

Organising invention through technical mentality: Simondon's challenge to the 'civilisation of productivity'

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ABSTRACT

According to Simondon, it is through the implementation of a 'technical mentality' that a technocratic system grounded on a communitarian 'ethics of productivity' can be transformed into a system of metastable functioning *as a value*. Simondon's overall project is twofold, aiming both at a unified paradigm for the social sciences, and at a pedagogy of technics, inspired by the concept of the technical mentality. The goal of this article is to provide a conjoint and consistent analysis of Simondon's paradigm by connecting the concepts of 'organising amplification' and 'technical mentality'.

KEYWORDS

Gilbert Simondon; Georges Friedmann; technical mentality; metastable functioning; organisation and invention

Introduction

Simondon championed social values in relationship to productivity and performativity in terms of what can be termed an 'economy of metastable functioning'. The term 'metastability' is derived from thermodynamics and it defines a system whose equilibrium is characterised by potential energy capable of producing quick, progressive transformation. Normal economic productivity is a measure of output per unit of input, occurring in a closed system that tends towards entropy; and thus to the exhaustion of the internal energetic resources of the system. Metastable functioning, on the contrary, occurs in an open system capable of inventing new values, following its internal and external inputs. It is through the implementation of a 'technical mentality', according to Simondon, that a closed technocratic system of the means/ends rationality can be transformed via the genesis of political and social invention. Simondon's project is characterised by a twofold theoretical approach, which we aim at unfolding by following two trajectories. On the one hand, we will deal with Simondon's search for a unified paradigm for the social sciences, dedicated to pushing social systems towards the organising of the 'amplification' of invention. On the other hand, we will examine how the 'technical mentality' inspires a pedagogy of technics geared towards the 'amplification' of invention. Firstly, we take into consideration Simondon's search for a concept of organisation not involving pre-established finality. Secondly, we will articulate Simondon's project along lines indicated by Georges Friedmann's exploration of the relationship between the division of labour and organic solidarity. Finally, we will elaborate on Simondon's commitment to 'technical culture', explaining in particular the role he assumed that 'technical mentality' should play in cultural transformation.

The information paradigm and question of legitimation

The 1962 *Colloque international de philosophie*, held at the Royaumont Abbey, was dedicated to *Le concept d'information dans la science contemporaine*. Simondon had planned the conference, or in

Martial Gueroult's words, he had formulated its programme: 'rising step by step from the more specifically technical level to the philosophical one, passing through logic, axiomatics and the consideration of human problems' (1965, 15) (see, e.g. Iliadis et al. 2015, 297–322 on the Royaumont conference). Most of Simondon's interventions during the conference display attempts to orient the discussion to the problems he had been particularly concerned with in his thesis *L'individuation à la lumière des notions de forme et d'information* defended in 1958 (2005). Simondon's paper at Royaumont was inspired by the same goal as the thesis; **that is**, providing a paradigmatic unification for scientific research. Simondon attempted to extrapolate fundamental paradigms from the processes of modulation and crystallisation, in order to construct a general process theory, as in his *Analyse des critères de l'individualité* (2005, 553–558) and *Allagmatique* (2005, 559–561).¹ In *Individuation* he addressed the problem via a partial convergence of modulation and crystallisation, explaining the processes of individuation in terms of his theory of information.² The Royaumont paper clearly represented for Simondon a further occasion to address the same problems.

The theory of information, as he had elaborated it in *Individuation*, centres on relations between metastable systems and the 'incident signal'. It underwent no substantial modifications at Royaumont. Based on his theory of information, Simondon went on to propose three paradigms of 'amplification'. 'Transductive amplification' was proposed as a general model for understanding the generation of structures, or what Simondon had termed 'ontogenesis' in *Individuation*: 'transduction is precisely capable of creating structures starting from a homogeneous metastable milieu' (2010, 174). In *Individuation*, Simondon had already referred to 'a process of amplifying communication, the most primitive modality of which is transduction, which already exists in physical individuation' (2005, 33, n. 10). This process was intended to be the basis for a unification of the social and natural sciences.³ Simondon's paper at Royaumont, *Amplification dans le Processus d'Information* was focused, perhaps for the last time, on developing a fundamental paradigm for *all* sciences of biological derivation, termed 'organising amplification'.

