Techné: Research in Philosophy and Technology ISSN: 1091-8264
21:1 (2017): 24–54 DOI: 10.5840/techne20174560

"Extimate" Technologies and Techno-Cultural Discontent: A Lacanian Analysis of Pervasive Gadgets

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Abstract: According to a chorus of authors, the human life-world is currently invaded by an avalanche of high-tech devices referred to as "emerging," "intimate," or "NBIC" technologies: a new type of contrivances or gadgets designed to optimize cognitive or sensory performance and / or to enable mood management. Rather than manipulating objects in the outside world, they are designed to influence human bodies and brains more directly, and on a molecular scale. In this paper, these devices will be framed as 'extimate' technologies (both intimate and external; both embedded and foreign; both life-enhancing and intrusive), a concept borrowed from Jacques Lacan. Although Lacan is not commonly regarded as a philosopher of technology, the dialectical relationship between human desire and technological artefacts runs as an important thread through his work. Moreover, he was remarkably prescient concerning the blending of life science and computer science, which is such a distinctive feature of the current techno-scientific turn. Building on a series of Lacanian concepts, my aim is to develop a psychoanalytical diagnostic of the technological present. Finally, I will indicate how such an analysis may inform our understanding of human life and embodiment as such.

Key words: emerging technologies, NBIC technologies, philosophy of technology, Lacanian psychoanalysis, philosophical anthropology

1. Introduction: The Current Techno-Scientific Blitz

In the opening scene of the science fiction novel *Accelerando* (Stross 2005), ICT wizard Manfred arrives at Amsterdam Central Station with eyeballs "powered up" (3) and equipped with high-tech glasses which keep him acutely up-to-date, so that he lives minutes, days, or even weeks into other people's future, assimilating

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gigabytes of information unceasingly, just to stay current. Soon he encounters like-minded early adopters of smart technologies, spreading "clouds of electronic emissions" as they move about (4). *Accelerando* reads like a literary laboratory, exploring an emerging future with Manfred as our guide or self-appointed research subject.

Readers who find *Accelerando* too futuristic might visit websites where enhancement products are presented, such as THYNC,[1] allegedly allowing consumers to manage their moods, providing calm or energy "on demand" by monitoring and electromagnetically influencing brainwaves with the help of a small ("science-proven") neuro-signalling device ("the most transformative consumer technology to come out of Silicon Valley in a long time"; "The first wearable technology that changes the way you feel"). In minutes, the website tells us, vibes propagated by this device allow you to relax or to invigorate yourself, or they may help you through your day, combining high-tech neuroscience with an elegant lifestyle. Is it a placebo? Maybe not.

Some of the emerging innovations presented in the literature or on the web may seem phantasmatic and far-fetched, others fairly trivial, but all in all, they raise the question (addressed during an expert meeting organised by the *Council of Europe*, for instance)[2] of how human existence and the life-world will be affected (or infected) by this upcoming avalanche of high-tech, miniature devices known as "converging," "emerging," "empowering," "intimate," or "NBIC"[3] technologies (Roco and Bainbridge 2003; Van Est et al. 2014) designed to optimise cognitive performance, sensory functioning, and mood management, while at the same time providing connectivity with global informational networks. As the prolific Hegelian-Marxist-Lacanian philosopher Slavoj Žižek argued, an extraordinary cultural change is taking place right in front of our eyes; a 'blitz' of innovations is being introduced into our socio-cultural environment (Žižek 2010, 327). How will this surging technological unfolding affect our being-in-the-world?

This issue will be addressed from a Lacanian psychoanalytical perspective, which may come as a surprise. Jacques Lacan is not commonly regarded as a philosopher of technology and his oeuvre tends to be bypassed in this area of research.[4] Moreover, Lacanian psychoanalysis is often associated with the linguistic turn pervading post-structuralism, focusing on language and the symbolic order rather than on technical "things" (Verbeek 2005). And indeed, at first glance, Lacan's oeuvre seems to deal almost exclusively with discourse and signifiers. Insofar as it is object-oriented at all, it is concerned with fairly enigmatic entities, deprived of materiality and tangibility: with the *object a* rather than with

objects, and with *the Thing* rather than with things (concepts which will be clarified below). On closer inspection, however, the dialectical relationship between human desire and technological artefacts runs as an important thread through his work. He was remarkably prescient, moreover, concerning the blending of life science and computer science as a distinctive feature of the current techno-scientific turn. His writings and seminars are particularly well poised, I will argue, to help us come to terms with the ongoing techno-cultural transitions fuelled by NBIC technologies now pervading human existence.

The design of this paper is as follows. First, I will outline the profile of this new genre of devices in more detail, framing them as 'extimate' technologies: both intimate and external; both embedded and foreign; both life-enhancing and intrusive (cf. Zwart 2015a). Next, I will focus on a key ingredient of a psychoanalytic understanding of technology, namely the concept of the uncanny, which comes into play whenever technical contrivances (traditionally seen as extensions, supplements or substitutes of human body parts) come too close, and / or become too biocompatible, too real. Subsequently, the basic contours of a Lacanian philosophy of technology will be presented, focusing on the dialectical interplay between electronic contrivances and human craving. Building on this dialectics, I will assess extimate technologies (i.e., wearable or implantable 'gadgets') from a Lacanian perspective. Finally, I will flesh out what this analysis entails for our understanding of human embodiment as such.

2. An Avalanche of Gadgets

To determine the profile of emerging NBIC gadgets in more detail, *Radical Evolution* by science author Joel Garreau (2005) provides an optimal starting point. Like *Accelerando*, the book purports to explore the emerging technological future, but by visiting and interviewing some of the pioneer researchers directly involved in the transition. The message is that we are refashioning ourselves with the help of embedded devices, from miniature self-monitoring contrivances and retinal implants (e.g., for infrared vision) up to mnemonics. We are approaching an inflection point in history, Garreau argues. For millennia, technologies were aimed toward the outward world, helping us to control and reshape the objects and environments we encountered. Now, however, the direction is suddenly reversed, as technologies are taking an inward turn. We ourselves (human bodies and brains) are increasingly becoming the targets of technological modifications. New contrivances have begun to merge with our minds, our memories, our metabolism, our moods, and even our personalities. We have entered the era of "engineered

evolution" (Garreau 2005, 6). A plethora of (more or less plausible, more or less futuristic) exemplifications is presented and assessed in Garreau's panorama. One of the most radical includes an additional chromosome to be inserted into the nuclei of our cells, providing additional plug-in-points as it were, in which genetic modules can be implanted so as to equip ourselves with additional features: a universal delivery vehicle for bio-molecular interventions, including on-off switches that can be activated by signals coming from wearable electronic gadgets (117).

Similar prospects are invoked by a recent *Rathenau Report* (Van Est et al. 2014). Electronic gadgets are shrinking in size, coming closer, becoming wearable, the authors argue. They are still mostly just on the outside, on our skin, but cochlear implants and deep brain stimulation electrodes have already entered our bodies. NBIC technologies have begun to monitor and modify daily behavioural repertoires and their invention has been heralded by a whole chorus of authors. The relationships between technologies and human bodies are becoming increasingly "intimate" Lucie Dalibert (2014) argues. New technologies are pervading the lifeworld, they are becoming *us*; the concept of a prosthetic no longer captures the intimate relations people have with these wearable machines, almost continuous with our bodies (Turkle 2003). We are becoming increasingly dependent on these tiny, subtle computers, so demanding that we seem forced to focus our daily attention on our (increasingly intimate) relationships with them (Turkle 2004). Rather than *extending* the body, as traditional prosthetics tend to do, these gadgets are oriented towards *incorporation* (De Preester 2011). The line between human subjects and technological artefacts is dramatically blurred by the introduction of miniature machines that easily fit into and become part of our lives (Tomasi 2008). Micro-implants, health monitoring technologies and Google Glass are just a few examples of these new gadgets that are increasingly getting closer to, or even penetrating our corporeal surfaces, giving rise to an intimate interplay between bodies, organs, and technologies (Lettow 2011).

