4 'Things ain't the same anymore'

Towards an anthropology of technical objects (or 'When Leroi-Gourhan and Simondon meet MCS')

Ludovic Coupaye

Introduction: the printer, the car and the doll

Just before leaving the office to go and pick up my children at the nursery, I decide to print one of the earlier drafts of this paper, to edit it on public transport. I deftly press the 'Ctrl' and 'P' keys on the keyboard and a new screen replaces the one where the document was visible. After a quick glance to check whether the correct device is selected, I click on the small icon showing a printer. I then pick up my wallet, which holds my staff card, walk out of my office and along the corridor to the place where the multifunction printer stands. Opening my wallet to avoid interference with the signal sent by the machine with my debit and travel cards, I place it over the small square attached to the side of the bulky machine. With a beep, the small screen on the top of machine lights up, showing images and text, including my staff ID code. I touch the part of the screen that reads 'pull print,' prompting a new beep, and a new screen appears, showing a line with the document's title. I touch the side icon that reads 'print all' and the machine comes alive: a fan starts somewhere, clicking sounds come from its inside and the tray on the right side rises automatically up into position. In a fairly rapid and rhythmic succession, the pages of the chapter are expelled onto the tray as the draft appears in printed form. Suddenly, the machine starts emitting a sort of wheezing noise and stops, beeping alarmingly. Startled by the signals, I wonder what is going on. The printer's screen now shows a red band marked with an 'X,' and an image of itself, with animated instructions about opening specific panels in order to remove a sheet of paper that seems to be jammed in its complex series of gears and rolls. Deciphering the instructions, I bend, locate the panel and open it. Having found the guilty sheet mysteriously trapped between rolls, I pull it out. I close the panel, the machine beeps, but now the screen indicates other panels to open and check. Cursing more or less silently (I can feel that time is fleeting), I comply, not finding any paper jam, and after several frustrating minutes, the printing resumes. Once it is done, I grab the small pile of paper and run back to my office. I am now running late, and I consciously blame it on the machine.

An analogous reaction was recounted by Alfred Gell, in his posthumous ground-breaking opus on the agency of art (1998). He described how,

should his car break down, he would consider it as an intentional act of treason, perpetrated by the car itself (ibid.: 16–19). These particular situations, where humans impute to objects forms of capacity to initiate events in their surroundings, invited him to use the concept of agency, summarised by Daniel Miller as a 'theory of natural anthropomorphism, where our primary reference point is to people and their intentionality *behind the world of artefacts*,' based on 'inferred intentionality' (Miller 2005b: 13, my emphasis). Gell's theory of agency was extended to other types of artefacts, such as the relationships a little girl has with her doll, or paintings. While it appeared as an almost universalist theory of things, agency had two sides: one was a sort of retro-projection of human-like (or living-like) capacities onto an object encountered; another one was about a direct efficacy of patterns and shapes on the viewer's cognition, a theme that Susanne KÜchler (Chapter 9) develops in relation to the idea of objectification. In this chapter, I focus instead on Gell's conception of agency as being the effect of a '*causal milieu* generated in the vicinity of an agent [assuming] a certain configuration,' interpreted as the index of 'the presence of another agent' (Gell 1998: 20, my emphasis).

By contrast, Bruno Latour's examination of artefacts offers a view from the opposite end (1991, 1998, 2000). Actor-Network Theory (ANT, hereafter) investigated how objects such as the lock on the door at a youth hostel or an overhead door-closer translate social (political, moral, ethical) intentions into a 'programme of actions' (Latour 1991, Akrich 1992) designed in the artefact (see also Schüll 2012), orienting human actors' behaviours. ANT's project was profoundly and primarily political, based on symmetrical examination of the participation of both humans and non-humans in social life, with an analytical focus on social mediations derived and solidified by technical arrangements, while simultaneously balancing simplistic social constructivism and material determinisms with an ontological pluralism.

Both approaches were part of a wider anthropological project that investigated artefacts from the angle of their social (or cultural) roles, lives, effects, and designs, as Sautchuk summarised (2019: 179–181). It is fair to say, however, that for both, the main horizon was an anthropic one: Gell sought to investigate social relations in the vicinity of art objects, while ANT sought to demonstrate how society was made durable (Latour 1991). In other words, relations were primarily understood from the angle of human sociality, located within or around the material and the technical, either as an effect, behind or before the artefact, or as a type of assemblage of human and non-human actors.

