Abstract: 'The strange meshing of impersonal and personal forces in technological action'

This paper asks what social and cultural theory can learn from technology, in particular from actions associated with information technologies. In contrast to many critical approaches that attribute a deficit of meaning to technology or information, it explores the spectrum of symbolisations technological action gives rise to. Furthermore, on the basis of several recent examples, the paper explores the importance of an encounter with impersonal forces in collective life that sometimes occurs technology. In analysis of contemporary examples, it argues, what is stake is less the emergence of new innovations, but an understanding of the relational processes and potentials that gives rise to new forms of symbolisation. It draws on the work of Gilbert Simondon and other recent cultural and political theory to describe some of the ways in technological action overflows social norms, forms, identities and structures. In relation to these overflows, cultural theory might develop accounts of symbolisation and signification that are sensitive to invention of technological materialities.
The strange meshing of impersonal and personal forces in technological action

What can critical thought learn from technological action? This is not a question that cultural and social theory has often asked. More often, the problem has been how to instil modern technology with culture, meaning or signification. This approach bypasses, however, any possibility of treating technological action as eventful in its own right. For instance, the anthropologist Marc Augé writes:

> [A]ll societies have lived in and through the imagination. We can say that in every case the real would be 'hallucinated' (the object of individual or group hallucinations) if it were not symbolised, in other words collectively represented. (Augé 1999, 8)

Without imagination and the symbolisation that flows from imagining, Augé argues, societies cannot be sustained. Relations to others or alterity have to be constantly and intensively symbolised in order to vivify social identity. Without testing identity in relation to alterity through symbolisation, 'the relationship to the world becomes congealed and virtualised, ... it creates the conditions for solitude and is likely to engender an I that is just as artificial as the image it devises of others' (Augé 1999, 25). In the congealing of relation to alterity, technology has been understood to play a significant role. Following the vein of much social theory, Augé proposes that technology threatens the work of symbolisation because it too readily affords images of others: '[t]he question is more one of knowing whether the development of technologies has released, especially as the work of those who use them for economic and political ends, a misdirected form of the imagination ('fictionalising') and with it a harmful energy of which they no longer have complete control' (105). In misdirected imaginings (available on the Internet, through live news, cinema, in photographs, but also in communication systems such as the financial markets), alterity does not have to be encountered. Whether in the audiovisual media, or in the programs of corporate innovation that deliver constant announcements of new interventions in communication, technology subjects alterity and symbolisation to mediation.

Augé’s perception of communication and media technologies as threat to symbolisation or representation is certainly nothing new. Critical thought struggles with what it regards as loss of meaning, alienation and disruption to social relations occasioned by contemporary technologies, particularly those associated with information, communication, genetics and biotechnology. However, the sheer volume of events concerning technology suggests that the problem for cultural analysis is no longer to persuade others that technologies undercut symbolisation, representation or meaning-making, but to help think how they intricately modulate collective life. Does the problem of technology shift shape if we accept that technologies produce symbolisations? Is it that technologies yield a competing, turbulent spectrum of symbolisations that are not easily conveyed in unified, ecumenical forms? If so, the problem then becomes one of exploring the divergent symbolisations coming out of technology.

TV-B-Gone and 209 codes: symbolisation and normativity

Actually, it is easy to challenge any simple opposition between technology and symbolisation. For instance, TV-B-Gone is a TV remote control that turns off all televisions operating in the vicinity (Bodzin 2004)? An article describing TV-B-Gone in Wired News, describes how the device interrupts television images constantly screened in public and commercial spaces:
The device, which looks like an automobile remote, has just one button. When activated, it spends over a minute flashing out 209 different codes to turn off televisions, the most popular brands first.

Altman [the inventor] said he prefers to ask people to turn off TVs. The problem is places where there’s a captive audience and no one is available to respond to requests, like the Laundromat or the airport. Altman said he has turned off sets at his local laundries and at airports around the Pacific Rim. (Bodzin 2004).

TV-B-Gone itself is not a discourse concerning technology. It intervenes directly in a technological system (switching televisions off and on). As it flashes out the ’209 different codes’ of popular television models, it affects in existing social relations congealed or crystallised around television technologies. It inflects relations between I and other. In Augé’s terms, the stasis of alterity associated with a media technology, television, is disturbed, perhaps only locally and temporarily, by a relatively modest albeit sophisticated gadget. The technology itself is a symbolisation that competes with other symbolisation.

In many technological situations and events today, competing symbolisations are embodied in technologies, just as much as in texts, events or images. It is not clear where signification ends and technical actions starts. Several analytical considerations prevent reduction of technologies to instruments in the service of different discourses. Firstly, what even counts as a technology is subject to manifold determinations. As Jonathan Sterne writes, ‘the force of the ’preconstructed’ ... weighs heavily upon anyone who chooses to study technology, since the choice of a technological object of study is already itself shaped by a social organized field of choices’ (Sterne 2003, 368). Given the analytical impossibility of finding any process that lacks material practices that involve technologies in some general sense, what counts as technology in a particular instance is the result of an interested social ’preconstruction.’ What counts as technology is socially contested. For a government official or corporate leader, the technologies to be fostered pivot around the familiar figures of biotechnology, biomedicine and informatics. In popular culture or consumer markets, what counts as technology figures largely in terms of audiovisual and communication devices. Whenever a field of relations or events is called ’technology,’ we can assume that the social relations that it affects are themselves unstable. Once they stabilise, technologies almost by definition disappear as ’technology’.