Similar developments are addressed by Žižek in several of his books. The current trend in electronic devices, he argues, is towards their invisibility, allowing them to fit imperceptibly into everyday environments (Žižek 2012, 16). They are everywhere and nowhere, disappearing from view, functioning smoothly, fully interwoven into the texture of daily life. We might equip ourselves with a third eye, for instance, a small camera hidden in our clothing or floating about, as a partial object torn from its socket. Gadgets will increasingly become part of our direct self-experience, moreover, decentering us 'from within.' Instead of influencing human beings via texts, images, or sounds (via 'culture'), these gadgets purport

to influence bio-molecular processes much more directly (Žižek 2009, 175), so that external influences appear to come from inside, indistinguishable from inner drives. Moods and emotions will increasingly be generated or thwarted through direct excitation of particular neuronal centres, with the help of drugs, electrical impulses, or electromagnetic waves. This allows us to evade the hazardous detour via reality (trying to gratify desires with the help of recalcitrant external objects) and to live up to the 'pleasure principle' (i.e., the unconscious urge towards satisfaction) more effectively, with little or no concessions to the 'reality principle' (i.e., the willingness to postpone or abstain from gratification): happiness achieved with neuro-chemical precision. The body has lost its former impenetrable density and has become technologically manageable and transformable (Žižek 2012, 22; cf. Miller 2001)

As one of his many examples, Žižek mentions a device that allows us to eavesdrop on our brain's "digital crackle" with the help of electrodes, transmitting signals to a computer that reads the brain's "inner voice" telepathically (Žižek 2009, 192). One day such electrodes, skin-born or even implanted into neocortical language centres, may transmit this inner voice directly to a machine so that we become short-circuited with our environment, bypassing the human voice but also hard copy writing or electronic messages (in Lacanian terminology: the 'symbolical order').

Another example mentioned by Žižek is *SixthSense*, a tiny wearable mobile webcam produced at MIT that turns all surfaces into screens onto which information can be projected (Žižek 2010, 337). Any surface in front of us may become a PC screen. Photos can be snapped and saved. The world becomes a multi-touch surface, while the Internet supplies additional data allowing us to orient ourselves. Information is projected directly onto real objects. In museums, for instance, not only guides and headphones but even our own memory system will become increasingly redundant, as contextual explanations can be projected onto the exhibits directly by touching them, with Big Other (i.e., the transpersonal, electronic, overarching, normative as well as informative infrastructures of the global technosphere) continuously filling in the gaps. But information also streams in the obverse direction. We are constantly uploading observations and interpretations into computers. There is a constant migration of content, ideas, and insights from wet *in vivo* towards electronic *in silico* environments, eventually amounting to what Žižek refers to as digital "metempsychosis": the migration of the human psyche into (small and wearable) computers (Žižek 2009, 194).[5]

In short, according to a chorus of authors, humanity is approaching a turning point, a radical cultural transmutation. Although NBIC gadgets are often presented as *enabling* devices, as means of communication and interaction, they increasingly appear to *use* us, not only to function effectively, but also to reproduce, proliferate, and multiply themselves (Žižek 2010, 132). These gadgets will spread even if they prove damaging, toxic, or addictive in the long run. What makes these devices so uncanny is their proximity, ubiquity, and intrusiveness. Eventually, they may achieve total digital control over our daily lives (Žižek 2010, 327).

Basically, what is claimed is that the general direction of technological development has dramatically shifted. Ernst Kapp (1877), founding father of the philosophy of technology, once argued that technology is directed from the inside (the sphere of human desire) towards the outside (the realm of recalcitrant natural objects), so that tools and instruments are extensions or exteriorisations of bodily organs, allowing humans to control and manipulate targeted items in the environment (Steinert 2015). A hammer, for instance, is basically a robust extension of a human fist, as exemplified by the iron prosthetic supplement of *Götz von Berlichingen*, the German knight to whom Johann Wolfgang Goethe devoted one of his first plays. Or, to mention a more contemporary example, the Samurai katana, so skillfully employed by Uma Thurman in the *Kill Bill* movies to take revenge upon her perpetrators (by chopping off arms and legs and tearing out eyes), is basically an ultra-sharp extension of her nails (on fingers and toes). Such technology basically acts as a mechanisation of the organic, eventually transforming human beings into "prosthesis-gods" (Freud 1948).

Currently, however, we experience a dramatic reversal of the vector of technology from extension towards incorporation (De Preester 2011). Miniature gadgets are now moving from the outside (the lab environments where they are produced) towards the inside (the human life-world, or even the human body). They are directed towards ourselves; they are entering our bodies and brains. The micro-mechanic becomes implanted and embedded within the organic, and may gradually optimise or even replace our most intimate organic components. We ourselves are becoming the targets of this change, which is meant to result in increased plasticity (and reduced recalcitrance) of human embodiment. The ongoing technological revolution entails a process of miniaturization, culminating in the colonisation of the human body (which quickly loses its impenetrability) with the help of bio-molecular or nanotech implants, i.e., technologies that actually *inhabit* us (Virilio 1998; Webster 2002).

These new technologies emphatically present themselves as user-friendly, as intimate and empowering life-style gadgets. These products of neurological, nano-technological, and bio-molecular research are infinitesimally small, rather than forbiddingly huge, and allegedly quite willing to fold, embed, and adapt themselves to our predilections. However, precisely this invokes suspicion. In a Heideggerian vein, one could argue that the danger no longer resides in the threat that something will go wrong, but rather in the possibility that *nothing* will go wrong, because these gadgets function so smoothly and convincingly (Žižek 2009, 195). In an era of tissue engineering, biomaterials, and nanomedicine, items such as pacemakers, artificial heart valves, and cochlear implants are the first prototypes of invasive contrivances which the near future has in store for us. The micro-mechanic becomes embedded in the organic to such an extent that biology and technology are merging on the molecular level. Bio-electronic implants may allow paraplegic patients to walk again, but such devices may also 'optimise' what we now regard as normal functioning, so that the boundaries between therapy and enhancement become blurred. Deep Brain Stimulation (DBS), for instance, which uses surgically implanted and battery-operated pulse generators (IPG) to deliver electrical stimulation to specific areas in the brain (brain pacemakers so to speak), may act as portable stimulators for mood modulation (Schlaepfer et al. 2008; Schlaepfer et al. 2013; Lakhan and Callaway 2010) by boosting the "plasticity" of neural systems (Malabou 2008). Indeed, organic brain components ("carbon-based neurons") may be supplemented or (partially) replaced by bio-electronic implant technology (Kurzweil 1999): evolution by hyper-technical means.

For a Lacanian psychoanalytic diagnostics of this development, the concept of the uncanny seems an obvious starting point. It was introduced into the philosophy of technology by Martin Heidegger (1953), but first of all employed by Sigmund Freud (1947) and subsequently taken up by Lacan, who forged his own version as we will see: the concept of extimacy (Lacan 2006).

3. Gadgets and the Uncanny

Heidegger has already argued, in *Introduction to Metaphysics* (published in 1953[6] but built on Sophocles's *Antigone*, written in or around 441 B.C.), that the technological prowess of human beings is disconcertingly uncanny. Whereas nature is δεινός (i.e., terrifying, forbidding), the most awesome and overpowering entity on Earth (το δεινότατον) is us ourselves. Initially, technology tended to 'fold' itself to nature, so that biomedicine basically aimed to assist the human body in restoring or maintaining its natural health (Heidegger 1967), employing artisanal technolo-

gies that were still part of a 'familiar' world (*heimlich*, in German); but gradually the sway of Western technology over nature has become definitely uncanny (*unheimlich*). We no longer feel at ease in man-made technological environments, but rather experience chronic discontent as we ourselves become increasingly targeted by an enframing force (*Gestell*) turning us into a standing reserve of human resources, the raw material of a global technological system currently unfolding. We are inescapably thrown out of our familiar dwelling into hypermodern existence, as vulnerable and fragile beings, saved by, but also irrevocably infected by technology.