Yet, this sociological focus, by placing the 'social' as their main horizon, also implicitly left 'the technical' as a secondary counterpart (a 'secondary agent' in Gell's phrasing, or as 'co-actor,' as Latour suggested), a sort of material figure out of a social background (see also Ingold 2008 and particularly Sautchuk 2019). As a result, it remains difficult to ascertain whether, analytically, the agency the printer (or a robot, or space station) is different (or not) from the one from a doll, a door closer or a pen. Their material and technical particularities are dissolved within the type of social relations/

lives they emerged from, manifest, generate, translate, transduce, and so forth. By qualifying them as social beings – or at best sociotechnical ones – their agency, in particular of the political kind, appears as affected by their materiality insofar as their design (a term that equivocates a social process of making and its result) more or less successfully manages to synthesise (more or less democratically) *predefined intentions*, be they social or psychological. Our investigations of politics, ethics, or justice, thus almost necessarily ends up seeking how the ‘social’ is indeed made durable, but within, behind, or beyond a ‘technical’ ontological ‘other.’ It is as if, wary of the spectre of technical determinisms, we would prefer identifying the main agency of technical objects (be they tools, instruments or digital objects), as having a ‘social’ source.

In this chapter, I wish to investigate the possibility of recognising and describing the alterity of technical objects’ agencies, in particular their specific ‘technicity’ as an ecological and historical modality of relations qualitatively *distinct* (but *not* separated) from human sociality itself. Pushing further Gell’s and Latour’s initial leads to specify the relations happening in the vicinity of emerging contemporary technical objects might require that, alongside the category of inferred agency, I add an agency that emanates thus from the ‘technical’ object itself, not solely in social terms but also in its own ‘object’ terms. This includes thinking of processes of objectifications, as Küchler invites us to do, as well as elucidating the specific vernacularity of objects’ lives – their modes of existence, which would not presuppose the uniqueness of human sociality. This means proposing ‘a technical life,’ not in opposition but alongside a social one (see Drazin, Chapter 5), a specific ‘technicity.’ This, is particularly crucial if we want, as Haidy Geismar suggests (Chapter 6), to elucidate further the actual ‘role of form or materiality in constituting sociality and meaning.’¹

‘Technicity’ was the central point of entry in both Gilbert Simondon’s² (2005, 2017[1958]) philosophical work on the mode of existence³ of ‘technical objects’ (TO, hereafter) and André Leroi-Gourhan’s work on technics⁴ (1971[1943], 1973[1945], 1993[1964]). For both authors, technics were a human horizon *in themselves*, not only because of the role they played in human phylogenesis, or the continuity it could present with non-human species, but because of the increasingly concretised, objectified and hegemonic place technics occupied in the mid-twentieth century.

This chapter is my first attempt at investigating further the ways in which industrial complex artefacts, though resulting/instantiating pre-existing social relations, as the Social Construction of Technology approach demonstrated (e.g. Bijker et al. 1987; Bijker 2010), nevertheless contains specific modalities of mediations, through a reading of Leroi-Gourhan and Simondon. I wish to try enriching Gell’s conception of agency and ANT’s conception of programme, not from a sociocentric angle, but as being materially shaped by them. In other words, investigating what would a proper non-anthropocentric relationality look like. I start instead, thus, from the agency emerging as a

specific field or effect as the materialisation of sets of topological and self-regulated causal relations, or resonances, internal to the TO, which include processes independent of the human agent engaging with it. By doing so, I hope to delineate the extent to which TOs exert their own (vernacular) agency onto a human actor and beyond. I thus choose to start by focussing on the particular *functioning* of industrial TOs, as an analytical entry point.

The functioning of technical objects vs. their function

One of Leroi-Gourhan's and Simondon's main premises was to challenge the apparent discreteness and fixity of TOs, a conception that has long fed both the analysis and museum presentations of artefacts (see Schacter, Chapter 14; Coupaye 2018). For both, an analysis of artefacts could not do away with the history of their evolution. Yet, far from any evolutionist theories, their view was not teleological, but was based instead on a Bergsonian understanding of temporality and potentialities, as virtual vectors of change and exchanges between entities (organisms) and their milieus, from which specific objects emerge as 'points of concurrence' or temporally situated iterations (Simondon 2017[1958]: 25–44, 124; Leroi-Gourhan 1971[1943]: 21–42), a mode of becoming that Simondon qualified as 'individuation.'

As a result, 'technical objects' can be defined as things coalescing as a locus of exchanges between humans *and* their milieus, as physical and/or sensory mediators. As such, this category encompasses the range of tools, instruments, and devices created and used by human beings to materially interact with themselves and/or their environments, from a knife, to a camera, a ritual carving, or an algorithm.

