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Theorising Bioart Encounters after Gilbert

Simondon

Abstract

In recent years “bioart” has been lauded in the social sciences for its creative engagements with the ontological stakes of new forms of biotechnical life in-the-making. In this paper I push further to explore the ontogenetic potentials of bioart-encounters to generate new capacities for thinking and perceiving the nonhuman agencies imbricated in the becoming of subjects. To explore this potential I stage an encounter with Gilbert Simondon’s philosophy of individuation, highlighting three implications for theorisations of the constitution and transformation of subjects. First, Simondon forces us to rethink the subject in terms of its transductive emergence from preindividual processes, and its metastable susceptibility to ongoing transformations. Second, he substitutes voluntarist conceptions of thought with an involuntarist primacy of material encounters as the conditions for novel individuations. Finally, I argue that Simondon enables a thinking of the politics of the (bio)art-encounter in terms of its ontogenetic capacity to materially produce, rather than merely represent, new subjects and worlds.

Keywords

individuation, Simondon, bioart, subjectivity, Affect, ontogenetic

Introduction

In recent years the field of “*bioarts*” practice has been lauded in the social science literature for its creative engagements with the ontological stakes of new forms of biotechnical life in-the-making (Zylinska, 2009; Thacker, 2007). Characterised by creative practices in which vital materials and biotechnologies become an integral part of the artistic process as well as the artwork itself, bioart¹ has typically been understood in this critical literature in terms of its capacity to alter extant ways of thinking about the nature of the arts and life sciences, as well as to transform the relations between artists and scientists and their objects and publics (Born and Barry, 2010: 105). In this paper I push the framing of this “logic of ontology” in bioarts practice further to theorise the potentials of bioart encounters to materially reconfigure the subject, reconnecting it with nonhuman forces and technical agencies that not only call into question the kinds of beings we think we are (our ontological constitution), but also condition the material possibilities for what we might yet become (what I term, following the philosopher Gilbert Simondon (2009a), our *ontogenetic* capacities). I focus here specifically on the artistic practices of one of the most prominent collectives, *The Tissue Culture and Art Project* (TC&A), whose work productively foregrounds the ontogenetic stakes of bioart encounters in two main ways. First, and conceptually, their practice highlights the insufficiencies of an ontological privileging of “the individual” in much social science and philosophical thinking for engaging the new technological renderings of “life” within the contemporary life sciences, where life becomes defined less as a property of discrete organic bodies that we can observe, and more in terms of a heterogeneous and overlapping milieu of material elements, technologies, and environments we might manipulate and engineer (Boucher, 2012). The ontological implications of this “dephasing” of life has thus been an ongoing focus of TC&A’s creative inquiry into the increasing potentials of the life sciences to create new forms of biotechnical individual, which they term the ‘semi-living’, comprising living fragments grown

over synthetic scaffolds that require technological intervention for their growth and maintenance (Catts and Zurr, 2013: 104). Second, and politically, the lead artists Ionat Zurr and Oron Catts state that by growing evocative ‘semi-living sculptures’ their practice attempts to reimagine the ontological status of these entities beyond theories of human exceptionalism omnipresent in cultural and technoscientific narratives on life, as well as an ‘increasingly pervasive engineering mentality’ that reduces life to a raw material organised around anthropocentric logics of utility and control (Zurr, 2012: 288)². By staging vital encounters with their fleshy materiality in the gallery space, TC&A’s installations instead creatively experiment with the possibilities for alternate relations of thought, vital matters and biotechnologies, generating new capacities for thinking and perceiving the different gradients of life that surround and constitute us (Dixon et al, 2012).

[Insert **Figure 1** – The evocative materiality of the *Semi-Living Worry Dolls* from the *Tissue Culture and Art(ificial) Wombs Installation*, Ars Electronica 2000. Medium: McCoy Cell line, biodegradable/bioabsorbable polymers, and surgical sutures. © Tissue Culture and Art Project (2000&2011). Photo: Oron Catts and Ionat Zurr]

The shock of the bioart encounter for contemporary social theory is clear: our capacities to think the reactive pressures and creative potentials of contemporary forms of biotechnical emergence, as well as our politics for articulating and performing these differently, depends on the elaboration of a new mode and image of thought. A thought that commences not from a presumption of the initial ‘givenness’ of individuated being, but rather from an affirmation of the ongoing event of its *individuation* within material processes that precede and go beyond it (Combes, 2012: 1). In other words, and drawing here on the philosophy of Simondon (2009a: 6), ‘a thought that would prove adequate to the problem of ontogenesis’. In this paper then I

explore the implications of Simondon's philosophy for how we might theorise bioart encounters as *ontogenetic events* that materially produce, rather than merely represent, new subjects and worlds. Whilst some scholars identify a tendency in Simondon's (1980: 49-50) work to clearly distinguish the technical and the living that would appear to jar with a contemporary thinking on biotechnology (Harvey et al, 2008), I argue that his *transductive* understanding of individuation, which focuses on the intensive foldings of living and nonliving forces as collectives become, affords new ways of articulating the political stakes of such artistic interventions in biotechnical processes, which serve to generate sites of *encounter* through which thought is opened to the creative potentials of life in excess of the individuated forms and bodies that would seek to capture it (Hynes, 2007).

To theorise this ontogenetic potential of bioart encounters the paper draws out three key implications of Simondon's philosophy for contemporary theorisations of the material constitution and creative transformations of subjects. Firstly, Simondon challenges inherited protocols of thinking 'the subject' as a transcendental necessity or norm, forcing us to *rethink subjects through immanent logics of emergence and metastability* (Read, 2011). His ontological inversion of individuals to material processes of individuation thus foregrounds the inadequacies of representational and individualist modes of thought for grasping the active participation of nonhuman agencies, technical environments, and affective forces in productions of human thought and action (Dewsbury, 2012; Parisi, 2009; Sharp, 2011). This more processual ontology of the subject also opens new ways of thinking 'processes of subjectivation' as a key terrain of political intervention and transformation (Guattari, 1995: 25), with recent work addressing the proliferation of spaces and technologies of biopolitical control that modulate the emergences of material dispositions, capacities and habits (Ash, 2012; Roberts, 2012; Sharpe, 2013). Secondly then, I argue that a philosophy of ontogenesis

enjoins us to rethink *events of subjective transformation*, replacing a ‘voluntarist’ image of the subject prevalent in much social scientific thinking with an ‘involuntarist’ primacy of *the encounter* (Zourabichvili, 2012: 56; Sauvagnargues, 2012). Framed through ontogenetic logics of the encounter, the world thus reclaims an inventive potential beyond the strict confines of the volitional subject, with the affective force of nonhuman materialities providing the creative spur to novel individuations and becomings. Finally, and following Simondon’s (2011a, 2012) writing on the ontogenetic potentials of aesthetics to produce new immanent relations of thought and world, I argue that *art* provides a privileged event-space for such transformative encounters (Michaud, 2012). For Simondon (2011a: 412), what defines art is its powers of what he terms ‘reticulation’: its capacity to forge new and unexpected connections of modes of thought, vital bodies, technical objects, and energetic milieus. By foregrounding these relational potentials, Simondon’s conception of art proves especially prescient for theorising the experience and politics of contemporary forms of arts practice, such as bioart, that emerge through the convergence of material, vital, and technical processes of individuation (Brunner and Fritsch, 2011). Thinking such art-technology encounters as ontogenetic and relational events, I contend, also generates an alternate sense of their political potential, pushing social theory beyond its preoccupation with art’s representational capacity to *individualise* (that is, to confirm or subvert extant identities or subjects in the world), and towards its non-representational capacity to *individuate* (to produce new material sensibilities; to invent new potential forms of life) (Hynes, 2013; Lapworth, 2015).