Compared to the technologies that Heidegger was assessing, the ontological physiognomy of emerging gadgets has noticeably changed. Their newness or discontinuity resides in their smallness and smoothness, in combination with their vector of operation: directly oriented *towards* ourselves. Technology is no longer threatening because it is awesome, but rather because it is subtle, and the new transformative power is focused on our own organism, on a *molecular* scale. The uncanny dimension of technology no longer resides in its monstrosity or enormity, and the archetypal example is no longer the hideous machine or the monstrous hydroelectric plant. Rather, what makes these gadgets uncanny is their minuteness, their precision, their ubiquity, and their pervasiveness. As David Gunkel and Paul Taylor (2014) phrase it, the current pervasive ubiquity of electronic-informational gadgets culminates in an enframing of human existence as *Dasign*. We increasingly feel overwhelmed and pervaded by this novel mode of enframing, so that these new devices, affecting the dialectical interplay of technology and human desire on the molecular scale, may perhaps be referred to as hyper-uncanny.

In order to come to terms with the *molecularised* biocompatibility of NBIC technologies, the concept of the uncanny as coined by Freud proves relevant. Although developed in an aesthetical context, the concept seems especially apt to capture instances of uneasiness and anxiety provoked by biotechnological manipulations (Assoun 1997). Etymologically speaking, Freud (1947) argues, the uncanny is that which used to be familiar, but from which we became estranged; that which should have remained hidden, but which has now become disclosed. First and foremost, it is that which emerges in the boundary zone between the artificial and the natural, the living and the non-living. To further develop his concept, Freud refers to the story *The Sandman* by E. T. A. Hoffmann, about the *automaton* Olimpia (the term robot had not been invented yet). Notably, the uncanny applies to body parts that seem easily detachable, such as Olimpia's implantable eyes. For Freud, the experience of the uncanny eventually amounts to castration anxiety, i.e.,

the concern that via the enframing of human bodies as aggregates of detachable and replaceable parts, items of intimate value ('partial objects' such as penises, eyes, or breasts) may be removed or replaced.

This lead was *taken up* by Lacan, albeit in the Hegelian sense of *Aufhebung* (sublation); for Lacan adopted, but at the same time thoroughly reframed the Freudian idea. In his seminar on anxiety, for instance, Lacan (2004) discusses two examples of religious art in which mutilated bodies are depicted: two portraits of female martyrs, painted by the Spanish Baroque artist Francisco de Zurbarán (1598–1664), namely Sainte Lucia, carrying her severed eyeballs on a plate, and Sainte Agatha, carrying her severed breasts on a similar plate. These parts had been violently removed in the context of religious persecutions. Such uncanny iconic visualisations confirm a basic subliminal anxiety concerning the detachable nature of the items involved. As stand-alone objects, removed and alienated from the body, they become obscene exhibits: too visible, too obtrusive and too close-up. For Lacan, however, the uncanny takes us far beyond the realm of aesthetics. The concept may especially be employed to address experiences invoked by technologies that affect human embodiment, such as transplantation medicine or synthetic biology (Zwart 2012; 2014). Uncanny is a removable body part that becomes *too real*.

4. Lacan's Philosophy of Technology in Outline

From a Lacanian perspective, humans emerge not as entities who *have* something which (other) animals *lack* (rationality, self-consciousness, big brains, a soul, etc.), but rather as beings who *lack* something which (other) animals *have* (a natural attunement or correspondence between instinct and *Umwelt*, between bodily needs and habitat; Zwart 2014; 2015b). Humans are born prematurely into this world, unable to either walk or talk. Even as adults, they cannot sleep without blankets nor trust their instincts. Although equipped with freely moveable hands, much of their time is spent on artificial crutches known as furniture (chairs, beds, etc.; Žižek 2010, 87). Humans are unhappy, stunted creatures from the very outset: 'divided,' craving, and tormented subjects (in Lacanian algebra: *$*), suffering from a chronic misfit between what they desire and what is expected of them. And rather than solve our problems, technology (once unleashed) will reveal and amplify this radical imbalance, this primal discord at the very core of human existence (Žižek 2012, 109).

In other words, Lacanian psychoanalysis basically concurs with the view of Arnold Gehlen and others of humans as *deficient* beings or *Mängelwesen* (Gehlen

1962) whose "organ inferiority" (Adler 1927) becomes compensated by culture, language, and contrivances: by the symbolic order, providing a life-line, a protective shelter against the threatening Real: technology as "vulnerability coping" (Coeckelbergh 2015b). But compensations inevitably become sources of malaise in their own right, not only because language (often embedded in communication devices) dramatically falters as a rule (due to our inability to articulate or come to terms with our desire), but also because of culture's inherent tendency to become excessive, giving rise to overcompensation, so that rather than serving us, the techno-symbolic order haunts us and preys on us (Zwart 2015b). We are not only fundamentally dependent upon language, but even "sick with language," as Žižek (2010, 83) phrases it. From a Lacanian perspective, language is a commanding mechanism, cleaving and infecting subjects, relentlessly colonizing their world.

In the techno-cultural ubicomp environment of today, where language and culture becomes embodied in high-tech contrivances (Coeckelbergh 2015a), this dialectics continues to unfold. For Lacan, human subjects are neither autonomous agents (who merely *use* certain artefacts to realise their goals), nor beautiful souls (who find themselves besieged by a relentlessly advancing technological culture). Rather, we are chronically divided subjects from the very start, craving for something (e.g., a missing object) which seems irrevocably lost. This object loss builds on a primordial experience of separation from parts of ourselves that we have been deprived of (Lacan 1966–1967, 842ff.), which results in a chronic gap and is invaded by desire and 'sutured' by technology. The classical (albeit farcical) description of this primordial separation experience is Aristophanes's famous myth about hominid beings who (at the start of the humanisation process) were cleft in two, as recorded in Plato's *Symposium* (Plato 1996; cf. Lacan 2001b), giving rise to a desperate yearning for the lost complement, as a basic thrust of culture.

This dialectics of technology, subjectivity, and desire already surfaces in one of Lacan's earlier texts entitled *Familial Complexes in the Formation of the Individual* (Lacan 2001a), where he discusses the complex of separation (from the mother's body). As foetuses, Lacan argues, humans nest as parasites inside the motherly womb, where all vital needs are lavishly met (Lacan 2001a, 30; cf. Lacan 1966–1967, 848). Separation (i.e., the birth trauma) is a choking experience and although breast-feeding is meant to uphold a certain level of proximity and intimacy, new experiences of separation and frustration await the newborn child. These may give rise to various symptoms later in life, such as alcoholism, anorexia, or other enacted refusals of the questionable replacements offered as substitutes for the irretrievably lost object: the placenta, the primordial nipple or breast, and so

forth; in Lacanian algebra: the object *a*. The persevering refusal of this inevitable separation (from a prototypically 'lost object') fuels repetitive efforts to artificially restore parasitic, nourishing relationships later in life, revolving around the scar or void that was left behind, outlining the lost object's haunting image.[7]

Thus, during extra-uterine existence, humans frantically aim to establish living conditions which mimic the lost original position as convincingly as possible.[8] And it is here that culture and technology step in, whose basic objective is to restore (to a certain extent) the vanished protective sphere. Yet, as Freud (1948) had already argued in *Civilisation and its Discontents*, this basic program of culture and technology is bound to fall short, because aside from solving certain problems, technological artefacts will inevitably introduce a host of new complications as well. Because we easily become dependent on these substitutes, they become sources of discontent in their own right, while human existence continues to be marked by frustration, frantic longing, and chronic desire.