This position as mediators of human agency is not restricted to 'modern' objects and does not allow a complete separation of industrial, mechanical, and automated 'hi-tech' objects from 'low tech' or even ritual objects (Simondon 2005: 86–99).⁵ Instead, Simondon, in particular, is concerned mostly with objects intentionally taken, made or designed to play a role in what Mauss would define as technical actions (1973[1935]: 75), that is, actions that are materially 'effective' (an efficacy vernacular to the actor) and 'traditional' (the product of historical dynamics of transmission and change). The term 'technical' here occupies an important analytical position, as 'whatever is woven together by the highly specific trajectory of "technical" moves becomes "material" as a consequence,' as Latour noticed (2014: 508). 'Technical' objects are thus supposed to extend human bodily and cognitive capacities in order to perform tasks or a set of tasks, or more generally to engage with the world.⁶

Forging the tools for an ethnographic investigation of contemporary TOs that both outline their anthropological import, as well as their particularity within the field of material culture, thus requires focussing on the materiality they encapsulate and importantly the vernacular – ethnographic – specificity they manifest in themselves. In order to discuss the particular type of agency they convey, not in the form of intentionality inferred from the point

of view of a human actor, but from the one built in or delegated, I suggest investigating the actual *functioning* of the object itself.

This is profoundly different from the study of *function* and/or use (consumption), both relations being inherently social, as Drazin reminds us (Chapter 5). As such, the functions and roles of whole TO might not be sufficient to reveal their historical specificity, or to show what makes the difference between a doll and a car, or a printer and a pen. The ‘delegate’ (or in Gell’s terms, the ‘secondary agent’) does not passively convey the ‘programme,’ but because of its existence within a milieu, it also behaves following its own rules and orients the ways in which actors engage with them (a point adumbrated both by Geismar and Knox, Chapters 6 and 8). Within social relations happening in the vicinity of a TO, some are indeed the result of human inference, but other relations also emanate from the encounter of human actions *with* the TO and its behaviours.

Completing Gell’s proposal, thus requires examining this *functioning*, that is the modes of interactions (relations), between the different components of a TO (at the most basic level, a blade and its handle; at a most complex one, the long and complex network that links together a keyboard to a mechanical device that grabs paper and burns ink on it). Taking my own vignette, these different components of a TO indeed fulfil specific *internal functions*, as organised relations between themselves (rolls and gears) as well as with the whole object (the printer).

This is neither an easy nor a comfortable task for anthropologists, who are predisposed to assume the pre-eminence of the social or cultural meaning within a given field of enquiry. Indeed, the difficulty lies in the way investigating a functioning requires a minimum of specialised knowledge (such as mechanics, engineering, electronics or programming) because the complexity of the type of TOs we are dealing with in this chapter often goes beyond the one found in a knife, a pencil or a spear-thrower. The discomfort comes from the spectre of technical determinism raised by the analytical moment, suggested by Simondon (2017[1958]: 25–26), which suspends social and cultural domains, discourses and interpretative moves, in order to examine the ‘technical.’ This ‘suspension’ is however crucial to avoid implicitly validating the social/technical divide and, instead, perform an analytical move in a dialectical process in which both thus can be put *back in phase* (Simondon 2017[1958]: 173–176). This ‘suspension’ of the ‘social’ is thus a requirement to reveal whether the type of relationships happening in the vicinity of the objects can be seen as a particular milieu generated by what is happening *inside* the object in order to identify its actual contribution to sociality.

In Gregory Bateson’s cybernetics terms, this corresponds to paying attention to the *code* instead of the *message* (1972: 103).⁷ Indeed, by suspending hermeneutics or semiotic analyses, the aim is instead to outline what type of ‘agency’ emerges from the medium, objectified through its functioning and the type of ‘causal milieu,’ as Gell coined it, it generates in its vicinity. For Simondon, the mode of existence of a TO comes thus from the emergence (ontogenesis)

of a specific combination of several functioning principles (concretisation), as deposits of both the history of technics and the synthetisation of several modalities and principles of actions (actualisation of technical principles or lineages; in the case of the printer: digitalisation, mechanics, optics, etc.). For anthropologists, it means, investigating this mode of existence *as well as* the results of the intersection of human intentions, material conditions and forms of vernacular logic.