Secondly, as sociologies of technology have long argued (see (Sterne 2003,) for summary), technologies congeal or crystallise sets of social relations. Making a technology is a deeply social act in that it transfers, borrows or re-routes social relations through different material arrangements. TV-B-Gone assembles and compresses a spectrum of proprietary innovations underlying television remote controls into a small keyfob. It re-routes the semi-frozen relation between viewers and the multiplicity of television screens in public places through the hands of the pedestrian.

'Google Desktop': searching for relations

The breakdown of any simple opposition between symbolisation and technological action suggests the need for more sophisticated theoretical accounts of how certain things become technological. What kinds of instability in collective life tip into technological action? For instance, Google Desktop, a piece of software first made available in late 2004 makes almost anything stored on the hard-drive of a personal computer searchable in the same way as the Web (Google Google desktop - search your own computer 2005). There is much to be analysed about Google as an enterprise, as a brand, as a symptomatically sprawling technical object-assemblage in early 21st century post-techwreck network cultures. Across its different entanglements, the search engine
has become popular and important because it has repeatedly afforded new ways of handling information on the Web. Although much of what is interesting on the Web refers outside the Internet (to places, people, events, artefacts, etc), Google has gradually made searchable a variety of information that is not strictly part of the Web. If Google were seen as a closed, complete technology, then it would collapse into a simple instrument or tool. But this is far from the case. Like many other technological projects today, Google is an ensemble of different practices, objects and actors in flux. Google Desktop is constitutionally open to further development. The Google Desktop API (Application Programmer Interface) encourages the development of ‘plugins’ that allow different kinds of information to be searched. Whereas Google Desktop initially searched mainly text files, plugins added by others allow it to search other types of files that are less common (Google Desktop - download plug-ins 2005). While none of this is particularly striking or singular now, it brings to the fore things that would have been surprising even a decade ago. In several respects, it complicates distinctions between self and other. My ‘personal’ information becomes impersonal, something that an individual searches like they search the Web. Further, the technology of searching is not fixed. Its envelope expand as others develop new elements (‘plugins’) to the software. That a software technology would be open to ongoing development by anyone, and that individuals would have so much information that they could no longer organise or control it, only search it, these are elements in a new situation.

Google Desktop, we could say, comes out of a problematization associated with information. A problematization, according to Paul Rabinow’s commentary on Michel Foucault, ‘is both a kind of general historical and social situation - saturated with power relations, as are all situations, and imbued with the relational “play of truth and falsehood,” a diacritic marking a subclass of situations - as well as a nexus of responses to that situation’ (Rabinow 2003,19). All technologies, even a heavily ‘pre-constructed social object’ such as the Internet, participate in such situations. They are imbued with a relational play of truth and falsehood that makes them at once a site of, object of and obstacle to symbolization and discourse. Technologies can be seen as intrinsic to situations.

Understanding the interplay of power-saturated historical-social situations and responses to them is key to making sense of what is collectively represented as real or valuable in any social formation. For contemporary European, American and Asian societies, a relation to information technologies has become a central structural commitment at many different levels, ranging across popular culture, markets, State, law, individual, social, national and international identity. It is hard to think of any formation of cultural or social life that does not orient itself in some way towards information. Yet this commitment is problematic in the sense that Rabinow theorises. Many different modulations of information propagate: corporate and research-driven high-technologies of production, health, communication, energy and transport, alternative technologies, popular cultural practices associated with media, technologies of war, security and crime. Practices and materials move between different sites, and interfere with each other. An algorithm developed for deep-space communication in the 1960s finds itself in domestic wireless networks in the late 1990s. What counts as information technology multiplies and refracts in many different directions.

If information is intrinsically unstable, if there are information technologies unfurling everywhere, then how does a historical-social situation occur in which information technology appears singular, or as a monotonous pulsation driving and corralling all cultural forms before it? Recent theory offers several different ways to respond to this question. Prosthetic or cyborg culture theories argue that human life itself is technological. Departing from phenomenological and materialist accounts of embodiment, significant works on technology such as (Ansell Pearson 1997), (Haraway 1997), (Stiegler 1998), (Hansen 2000) and (Braidotti 2002) argue, very broadly.
speaking, for the constitution of humans (or ‘the human’ in some cases) through technology. Cyborg, prosthetic or post-human evolutionary accounts of technology, I would argue, responded to the problematization of information as it occurred during the 1990s by placing technology at the centre of the historical-social situation. They risked essentialising technology in order to prise it away from the absurdly stubborn double-handed grasp of instrumentalism and determinism. The cyborg figure was particular apt in engaging with information and communication technologies as neither instrument (of human intentions) nor as absolute Other (the juggernaut of history), but as form of life, as something intimately inhabited and habituated.