This situation is captured by Lacan's 'matheme of desire': $\$ \lozenge a$, where $\$$ ('barred S') represents the 'split' (tormented, craving) subject and *a* the lost, impossible, inexorable object (the object-cause of human desire); while the diamond (lozenge, *poinçon*) in the middle can be read as an arrow pointing in both directions, so that desire, besides functioning as a vector oriented towards the missing object's coordinates, may also be aroused by particular items which present themselves as alluring substitutes, making us aware of what we lack and conveying the promise that the script of our core phantasy can still be realised.

The idea of the missing part (the absent 'partial object') first and foremost applies to the placenta, as we have seen: our primordial life-saving, organic extension symbolising the lost object *a* in a rather profound way (Lacan 1973, 221). In his Seminar on anxiety, Lacan argues that the first primordial trauma is indeed the experience of being born (Lacan 2004, 362): the exodus from the womb, the experience of being slit from the placenta, and the separation anxiety resulting from this. From the newborn child's perspective, the motherly breast emerges as a kind of externalised placenta, loosely attached to the maternal body as a soothing remainder: something which actually seems to belong to the body of the child, something to which he or she seems entitled (Lacan 1966–1967, 256).

Thus, during the nursing stage, young children still experience themselves as fused, more or less, with the mother's body. They do not yet perceive themselves as fully separate entities and do not yet see the breast as an 'object,' but rather as something which somehow continues to belong to their own corporeal self. During breast feeding, the breast and nipple stand out as temporary extensions whose

surface smoothly folds itself to the oral mucous membrane. But this experience of fusion is illusory and untenable. The separation experience becomes repetitive, giving rise to additional frustrations. Replacement of the organic object (i.e., the mother's breast) soon becomes an option, and the soothing function may be transferred to a doe, for instance,[9] or to artificial comforters, feeding bottles, and so on; this is where technology enters the scene. The organic original becomes a replaceable, transferrable ("cessible") object (Lacan 2004, 363); replaceable by substitutes (plastic or otherwise) purporting to mimic it, in function as well as in shape.[10] Technology thus produces a host of potential substitutes: technologically reproducible partial objects, alluring but deceiving replacements of the real (lost) thing. These substitutes cannot really gratify desire, however, and the awareness of the painful, insatiable loss will continue to torment us.

For Lacan, building on Freud, another instance of a faltering object, unleashing the dynamics of human desire, is the phallus. Although unlike Freud, Lacan emphasises that it does not refer to the (physical, visible, organic) penis, conceived in more traditional psychoanalytic accounts as a male anatomical 'privilege' (Verhaeghe 2001, 10), but rather to the phallus as a *symbolical* item, functioning as an irretrievably lost (and only partially replaceable) spectral thing (whose absence is denoted as: –φ). The phallic object *a* is not something we may or may not 'have,' ready at hand, but rather something whose presence and performance remain highly precarious: something anatomical only in the *etymological* sense of the term (ἀνα-τομία as referring to bodily items that can be or have been cut away). As Žižek phrases it, notwithstanding its obstinacy, the (phallic) object *a* has no positive ontological consistency (Žižek 2010, 69), so that we are chronically in need of stand-ins. Consider, for instance, the stereotypical gun in Western movies, or the enchanted sword in early medieval or Samurai tales, or Uma Thurman's katana, previously mentioned. For Lacan, (the lack of) the phallic object (–φ) basically refers to a vacancy at the core of human existence, amounting to the inability of individuals to overcome their impasses and achieve their goals, i.e., to satisfy the desires of others as well as of themselves. Various objects (artificial replacements) purport to suture this void (Ragland 1995, 189) and technology provides us with a plethora of questionable compensations to counteract the chronic malaise (in Lacanian algebra: a/–φ). In other words, the function of technology is not primarily to satisfy bodily (biological) needs, but rather to produce alluring semblances, enticing 'objects of desire,' arousing in us a craving that goes beyond the mere satisfaction of physiological urges, promising singular forms of *jouissance* which are currently denied to us. Although the desirable object (a particular gadget, for

instance) may easily be mistaken for the thing itself, it is actually a lure, invested with libido and fetishized by desire.

The common factor of various (oral, anal, or phallic) replacements is that they are connected with experiences of loss as well as with bodily orifices, pointing out the gaps (Verhaeghe 2001). Moreover, aside from the lost objects discussed so far, Lacan adds two additional items to the set, namely the scopic object *a* (the gaze of the Other, associated with the eye as an organ and the pupil as an orifice) and the auditory object *a* (the voice of the Other, associated with the ear as an organ and the auditory channel as an orifice).[11] The missing item (–φ) becomes a vector of desire, giving rise to a relentless quest for the alluring entity that technological substitutes purport to mimic. Lacan connects this with the Freudian mechanism of displacement (*Verschiebung*) and with the linguistic concept of 'metonymy': the tendency of desire to continuously shift its target, to remain dissatisfied, to keep craving for 'something else'; resulting in endless deferral, so that the insatiable quest for the lost object becomes an interminable adventure.

What makes technological substitutes alluring is their promise to fill up the emptiness resulting from the loss (*a*/–φ). The disavowal of the inexorable nature of the loss gives rise to an interminable process of multiplication, a production line of substitutes, purporting to fill the gap (Žižek 2009, 61). New high-tech options for replacement will continue to become available in the future, claiming to mimic the lost original as closely as possible. In accordance with the matheme of desire ($\$ \lozenge a$), subjects will cling to them, fuelled by the unconscious conviction that the phantasmatic object may somehow still exist. Thus, technological experiments become 'practices of desire' and objects which to others may seem ordinary entities (say, an iPhone, or a particular gadget used for gaming) may function as the object-cause of desire, a metonymic stand-in for the lost object, which left behind a thinly coated, discomforting void. The subject's desire may become fixated on a singular object in an obsessive manner, so that all daily activities begin to circulate around it, resulting in a radical narrowing of focus, and in the elevation of a minor activity into a time-absorbing end in itself (Žižek 2012, 127). The gadget becomes a fetish: an object that purports to 'suture' the missing part (*a*/–φ).

5. Extimacy

The newness of emerging NBIC technologies basically resides in the fact that, as alluring gadgets, they allow us to monitor and manipulate our own bodies more directly, as we have seen. But this is not altogether new, one might argue. Biomedical interventions have always endorsed the objective of restoring the integrity

and functionality of the human organism through technological interventions, and aside from the partial objects discussed above (placenta, breast, phallus, etc.), various other organs or body parts may become disconnected or dysfunctional, for various reasons, so that craving subjects may put their hope on supplements or substitutes designed to replace the faltering item.

The latter is definitely true. Lacan explicitly discusses transplantation medicine, for instance (Lacan 2004, 363), stressing that developments in this area move forward very quickly and will continue to surprise us. He explicitly discusses the harvesting of organs from brain-dead persons, artificially kept alive for no other purpose (364). In the case of a faltering organ, a kind of emptiness or gap emerges in the intimacy of our body, which Lacan refers to as a "vacuole" (2006, 232), a sinister, empty space once occupied by the now dysfunctional body part (–φ), so that the vector of desire pushes the craving subject towards a possible life-line, an organ implant: the object *a* of transplantation medicine, in accordance with the matheme *a*/–φ (Zwart 2014). But the implant is likely to prove a highly precarious 'solution' and the new organ (due to detection and rejection by the body's immune system) is bound to become an issue of concern in its own right (and a candidate for future replacements).