Inside and outside the technical object: at the intersection of milieus

I have sent the command from my computer, made sure it got accepted by logging on to the printer, and the rest of the process follows 'causal actions' that transform the digital information I have sent into a series of electronic signals which, running physically through a sequence of devices, activate the complex set of rolls, grab the sheet, and control the movement of the laser, which organises the distribution of toner to form signs on the paper. Once I have activated my 'user profile' and pressed the 'print' icon, I have no control in the sequence of events that occur inside the machine. All is dealt with by the processors following a predefined and fixed programme regulating in a predetermined way the circulation of electricity animating the rolls and controlling the movements of the laser beam charging the OPC drum, in turn capturing the toner before depositing it onto the paper. The printer acts as a mediator between my intention, the whole network and the printed paper. But it also directs my own actions: I have to start the process, to leave my office and go to the actual machine, to use my staff card and, in the case of a paper jam, to spend time sorting it out.

Such technical objects, as both Leroi-Gourhan and Simondon suggested, are not only mediators of human intentions, but their functioning also generate an operating *milieu* around them, through what and how they do things, what they demand and require to work, as well as what they afford. The concept of 'milieu,' by analogy with biology, plays a crucial role in both Simondon's and Leroi-Gourhan's understandings of technics. It can be summarised as a global field in which an entity (living organism or technical object) is immersed and with which it interacts but also upon which its existence depends (Bateson 1979). As an environment, which can be internal or external to an organism or, in Leroi-Gourhan and Simondon's work, a TO, the concept of 'milieu' implies relations of mutual and recurrent causalities within and around the TOs. As such, implicitly, both authors invite us to develop a form of ecology of TOs as the study of relations between machinic 'organisms' and their surroundings (including other organisms).

Both break down this notion of milieu into interrelated ones, in order to specify the different effects of relations of technical innovations. Simondon and Leroi-Gourhan both identify an 'external milieu' (fundamentally spatial, geographic and natural), to which Leroi-Gourhan adds an 'internal milieu' (cultural), and Simondon a 'technical' one, which includes existing technics

and TOs (Leroi-Gourhan 1973[1945]: 333ff; Simondon 2017[1958]: 54–59; see also Audouze 2002).

To these three interrelated milieus, we can also add what Simondon defines as two resulting and related effects. First, an *internal resonance* of the TO – emerging from how the different parts of the printer have come to be coherently and synergistically organised to function together in relation to the whole object.⁸ In other words, complex TOs coalesce as several technical principles brought in coherent equilibrium, but also potentially generative of further developments. Second, crucial for Gell's notion of agency, the TO also generates an external resonance, which Simondon coins *associated milieu*. This associated milieu is a sort of the vectorial product of the internal resonance of the TOs and the world outside its physicality, resulting in the (material, social, psychological) enrolment of the object's vicinity – that is, the vicinity around the TO becomes thus enrolled and part of the existence and functioning of the TO.

Simondon identifies the relations between a TO and its various milieus, in terms of mediations of two analytical categories, 'energy' and 'information',⁹ adapted from his critical reading on cybernetics.¹⁰ For living beings in an evolutionary perspective, the requirements for these two exchanges led to the phylogenesis of 'effectors' (such as claws, beaks, fins, legs, hands) and 'sensors' (sensory organs, including those dealing with vestibular and proprioception). In human beings, both have become increasingly mediated as processes of externalisations (Leroi-Gourhan 1993[1964]). On one side, effectors became externalised both as prosthetic extensions (that is, material), and mediums of action (e.g. the knife as externalisation of the teeth; Leroi-Gourhan 1993[1964]: 90), that Simondon qualifies as 'tools.' On the other side, technical externalisations of the senses (e.g. the telescope as an extension of the eyes: 2017[1952]: 130–131, 2005: 88) leads to the emergence of 'instruments' (e.g. sounding line, stethoscope) or 'sensors.' This idea of externalisation the physico-biological role of effectors and sensors allows us to rethink the question of agency through, on the one hand, the ways bodily capacities (which includes language and memory) are not only extended beyond the body but also crucially reframed into specific modalities of internal functioning and, on the other hand, the material effects of delegations. Indeed, Simondon indicates (2005: 89–92), these modalities of externalisation become materialised in three 'relational functions' of the living organism and its milieu: (1) prolongations of effectors or sensors (that is the extension of the reach achieved by a rope, a stick, or a telescope); (2) transformation of the action (direction, velocity, intensity, and/or even materiality: such as from kinetic to electric or chemical); (3) isolation (such as fur, gloves or tongs that can protect from low or high temperatures, dirt, shocks, wetness, and so forth.).

TOs emerge thus not only as combinations of the two categories of relations (effectors, as medium of actions; and senses, as medium of information exchanges), but also as various combinations of their three 'relational

functions,' as the materialisation of specific ecologico-historical relations. Importantly, to be able to act *in an effective way* (in a Maussian sense) as mediators between human actors and their milieu, these three relational functions and their combinations must be structurally organised within the TO so that their respective intended and unintended effects (heat, noise, vibrations, etc.) are in synergy and in equilibrium, in a way analogous to the organs of living beings, creating an *internal resonance*.