This paper therefore aims to stage a mutually transformative encounter between the ontogenetic thinking of Simondon and the bioart practices of TC&A. *Theorising bioart through Simondon*, I argue, opens a thinking of bioart that goes beyond traditional discussions of its subjective effects on the viewer, as well as simplistic diagnoses of a “posthuman” rupture. As Robert

Mitchell (2010, 2012) has previously argued, Simondon's conception of artworks as sites of intense *mediation* between thought, technologies, and bodies provides a compelling understanding of the experience of bioart in the gallery, which focuses affective attention on those "sites" (e.g. orifices such as the nose and mouth) and "processes" (eating, breathing, touching) of the body through which nonhuman milieus are literally inserted into the human. However, and pushing further than Mitchell, I explore how Simondon's theorisation of the 'transductive' forces of art-encounters offers a more ontogenetic sense of the potentials of bioart, understood not just as transforming relations between extant subjects and objects, but as immanent interventions in collective processes of individuation through which these embodied subjects and semi-living objects come into being. I therefore begin in the following section by drawing out key concepts from Simondon's theory of individuation – specifically *singularity*, *metastability*, *transduction*, and *affectivity* – that foreground a different understanding of the material processes weaving the immanent fabric of the social, opening contemporary thinking on the subject to the preindividual forces and nonhuman relations imbricated in its ongoing formation, as well as conditioning its metastable susceptibility to disruption and transformation through novel encounters.

Conversely then, I argue that *theorising Simondon through bioart* serves to actualise new potentials of his thinking, providing a site to reassess certain interpretations that reduce the full complexity of his thought on the material relations and co-evolutions of being and technology. I am thinking here, for example, of the philosophy of Bernard Stiegler (2009) who reduces Simondon's ontology of preindividual being to a subset of his conception of the technique (Barthélémy, 2012). On the other hand, the recent work of Elizabeth Grosz (2011, 2012) draws from Simondon a contemporary politics of individuation and (inorganic) life entirely disconnected from his thinking on technical objects. With an ever increasing interest in

Simondon's thought in contemporary social theory, important questions thus emerge regarding the potential ways in which we might 'inherit' Simondon today (Stengers, 2004; Hayward and Geoghegan, 2012). Following Adrian Mackenzie (2002), I argue for an approach that would follow the spirit of Simondon's 'transductive' method: one that returns his concepts to use, discovering new operations, and forging new connections between heterogeneous domains of thought and practice that expand the possibilities of this inheritance. It is this approach I seek to enact in this paper, highlighting how an encounter with bioart can help facilitate the task of *thinking transductively* across what have typically been read as independent and self-contained 'pillars' of this thought (Chabot, 2013: 107)³: between his philosophical reflections on being and individuation (Simondon, 1992, 2009a), the genesis and evolution of technical objects (1980, 2009b), as well as his lesser-known writings on the potentials of 'technoaesthetic' encounters (Simondon, 2012, Simondon, 2011a).

From Individuals to Individuations: the Philosophy of Simondon

Following a gradual trickle of translated extracts from his works into English over the last few years, as well as the recent translation of two influential commentaries (Combes, 2012; Chabot, 2013), an increasing number of contemporary scholars have been drawn to the thought of Simondon and especially its implications for current debates around technical activity (Ash, 2014; LaMarre, 2012; Kinsley, 2014), nonhuman agency (Venn, 2010; Grosz, 2012), and a politics of individuation (Toscano, 2012; Read, 2011). What is distinctive about these contemporary engagements is a growing appreciation of Simondon *as a philosopher*, whose work presents a radical transformation in the terms and modes through which philosophy thinks being. This challenges a long-standing tendency, stemming in part from the critical acclaim given to his first publication, *Du mode d'existence des objets techniques* [1958] (henceforth MEOT), to read Simondon (1980) as merely a 'thinker of technics' (Combes, 2012: 57)⁴. This

new wave of engagement with Simondon's philosophy in recent social theory, I argue, can be broadly divided into two distinct perspectives. The first situates Simondon in a philosophical lineage of *phenomenological* thinking (especially in relation to his doctoral supervisor, Maurice Merleau-Ponty), framing his theorisation of the potentials of technical individuation through the subjectivist lens of the 'lived body' and intersubjective relationality (Hansen, 2006; Landes, 2014; de Beistegui, 2005). The second perspective, and what I draw on in this paper to rethink bioart, is a non-phenomenological, Deleuzian reading that more forcefully shifts social theory from the prevalence of a 'human constructivism' to what Brian Massumi (2009: 38) terms a 'nonhuman inventivism', highlighting the preindividual forces and material processes conditioning the emergence of bodies and subjects (Grosz, 2012; Iliadis, 2013).

Indeed, it was Deleuze (2001: 43) who, in a review of Simondon's *L'Individu et sa genèse physico-biologique* [1964], provides one of the earliest engagements with Simondon's thought as philosophy, finding a 'profoundly original theory of individuation' that he would draw on in the elaboration of his own concepts of 'impersonal singularity', 'intensive difference', and 'transcendental field' (Deleuze, 2004a, 2004b). There is now a growing body of scholarship exploring the resonances and overlaps between their ontogenetic philosophies, which has tended to focus on the significance of Simondon for generating new perspectives on Deleuze's thinking (Bowden, 2012; Rozzoni, 2012; Sauvagnargues, 2012). However, and conversely, there has been much less critical reflection on the implications of Deleuze's reading for contemporary interpretations of Simondon, and the commentators that do address this question have typically argued for an approach to Simondon "purified" of his association with Deleuzian philosophy (Hansen, 2001; Barthélémy, 2012). Whilst there is certainly a danger of too easily conflating their philosophies within the contemporary literature⁵, I want to stake a stronger claim in this paper for the productivity of Deleuze's encounter with Simondon, especially in

the context of rethinking bioart, which by foregrounding the centrality of ‘preindividual disparity’ and ‘the problematic’ to Simondon’s genetic ontology pushes us beyond humanist and phenomenological interpretations of a theory and politics of individuation to explicitly foreground the immanent folds of material processes and ‘inhuman’ encounters in the vicissitudes of subjects (Toscano, 2012: 111). Thinking Simondon through Deleuze’s innovative reading in this section enables me to delineate two main postulates of a philosophy of individuation that provide the basis for an ontogenetic conception of bioart encounters: the rethinking of individuals as *emergent and metastable syntheses of preindividual singularities*; and an understanding of events of subjective transformation in terms of the *irruption through encounter of forces of disparation prior to subjects* that introduce discord into habitual circuits of sense-making, opening other possibilities for thinking, feeling, and being.