Here again, the new genre of devices purports to provide craving subjects with solutions that seem more lenient and smoother, and definitely less organic. NBIC devices are biomimetic rather than corporeal, optimising the functioning of tissues and organs via molecular and electronic signals. No doubt the actual effectiveness of these solutions may often prove highly questionable, due to the recalcitrance of bodily existence resulting in (foreseeable or unforeseeable) 'complications.' Still, the scenario must be taken seriously that some of these gadgets will indeed be able to function flawlessly and convincingly in an integrated way, as optimising substitutes and objects of desire. In that case, a new dimension is added to the debate. As biomimetic replacements they may become increasingly intimate, while at the same time remaining alienating artefacts. In short, they become 'extimate' technologies: both intimate and external; both embedded and foreign; both life-saving and intrusive. This ambiguity is captured by the concept of 'extimacy,' a portmanteau term conjoining the notion of intimacy with that of radical exteriority (Lacan 2006, 224, 249), allowing us to stipulate the ambiguous position of the "extimate object *a*" (249) and its substitutes.

Like Freud, Lacan refers to Hoffmann's "visionary fantasy," i.e., the story of *The Sandman* to further elaborate his concept (2004, 364). Olimpia's replaceable eyes, which apparently can be removed from and reinserted into their sockets, are

both fascinating and deterring, both alluring and disconcerting. As transferrable objects *a*, they exemplify the uncanny par excellence. But, Lacan argues, this story reflects the age of the mechanical human-machine, to which the Freudian period still belonged. In the current era, the focus of attention has shifted to a new type of electronic contrivances, of which ELIZA, the computerised psychotherapist with a Rogerian (client-centred) voice, developed at MIT and named after Eliza Doolittle (the heroine of Shaw's *Pygmalion*, with the hyperplastic voice), provides a more provocative and up-to-date example (Lacan 1966–1967, 27). The extimate object *a* of emerging technologies is no longer something organic, but rather something small, communicative, elegant, carefully designed and containing a miniature, chip-sized computer.

In the course of the twentieth century, Lacan (2004) argues, various objects *a*, such as the human gaze and voice, became externalisable and transferrable with help of cameras, voice recorders, and similar devices. Although nowadays we have sufficiently familiarised ourselves with such techniques, they were initially experienced as fairly shocking: evoking both fascination and concern. For indeed, what used to be natural and familiar ('*heimlich*,' namely eyes, voice, etc.) became technologically reproducible. In the current era, artificial substitutes of the other's gaze and voice have become ubiquitous, and the same has happened to oral or phallic objects of desire. We are surrounded by alluring (EAT ME! DRINK ME! USE ME!) objects on display around the globe. The human gaze and voice have even entered the stratosphere via satellites (1973, 305) and it has become virtually impossible to escape the sway of the electronically reproducible (de-humanised, but still human-like) voice and gaze of the Other.[12]

To some extent, *all* artefacts may come to play the role of object of desire. We may go as far back as Aristotle's *Physics* where (in Book II) Aristotle argues that, whereas some things exist by nature, others are manufactured by human hands. A bedstead is Aristotle's pet example of a man-made artefact. For although a bedstead is made from wood (from natural materials), the decisive component (the form) is artificial (human-made). And indeed, he adds jokingly, in case of procreation, whereas humans will propagate humans, bedsteads are not expected to propagate bedsteads (Aristotle 1980, II.1., 115); since, should the wooden material prove to be alive and sprout, twigs and leaves rather than bedsteads will come up. In other words, for Aristotle, a bedstead is not primarily something which keeps us warm at night (thereby satisfying a mere biological need), but first and foremost an object of desire: a marriage bed, where conjugal relationships are consumed and children are conceived, i.e., a setting meant to create optimal conditions for

erotic pleasure. And if, twenty-five centuries later, posters in shop windows convey the promise of airplanes eager to transport us to alluring white beaches and blue lagoons, the message is basically the same, although advanced technological infrastructures (computer networks, airports, airplanes, hotel facilities, etc.) must now be mobilised to realise our dreams.

But again, whereas bedsteads and airplanes are externalisations of desire, the new wave of 'extimate' technologies focus their attention far more directly on the increased manipulability of the human organism as such. This means that the time-old frantic quest for external replacements of the lost object *a* (the one thing that promises to make us whole) is now fuelled by a new type of target, while a new kind of vacuole emerges within the intimacy of our bodies: an emptiness which can allegedly be sutured by wearable or implantable, biocompatible and electronic gadgets (a/– φ). In the context of mood management, for instance, these gadgets may allow us to monitor synaptic biochemistry quite closely, while releasing electro-magnetic currents or psycho-pharmaceuticals in response, acting on both sides of the matheme of desire (*$ ◊ a*) by producing an object that both targets and triggers the inner functioning of the subject.

Such technologically reproducible wearables or implants have already begun to enter our intimate life-worlds and bodies, as we have seen. In laboratories around the globe, smart watches, biochips, neuro-implants, etc. are already being developed. As these 'intimate' technologies are actually quite intrusive, *extimacy* seems a far more optimal term than intimacy. Extimate devices purport to assist us in our frantic efforts to enjoy life, but at the same time, they are likely to become an object of intense concern: is the gadget still functioning properly? For indeed, should the extimate object falter, new intrusions are doubtlessly awaiting us. Moreover, as many of these gadgets connect their users to global networks, they enable permanent self-monitoring and self-surveillance, giving rise to an electronic super-ego: the voice and gaze (and helping hand) of the Big Other (Φ) on whom we increasingly come to depend, pointing out that we fail to enjoy life as we could and should.

In other words, from a Lacanian perspective, extimate devices play a multifactorial role. On the one hand, they act as seductive, yet questionable substitutes, purporting to replace the irretrievably lost object with a sophisticated version (*a*/– φ). At the same time, they focus on the craving human subject (*$*) more directly and effectively than previous interventions. In contrast to traditional aphrodisiacs, for instance, new devices (substitutes of the phallic object *a*) may offer direct stimulation of the pleasure centres in the groin or brain to produce arousal and

/ or satisfaction (Žižek 2012). Thus science and technology purport to realise a complete scientific self-objectification of humanity, or as Žižek argues, the transformation of humans into objects of control with the help of computerised devices, allowing individuals to live up to the relentless injunction to satisfy their wants.

6. Objects of Desire: Cybernetic Discontent

Because human technology is closely interwoven with language, societal expectations, and techno-scientific experimentation, Lacan sees it as fundamentally different from tool-use by (other) animals. We inhabit a self-made world, a global, metropolitan technotope on which we are highly dependent, surrounding ourselves with commanding electronic devices (USE ME!). These gadgets stand out as weird objects, adding a new dimension to the ontology of things. For although ontologically speaking all things may speak to us, may light up in front of us, and may indicate their presence to us (Cole 2013), gadgets do so in a remarkably articulate, sophisticated, and insisting way. And it is through these gadgets that the commanding voices of politics, governance, and the market economy (Φ) summon and survey us. Instead of being mere instruments, these gadgets are beset with language, functioning as carriers of messages and claims: as an electronic superego, conveying and reinforcing the injunction to adapt our lives ever more rigorously to the emerging metropolis (literally: the *mother*-polis) whose advent they exemplify and announce.

Lacan made this point on May 13, 1970, when (before a crowd of Maoist students) he discussed the famous *Quotations from Chairman Mao Zedong* (better known as the 'little red book'). Rather than being economically exploited by capitalism, Lacan argued, the working-classes are first and foremost bereft of a particular type of dexterity or know-how, connected with particular forms of technology: workers as operators of big machines processing the raw materials of nature. This type of work is becoming increasingly automated and redundant. Therefore, Lacan was struck by the fact that Mao's booklet still purported to be a 'manual' (instructing readers how to manually operate machines). This, Lacan argued, seems outdated, as a new type of device is emerging: very small, functioning smoothly and completely forged by science, known as "gadgets" (1991, 174). As an example, Lacan referred to a tiny recording device someone in the audience was actually using to record his speech. As big machines are increasingly being replaced by or operated with the help of electronic devices (not handled manually, i.e., with our hands, but subtly touched by fingertips), traditional forms of industrial know-how are quickly becoming obsolete, while 'manuals' inevitably lose

their effective and subversive potential. It is via these smooth, opaque devices that the voice of power (Φ) now speaks to us. Or as Lacan phrased it three years later (in Seminar XX): science produced a new wave of miniature "gadgets" (1975, 104) and we have become (in a more radical sense than we are usually aware of) the subjects of these contrivances, which determine the elementary structures of contemporary existence.