It is this generated internal resonance, a set of topological self-regulated causal relations, materially constitutive of the TO, and the ways in which its structure relates to its functioning, which potentially constitute the main analytical point of entry into complex TOs. Indeed, in simpler tools and instruments, the main sources of both energy and information are external to the TO, often in a human actor who operates the object, giving it its force (energy) and direction (information) and interacting with its operational mode (a knife held in the hand, see Sigaut 2012). In the medieval windmill, while the main source of energy came from the wind, the miller's action was required and determinant in positioning the tail pole to orient the arms into the wind and maintaining the internal components, making the miller the main provider of information. The human actor was thus a functioning part of the TO itself.

As complex objects become more autonomous in both information and energy transfers, as they become associated with both separation of knowledge and skills and hierarchical organisations, the role of human actors from essential co-actor of its functioning is increasingly transformed into ensuring and controlling that the 'vicinity' (material and social) of the TO support their proper functioning (clearing the paper jam). In the case of my engagement with the printer, my role as actor becomes limited to the supply of basic commands ('Ctrl+P,' click, going to the printer, press, log in, etc.) and material (replacing paper), and following the machine's commands to clear the jam.

In a way that feeds technical deterministic interpretations, the agency of the machine directs my bodily actions, an agency that I experience as a form of political effect of alienation (Simondon 2017[1958]: 16, 133–134), and which Langdon Winner summarised as reverse adaptation (1985[1977]: 226–236). Indeed, combined with the emergence of industrial capitalism and its particular ecological-historical ethics, research on 'efficiency' (as the ratio of exchange of information and energy in quantified terms and in velocity) lead to the design of complex TOs, in which these relations become more detached from the actors, and delegated to the modalities of functioning of the objects (Simondon 2005; 2017[1958]: 79–81).

If I were to copy out what I have typed on my screen with a pen and piece of paper, it would definitely take more time than printing it. Instead, I have delegated the materialisation of the words on the screen to a chain of causal actions and information transfer, which – using the electrical energy grid and the digital network set by my institution – is transmitted to the printer. In turn, the printer's chain of internal effectors and sensors, verifies that it is actually

me (or a human delegate with my staff card) who is standing in front of it, before automatically operating the transfer of the digital code into a printed paper. If I were to use a pen to copy out the chapter, I would be involved in a bodily relation with the pen, the ink and the paper in each element of the scripting of the second copy, but with the printer, I am excluded from the functioning of the machine.

Processes of delegations in modern TOs include and go beyond the translation of a (social/moral) programme as defined by ANT. From this ecologico-historical perspective, increases in complexity require also increasing in the internal structuration and self-regulation of effectors and sensors, in order to deal with the counter-effect of each of its components and functions, which inherently also generate an exclusion (alienation) of bodies from the functioning of the machine. Not only is '[t]he machine [...] a deposited human gesture that has become a stereotypy and the power to restart' (Simondon 2017[1958]: 151), but it also implies new forms of temporality when it comes to memory ('information') and power ('energy'): indeed, among the main criteria that govern their conception is the velocity of operation, the limit of which was, until recently, set by human agents, as the factory line scene in Charlie Chaplin's *Modern Times* (1936) sarcastically shows. To fuel such velocity, power (and, increasingly, information) cannot come from human agents anymore, but must be *harnessed* from other sources. This is where automatisa-tion, auto-correlation takes the shape of 'autonomisation.'

The functioning of modern TOs comes thus from the creation (the origin of which is definitely social and historical) of an *internal structuration* made out of increasingly complex assemblages of functions of prolongations (delegation), transformations, and isolations, all in charge of operating the exchanges of information ('commands,' 'programmes,' 'knowledge') and energy (causal actions, 'power,' agency), independently from human experience and actual agency. In turn, the functioning of TOs generates around it an *associated milieu* that extends its reach by materialising in complex infrastructures (see Larkin 2013; Knox 2017), notably to 'the environment.' It also both excludes and orients human actions in specific ways,¹¹ which cannot only be accounted from the angle a simple inferred agency or a hermeneutic of machines as metaphors for society. Instead, we might also need to take into account the ways in which our inferences, our bodies and our interpretations of the world are not only shaped by TOs but also excluded from their functioning.

The politics of technical objects and the object of technical politics: removal and isolation

I use 'politics' to refer to relations framed by conceptions of governance through control (power) and justice (fairness), and to interrogate what does Simondon and Leroi-Gourhan's analytical move could bring to the old question of the politics of artefacts (Winner 1986) in a way which would extend Gell's and Latour's existing analyses of agency.