Thinking the Preindividual: Singularity, Encounter, Metastability

For Deleuze, the force of Simondon’s thought lies in the problem that it rediscovers and reinvents. The specific problem motivating Simondon’s novel theoretical constructions is the *problem of individuation*, or the question of the processes conditioning the emergence and differentiation of individuals in any domain. Whilst individuation is by no means a novel concern for philosophy, Simondon (2009a: 4) contends that throughout its history Western metaphysics has been captive to a static conception of being, one which takes ‘the reality of the constituted individual’ as its central and organising principle. More specifically, he argues that philosophy has tended to understand the reality of individuation through two main approaches, both with their roots in ancient Greek philosophy: a *substantialist* tradition of uncreated unitary being following Epicurus, and the *hylomorphic* schema developed by Aristotle (Simondon, 2009a: 5). What unites these approaches is their stubborn attempt to disclose a ‘principle of individuation’ which they can only think in the form of a ‘term that is

already given' (Combes, 2012: 2). Accounting for the moulding of a clay brick, for example, Simondon argues that a hylomorphic approach understands its individuation in terms of the imposition of an anterior and active principle of form (the shape of the physical mould) on an amorphous and passive matter (the clay) (Sauvagnargues, 2012: 3). Indeed, one of the aims of Simondon's philosophy is to demonstrate how the form-matter distinction of hylomorphism is not only a problem for our thinking of the genesis of physical objects, but also underwrites dominant conceptions of technology (culture as forming, or formed by, an external technology) as well as aesthetics (the Kantian duality of material content and transcendental form) (Mackenzie, 2002: 45). For Simondon (2009a: 6), this ontological privileging of the constituted term, and transcendent separation of the principle of individuation from its process, is a pernicious habit of thought that renders philosophy incapable of both thinking the operations and mediating relations that constitute the individual, as well as for imagining other immanent modes of existence beyond the already-given. For a static dialectic of form-matter coupling then, Simondon substitutes an energetics of *modulation*, shifting a thought of individuation from the reality of individuated forms to a process of continuous and unpredictable becoming on a shifting plane of preindividual forces and tendencies⁶. To conceive individuation as dynamic and relational events of modulation, Simondon (2009a: 5) famously argues for a thought that would seek to grasp 'the ontogenesis in the entire progression of its reality, and to know the individual through the individuation, rather than the individuation through the individual'.

So how does Simondon begin to articulate the individual in terms of its ontogenesis? For Deleuze (2001), the originality of Simondon's response to this question is the way his philosophy forces us to think the emergence of the new from the standpoint of 'preindividual singularities' rather than the constituted individual. Simondon, he argues, urges us to imagine:

‘A world of discrete singularities that overlap, that overlap all the more in that they do not yet communicate, in that they are not yet held within an individuality: such is the first moment of being’ (Deleuze, 2001: 45-46)

As Deleuze (2004b) highlights, singularities here are thus not the pre-given qualities or predicates of an individual as in substantialist modes of thought, but are rather immanent events in its creative emergence, constituting ‘points of inflection’ around which a situation transforms itself and follows a new trajectory of becoming (Debaise, 2012: 5). In his own writings, Simondon (2009a: 9) offers a more physicalist definition of the singularity through the paradigmatic example of ‘crystallisation’, theorising its irruptive emergence as the energetic catalyst, or ‘seed’, that forces a field of potentials into a state of ‘problematic disparity or tension’. Individuation proceeds from this dynamic and heterogeneous condition of disparation by inventing a new dimension - ‘the individual’ - that facilitates novel modes of interactive communication between divergent orders and singularities. Following Simondon then, the concept of the individual is radically transformed: no longer primary in the order of sense, it is instead rethought as an emergent and ‘partial resolution’ to an encounter between disparate forces and potentials that comprise the energetic milieu of the preindividual (Simondon, 2009a: 8). To conceive of these new mediations and integrations of forces through the encounter, Simondon argues that we must replace the abstract and static notion of ‘form’ in hylomorphic thinking with the intensive and material force of what he terms *information*. Rather than an external term to the matter it transforms like in cybernetic theories, information is instead understood as an immanent force of tension that generates a ‘demand for individuation’ as an iterative and ongoing process of ‘taking-form’ (Simondon, 1992: 315-316).

Framed through this ontology of preindividual singularities and problematic encounters, Simondon thus argues that ‘the individual’ must not be understood as a static, complete, and stable form. Nor, however, should it be defined in terms of a chaotic openness or instability, and indeed Simondon is particularly interested in thinking the various material thresholds, mentalities, and embodied orientations that constitute an individual’s specific form of openness. Inspired by the theorisations of energetic states from the thermodynamics of his time, Simondon contends that to theorise individuation’s dynamic process requires recourse to a conception of being as *metastable*; that is, an equilibrium ‘supersaturated’ with incompatible singularities and divergent force-relations that provide the conditions for new individuations (Simondon, 1992: 301). As metastable, the emergent individual does not exhaust this potential in the single stroke of its individuation, but is instead ‘always more-than-one’, remaining connected to an unresolved charge of preindividual reality that grounds and exceeds the actual capacities and relations it has established (Combes, 2012: 3). This preindividual reserve, or ‘margin of indetermination’ (Simondon, 1980: 4), thus comprises tensions and forces that not only condition the potential orientations of the individual, but also render it prone to plural individuations and becomings through future encounters (Venn, 2010: 150). As Simondon writes:

‘Becoming exists as one of the dimensions of being, corresponding to a capacity beings possess of falling out of step themselves, of resolving themselves by the very act of falling out of step’ (Simondon, 1992: 300-301)

In sum, Simondon’s philosophy introduces a number of important concepts that begin to open a thinking of the transformative potentials of art-encounters beyond the analytical strictures of representation and hylomorphism. First, Simondon’s concepts of disparation and information

provide a thinking of events of individuation through ontogenetic logics of the encounter, which he contends do not occur between already-constituted individualities, but instead play out on a preindividual field of forces and singularities that constitute the intensive and indeterminate dimensions of inorganic matters, vital bodies, technical objects, and even thought. Furthermore, and as I elaborate in the following section, Simondon invites an understanding of subjective modes of thought and perception not as stable or self-contained forms, but rather as metastable processes of individuation open to future transformations, thus foregrounding the subject's always-incipient potential 'to be nudged into a different course of thought and action' (Dewsbury, 2012: 74).