Lacan's fascination with gadgets goes back to Seminar II (1978), however, where the repercussions of the cybernetics-informatics revolution for human subjectivity are extensively addressed. Whereas the early modern (Cartesian) epoch (when the modern subject was born or invented) was still under the sway of mechanical machines giving rise to the mechanistic concept of the machine-man (*l'Homme-Machine*), Lacan argues, we have now entered the era of cybernetic, computerised, and digital contrivances, intimately connected with language, mathematics, and computer codes (the 'symbolic order'), so that the affinity and proximity between humans and machines becomes much more intense than many philosophers (on the basis of established anti-mechanistic biases) still seem to presume. Bodies and computer-like machines are increasingly and relentlessly merging. Rather than being mechanistic devices (along the lines of late-medieval *horologia* as described by Thomas Aquinas in the thirteenth century[13] or early modern clockworks as developed by Huygens in 1656), these cybernetic gadgets are self-corrective, interactive mini-computers. And although their genealogy may be traced back to the calculation machines designed by Blaise Pascal, their current pervasive omnipresence represents a "mutation" in the history of technology (Lacan 1978, 45). They provide us not only with new material things, but first and foremost with messages and input: with injunctions and information.

This concurs with Lacan's reframing of unconscious desire in informational (post-Freudian) terms (instead of vitalistic ones). While for Freud the drives or instincts "originate from the somatic organisation, from the body" (so that the *Id* can be regarded as the inner animal, Freud 1941, 67), Lacan reconceptualises unconscious desire with the help of twentieth-century research fields such as linguistics and cybernetics. The Lacanian unconscious is biological only in the sense of *molecular* biology: a post-Freudian research area involving messages and codes (i.e., molecular information, cf. Zwart 2013). The unconscious is structured like a language and desire is not framed as a biological 'need' (directed at certain organic objects or substances), but as a craving which emerges in the symbolical realm of informational circuits and signifiers, where gadgets 'feed' us with enticing cues.

While Lacanian psychoanalysis discloses important aspects of NBIC technologies, these technologies reciprocally emphasise important dimensions of Lacan's understanding of human subjectivity as well. NBIC gadgets highlight the informational-cybernetic nature of human desire as such. The symbolic world of human existence is an ambiance of electronic-cybernetic-informational machines, Lacan argues (1978, 63), and it is only due to such machines that we (as decentered subjects) can emerge. Indeed, even the brain itself is cybernetically redefined as a "homeostat" or buffer ("organe-tampon," 1978, 96), mediating between unconscious desire and external reality. From a Lacanian viewpoint, the unconscious is not an interior psychic 'depth' (as envisaged by depth psychology), but entangled in a pre-structuring discursive system (the discourse of the Other) and a close affinity can be discerned between the (structure and logic of the) unconscious and the (structure and logic of) gadgets, offering short-cuts for desire.

Lacan was initiated into cybernetics by structuralist scholars such as Claude Lévi-Strauss, but also by Georges Guilbaud, a Catholic mathematician whom he befriended in 1950 (Roudinesco 1993; Lafontaine 2007; Liu 2010) and who acquainted him with the Moebius strip as the basic topological framework of human subjectivity (Roudinesco 1993, 469). While Friedrich Nietzsche (1980, §169) regarded the labyrinth as a model for our psychic "architecture," Lacan envisioned both gadgets and the human subject as structured like a Moebius strip (Lacan 2004, 161; 1973, 174): a pure surface or circuit, without termination, without hidden depths, but always with a reverse side, as something is always hidden from view, so that something else is always to be expected. Instead of reaching a final destination, subjects (challenged and prompted forth by signifiers) become entangled in repetitive loops, finding themselves in similar positions time and again, even if they decide to move the other way.

Thus, human desire is not primarily a somatic phenomenon (a biological urge to consume certain ingredients, fluids or substances) and human subjects do not live "on bread alone," as the Gospels phrase it (Matthew 4:4), but first and foremost on words and signifiers: symbolical input, provided by folding networks that coordinate the life-world. Lacan elevated psychoanalysis to the level of high-tech (Lafontaine 2007, 35) by indicating how NBIC Gadgets allow the symbolic order (the discourse of the Other) to become embodied in electronic machinery (Schmidgen 1997). The object of desire (*a*) is definitely not something tangibly organic, as we have seen, but of a symbolical nature, in the linguistic-cybernetic sense of the term. And the primordial symbol par excellence, as Henning Schmidgen (1997) argues, is the zero[14] or minus sign (-), signifying the absence of what

we inexorably lack, while at the same time realising a symbolical presence of that which is physically absent, paving the way for gadgets that promise to compensate the loss. The signifier (denoting presence or absence) *obliterates* the organic thing, as by indulging in symbolical games we may endure the demise of its tangible availability. Humans have always dwelled in a technological ambiance, but now "gadgetry" is becoming the new "dispositive" (Geoghegan 2011). And while humans increasingly communicate and interact via gadgets, the reverse seems no less true: gadgets and electronic networks communicate with each other *via us*.

This allows us to add precision to the 'inward turn' already outlined above. The traditional technological situation, as we have seen, is that of a particular organ supplemented by an instrument (ὄργανον in Greek) so as to make the outside world more handleable and survival-friendly, although this supplement often profoundly affects the human body and its organs in return, so that a process of co-evolution is unleashed: a complex interplay of the organic and the mechanic, of human embodiment and technology. In other words: while humans are reshaping (humanising) the outside world, they actually also re-sculpt (domesticate) themselves as well, so that we are not only the product of a natural, but also of techno-cultural evolution. Our tools and contrivances, indeed our apparatus *allow us to appear* as subjects and human beings are, to a significant extent, self-made (Stiegler 2010; Zwart 2009; Lemmens 2015). But whereas so far this process unfolded via externalising tools, we are now becoming the target of self-reengineering much more directly.

And this explains the ambivalent responses which emerging smart technologies evoke. On one hand we realise that, rather than posing a threat to human autonomy and dignity, our subjectivity and cognition can only emerge and function within complex environments of technological artefacts, embedded in a plethora of social networks. From the very outset, human self-consciousness co-evolved in interaction with technology and the symbolic order. We have always been thrown into a world of self-made things and over the course of millennia, human intelligence has become increasingly externalised and extra-somatised (via technology-based innovations such as alphabets, handwriting, printing, typewriters, laptops, etc.). Therefore, as Žižek convincingly argues, instead of merely bemoaning the progressive externalisation of our mental capacities, we should focus on the enabling dimension as well: the more our capacities are transferred to machines, the more we emerge as subjects (Žižek 2012, 16). It is in interaction with artificial objects that we become 'subjected.' In principle, this also applies to the new wave of electronic gadgets through which the individual life-world becomes more inti-

mately connected to global networks, thereby realising the ancient philosophical ideal of cosmopolitanism (*Weltbürgerschaft*).