This quasi-essentialising strategy, however, sometimes overshadowed a wider ‘nexus of responses’ associated with information and communication technologies. A second lineage associated with the French philosopher Gilbert Simondon, and later with Michel Serres and Bruno Latour (Latour 2002; Serres and Latour 1995; Simondon 1958), has strong potential to illuminate this wider nexus. Technical objects are composites whose mode of existence is more important to understand than any function, use, material or form associated with them (Simondon 1958). Technical objects are primarily to be understood as a temporal involution of relations. As Bruno Latour puts it, ‘[t]echnology is everywhere, since the term applies to a regime of enunciation, or, to put it another way, to a mode of existence, a particular form of exploring existence, a particular form of the exploration of being in the midst of many others’ (Latour 2002, 248). The doctrine of the fold associated with Serres and Latour’s account of technology identifies something crucial to the nexus. Following Serres, Latour describes how a hammer ‘folds’ together times, places and ‘actants’: ‘[t]here is nothing less local, less contemporary, less brutal than a hammer, as soon as one begins to unfold what it sets in motion; there is nothing more local, more brutal and more durable than this same hammer as soon as one folds everything implicated in it’ (Latour 2002, 249). On this expanded reading of technological action, Google Desktop’s transposition of Web onto personal computers, and its erosion of distinction between what is mine and what is the other’s, folds together different times, places and others. It’s ongoing transformation attests to a mode of existence specific to the historical formation of the informatic problematization.

In the lineage of accounts of technology represented by Simondon, Serres and Latour, the openness of technologies is not some local peculiarity associated with late twentieth century Western modernity. It challenges the prevalent ontological carve-ups of material-social realities. Simondon can write:

Through the intermediary of the technical object, an interhuman relation that is the model of transindiviality creates itself. This can be understood as a relation which does not put individuals in relation by means of their constituted individuality, which separates the one from the other, nor by means of that which is identical in each human subject, for example, the a priori forms of sensibility, but by means of this charge of pre-individual reality, this charge of nature which is conserved with individual being, and which contains potentials and virtuality (Simondon 1958, 248).¹

Precisely in relation to others, the domain in which technology has typically been regarded as corrosive, Simondon counsels attention to technological objects and actions. While we still need to see how technologies do this, Simondon’s comment already resists some forms of reduction of technological action. Technology is not, as State and enterprise cultures of innovation often imagine, some substance or vital force which must be nurtured, controlled or marshalled. Rather it occasions the invention of relations that overflow existing modalities of perception, identity, social structures and organisation. As Latour puts it, ‘far from primarily fulfilling a purpose, they [technologies] start by exploring heterogeneous universes that nothing, up to that point, could have foreseen and behind which trail new functions’ (Latour 2002, 250). They provisionally and
intermittently occasion or eventuate something thoroughly contingent yet collectively important, what Simondon terms (for reasons explored below), a ‘transindivudual’ relation.

**Botnets and RSS feeds: abstract and impersonal**

It is always a mistake to view social life from the standpoint of a single sector (such as technology, economics, politics, etc). Nevertheless, technological action effects, on occasion, a mode of collective life that differs significantly from identities, structures, historical evolution or types. From the standpoint of cultural theory, contemporary technology is understood as the epitome of regular, predictable or repeatable action. Hence, the claim that technology could give rise to something heterogeneous or unexpected seems puzzling if not paradoxical. The claim however centres on the specificity of technological actions. Only insofar as technologies remain ‘open’ in some way do they participate in technological action.

Examples of this openness can be found littered around the Internet and networked personal computers. Recent reports of ‘co-ordinated malware attacks’ (CMAs) have appeared in news and online media. Computer security consultants warn of a co-ordinated assault designed to establish a huge botnet under the control of hackers. CA reckons that access to the compromised PCs is for sale on a black market, at prices as low as five cents per PC (Leyden 2005). Locating potential openings in generic Windows-based computer platforms, increasingly sophisticated ‘botnets’ link millions of mass-market commodities into a co-ordinated media machine functioning as a distributed, unregulated email spam server. The technological action in this case pivots on a ‘hack.’ Whatever its cultural, political or economic worth, this hack of networked personal computers is a significant creative act. Mackenzie Wark describes a hack as an abstraction:

> To hack is to abstract. To abstract is to produce the plane upon which different things may enter into relation. It is to produce the names and numbers, the locations and trajectories of those things. It is to produce kinds of relations, and relations of relations, in which things may enter. (Wark 2004, 083)

While the notion of the hack developed by Wark (strongly influenced by Deleuze and Guattari) does not refer to specifically to technological action, it departs from it. Technological action offers a model for other abstractions.

What is abstracted in the action that turns a personal computer into part of distributed spam-network? It does not impose a form on matter. The production of relations and relations of relations does depend on representations through which a subject orders and directs her will. A hack or inventive act occupies a different, more intimate, potentialised zone out of which form and matter only separate retrospectively. The sociologist Andrew Barry describes the importance of the milieu in which this occurs:

> ... What is inventive is not the novelty of artefacts and devices in themselves, but the novelty of the arrangements with other objects and activities within which artefacts and instruments are situated, and might be situated in the future. (Barry 2001, 211-2)

The ‘novelty of arrangements’ Barry mentions here are not arbitrary. They occur within ‘technological zones of circulation’ (Barry 2001, 202-3). Only sometimes do these zones occur within centres of calculated innovation such as research laboratories or start-up companies.