Regimes of Individuation and Transductive Affects

Whilst Simondon does not abandon a concept of 'the subject', his philosophy of individuation can be understood as an attempt to radically rethink the humanist and essentialist metaphysics upon which it has traditionally been built. Central to this is his conception of the distinction between living/nonliving and human/nonhuman based not on any substantial difference, but rather through an ontogenetic lexicon of interconnected 'regimes of individuation' of which he distinguishes three: physical, vital, and psycho-social (Simondon, 1992: 312). The initial distinction he draws between physical and vital individuations is thus not essential but *operational*, characterised by the type and quantity of relations and processes it implicates in response to the demands of information. Whereas a physical individuation is capable of receiving information only once, developing and amplifying this initial singularity at its topological edges, vital individuations constitute an interior milieu and membrane function through which it is capable of receiving successive contributions of information in a perpetual activity of becoming (Simondon, 1992: 307). The vital individual thus never attains the static self-identity of the physical individual, but is instead defined by Simondon as a 'theatre of

individuation' which can only maintain its existence by continually resolving problems with its surrounding intensive milieu through, for example, movement, excretion, and nutrition (Simondon, 1992: 305). Rather than a pre-constituted reality then, the 'psychic individuation' generative of subjectivity is rethought in terms of a further creative elaboration of problems of 'heterogeneity and incompatibility between the vital individual and its preindividual milieu' that the living being resolves through the invention of new metastable orders of interiority and 'psychic' operations (thought, perception, symbolisation) (Simondon, 2005: 108; quoted in Hansen, 2006: 171). Furthermore, Simondon argues that these subjective forms are not ontologically distinct emergences coming *after* the physical and vital in chronological succession, but are instead *co-emergent* with them through processes of individuation that bring heterogeneous realities into contact, elaborating and complexifying them into something different.

To theorise the way in which matter, life and thought individuate conjunctively to generate transformative events, Simondon introduces the concept of *transduction* which denotes:

'[A] process, be it physical, vital, mental or social in which an activity gradually sets itself in motion, propagating within a given area, through a structuration of the different zones of the area. Each region of constituted structures serves as principle of constitution for the next region, such that a modification is thereby gradually extended at the same time as the structuring operation' (1992: 313)

Emerging as an encounter between disparate realities then, transduction proceeds through the energetic restructuring of preindividual forces and singularities in a specific field into new metastable orders, which may in turn propagate as information for individuations in other

domains. As Adrian Mackenzie (2002: 25-26) has underlined, technological objects and processes can be understood as privileged sites of transduction, which operate by reconfiguring heterogeneous physical, vital and social milieus, themselves composed of different informational structures and potentials, into relations of 'recurrent causality' that are generative of new ontological realities (Simondon, 1980: 66). As a contemporary example one only has to think of the recent proliferation of touchscreen technologies, and how these are working to subtly rewire the intensive connections of digital processes of image and sound with the sensori-motor capacities of the body in ways that elicit new affective experiences. By substituting static theories of substance for relational ontologies of co-emergence, Simondon's concept of transduction thus opens potentials for thinking the transformative stakes of contemporary sites of individuation such as bioart that emerge and evolve through the creative foldings of vital, technical and subjective realities, and which often entail new and unexpected capacities, relations, and practices that challenge extant categories of thought.

For Simondon (2009a: 9), the force that drives and sustains these transductive movements of individuation is *affectivity*. Drawing primarily on Simondon's (2005: 247) account of psycho-social individuation in *L'Individuation psychique et collective*, Couze Venn (2010: 148) argues that affectivity is the 'psyche's transductive form *par excellence*', arising in the mode of an encounter between the subject and its charge of preindividual reality exceeding the order of the self. By theorising affectivity as a relational force of ontogenesis, Venn highlights how Simondon's philosophy can contribute in a number of interesting ways to contemporary debates around the affective rendering of emergent subjectivities. Firstly, and in a similar vein to Spinozo-Deleuzian interpretations, affects in Simondon's thought cannot be reduced to a psychic property or interior state of an individuated subject, like personal *emotions* which represent bio-culturally modulated expressions of its felt intensity. Instead, affectivity operates

on an impersonal register of relationality, transforming and energising bodies and thought in ways that exceed pre-existing significations and articulations. Framed through the lens of relationally transformative affects, Simondon (2009a: 10) argues that being therefore never possesses a ‘unity of identity’ but only a ‘transductive unity’, implying an understanding of the subject wherein material relations to the outside, to the collective, is not something that comes to an already constituted subject from without, but something without which the subject would not be constituted. Experiences of affectivity then, as Venn (2010: 149) highlights, have an important role in Simondon’s thinking as the ‘intensive sign’ or ‘index’ of the subject’s more-than-individuality; as events of material resonance, registered at the level of pre-conscious sensations and vibrations, affects provoke embodied apprehensions of the collective forces and nonhuman agencies conditioning the subject’s material transformations and becomings. Entailing a momentary loosening of the binds of constituted individuality then, affective encounters give rise to events of what Simondon (1992) terms *disindividuation* which rather than dissociating the subject from its capacity to individuate (as in Stiegler’s (2010: 37) limited use of the term to diagnose modern technology’s ‘short-circuiting’ of processes of collective individuation), instead provide confrontations with the nonindividuated potentials it carries within it, which may become actualised in subsequent individuations. Therefore, and although Simondon (1992: 317) claims that we cannot ‘*know individuation* in the common sense of the term’ (i.e. as an object of knowledge for a detached, knowing subject), the problematic of affectivity constitutes in his thought the possibility for *feeling* individuation’s transductive process (Venn, 2010: 149). Missing from Venn’s engagement with Simondon’s philosophy, however, is a clearer sense of what role technology and art might play in the production of new affective relations of the living and nonliving. In the following section, and through an engagement with Simondon’s (2012, 2011a) writings on *technoaesthetics*, I argue that by making physical, vital, and psychic registers of experience conjunct in creative ways,

contemporary art-technology encounters can be understood to generate new affective attunements to the transductive forces modulating between experiencing bodies and expressive technologies.

Technoaesthetic Encounters

Whilst the political implications of his theory of individuation was not of paramount concern for Simondon, I argue his philosophy nevertheless provides important resources for contemporary critiques of a politics of identity, and particularly the voluntarist conception of the subject as the grounds for, and source of, real existential change on which it depends. Through the concepts of preindividual singularities and transductive affects outlined above, Simondon (2005: 302) stimulates us to readdress the question of the ontogenesis of the social, locating the catalyst of change in the movements of disindividuation generated by the event of an *encounter*. Deleuze's interpretation of Simondon provides an important clarification here, arguing that what thought encounters are not already-constituted identities, but rather the affective force of non-representational *signs*: intensive 'flashes' of differential forces and singularities that cannot be situated within the topos of recognition, confronting thought with what it has yet to think (Deleuze, 2004a, 22; Deleuze, 2008). Simondon's thought thus opens towards an alternate conception of the politics of subjective and social change, one which following Deleuze's 'involuntarist' reading can be understood less as the actualisation of a latent preindividual potential held 'in common' by human subjects as in naturalist interpretations of a Simondonian politics (e.g. Combes, 2012; Virno, 2004), and more in terms of transformative event-inventions brought about by the 'inhuman' shock of material encounters (Toscano, 2012: 111). What Simondon offers then, I argue, is a way of thinking an *ontogenetic politics of encounter* founded on two interrelated vectors. The first we might term a *vector of disindividuation*, understood as the irruptive emergence within experience of

intensive signs, new relations of preindividual forces and singularities, which render previously sanctioned perceptions and sensations of our milieu inoperable or untenable. The novel tensions generated by this rupturing event of disindividuation call for a resolution, thus opening possibilities of a second *vector of invention*, involving a widening of potential in the realm of experience and transforming the scope of what a body can do and the affective relations it may enter into (Massumi, 2009).