And yet, at the same time, a decisive new turn seems to unfold. In the traditional situation, a clear distinction could still be upheld between the organic, the natural, and the biological on the one hand and the mechanical, the artificial, and the prosthetic on the other. But electronic gadgets disclose an intimate accessibility (and therefore vulnerability) of unconscious desire for the workings of these smart devices, finally pulling the image of the human-machine from metaphor to metamorphosis, from 'utopia' (or dystopia) to 'science' (Zwart 2009). While human bodies (once skilfully operating big machines) become targets of subtle technological modifications (or at least participants in an increasingly uneven game), a new collective superego is emerging, bombarding individuals with the injunction to enjoy life, excessively and to the fullest. In other words: *$* is put to work, in order to live up to this relentless summons (Žižek 2012, 299), which can only be realised with the help of increasingly efficient equipment. Thus, we are faced with the emergence of a global metropolitan 'mother-city,' a gigantic, multitasking, web-like ambiance, in which we are simultaneously exploited, surveyed, and spoiled. And this creates a metro-spherical ambiance of care and abundance (or even superabundance and overkill), an electronic-informational Gaia, representing a rupture with the constraining and restricting patriarchal societies of the past (from ancient Greek and Biblical versions up to the Faustian era of big machines). Bodies and life-worlds are colonised by the techno-symbolic order via gadgets as condensations, constantly absorbing and transmitting coded messages, although we will fail to realise the ancient Gnostic dream of transforming ourselves into virtual beings, radically cut off from the natural body (Žižek 2012, 167). Rather, due to various forms of recalcitrance, human beings may increasingly be outcompeted by (and compare unfavourably to) the smart machines, proliferating at such a high pace.

Thus, from a Lacanian perspective, what is so disquieting about these gadgets is that they come too close, due to their ability to mimic the obtrusively missing item so convincingly and smoothly. As alluring substitutes emerging in the outside world, they claim to address our deficiencies and longings in a disconcertingly straightforward manner, by revealing and reprogramming the molecular dynamics of embodied desire as such. In short, Lacan's dialectics of technology and desire revolves around three decisive moments. First of all, the primordial traumatic experience of separation or object loss. Subsequently, the desire to replace the missing item with the help of substitutes, as objects of desire. And finally, the claim that

newly emerging gadgets focus their attention on craving subjects fairly directly. In other words, these gadgets, while emerging as alluring *objects* of desire, also allow us to effectively modify the *subject* as such, so that they operate on both sides of the equation (*$ ◊ a*). What is especially disconcerting about these gadgets is the conviction that they may succeed where previous technologies failed, notably because, rather than simply providing us with yet another set of questionable substitutes, they purport to suture the impotence or lack much more directly, with the help of interactive, electronic, wearable, or implantable devices that are closing in on us, coming suspiciously close. They seem to mimic the irretrievably lost object far too smoothly, and this invokes an experience of uneasiness.

In many cases, these upcoming devices will surely remain erratic appendices that continue to stick out conspicuously, due to their failure to become really embedded in the body as a whole (Žižek 2009, 122–23; 2012, 156). But the alternative scenario, namely that some of these gadgets may become embedded quite smoothly, efficiently, and intimately, must be taken into account as well. Even in such a case, however, the electronic replacement of the missing object is likely to prove a toxic lure, a damaging illusion in the end (as the object *a* remains an impossible, inaccessible, spectral object, forever eluding us). But still, as Žižek argues, even these deceiving substitutes may nonetheless on some occasions do us some good, such as providing us with the coordinates of our desire, teaching us how to (at least temporarily) domesticate the formula *$ ◊ a*, and how to track a provisional course for our aspiration of fulfilment, even if it proves vanity in the end (Žižek 2009, 62; 2010, 69–70).

7. Βιος and τέχνη: A Final Dialectical Twist

From a Lacanian perspective, it would be naïve to think that NBIC gadgets will allow us to overcome our corporeal and cognitive shortcomings, as various post-humanistic scenarios suggest. As precision devices, they will prove both beneficial and toxic at the same time, and it is their inherent toxicity which tends to be obfuscated by post-humanistic proclamations of the advent of a bright and happy, hyper-technological and gadget-saturated future.

Moreover, adding yet another dialectical twist, one may argue that these gadgets, rather than introducing something definitely new into human existence, reveal or emphasise something which has been there from the very outset, namely extimacy *not* as a recent byproduct of emerging technologies, but as an eclipsed, endogenous dimension of human embodiment as such. Human bodies are inherently pervaded by intrusive entities, either beneficial or toxic (usually both) in

a very profound way, and this already applies to our 'natural' organs. Extimate gadgets may undermine a reassuring, but imaginary view of the human body in its natural, unviolated state, thereby revealing an unsettling truth. Rather than unleashing a completely new situation (without precedent in the history of technology and evolution), extimate technologies actually allow us to acknowledge extimacy as a basic dimension of embodied life itself. The extimacy of partial objects is something Real, obfuscated perhaps by various fictitious images of the body's wholeness, integrity, and inviolability, but now relentlessly brought out into the open, giving rise to a narcissistic offence, challenging our sense of dignity, individuality, and agency.

This already applies to the classical psychoanalytic set of 'partial objects' discussed above. The motherly breast, for instance, while providing a life-line to newborn infants, may well become a toxic, metastatic threat to the mothers themselves, an extimate object arousing suspicion, giving rise to practices like regular check-ups or self-monitoring, or even preventive removal, so as to forego cancer (the archetypal, demonic, organic threat from within). In other words, the ambivalent status of extimacy may already apply to this particular appendix-like organ as such.

As to the faeces (the anal object *a*), it is remarkable how, in recent years, human excrements became a focal point of attention in biomedical research no less than in psychoanalytic practice. Life scientists have taken to studying the gut microbiome (i.e., the millions of microorganisms (*E. coli* and others) inhabiting our intestines, responsible for our metabolism, functioning as benign intruders, but regarding us merely as their ecosystem) while human stool is now increasingly used as a diagnostic tool (for detecting colon cancer) or as a resource for therapy (as faecal microbiota transplants or faecal bacteriotherapy). In other words, what these developments reveal or confirm is the view of the anal object *a* as something which is both me and not–me, both familiar and repellent, both an item of waste and a gift, both detestable and valuable: a view that has been propagated by psychoanalytic literature from the very outset.

Testicles may be regarded as extimate 'partial objects' in a rather palpable manner and their extimate status is already underscored by their curious anatomical position, both inside and outside the body, drenching male bodies (notably during adolescence, but also later in life) in testosterone, a toxic substance, giving rise to excessive, unquenchable desire. But they may also function as model organs whose *modus operandi* is mimicked by smart, wearable devices, worn on (or directly under) the skin, ejecting electronic signals or bioactive substances (as bio-

chemical signals) into the human organism, urging tissues and organs to respond more adequately to recorded instances of deprivation or excess (as indicated by precision measurements), or simply to invoke specific moods of states of arousal (gadgets which function as clean, electronic, pseudo-organic 'gonads' as it were).

The phallus is the extimate "organ without a body" par excellence, as Žižek (2012, 78) phrases it, attached to bodies, but without really becoming an organic part, rather "sticking out as an excessive, incoherent supplement." As a detachable organ, it is connected with gender in a rather flexible way, and both erotic literature and psychoanalytic practice inform us that the detachable, transferable phallus plays a key role in a plethora of erotic activities and phantasies, ranging from transvestism via masochism up to fetishism. Recently, it was discovered that role reversal (phallus transference) is not exclusively an ingredient of human eroticism. In a Brazilian cave, a research team discovered a case of intromittent sexual organ reversal among insects of the genus Neotrogla (Yoshizawa et al. 2014). While females have a highly elaborate, penis-like structure (a *gynosome*), an intromittent organ in males is lacking. In fact, these polyandrous females are equipped with various organs for grasping and holding reluctant males, coercively gripping their sternum, so as to procure gametes from their sperm storage organ (*spermatheca*) while, during the extended copulation process (40–70 hours), male bodies often become fatally mutilated. In the near future perhaps, as a case of what Freud called *Anlehnung* (literally: 'to be modelled after' or 'to lean-upon'), sensitive, functional, and embedded devices may be developed such that 'active' and 'passive' roles (as Freudians once phrased it) may become a matter of choice or mood rather than of anatomical destiny. It is no coincidence perhaps that, precisely now that the 'phallic woman' phantasm is becoming technologically plausible, this same scenario also emerges as something already biologically real; although the question remains whether the transfiguration of the phallic object into a gadget would indeed subvert or rather expose (or reinforce) the (traditional) psychoanalytic image of phallic pleasure as a gendered 'privilege.'