How then does abstraction occur in technological action? How does it, sometimes and provisionally, give rise to what Simondon calls a ‘transindividual relation’? Another example, similar in some ways to CMA botnets, offers a clue. The rapid development of the ‘blogosphere’ or weblogging has been reported and discussed in many places. Sometimes it seem as though blogging re-kindles expectations associated with the Internet and WWW in the mid-1990s: that a...
newly vitalised public sphere could emerge because of real citizen participation (Gilmore 2004). Whether or how this public sphere develops is not central to the argument here. Blogging could be seen as mired in individual identity, or as an expression of identity speeded up to take account of the pace of the commercialisation of the Web. However, the novelty of certain practices, activities, objects and relations associated with weblogs is not so much the way that they accelerate the updating of web pages. (A major problem with web pages during the growth of the WWW was keeping pages up to date. Static web pages soon became dated and littered the web. Weblogs significantly alleviate this problem.) Rather, novel arrangements have arisen in relations between weblogs in the form of RSS feeds (Rich Site Summary or more colloquially, Really Simple Syndication; the equivocation over what RSS stands for is an interesting symptom of contestation) allow ongoing notification of web content updates to flow laterally between weblogs and also to 'feed readers' (or 'news aggregators') (Wikipedia 2005). The abstraction in RSS comprises the provision of a summary of the contents of a website in a machine-readable (XML) form. Because other websites or software can read this summary mechanically, RSS 'feeds' or documents act as news feeds or wire-services for the rapidly changing Web content comprised by thousands of weblogs. These feeds de-personalise weblogs into various categories and topics. The potential to combine feeds in many different ways, means that RSS 'vectoralizes' (Wark 2004, 339) the weblog as expression of individual(s).

Postmodern accounts of subjectivity would perhaps regard blogs and RSS feeds as evidence of a media-technological fragmentation of subjectivity and experience. However, what appears as fragmentation can also be invention. The variety of objects, activities and practices connected together in RSS might result in nothing too important. It is hard to tell at the moment. Yet the example highlights the impersonal forms and forces associated with technological action. In it, a somewhat more impersonal set of relations is encountered. In their introduction to a volume of essays written mostly by anthropologist about technology, Stephen Collier and Aihwa Ong frame this impersonality using the notion of global forms: ‘global forms are limited or delimited by specific technical infrastructures, administrative apparatuses, or value regimes, not by the vagaries of a social or cultural field’ (Ong and Collier 2005, 11). RSS possesses an abstract nature that relates to the specific technical infrastructures of websites, webservers, HTML code and web-browsers designed to circulate globally.

The establishment of relations or correlations between different parts of the Web embodied in RSS feeds is typically of technological action. It abstracts from existing arrangements something that was immanent to them. Such an abstraction can only occur in an encounter with impersonal forces, potentials that are not yet individuated, organised or institutionalised in social systems and functions. Countering the weight put on personhood in many innovation contexts (Strathern 1999, 21), in invention, something impersonal, an encounter between living and non-living occurs. Informed by a cybernetic concept of feedback (‘auto-regulation’), Simondon argues that:

There is no purely internal, entirely isolated auto-regulation; the results of action are results not only in themselves but also through their relation to the exterior milieu, to the ensemble. ... The type of memory and the type of perception that suits this aspect of regulate necessitates the integration or transformation of a posteriori into a priori that the living alone realises itself (Simondon Du mode d’existence des objets techniques 1989, 125).

From Simondon's standpoint, invention as abstraction arises from a particular relation that life has to something external to itself. But it is a specific movement of ‘retroaction’ or action of the future on the present underpins this reading of abstraction. Abstraction eventuates when an a priori comes into being and begins to subsume or re-configure existing arrangements. Retroaction links not-yet individuated fields to existing structures, forms and matters. The transformation of what
is experienced, or felt into something that is pre-given (\textit{a priori}) occurs through a process specific to life itself. It draws on ‘interior milieus’ (such as memory and imagination) whose dynamic reorganisation alters how the life form remakes itself in a habitat. Much could be said about how Simondon understands life as playing out on surfaces and membranes separating adjacent interior and exterior milieus or zones of individuation.

\textbf{From modification to emulation, from abstract to concrete}

All technological action enucleates around an abstraction. It would be better not gloss ‘abstraction’ in a mentalist fashion, especially since every abstraction is subject to concretisation. It is a social-material, that is, collective, event. It does not have a punctual character, but different durations. Importantly, it is mixes impersonal and personal forces. In a recent interview, Giorgio Agamben comments:

[Simondon] always thinks individuation as the coexistence of an individual, personal principle and an impersonal, nonindividual principle. In other words, a life is always made up of two phases at the same time, personal and impersonal. They are always in relation, even if they are clearly separated. The order of impersonal power that every life relates to could be called the impersonal, whereas desubjectivation would be this daily experience of brushing up against an impersonal power, something both surpassing us and giving us life. That, it seems to me, is what the question of the art of living would be: how to relate to this impersonal power? (Agamben 2004, 124)

What is this impersonal force that technological action encounters in some way or other? How does it relate to invention as abstraction relate to it?