In the final section of MEOT, Simondon (2011a) argues that technology and art represent privileged sites of invention, each constituting singular modes of intensive *mediation* through which the subject encounters and connects to preindividual nature. Like his theory of the individual Simondon (2011a: 411) provides a genetic account of technology and art, tracing their emergence from within what he terms the ‘dephasing of primitive magical unity’, which defined an immanent mode of thinking and experiencing the world prior to the ontological separation of objects from subjects (science/technics), figure from background (aesthetics), or the whole from its parts (religion) (Chabot, 2013: 132). Following Simondon (2011a: 416-417), technology and art emerge as different tendencies in (re-)articulating the relations of thought and world; where technology extracts and objectifies physical manipulations and gestures that render specific localities of an eventfully creative world actionable, art produces intensified moments and encounters – or ‘key points’ - that reconnects what is singular in these objects to a wider universe of forces and affects. With technology, however, he contends that our capacity to think and engage these ontogenetic possibilities is attenuated due to the predominance of hylomorphism in cultural and philosophical responses to technological objects, which consider them from the impoverished angle of a fabricational intentionality overseeing their creation (Simondon, 1980: 2). Simondon’s (1980: 64) point is that ‘technical invention’ does not proceed through the hylomorphic imposition of cognitive forms or schematics on matter from

the outside, but rather as an indeterminate event that always has the potential to exceed the intentions of design, coming about through processes of 'self-conditioning emergence' that shift present forces into new compatible orders of material relation. Providing the example of the Guimbal hydro-powered turbine in MEOT, Simondon (1980: 57-59) contends that while the engineer may indeed act to bring the energetic fields of tidal seawater and pressurised oil to the brink of a new regime of functioning, the crossing of the threshold to technical operation belongs to the novel actualisations of their own plurifunctional potentials. However, what defines the singularity of 'technical invention' in contrast to the more irruptive creativity of vital or aesthetic modalities is that it is a process driven by a broader tendency which he terms *concretisation*. Understood as a process of concretisation, technical evolution thus unfolds through the increasing convergence and integration of heterogeneous elements and forces into self-sufficient modes of interoperability (Simondon, 1980: 31).

Simondon (2012) further develops these reflections on the potential relations of art and technology in his later writing on 'technoaesthetics'. Rather than ontologically discrete domains, Simondon (2012: 3) instead provides a transductive understanding of 'the technical' and 'the aesthetic' as two dynamic poles in a shifting continuum of process. Indeed the difference between them, as Massumi (2011: 53) argues in his engagement with Simondon's philosophy of aesthetics, is that the regulatory principles of technical concretisations tend towards the poles of functionality and profitability – or 'use-value'. Art, on the other hand, has no manifest use-value and sometimes even no exchange-value. 'At its best', Massumi writes, art possesses 'event-value'. Simondon therefore argues that whereas technology tends towards the creation of divergent fields of objects separated through the specialisation and individualisation of function, art is an attempt to establish anew the transductive connections between heterogeneous modalities of thought, perception and practice with respect to each

other: for ‘re-reticulating’ the world *differently* (Simondon, 2011a: 417). This transductive event-value, as Massumi highlights, provokes a more inventive sense of art’s political potential – ‘it is that which pushes further towards the indeterminate but relationally potentialised fringes of existing situations, beyond the limits of current framings or regulatory principles’ (Massumi, 2011: 53).

Whilst Simondon’s own writings on aesthetics tended to focus on more traditional examples of artistic object like paintings or sculptures (Mitchell, 2012: 101), I argue that his conception of art as a transductive event opens towards new ways of thinking the transformative potentials of contemporary art-technology encounters, retaining a sensitivity to the affective and relational processes through which technology becomes artful. This evental potential, as Massumi (2011) makes clear, is not something that art brings *ex nihilo* to the otherwise deadening reproductions of technologies (as in Grosz’s (2004: 260) rather dualistic account of art and technology), but instead emerges through art’s creative encounter with the transductive forces and indeterminate potentials within technology to generate other possibilities of thinking and feeling. Art does this by producing a disindividuating rupture in sense, *suspending* bodies and technologies from their semiotic contents and the dominant significations circulating in the social field (Massumi, 2011). Within Simondon’s writings then, art is understood not to address itself to the already-individuated forms and functions of the present, but instead generates interstices in the present that deploy the inventive forces and potentials of futures yet-to-come (Hynes, 2013: 1940). As he writes in *Imagination et Invention*:

‘every inventor in the matter of art is a futurist to a certain extent, which means that he exceeds *hic et nunc* of needs and ends by enlisting in the created object sources of effects that live and multiply themselves in the work: the creator is sensitive to the virtual [...]

the progress of the future and the amplitude of the world as a place of manifestation’ (Simondon, 2008: 182; Translated in Michaud, 2012: 128).

It is this ‘future-orientation’ (O’Sullivan, 2010: 189) of the art-encounter that defines its ontogenetic potential: its suspension of the most available potentials, those potentials already most comfortingly embodied and usefully habitualised, instead opening the subject to unforeseen and unthinkable forces of becoming.

This more ontogenetic understanding of art-technology encounters thus gestures towards a sense of politics obscured by a representational analytic, which is less the didactic critique of extant positions and discourses, than a creative experimentation with new potentials of thinking and feeling beyond the limits of current framings. Simondon’s philosophy provides the tools to affirm this potential, enabling us to think art-encounters as disindividuating events that by suspending functional modalities of relation to other individuals, and by enabling these individuals to appear in their more-than-individuality, ‘force the subject to become aware of what in itself is more-than-itself, and to become engaged in new individuations called forth by this discovery’ (Combes, 2012: 38). It is this potential of bioart encounters to generate new capacities for thinking and perceiving the human subject, and to transform relational configurations of embodied subjects, semi-living entities, and technologies that I want to unpack in the final sections of this paper.