Finally, the availability of retinal and cochlear implants may affect the way we assess and experience our natural eyes and ears, as embedded and sophisticated, but at the same time increasingly replaceable and optimisable contrivances, so that smart implants may allow us to fill the gaps, remove the blind spots, increase resolution, broaden the spectrum of detectable frequencies, or equip ourselves with an additional (movable) third eye or ear. The availability of micro-implants may point attention to gaps we hardly realised were there, such as our inability to discern infra-red light, only noticeable to us as heat. Once installed, however, the

gadget may take on a life of its own. A third eye, for instance, may (willingly or unwillingly) become the incarnation of a perverse, stalking drive.

But one could argue that extimacy even goes much further back in the history of life and that mitochondria (as powerhouses of eukaryotic cells) may count as the most primordial version of the extimate 'intruder.' The theory is that they once entered the eukaryotic cell as invading (or absorbed) bacteria ('symbionts'), as intimate and organic (biocompatible) 'devices' so to speak, making eukaryotic life possible (Lane 2005): the cellular version of the forgotten 'other' (but now incorporated rather than lost). And electronic precision devices may well single out mitochondria as targets of choice, to address symptoms of depression and fatigue, for instance, by manipulating mitochondrial functioning.

NBIC technologies operate on both sides of the matheme of desire ($\$ \lozenge a$) as we have seen: not only by (promising to) produce objects of desire which individuals obsessively may want to *have*, but also by challenging forth craving subjects into certain modes of *being*, claiming to evoke bodily *jouissance* in more immediate ways, bypassing precarious detours via culture (via others). This strategy is perhaps comparable to drug use although, while drugs function as toxic intrusions drenching the body as a whole, precision delivery of electronic and molecular signals purports to sooth or suture human craving only where it hurts. But Lacan's fascination with smart contrivances does not preclude the acknowledgement of the inevitable fiasco of high-tech fixes as currently advertised. And rather than applauding the 'death of the autonomous subject' and the supremacy of an all-encompassing techno-cultural system, as Céline Lafontaine (2004; 2007) suggests, a Lacanian perspective emphasises the vulnerability and fragility of the subject vis-à-vis the cyber-informational techno-sphere and the extent to which desire is increasingly pre-structured by the informational circuits of the Other: a vulnerability which will be eclipsed (rather than surmounted) by the endorsement of autonomy as an (either humanist or post-humanist) ideal. A Lacanian viewpoint both highlights and problematizes the exploitation of the increased dependency of (supposedly plastic and malleable) individuals on informational networks which (in neo-liberal societies) purport to liberate and empower them (Lemmens 2015). Although the realm of the symbolical is increasingly embedded in gadgets (as exemplifications of the informational logic currently holding sway), it will nonetheless fail to completely erase the other basic dimensions of human subjectivity and desire, namely the (phantasmatic) imaginary and the (enigmatic) real (cf. Nusselder 2009, 69). A Lacanian way out would be to endorse a Heideggerian ethos, as delineated by Gunkel and Taylor (2014): that is, instead of trying

to stop the advance of 'high' technology (whose gadgets will increasingly claim us), we must *work through* and actively question the unfolding present. And while cybernetics and electronics reduce language to data transmission, a Lacanian approach will eventually focus on (and even enable the emergence of) other scenes (either artistic or analytic) where (in the folds and margins of the system) subjects are actively invited to respond to their *being* spoken, and to articulate their desire, their "residue of truth," in a more "poetic" manner (Lacan 1967–1968, 27).

Notes

This article builds on a number of lectures and profits from responses and discussions at various meetings, including: "The Enhancement-Debate as a Symptom of Our Ontological Self-Image," Symposium: Posthumanism and Somatechnologies (University of Twente, April 10, 2014); "Technology, Intervention and the Control of Human Beings: What Is at Stake?," Emerging Technologies and Human Rights (Council of Europe, Strasbourg, May 4, 2015); "Extimate Technologies: Bio-Implants, Self-Management and the Uncanny" (Centre for Critical Philosophy, Ghent March 19, 2015); and the 29th European Conference on Philosophy of Medicine and Health Care (Ghent, August 20, 2015).

1. http://www.thync.com/.
2. http://www.coe.int/en/web/bioethics/emerging-technologies.
3. The NBIC acronym refers to "nanotechnology, biotechnology, information technology, and cognitive science" as a converging research field (Roco and Bainbridge 2003).
4. In a recent overview of post-phenomenological philosophy of technology (Rosenberger and Verbeek 2015), for instance, although contemporaries such as Heidegger and Merleau-Ponty are elaborately discussed, Lacan is absent.
5. A comparable gadget is the iSkin concept, a skin-worn, very thin sensor overlay, biocompatible, flexible and stretchable, folding itself to suit various bodily locations such as finger, forearm or ear, fostering "direct, quick, and discreet input for mobile computing" (Wiegel et al. 2015).
6. When Watson and Crick discovered the molecular-informational structure of DNA and Lacan launched his weekly Seminar (Zwart 2013).
7. Here as well, Lacan refers to the severed breasts of Sainte Agatha (using Giovanni Batista Tiepolo's version on this occasion) to emphasise that the irretrievably lost object can only be envisioned at the very moment of its disappearance, as a transient snapshot, such as in the case of falling stars at night, or elementary particles in cloud chambers, or a paralysing, captivating glance, spotted briefly and in passing.
8. This idea was elaborated by Peter Sloterdijk (1998, 487ff.), both building on and criticising Lacan (Sloterdijk and Heinrichs 2001, 12ff.).

9. At one time a widespread practice to which Jean-Jacques Rousseau (as a true Romantic) vehemently objected, in one of the first scholarly publications devoted to this subject.

10. Lacan repeatedly refers to Donald Winnicott, who sees childhood toys and dolls (such as teddy bears) as transitional objects (both external and intimate, both real and illusory) which may soothe and facilitate the inevitable destruction of the symbiotic mother-child relationship by temporarily replacing the object *a*. A fetish, Lacan adds, is basically a frozen transitory object for adults (Lacan1967–1968, 35–36; 1994, 34–35).

11. Building on Aristophanes's parable in *Symposium*, Lacan further explores this experience of profound loss by arguing that it gives rise to a "lamella," an ultra-thin surface (Lacan 1966–1967, 847; 1973, 222), a flexible remainder of the traumatic cut, a two-dimensional, fictitious 'organ,' attaching itself (as a highly sensitive film) to corporeal orifices (mouth, anus, the inner mucosa of vagina or penis, etc.), thereby creating erogenous zones, instilling in human individuals a yearning for something to which they somehow seem entitled and which they apparently cannot do without.

12. In one of his seminars, Lacan speaks about the Apollo project. The astronauts, he argues, having left the field of gravity of planet Earth, still remain within the techno-scientific realm of communication technologies (Lacan 1991, 187). During their space-journey, they are accompanied by the electronic version of a human voice: their auditory connection with Houston (the Big Other): their auditory object *a*. As long as this connection is alive, they will survive (188).

13. Aquinas 1922, Pars 1a 2ae, Quaestio XIII, second article.

14. One explanation of the origin of the number zero is that it represents the empty hollow left by a counting stone in the sand (Kaplan 1999, 25).

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