To offer another even more popularist illustration of the dynamics of abstraction occurring in the information problematic, we could turn slightly away from the domain of software and Internet to consider ‘case-modding,’ a technique of customising certain aspects of the hardware of desktop personal computers. With the exception of some specialized commercial, industrial, military and research computers, most computing hardware consists of generic, commodified components assembled using standardised cables, brackets and boxes. Rarely discussed, these bits and pieces make up a large chunk of the material existence of the ‘information age.’ The hardware components have no necessary relation to each other. They can be put together in different ways because they are linked through the ‘global forms’ or conventions of standards and protocols (Galloway 2004). Some of these forms relate to conventions of communication (I2C, PCI, USB, SCSI, etc), some relate to the physical specificities of holding racks, printed circuit boards, brackets, plugs and sockets together. As an ensemble, the computer remains practically abstract. Elements can be varied without the ensemble falling apart. Indeed, this is very much becoming a formal principal of the design of such systems.

One impersonal force encountered is quite physical: heat. Information processing generates increasing quantities of heat as information moves more quickly through miniaturised circuits. The opposition between energy and information that is sometimes used to distinguish the information age from the machine or industrial age is very leaky. Contrary to the images of cool, frictionless action, computation takes place in an silicon semiconductor environment whose ambient temperature must stay within narrow limits if the digital is to remain digital. Outside quite narrow thermal parameters, the digital quickly becomes analog. In commodity computing hardware comprising generic components, ambient temperature is maintained by conducting heat outwards (‘heatsinks’)and moving air across the vital components – CPU, harddrive, memory and graphics card – through fans and vents. Via classic cybernetic feedback loops between sensor and actuator, motherboards contain build-in temperature sensors for different components that
can be linked to speed controls on the case fans.

When the noise of the computer begins to intrude on work or entertainment, the desire to reduce noise but retain speed leads to interesting modifications. The cooler the system, the faster it can run. With enough cooling, it can be ‘overclocked’ (that is, run faster than the manufacturer’s specifications). But speeding up the system and making it quieter pull in opposing directions. Practices of case-modding radicalise the use of fans and cooling equipment in reconciling these opposing vectors of speed and sound. For instance, ‘Casefan casefan casefan casefan casefan’ (Edge 2005) is a patently absurd computer case made of nothing but cooling fans. While it keeps the circuitry very cool, it tends to be quite noisy, and heavy. Like heavy tail fins on a car, it does not change the essential character of the technological object, the computer. However, other case modifications do change something essential. Because noise increases as fans move more air, case modders swap other quieter fluids for air:

Russ Kinder, an architect in Grand Rapids, Mich., turned to a more radical approach: computer submersion. After setting up a PC that had to run day and night, he didn’t want any nocturnal buzzing. So, he says, he plunged the computer into an acrylic tank filled with mineral oil. (Forelle 2005)

An oil-filled fish tank is unlikely to be commercially practical, but it almost eliminates the noise of this computer in its domestic setting. These modifications, even the myriad trivial alterations made for ornamental purposes, address something at once abstract and impersonal. The personal computer remains abstract to the extent that it consists of generic, commodity components linked together by the impersonal global forms of standards and protocols. The relation between the computer and its environment (an office, a living-room, a workshop, a bedroom, a server-room) is imperfect in that it cannot tolerate changes in temperature very well. What remain abstract in the personal computer also makes it fragile.

The modifications concretise the abstraction contained in the assembly of different components. Simondon writes, ‘the concrete technical object is one that is no longer in conflict with itself’ (Simondon Du mode d’existence des objets techniques 1989, 34). They modify an aspect of the reality of the ensemble by establishing different relations between the sub-ensembles. The oil moves around around the components, even through the fans themselves. Rather than trying to trade-off between noise and heat as air-based cooling does, the oil-cooled computer moves heat silently and relatively slowly. Movement from abstract to concrete constitutes a form of progress specific to technological action according to Simondon. The modifications carried out by case-modders are for the most part minor concretisations that slightly alter or refine relations between elements of the technical ensemble, of the computer. They concretise the abstraction of the computer in relation to particular domains or properties such as sound and heat, as well as in relation to personhood or group identity.

Sometimes effects arise independent of any intention on the part of inventor or modder. They go beyond a re-fashioning of generic, commodified hardware. A ‘multitude of forces’ (35) begin to extert themselves in relations between parts of the ensemble as it is increasingly concretised. One aspect of this potential is addressed by Maurizio Lazzarato when he describes the openness that accompanies contemporary commodification:

What the transformation of the product into a commodity cannot remove, then, is the character of event, the open process of creation that is established between immaterial labor and the public and organized by communication. (Lazzarato 1996, 145)

Lazzarato’s view of contemporary products (including technologies) focuses on their ongoing, intricate connection to immaterial labour. Immaterial labour makes things using cybernetic,
informational and cultural strategies. Case-modding progressively concretises abstract relations between commodified hardware components, but it is only one instance in the interlinked domains of information and communication technology where relations between marketisation and technological concretisation are disrupted. Sophisticated, proprietary technical platforms such as computer game entertainment consoles also show signs of this rupture. Sony Corporation recently released the PlayStationPortable, a handheld computer game console (Sony Computer Entertainment America 2005). Within several weeks, the console, Wired News reported, On May 10, sites like PSP Hacker reported that a Japanese hacker known only by the name Mr. Mirakichi had developed a program called RIN that let the PSP play software written for the original black-and-white Nintendo Game Boy system (Kohler 2005).