Affective Disindividuations: Transducing the ‘Extended Body’

To date, a number of academic commentators and art critics have interpreted the experience and politics of TC&A’s bioart through a narrowly representational lens of rational and intentional subjects, suggesting that insofar as the affective encounter disturbs and fascinates,

it disables capacities of critical judgement on the tendencies of contemporary biotechnologies (Gigliotti, 2006; Birke, 2006). This theoretical pitching of an artistic politics at the representational level of subjective judgement and institutional critique has meant it has been those bioarts practices that articulate an explicit manifesto for social change (such as the activist practices of the Critical Art Ensemble) which have typically been celebrated over and above the more playful, ironic, and affective interventions of TC&A (Giannachi, 2006). Here then, I argue Simondon's philosophy provides a more productive lens for theorising the affective and ontogenetic registers of politics opened up by bioart encounters for two main reasons. Firstly, Simondon's (2009b: 24) theory of 'technical mentality' pushes us beyond the ideological and discursive interpretations of dominant forms of thinking and doing technology we find in critical theory, to instead attend to the metastable field of material perceptions, affective dispositions, and immanent values that are the ontogenetic conditions for these emergent modalities of thought and action. For Simondon (2012), and as foregrounded in his concept of 'technoaesthetics', a concern with technology is thus also a concern with aesthetic thought and practice – of the capacities of technical objects to transform material capacities of thinking, perceiving and sensing the world. Simondon (2009b: 24) therefore affirms artistic practices and encounters as a privileged field for transforming our 'technical mentalities' (beyond representational logics of function and use) in ways that might attune thought to the creative and indeterminate potentials of technical and vital processes. Secondly, and as Mitchell (2012: 98) highlights, Simondon's material reimagining of artworks as intense sites of 'mediation' helps us to think the embodied sense of 'becoming-medium' for other forms of life at stake in bioart encounters, which he argues generate possibilities for altering the topological relations connecting 'gallerygoers' as elements within broader milieus of biotechnology that incorporate, for example, technical functions, scientific practices, and rituals of consumption. However, and by framing this transformative potential in terms of the production of new

‘interpersonal relations’ and connections of ‘spectators to the wider world’, I argue there is a tendency in Mitchell’s (2012: 101) account to fall back into a separation of constituted subjects and the world “outside”, and thus a rather conventional understanding of mediation as an external relation between constituted terms. Through an engagement with Simondon’s (2009a) concepts of ‘transduction’ and the ‘transindividual’ in this section, I instead want to delineate the more specific, ontogenetic sense of artistic mediation operative in Simondon’s thought, understood as an event of individuation involving the reciprocal transformation and becoming of subjects and world.

As noted earlier, affective encounters are central to Simondon’s conception of the “disindividuation” of the subject, carving a space through which preindividual reality bursts forth to potentialise the present, and exposing us to a moment in which the fiction of a static and isolated self slips away. Simondon (2009a: 8) argues that such events of disindividuation also furnish the possibility for new modalities of relation to others, determined not by logics of constituted identity or function which characterise what he terms ‘interindividual’ relations, but rather through a ‘transindividual’ relationality of uneffectuated preindividual potentials experienced only as affect. This experience of the transindividual emerges through a restructuring of the *collective* in response to the incompatibilities introduced by novel encounters, thus opening a thinking of the collective not as a pre-given totality or form as in traditional sociological accounts, but instead as a dynamic process of individuation emergent from the impersonal zone of metastable potential that constitutes the preindividual field (Combes, 2012: 52). Through the staging of affective encounters, Simondon argues that art can be understood to interrupt and suspend habitual, interindividual relations suppressing the effectuation of the preindividual, thereby providing conditions for individuations of the

collective that give rise to new transindividual forms of coupling between the inventive capacities of a plurality of (human, nonhuman, technical) individuals.

The inventive limits and affective possibilities of emergent forms of transindividuality is arguably at the core of TC&A's ongoing theoretical and artistic experiments with what they term the 'Extended Body' (Catts and Zurr, 2006: 2). Spotlighting the 'semi-living object' as one of its most evocative icons, the Extended Body is a conceptual device used by Catts and Zurr to engage critically and creatively with the potentials of contemporary biotechnologies to assemble disembodied fragments and elements of the human and nonhuman, the organic and inorganic, in technologically mediated and augmented forms of collective life. Unsettling the molar logics of identity and 'interindividual' relationality that underwrites posthuman imaginings of the 'hybrid' or 'chimaera' (Andrieu, 2007), the Extended Body instead emerges through transindividual relations of material exchange and affective resonance that constitute its incessant openness to modes of processual becoming. In this regard, I argue that what is particularly distinctive and affective about TC&A's bioartistic practice then is their attempt to generate and perpetuate a more permeable sense of the human body in its material relations within biotechnical milieus of the semi-living through two main techniques. First, and *performatively*, TC&A's installations frequently deploy various events and rituals to unsettle the spatial and temporal limits of the bioartwork. An especially affective example here is their meditation on the utopian promises and imaginaries of "victimless consumption" in the *Disembodied Cuisine* (2003; Nantes, France) installation, in which embodied subjects and bioartworks were quite literally connected in a 'feasting ritual' where semi-living frog steaks were cooked and eaten by volunteers in a *nouvelle cuisine* style dinner (Catts and Zurr, 2013: 104-109). Therefore, and although one initially confronts the assemblage of perspex dishes, beakers, and fleshlike substances in microgravity bioreactors with clear borders, TC&A's

performative rituals introduce a subsequent confusion about the precise spatial boundaries of the bioartwork, encouraging an affective sense of the body's material and molecular implication within its ongoing and indeterminate individuations.

Secondly then, and *viscerally*, TC&A's bioart encounters are predicated on thinking and feeling the living body as a continuous topological folding of the material intensities and forces of the outside, and thus their installations seek to creatively experiment with the body's capacity to transduce these divergent realities into new processes of collective individuation (Mackenzie, 2005). The transformative potential of encounters of human and nonhuman bodies is an explicit focus of TC&A's most recent project, *The Tissue Engineered Muscle Actuator* (2012-present), which attempts to develop a 'semi-living machine' that technically organises and amplifies the physico-chemical contractions of muscle fibres grown in-vitro (Catts and Zurr, 2013: 111). The semi-living machine is in turn connected to speakers that transduce the mechanical energy of these contractions into low-frequency sounds, which vibrationally impact and modulate bodies in the gallery space through viscerally-felt affective intensities. Working through the transductive force of sonic affects then, the *Muscle Actuator* explores the potential for new transindividual events of affective exchange between the twitching contractions of semi-living materials, the vibrational pulses of electronic sound, and the convulsive tendencies of our own flesh and bone. Following Simondon (1992: 304), what experiential encounters with bioart foreground is an affective sense of the human body as always-already transindividual: as an ontogenetic event comprising more than one kind of life. Thinking the affective power of bioart encounters through Simondon's transductive perspective thus entails a shift in our conceptions of a politics of (bio)technologies: from representational modes of prophylactic closure that would seek to defend the human subject's essential unity from the contaminating threat of technology, to a more molecular politics of

creative micro-interventions that reconfigure and transform the material relations of forces and bodies in ways that open new potential forms of collective life. Or in other words, for new capacities of sensing the nonhuman materiality that *we are* affecting and being affected by the materiality that surrounds us.