It might start with recognising that TOs appear *intrinsically* as the actualisation in material forms of ecologico-historical relations between living beings – in my case humans – and their milieus – as they have been since the origin of the human species. This relationality can make them political entities, as ‘society made durable,’ indeed, but also as ‘culture’ given material (efficacious) shape as George Kubler wrote (1962).¹² As efficacious and historical (in the Maussian sense) concretisations of technical relations, their status of co-actors invites us to question simple issues of governance.

Take the agency of the printer/photocopy machine at the end of my corridor. It is not only different from the one emanating from a pen, but it also materialises a technicity – a historically situated ‘mode of being,’ as Sautchuk summarises (2019: 182) – as a specific relation explicitly political/ethical/moral: the amount of energy and paper consumption, and of resources for the maintenance of individual printers led my institution, in 2013, to decide to stop supporting individual printers for moral and financial reasons.¹³ This is where, indeed, the social reappears, not solely as the origin of the design, or a pre-causal inference originating from a distant human agent, but in a Maussian physical and bodily technical form. The delegation of printing to collective devices might contribute to saving energy and paper, but it simultaneously has a direct effect on my body and my mind as I have to physically walk there to print (and queue, should someone else be already there).

In this bodily encounter, it is not mechanical relations nor automatisations inside the printer that are fundamentally anti-democratic (there are indeed mechanical relations in hand writing between pen, paper, ink, hands and eyes for the words to appear and ideas to take written or drawn shape). TOs’ three relational functions of prolongation (externalisation, delegation, extension), transformation (translation), and isolation (protection) start to appear, however more explicitly political, when their effects extend to other entities, particularly living beings, privileging predefined forms of governance, as ANT has demonstrated (Akrich 1992).

From the angle of agency, TOs (particularly those that perform automated decision-making processes, such as algorithms), AI and their concretisation in smart machines such as driverless cars or targeted adverts, can no longer be seen as simply neutrally mediating power relations between what Gell identified as agents and patients, or ANT’s ‘actors.’ Building on these approaches, one can try to specify what happens when the particular functioning of TOs relies increasingly on autonomous and self-regulation processes, not only translating but in fact removing further away the delegation of the programme from its social origin. The recursivity of the ‘sensors’/‘effectors’ relations, which include knowledge acquisition, as Hannah Knox shows (Chapter 8), decision-making and action, make these fully externalised, translated and operated by, and through, the functioning of the TOs, and leaves humans’ interpretative and imaginative capacities and their performance excluded from the actual operation (Simondon 2017[1958]: 139–141; see also Ingold 2000).

I feel the isolation might be the key relational function here, as it indeed can lead to a profound alienation (and at times submission) of *both* the actor *and* the milieu from this materialised ecologico-historical relation. First, within such technicity both living beings and their environments thus risk being confined in their role as being enrolled in the *functioning* of the TOs (as supervisors in charge of their maintenance, as resources that need to be extracted to provide energy and/or information, as users who have to adapt to the functioning). This ‘associated milieu’ can thus generate a form of ‘reverse adaptation,’ where the role of humans and non-humans as actual partners and co-actors of their effects is not solely constrained by the type of technicity manifested in the object but also directed by it. Second, when the TO both excludes the patient from its functioning of decision-making and isolates further the primary agent from the interaction, it obfuscates and befuddles the possibility of tracing agency back to its source – the actual agent accountable for the action. This can indeed be experienced as a form of unilateral violence – a ‘sorcery of technics’ of a sort, to reuse Gell’s imagery (1992). I take my point from Gell’s example of Pol Pot’s landmines (1998: 20–21), which do not really compare *anymore* with smart weapons. The decision to place a mine in a specific spot was ultimately made by a human, even when ordered so by Pol Pot through a long chain of command that isolated the soldier from the dictator. When an algorithm can (and might) make landmines decide whether they should deploy and where, and whether they should explode or not under a pre-defined walker, accountability will become complicated to attribute: is it to the mine itself (which seems to have decided by itself to explode), the coder of the algorithm (who programmed the conditions for making the decision), the whole software (who executed the decision), the arms company (who designed the device), the military chain of command (who bought them), or to the whole political regime that authorised their use? Perhaps we should look instead into the technical politics, the actual historically situated *choice* made by a collective of humans and non-humans to generate a technicity where an algorithm *isolates and excludes human choices and responsibilities* from the actual gruesome result.