If RIN allows a proprietary hardware platform to run software written for other older platforms, then the commodification of the technology, which is based on a market for platform-specific games, begins to break up. In this case, the circulation of software and code afforded by the Internet means than any chink in the closure of a commodity digital technology will be quickly opened into a platform. (Every attempt to date, for instance, to regulate the copying of audiovisual material on personal computers using hardware or software protection schemes has failed.) If case-modding example suggested that technological action often explores traits specific to the materials and relations involved, the PSP software modifications suggest that these material traits are intimately linked to social arrangements and communication.

**BitTorrent: integrative and disruptive action**

Disruptions of the structure of the commodity are rife in electronics and computing. But why do these disruption appear in some technological zones and not others? Many of the examples of arrangements, practices, artefacts and events that disrupt the structure of commodities involve making them publically contestable in some way. In his use of Simondon, Paulo Virno picks up on aspects of collective life related to an impersonal dimension:

[T]he collective experience, the life of the group, is not, as we usually believe, the sphere within which the salient traits of a singular individual diminish or disappear; on the contrary, it is the terrain of a new and more radical individuation. By participating in a collective, the subject, far from surrendering the most unique individual traits, has the opportunity to individuate, at least in part, the share of pre-individual reality which all individuals carry within themselves. ... Only within the collective, certainly not within the isolated subject, can perception, language and productive forces take on the shape of an individuated experience. (Virno 2004, 79)

Following Simondon, Virno avoids opposing an individual I to a collective We. His formulation refers to something that is neither self nor other, the ‘share of pre-individual reality’. In many of the examples just discussed, technological action has a dimension that unfolds in relation to ‘pre-individual reality’ or impersonal forces (Agamben’s term) on which all individuation has an ongoing dependence. This dimension is collective yet not social or cultural in any conventional sense of those terms. It overflows subjective experience or individual control. Individual figures appear to accompany events in the process of individuation. Hackers, for instance, are often represented as isolated criminal figures. The mundane reality of hacking, however, centres on interaction, copying, communicating and working with other people in exploring and bringing into relation specific material-technical traits. While language and perception are also terrains of individuation, ‘productive forces’ (amongst which technologies usually belong) expand and intensify the zone of mutability or virtuality. They complicate any opposition between I and We because they cannot be reduced to either.

This is, in some instances, because technological actions actions occurs non-representationally.
Although his account is steered by an over-arching notion of the 'general intellect', Virno affirms the linkage between technological action and the feasibility of 'non-representational democracy':

The entire realm of productive forces is pre-individual. It is social cooperation in the form of action in concert, the totality of poietic, “political,” cognitive, emotional forces (Virno 2004, 78).

Whilst Latour’s account of technical mediation as folding had already countenanced several dimensions (space, time and agents (Latour 2002, 250)) that prevent technology from being reduced to means or instrument, the emphasis in Simondon’s account on pre-individual realities entails something irreducible to form or matter. When Virno adds ‘poietic, political, cognitive and emotional’ elements to ‘productive forces,’ he is not just referring to the high value of affective labour in post-Fordist organisation of work. He is highlighting the problematic character of contemporary technology itself as something that both integrates, regulates and disrupts identities. The need to investigate this non-individual, non-representational dimension has recently been highlighted from a different angle by the sociologist Michel Callon. It is necessary, he writes,

\[\text{to describe this space where the emerging identities created by techno-sciences’ overflows could be discussed and could be mobilized in order to compose, to constitute, the collective.}\]

There’s a strange meshing of techno-sciences and economic markets which produces ... the proliferation of new identities and which constantly creates new uncertainties about the constitution of the collective. (Callon, Barry, and Slater 2002, 287).

The proliferation of new identities correlates with ‘uncertainties about the constitution of the collective.’ For Callon, this ‘strange meshing’ of techno-sciences and markets underlies emergence of identities. Via Simondon’s account, we could say that technicity as a system of references (renvois) (Stiegler 2003, 162) encounters pre-individual reality in technological action. These references or arrangements (to use Barry’s term) are not purely technical. Callon suggests that technological actions are also ways of inhabiting markets, or making different kinds of markets. (Many of the examples considered above could be analysed along these lines.)

Normative readings of technological action regard it as stabilising social relations. From this perspective, ‘technology is society rendered durable’, a perspective developed extensively in work on the social construction of technology (Law and Hassard 1999). In that ordering, human actors take on personhood through individuated and often highly normalised functions: they function as operators, users, power users, affluent consumers, executive etc within symbolisations of stable technical objects. But a different normativity of technological action comes through in Simondon’s account. He writes, ‘in effect, technical norms are entirely accessible to the individual without him [sic] having to have recourse to a social normativity’ (Simondon L’individuation psychique et collective à la lumiere de forme, information, potential et metastabilite 1989, 264). While these norms are not social, they still frame technology in ways that could offer hope of an ecumenical symbolic unification of diverse social groups (Combes 1999, 104). However, a different understanding of action sometimes disrupts this normative framing.