Disorienting Perception: The ‘Killing Ritual’

Individuation, for Simondon, is always a process of the in-between, serving to unsettle hylomorphic dualities that form the core of much post-Kantian philosophical and aesthetic thinking. Theorising perception, Simondon (2009a: 9) argues that this includes the Kantian duality between the material contents of experience out there in the world, and the *a priori* forms imposed by the intellect upon these otherwise chaotic contents. Whereas Kant remains tied to a hylomorphic dyad of form/content and a cognitivist understanding of the subject when explaining perception, Simondon (2005: 243) moves more decisively towards a theorisation of the genesis of perception in terms of a transductive process of individuation. Conceived as metastable individuations, he argues that both subject and object, and by extension then spectator and artwork, are envelopments of preindividual forces and singularities (Salter, 2012). Perception here becomes reframed as the individuating operation that generates, through the problematic encounter of subject and world, an internal resonance; a certain modality of perceptual resolution. Following Simondon (2005), the genetic element for events of perception is therefore not our confrontation with the ready-made forms and objects of the world, but rather a disorienting encounter with ‘dynamic coefficients of intensity’ he terms ‘information’ which force the subject to constantly reconfigure its relation to the world (p. 242). The forms that come to occupy perceptual experience are thus reimagined as the vestiges of encounters with these intensive, preindividual forces of information. As Simondon writes:

‘Perception is not the grasping of a form, but the solution of a conflict, the discovery of a compatibility, *the invention* of a form. This form which constitutes perception not only modifies the relation of object and subject, but also the structure of the object and that of the subject’ (Simondon, 2005: 235)

In other words, events of perception involve not only the dynamic emergence of perceptual forms, but also the invention of new transductive folds and vital liaisons of thought and world. Initiated by the disorienting incompatibilities of forces generated through material encounters, perception thus discovers modes of *orientation*, directing attention towards some things (not just physical objects, but also thoughts, feelings, judgements), whilst relegating others to the ‘background’ of awareness (Simondon, 2005: 244). However, these modes of perceptual orientation are never static or self-contained. Instead, they are themselves metastable, composed as a wealth of preindividual forces and incipient forms that may, through the disorienting shock of a new encounter or interruption, be actualised as creative responses to novel incompatibilities of subject and world (Connolly, 2011).

At stake in encounters with bioart, I argue, is a disorientation of perceptual and intensive registers that makes affectively felt this imperceptible background of perception and the “more-than” of human subjectivity. Perhaps one of the more evocative means by which this is staged in the gallery installations of TC&A is through the tactile aesthetics of the *Killing Ritual*. At the end of every durational installation, TC&A face the ultimate challenge of an artistic endeavour – destroying their creations⁷. Devised as a provocation on the temporality of living art and the affective and emotional implications of biotechnological intervention in vital systems, the ritual is performed by switching off and removing the semi-living sculptures from their sterile containment in the bioreactor, and inviting the audience to *touch* them. As the

sculptures possess no immune system to defend them from contamination, their exposure to the bacteria in the air and on our hands proves fatal. The material encounters instigated through touch gives rise to modes of informational linkages between bodily membranes and world, transforming sense-perceptions of the sculptures from inert and contained coagulations of “fleshy matter” to dynamic forms of vibrant life with which our bodies co-inhabit a world of bio-chemical exchange, and whose problematic presencing demands from us an affective response. The irony, of course, is not lost on TC&A, who highlight how the killing ritual is no more violent to non-human forms of life than the act of brushing our teeth in the morning (Catts and Zurr, 2007). The ethical imperative of TC&A’s bioartistic practice thus lies less in a didacticism of moral *responsibility* that would demarcate in advance the acceptable remit of thought and action (what should we do?), than a creative experiment with the implications and possibilities of different affective relations, or new ethical modes of *response-ability*, to life’s dynamic and inventive process (what can we do?). Rather than ready-made solutions then, TC&A instead stage problematic shocks to thought and perception that encourage a more permeable and metastable sense of the human subject in its affective relations with the vital, material, and technical agencies constituting its intensive milieu of emergence.

[Insert **Figure 2** – Image from *Pig-Wings – Killing Ritual*, Biofeel exhibition, 2002. Medium: biodegradable polymer, bone cells, and glow-in-the-dark plastic coffin. ©Tissue Culture and Art Project (2002). Photo: Ionat Zurr]

In her recent engagement with the thought of Simondon, Jane Bennett (2010: 56) takes aim at the modernist tendency of hylomorphically parsing reality into inert matter (it, things) and vibrant life (us, beings). Theorising a ‘vital materialism’ that takes seriously the intimate entanglements of human and nonhuman agencies in social and political life, Bennett (2010: 14)

contends that the ethico-political task becomes the staging of encounters that cultivate and amplify capacities to discern and respond to the nonhuman forces conditioning our ongoing dynamism, and thus our potential to think and be otherwise. By inviting audiences to see, eat, and touch the semi-living, I argue that encounters with bioart may be understood precisely as such ontogenetic events that invent new capacities for affecting and being affected by vital matters. The potential of the killing ritual in particular to perturb and disorient already-existing modes of perception is clear in the testimony of many participants who did not perceive the sculptures as ‘alive’ until they were finally killed:

‘[the semi-living jacket in the *Victimless Leather* exhibition] started growing, growing, growing until it become too big. And [the artists] were back in Australia, so I had to make the decision to kill it. And you know what? I felt I could not make that decision. All of a sudden I’m here not sleeping at night about killing a coat. That thing was never *alive* before it was grown’⁸

Conclusion

How might we understand this feeling of ‘aliveness’, this disorienting sense of a problematic vitality, in encounters with bioart? In theorising the individuation of the living, Simondon (1992) is careful to distinguish himself from the hylomorphism of traditional vitalist philosophies that would posit life as a supervening force or spiritual substance adding a vital spark to the inertia of a passive matter. Instead, Simondon is interested in theorising the transductive connections that individuation generates between the living and nonliving, arguing that vital individuals remain indebted to the potentials and singularities of the prevital and preindividual, which they draw on and elaborate in the ongoing process of their creative becoming (Grosz, 2011: 38). Rather than a pre-given substance or essence then, Simondon

(1992: 305) forces us to think life as an ‘ontogenetic operation’: as a transductive movement and unfolding of potentials unknown in advance, with the living individual understood not only as a result but also, and more profoundly, ‘a theatre of perpetual individuation’ – a metastable event in its inventive process that always carries the potential for further individuations. Life, then, emerges and unfolds ‘in the interstices of the not-yet’, eluding the forms, practices and concepts that would seek to contain it (Hynes, 2007: 161). Thinking life ontogenetically, I argue, thus shifts the terms of debate for theorising the political and ethical implications of contemporary biotechnological interventions; pushing beyond a (Foucauldian-biopolitical) focus on the discipline and regulation of already-constituted bodies and subjects, through an attentiveness to the immanent reconfigurations of the interstitial milieus and collective processes through which bodies come into being, as well as their material and affective capacities for becoming-other.