It is important to remember that, in itself, technicity, as materialised modes of relation made intrinsic to TOs, does not necessarily create inequalities, even when its agency comes from the translation of an explicit moral programme delegated by humans. But we might have to scrutinise further how collective and networked associated milieus, stemming from the reproduction of ‘technological frames’ (Bijker 1989), based on automatised (self-regulated) hierarchy and control, actually privilege the emergence (ontogenesis) of objects whose functioning and effects stabilise/justify power relations (see Schüll 2012), both intended and unintended.

It seems to me at this stage that inequality emerges when the ontogenesis of the TOs realises a form of mediation that presents *at least* the three following characteristics together: (1) when it excludes human actors to a point that their main relation with them is of subordination to its functioning rather than as a collaborator; (2) when the direction of the agency is unilateral from

the object onto the body and the mind of the human actor; and (3) when the 'primary agent' from whom originates the agency delegated is so removed that they are unidentifiable.

In addition, as Andrew Feenberg remarks,

[t]echnology is power in modern societies, a greater power in many domains than the political system itself. The masters of technical systems, corporate and military leaders, physicians and engineers, have far more control over patterns of urban growth, the design of dwelling and transportation systems, the selection of innovations, our experience as employees, patients, and consumers, than all the electoral institutions of our society put together.

(Feenberg 1999: 131)

Today, this might apply to how big-tech corporates rely on the technical logic embedded within the TOs that we engage with directly (bodily) at every moment of our lives, to unilaterally decide to impose upgrades on globally used software and mobile devices, extending the reach of their 'agency' at a planetary level. On the one hand, the development of connectedness (globalisation of Wifi, Internet of Things, AI, etc.) simultaneously extends (prolongs) human agency and requires new centres of information 'control' (data-mining, surveillance, automatic and unwanted upgrades), and energy supply (see Stiegler 2009). On the other hand the milieu generated by contemporary TOs and their interrelations is so vast and complex,¹⁴ that people are inevitably isolated – alienated – from their technicity as any complete knowledge of their actual functioning is impossible, consolidating existing forms of structural social (cultural, racial, gender) exclusions.

The particular forms taken by contemporary TOs (and their extended relational functions of prolongation, transformation and isolation) cannot be separated from the historical roles of rationality, industrial capitalism, colonialism, and global neoliberalism and sex- or race-based relations. Scholars, such as Brian Pfaffenberger (1992) portraying situations of resistance, or as Trevor Pinch and Wiebe J. Bijker, revealing the social construction of technology (1989), have adumbrated avenues for the emergence of possible forms of techno-democracy or techno-resistances. However, because of their complexity and coherence, the design of new TOs requires specialised knowledge and resources that are already shaping innovations in both science and industry. As a result, the extension, connection, and cohesion of contemporary TOs into global infrastructures might constitute an extended associated milieu within which citizen participation might be occurring everywhere in a *contact zone* (Pratt 1991; Clifford 1999[1997]).

Conclusion: towards a 'technography' of objects?

In this preliminary reflection, I have attempted to think through how technical objects manifest historically and ecologically situated forms of agency

that coexist with the ones described by Gell and Latour, and have outlined ways to bring these forms to light, using Simondon and Leroi-Gourhan's *technologies*. I suggest that objects can not only generate feelings of desire, frustration, or hate, and they do not solely translate, as Latour pointed out, political and moral programmes of action: they also create milieus, in ways that reproduce, reaffirm and consolidate privileged forms of social relations or technical politics, adjudicating which place is to be given to human subjects.

However, extending the notion of agency cannot simply lead to a post-human attribution of artefacts' responsibility and accountability for the forms of violent governance they generate in their vicinity – however modern, complex, and automatic they are. As Carlos Sautchuk summarises, after Simondon: the technical object 'not only performs a reversible mediation, but it also comprises a paradigm of the relationship between living beings and the environment and a model of the collective relation' (Sautchuk 2019: 181). It might mean investigating whether their technicity, as *situated* ecologico-historical relations materialised and stabilised within their functioning, privileges some modalities of actions that emphasise forms of isolation, alienation, exclusion, and disempowerment.

That is why I might end up still missing my old individual printer.