For instance, BitTorrent, a program that allows anonymous distribution of files on the Internet without the use of web-servers, has been downloaded by 20 million people according to newspaper reports (Norton 2005). BitTorrent links the movement of information to the popularity of that information. The availability of files on the Internet via BitTorrent directly reflects their popularity. The more people who download a particular file using BitTorrent, the more widely available that file will tend to become. Instead of storing information on high-bandwith servers, BitTorrent, like other ‘peer-to-peer’ software, distributes storage. While consumption in general depends on systems of mass production and distribution, BitTorrent decouples distribution from commodity production. Like many of the examples cited previously, BitTorrent arises in a
technological zone in which access and distribution of information is heavily problematised. Although attribution of radical, democratic potential to BitTorrent can easily sound doggedly libertarian, the very diverse forms of attention (legal, mainstream media, political, market, popular) it attracts suggests something is at stake.

To varying extents, an action participates in a becoming or event that restructures a domain. It links different orders or disparate realities. BitTorrent amplifies resonances already found in a particular domain of collective life because it enmeshes the availability of information with its popularity. Rather than acting by imposing a form, this act is reticulatory. Like other domains, technical ensembles contain privileged sites and moments where a power of acting and an openness to being acted upon are concentrated (Simondon Du mode d’existence des objets techniques 1989, 164). Privileged moments and sites exist because relations intersect there. At those points, perceptions, feelings and action can become elements of a collective individuation. In those sites and moments, collective individuation that re-forms an I or We occurs. In her commentary on Simondon, Muriel Combes writes, ‘it is only by passing from the level of technical objects to the more profound level of technicity that one can grasp in what the normativity intrinsic to technology consists’ (Combes 1999, 109). At the level of technicity, technological action no longer encounters a set of norms specific to an object, but to relations that exceed the specific object. At the level of technicity, technological action no longer concerns norms specific to an object, but relations that exceed the specific object. In this context, action comes from the ‘reticular reality’ (Combes 1999, 115) of technicity.

**Beacon: powers of relation in action**

A deceptively simple recent artwork by the British new media artists Jon Thomson and Alison Craighead touches on the reticular character of technological action in the informatic problematic. The work is called 'Beacon' (Thomson and Craighead 2005). It appears onscreen as a very simple visual form, an almost rudimentary design graphically. Words and phrases currently being typed into WWW search engines somewhere roll across the screen: ‘vera wang, superman, air malta, neenah wi, maxim magazine, atk, juno reactor labyrinth, gay pornstars, yard hydrant’. A ‘read-me’ document beneath the beacon states: ‘[t]he beacon continuously relays selected live web searches as they are being made around the world, presenting them back in series and at regular intervals’ (Thomson and Craighead 2005).

In what sense could such a work constitute a beacon, something that marks a privileged or special site? What place, in the domain of the Internet, could be signalled or marked by a beacon? To return to the question posed earlier, how could technological action as encounter with impersonal forces occur here?

Privileged moments and sites exist by virtue of relations running through them. Action in relation to those privileged places or sites is particularly charged, resonance or amplificatory. Perceptions and feelings become elements of singularly eventful operations. Thomson and Craighead write '[t]he beacon has been instigated to act as a silent witness: a feedback loop providing a global snapshot of ourselves to ourselves in real-time' (Thomson and Craighead 2005). What can we learn from technological action when it takes on this character? The opposition between technology and culture that underlies many critical accounts of technology begins to collapse. The threat posed by technologies to symbolisation, exemplified by Marc Augé’s comments, looks rather different from the perspective of individuation. The threat is neither loss of relation to the world nor destruction of symbolisations. Simondon writes:

The presence of the world is never eliminated by use of machines. But relation to the world can be split and pass through the several intermediate stages of symbolisation. To this there corresponds a technical construction that distributes viable points throughout the world
through the intermediary of the machine. This perception is not much more automatic than perception by sensory organs (Simondon L’individuation psychique et collective a la lumiere de forme, information, potential et metastabilite 1989, 287).viii

Simondon insists that the splitting or staggering of relation to world (and others) associated with machines is ‘not much more’ automatic than sense perception itself, nor does it eliminate relation to the world. Rather than direct symbolisation, there are staggered ‘levels of symbolisation’ associated with technological action. These levels of symbolisation are not in opposition to symbolisations found in religion, politics, media or popular culture. Rather they re-distribute or spread them at specific points of intersection.

An understanding of ethical action could be derived from this point. An technological act resonates to the extent that it enters into relation with other acts by virtue of the technicity it engages with. This engagement does generate symbolisations and I-Other identities. But the symbolisation and identity would be generated through resonance of acts with other connected acts. Perhaps what ‘Beacon’ symbolises then is not the breakdown of self-other relations posited by Augé, but how the reticular reality of technological action distributes itself around privileged sites and moments. The emergence of identities in this context is intrinsically collective because acts are linked to other acts, and transformation of self accompanies potential transformations of others.

So too, a mode of thought and a method of investigating cultural situations could base itself on technological action. The notion of problematic situations proposed by Paul Rabinow suggests that power-saturated social fields precipitate unstable interplays of truth and falsehood. Tracing the outlines and shadows of a problematic poses specific analytical challenges because it bears within it specific forms of intelligibility. Things make sense within a problematic. The examples introduced in the discussion above all come from the relatively limited but prominent domain of Internet and personal computers. This domain of information technologies is highly saturated with power relations, and has demonstrated many interplays of truth and falsehood at different levels over the last few decades. Many hopes, expectations, formations of identity, value, norms and commodities have been associated with it. The implication of technological action is that thought cannot respond to an entity (artistic, political, social, ethnic, technical, religious, etc) in genesis without performing an accompanying or analogous individuation. Even ordinary perception is individuation since it modulates, albeit often minutely, relations between the perceiver and milieu. An observer receptive to singularity undergoes a genesis connected to that occurring in the domain in question. To the extent that following technological action tentails individuation for the thinker, technological actions have no pre-constituted observers.

