio Agamben (1998, 1999).

25 See, for example, Rosen (1991, 2012) and Kauffman, (2008, 2016a, b).
26 See also Kauffman (2016b). The work of Johanna Seibt is also important, in its bringing Whiteheadian Process Theory to different scientific practices; see especially: Seibt (2010) on the relations between ontology and theories of particulars; (2018a) on ontology, process theory and biology; and (2018b) on modes of occurrence and her creation of a General Process Theory. (Indeed, see the whole collection of which Seibt, 2018a is a part: Nicholson and Dupré, 2018.)
27 The confluence of this discussion with evolutionary theory and its concepts of 'preadaptations' (see: Buss et al., 1998; Ardila, 2016) and 'exaptations' (Gould and Vrna, 1982; Stengers, 2011, p. 330) is striking, but its examination is for another time.
28 Editors' note. See Chapter 10 on anticipation and the concept of the contemporary in this volume.

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