One of the key implications of contemporary engagements with Simondon’s philosophy then is how it refocuses our attention as social scientists to those ‘streets, factories, and theatres’ (Hayward and Geoghegan, 2012: 8) where life, in all its multiple embodiments and biotechnical mediations, is being thought and articulated *differently*. In this regard, bioart can be productively considered within a broader field of aesthetico-political practices extending beyond the formal space of the gallery – including forms of tactical media, biohacking, and biodesign (Zylinska, 2009) – that creatively experiment with biotechnologies in ways that enliven and transform collective relations of thought, living bodies, and technical milieus. What an engagement with Simondon’s philosophy makes possible is a thought of how these creative practices and interventions serve to enhance bodily capacities for becoming sensitive to the material processes and relations that give birth to the status quo, as well as orienting thought and perception towards other potential individuations. In Simondon’s (2012) thought, art thus

presents a privileged “theatre of encounter” which extracts from the determinations of subjects and objects the possibilities for new material sensibilities and compositions of being. This ontogenetic potential of art is further echoed in the thought of Simondon’s most famous interlocutor, Deleuze, who writes that rather than simply representing or reflecting on life, art serves to generate sites of attachment and sensitivity to its force of creative difference and the metastability of its forms:

‘Difference must be shown differing. We know modern art tends to realise these conditions: in this sense it becomes a veritable *theatre* of metamorphoses and permutations. A theatre where nothing is fixed’ (Deleuze, 2004a: 68)

Rather than seeing TC&A’s artworks, and the domain of bioarts practice more generally, as an existential threat to the supposed propriety and essential unity of human life (Birke, 2006), we might instead theorise encounters with bioart as rendering explicit some of the ontogenetic consequences of new biotechnical mediations of living and nonliving milieus for how we think and respond to emergent forms of collective life. To encounter the “semi-living” then is precisely to encounter this metastability of life’s ontogenetic becoming, generating a disorienting and affective sense of ourselves as materially implicated in its indeterminate and excessive possibilities for future transformations.

Notes

¹ It should be noted here that ‘bioart’ represents a broad and contested term for a heterogeneous array of artistic practices that incorporate different expressive media, technological engagements, and philosophical orientations. Artistic practices involving, for example, tissue culture engineering (e.g. Tissue Culture and Art), genotype and phenotype reprogramming (Marta de Menezes), bio-robotics (Stelarc), and bodily self-experimentation/biohacking (ORLAN) have all come under the banner of “bioart” in recent years. For bioartist Eduardo Kac, it is the engagement with biotechnology at a “material level” that distinguishes bioart from practices which use traditional (painting/sculpture) or digital media to address biotechnological themes and concerns. Whilst recognising this heterogeneity, when using the term ‘bioart’ in this paper I am implicitly referring to the practices of the Tissue Culture and Art project to reflect my empirical focus.

² The commodification and consumption of the semi-living has thus been a recurring focus of TC&A’s work, ranging from their early mediations on exploitation and ‘victimless’ consumption in the *Disembodied Cuisine* [2000-2001] and *Victimless Leather* [2004] projects, to their more recent examinations of ‘revitalisation’ and nonhuman agency in *The DIY De-Victimizers* [2006] and *Tissue Engineered Muscle Actuators* [2013-Present]. Further details on their ongoing practice can be found at: <http://www.tca.uwa.edu.au/> and <http://www.symbiotica.uwa.edu.au/>

³ This tendency to read the different elements of Simondon’s thought in a self-contained way is something exacerbated by the rather unorthodox publication history both within his native France (in which the two parts of his principle thesis, *L’Individuation à la lumière des notions*

de forme et d'information, were published 25 years apart), as well as the paucity of translations of his works available in the English language (which at the time of writing include translated fragments in different journals, and one book: Simondon's (2011b) introductory lectures on general psychology, translated as *Two Lessons on Animal and Man*). Sadly, Simondon's own capacity to fully explore and elaborate the nature of the connections between his thinking on being and technology was cut short by his struggles with illness from the early 1970s until the year of his death in 1989 (Bardini, 2014: 4).

⁴ When referencing MEOT in this paper I have made use of Ninian Mellamphy's unpublished translation of the first part of the book (Simondon, 1980), as well as Ninian Mellamphy, Dan Mellamphy, and Nandita Biswas Mellamphy's recent publication of the third part in *Deleuze Studies* (Simondon, 2011a). When engaging material from Simondon's principal thesis, fully published in French as *L'Individuation à la Lumière des Notions de Forme et d'Information* (Simondon, 2005), I draw on the published translations of chapters in *Parrhesia* (Simondon, 2009a) and the edited book '*Incorporations*' (Simondon, 1992), as well as the unpublished translation of his chapter on perception by Taylor Adkins (available at <http://speculativeheresy.wordpress.com/>). Where no English translations exist for certain texts – such as *Imagination et Invention* (Simondon, 2008) – I rely on translated quotes taken from other secondary literatures on Simondon. However, and when I do, I also provide the relevant page numbers from the corresponding texts by Simondon in French.

⁵ The differences between Deleuze and Simondon's theories of becoming is the focus of an article by Hansen (2001), whose concern lies with challenging Deleuze's supposed misappropriation of Simondon's philosophy. Hansen argues that Deleuze's interpretation incorrectly makes of the preindividual a 'transcendental condition', affording it a separate ontological status, such that individuation becomes the 'actualisation of a transcendental field' rather than an ongoing, transductive mediation between two co-evolving terms as in

Simondon's philosophy. However, I argue that Hansen's thesis similarly relies on a misreading of Deleuze's (2004b) own development of the concept of the 'transcendental field' and specifically the material and intensive processes that relate it to actuality. Moreover, it misses the ways in which Simondon's theory of individuation as transductive mediation in fact explicitly informs Deleuze's more processual thinking on the folds of the virtual and actual developed in his later writings on the concepts of 'the membrane' (Deleuze, 1999) and 'the crystal-image' (Deleuze, 2005). In contrast then, I argue that Deleuze's engagement with Simondon in his texts of the 1960s, which as Sauvagnargues (2012: 20) writes should be understood in the context of his Nietzschean critique of (Hegelian) dialectical reason and the primacy of the negative, draws from Simondon's philosophy an affirmative theory of difference (disparity) and the encounter that helps push his thought to its non-anthropological and ontogenetic limits.

⁶ Rethought through the conceptual lens of modulation then, the clay brick's individuation is conceived as the emergent effect of the coming-into-resonance of a plurality of material forces and tendencies: including, for example, the malleable potentials of the clay's colloidal microstructures, the energy and pressure imparted by the labourer, and the physical force of the mould (Sauvagnargues, 2012: 3).

⁷ As Catts and Zurr (2007: 239) state, transporting living materials across international borders is incredibly difficult, and because of the high costs and infrastructure required for 'feeding' the semi-living sculptures under sterile conditions there is usually no one willing or able to adopt them at the end of the installation.

⁸ Comments made by Paola Antonelli, lead curator of the *Victimless Leather* exhibition at the New York Museum of Modern Art (2008). The original article is accessible at http://www.nytimes.com/2008/05/13/science/13coat.html?_r=0.

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