Finally, certain technological actions, despite the relatively instrumental function often attributed to technology, point toward a different development personhood. Wtechnological action generates an a material-psychosocial point of connection to self that only secondarily relies on social norms, Simondon suggests,

[a] technical operation achieves in effect what work or other functions of communication cannot fulfil: the reactivity of the act. Constructive activity gives to human beings the real image of the act because what is in the moment object of construction become means of a further construction thanks a permanent mediation. It is this continuous and open regime of the time of technical effort that permits an individual to have a reactive consciousness of her own action, and to be her own norm. (Simondon L’individuation psychique et collective a la lumiere de forme, information, potential et metastabilite 1989, 264).ix

On occasions when it escape governance by norms of work, community or consumption, technological action allows an individual to glimpse their own actions outside any framing by
social function or norms. ‘the passion of a computer programmer, who, in order to invent the way a situation becomes “processable” by a computer, must submit to a becoming that transforms him into a mediator, site of coinvention of the situation and language’ (Stengers 2000, 112). Rather than technological action becoming ‘hallucination’ (Augé’s term), this exposure to a ‘continuous and open regime of time of technological action’ cannot be reduced to social norms.

**References**

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Par l’intermédiaire de l’objet technique se crée alors une relation interhumaine qui est le modèle de la transindividualité. On peut entendre par là une relation qui ne met pas les individus en rapport au moyen de leur individualité constituée les séparent les uns des autres, ni au moyen de ce qu’il y a identique en tout sujet humain, par exemple les formes a priori de la sensibilité, mais au moyen de cette charge de réalité pré-individuelle, de cette charge de nature qui est conservée avec l’être individuel, et qui contient potentiels et virtualité.

Il n’y a pas d’auto-regulation purement interne, entièrement isolée; les résultats de l’action sont des résultats non seulement en eux-mêmes mais aussi par leur rapport au milieu extérieur, à l’ensemble. ... Le type de mémoire et le type de perception qui conviennent à cet aspect de la régulation nécessitent l’intégration, la transformation d’a posteriori en a prior que le vivant seul réalise en lui.

l’objet technique concret est celui qui n’est plus en lutte avec lui-même’

This immaterial labor constitutes itself in forms that are immediately collective, and we might say that it exists only in the form of networks and flows. The organization of the cycle of production of immaterial labor (because this is exactly what it is, once we abandon our factoryist prejudices-a cycle of production) is not obviously apparent to the eye, because it is not defined by the four walls of a factory. The location in which it operates is outside in the society at large, at a territorial level that we could call “the basin of immaterial labor.” (Lazzarato 1996, 137)

Technical objects can permit transindividual rather than interindividual relations to emerge in collective life. The emphasis of existing social accounts of technology rests on interindividual relations hold between constituted individuals in functionally differentiated zones of a social field. Transindividual relations pertain to the individuation of collective life rather than the reproduction of existing social functions. Individuation of collective life structures pre-individual reserves that individuals carry insofar as the not fully individuated. In the same that a technical ensemble carries pre-individuated reserves, collective life, rather than being determined through a social contract or cohering through formations of sovereignty, can be understood as a process of individuation of what is in common but not yet individuated in a group of individuals. In the case of technical ensembles, the transindividual dimension would mean that technical objects become involved in the structuring of collective life.

En effet, les normes techniques sont entièrement accessible à l’individue sans qu’il doive avoir recourse à une normativité sociale’

With some notable exceptions such as Walter Benjamin, critical responses to technology, such as Heidegger, the Frankfurt School thinkers, and poststructuralist theory, maintain a radical separation, even an opposition between technological action and reflective or critical thought. Critical thought was predicated on the assumption that the conditions of perception, representation, conceptualisation and judgment are themselves separate or detached from the technological practices and contexts in which they were located. Such an assumption persists in much contemporary critical theory of technology (Feenberg, 1999; Poster, 1990) and in many attempts to regulate or normalise technology, ranging from advertising to government legislation.

La présence de monde n’est donc jamais éliminée par l’utilisation de la machine; mais la relation au monde peut être fractionné, et passer par l’intermédiaire de plusieurs étages de symbolisation, à laquelle correspond une construction technique qui répartit au long du monde des repères valables selon une perception par l’intermédiaire de la machine; cette perception n’est pas beaucoup plus automatique que la perception directe par les organes sensoriels.’

L’opération technique réalise en effet ce que le travail ou les autres fonctions communautaires ne peuvent réaliser: la réactivité de l’acte; l’activité constructive donne à l’homme l’image réelle de son acte, parce que ce qui est actuellement objet de la construction devient moyen d’une construction ultérieure, grâce à une permanente médiatisation; c’est ce régime continu et ouvert
du temps de l'effort technique qui permet à l'individu d'avoir la conscience réactive de sa propre action, et d'être sa propre norme. En effet, les normes techniques sont entièrement accessible à l'individu sans qu'il doive avoir recours à une normativité sociale.'