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Notes

- 1 This approach is not entirely dissimilar to W.J. Thomas Mitchell's work on images (2005). However, 'agency' has also be taken into critical examination and debates in archaeology, though a series of papers, either in favour or reacting against what has been called the Symmetrical Archaeology or 'New Materialism' (Witmore 2014; Lindstrøm 2015, 2017; Ribeiro 2016; Sørensen 2016, 2018). While I am also advocating a focus on objects in themselves, I feel my position being analytically different from Graham Harman's Object-Oriented Ontology (2018), which can be construed so post-human that it runs the risk of underplaying the role of vernacular theories of language and praxis. This is perhaps because of the fundamental Heideggerian quest of [universal] ontology and a lack of anthropology, in contrast to Leroi-Gourhan's and Simondon's positions, for whom emerging processes and potentialities are so capital that they approached artefacts as both diachronic and synchronic evolving complex

entities in ecological relations with their milieu. As anthropologists, we cannot reject the relations between emic imaginations of language (categories) and practices (See Geismar this volume for a similar caution vis-à-vis this form of New Materialism). Most importantly, we should not forget that our own modern categories, though dominating the contemporary world, are themselves vernacular. *At this stage*, I am more inclined to examine closer Karen Barad's 'agential realism' (2007), possibly in a cross-reading with what Simondon and Leroi-Gourhan are suggesting.

- 2 See Yuk Hui's 2013 paper on the intellectual relations between Simondon and Latour.
- 3 The concept of the 'mode of existence' finds its origin in the philosophy of Étienne Souriau (2015[1943]), whose major influence on Bruno Latour, prompted the latter to call his 'sequel' to *We Have Never Been Modern* (1993[1991]), *An Inquiry into the Modes of Existence* (2013). Fifteen years after Souriau, Simondon published his own work, *On the Mode of Existence of Technical Objects*. There are relations between the two philosophical approaches. Grounded in phenomenology, the concept also deals with question of ontology, but both Souriau and Simondon followed Henri Bergson's views on the primacy of processes over essences.
- 4 I am using here the term 'technics' instead of 'technology' because of its epistemological fuzziness (Simondon 2017[1958]: 9, n1; see also Schatzberg 2018; L. Marx 2010[1997]; Coupaye 2021), which confuses 'the theory or study of industry and of the mechanical arts' with actual devices, skills and practices engaged in technical activities.
- 5 Ancestors of contemporary complex mechanical things go back *at least* to the 2nd c. BCE, with the Antikythera, but also include siege engines, Renaissance fountains, theatre installations, as well as fourteenth-century clocks and pre-industrial water and wind mills (see Gille 1986[1978]; Brun 1985; Bedini 1964). Arguably, Gell's little girl's doll is also a mediator but of a different kind of relations than those of, say a knife or a printer, and more akin perhaps to parental care (I am grateful to Timothy Carroll for pointing this out).
- 6 In these respects, the embeddedness of technical objects within human lives is not enough to analytically define 'post-humans' or 'cyborg.' But the reverse might correspond to a particular vernacularity as I can read through Timothy Carroll and Aaron Parkhurst's Chapter 3.
- 7 Compare with Jean Baudrillard 1996[1968], whereby technics are analogous to a language [structure] and consumption to speech. To push further this idea would require re-investigating McLuhan's classic study (1995[1964]).
- 8 For the sake of space, I will not deal here with the complex concept of 'technical individuation.' See Simondon 2017[1958]: 25–26; 54; Barthélémy 2012: 213).
- 9 Information is seen here 'as the arrival of a singularity establishing a communication between levels of reality' (Simondon 1964: 130). But note also how 'energy' and 'information' are also categories vernacular to modernity.
- 10 But see Hui 2015 and Rodriguez and Blanco 2017.
- 11 It also both generates and requires a general technical milieu which frames the reproduction and appearance of new technical objects in specific directions and along specific paradigms, only rarely shifted by true inventions (see Leroi-Gourahn 1971[1943]: 376–394; Simondon 2005). Hence, the limit posed by Moore's Law on the miniaturisation of processors, might indeed require the shift to quantum processors, instead of the electronic ones.

- 12 Importantly, but outside of the scope of this chapter, they also contain within themselves potential for other emerging forms and relations (Simondon 2017[1958]: 25–81).
- 13 In the summer of 2013, UCL Information Services, as part of a contract with Xerox, implemented the print@UCL service across the university, both in student and staff areas, removing their support to individual printers that staff had in their office.

This service uses ‘pull printing’ this ensures that users have the conscious choice to release their document at the screen of the print device instead of it just printing out automatically as soon as the user submits it from their workstation.

(UCL ISD, email of the 03/04/19)

Alongside concerns for sustainability, the choice also included financial considerations (a contract with Xerox). By the time this chapter reached its final form, in 2019, old printers were actually replaced by new ones, whose software maintenance is done at a distance by Xerox, removing the ability of the IT person in our department to intervene on issues stemming from connections or settings, which have become automated and unalterable by any users on site.

- 14 I am not dealing in this paper with the ways in which technical objects can form ensembles or technical systems. However, extending the reflection would need to shift the analytical scale up to wider [socio]technical systems.