When editing the proceedings of the conference, Simondon added a brief abstract, in which he summarised 'continuous modulation' and 'discontinuous transduction' in terms of the paradigm of 'organising amplification'. It is worth quoting this in full:

There are three main typologies of amplification: transductive propagation, modulation, organisation. The first does not have limits in itself; it is discontinuous, proceeds by all-or-nothing and does not entail gradation; it is irreversible; its energetic performance is quite high. The second, which is continuous and progressive, presupposes a reduction of the energetic performance of the system; it corresponds to the operation of technical modulators used for treating the information signal. Lastly, organisation, which is manifest in biological processes, is a synthesis of the former two; it corresponds to a quantum regime and functions through consecutive waves, mainly during growth processes. The three typologies provide paradigms for the understanding of complex situations. They share the primordial condition of any process of information: the existence of a metastable state and of a quasi-system [*quasi-système*] capable of effectively receiving an incident signal which modifies the equilibrium of the system rich in potential energy. (Simondon 1965, 417)⁴

Simondon clearly considered that 'organising amplification' provided a *real synthesis* of modulation and transduction: of the (i) 'continuous and progressive' amplification and (ii) of the 'discontinuous' and 'irreversible' one. Organising amplification is conceived of as a process having a precise aim; that is to say that it provides a finalised and directive form of amplification in informative processes. This model of amplification, applied by Simondon to information processes, comes from biology rather than from electronics. It indeed has paradigmatic value, especially in the psycho-social domain. A common regime of transduction and of modulation can be established when successive decisions of transduction, instead of triggering each other in a perpetual instantaneity, order themselves through auto-regulation in a sequence. Processes are oriented, instead of being undefined; and each decision takes into account the effect of the previous decisions (Simondon 2010, 170–173). Simondon's paper hereby shifts the focus to the field of the social sciences, through a 'biological' reformulation of the technological concept of information. This tendency in Simondon's thought is

not only confirmed by his notes to the Royaumont paper (2010, 174–176), but is also evident in what he stated when closing the *colloque*:

105 The idea of organising this conference derives from the fact that the notion of information, originally elaborated within the fields of some of the exact sciences and of the technology for submarine cable transmission, is now a notion that has some *fringes* [des *franges*]. It is now used out of its original context, sometimes metaphorically, sometimes abusively. However, what the borrowing [emprunt] clearly shows is the presence of a need. The usage for an emerging function pre-exists the fully formed instrument. Put differently, we wished we could demonstrate – starting from a usage which is perhaps abusive but in fact reveals an actual tendency – that a possible research path towards the widening of the notions of information and organisation, starts from the awareness [prise de conscience] of the existing needs – in the exact sciences and, probably, in less exact sciences such as the social sciences [sciences humaines] which are now organising themselves – to generalise this notion of information. This is precisely what we have tried to do. (De Possel 1965, 157–158)

110 These ideas address the legitimisation crisis in the social sciences, which in that period was *also* a central issue for the epistemological status of the exact or ‘hard’ sciences. Furthermore, there was also contention over the nature of the life sciences. After Royaumont, Simondon abandoned these issues, concentrating on his academic career, and focusing on the teaching of psychology and philosophy of technology. But he always kept questioning the political significance of a science of society inspired by biology and technics.

120 Technics and culture

The paradigmatic role of organisation and its importance in social processes also emerged, even if only in an implicit way, in Simondon’s text on *Technical Mentality*.⁵ For Simondon technical mentality is:

125 ... a mode of knowledge *sui generis* that essentially uses the analogical transfer and the paradigm, and finds itself on the discovery of common modes of functioning – or of regime of operation – in otherwise different orders of reality that are chosen just as well from the living or the inert as from the human or the non-human. (2012b, 1)

130 This paper has an explicit ‘axiological purpose’, namely contributing to the development of a technical mentality in the domain of the will and of values. This is a sort of normative research aimed to reconcile culture and technics in their social context. The problem of reconciliation of culture and technics was already essential in his *thèse complémentaire, Du mode d’existence des objets techniques*. In the *Introduction* to this latter work, Simondon defended the necessity of bringing culture to a new awareness of technics. To attain this goal, ‘more stability’ was needed in the technical domain, facilitating the integrating of technical reality ‘to culture, regulative by nature [*par essence*]’ (Simondon 2012b, 18). Simondon’s purpose is to make explicit the regulatory potentiality of technics: the achievement of this goal would allow for a reconciliation of technics with culture, promoting the birth of a technical culture. As he writes in *Du mode*:

140 ... the ideas of enslavement and liberation are still too close to the ancient conception of the human being as a technical object, and they cannot help solving the real problem of the relation between the human being and the machine. The technical object has to be known in itself in order to make the relation between the human being and the machine stable: hence the necessity of a technical culture. (Simondon 2012b, 102)

145 But what are culture and technics according to Simondon? A partial definition of culture can be derived from the paragraph of *Du mode* quoted above, where culture is seen as an essentially regulative reality; that is to say, a reality characterised by intrinsic normativity. In his paper *Culture and Technics*, Simondon makes it clear that culture is ‘a question of techniques, techniques for constituting collective or individual habits, or training in the various prohibitions and choices that define a psycho-social personality’ (2015, 18). Technics, or as Simondon prefers to call the entire domain of technics, ‘technicity’ in turn is defined as the whole of the ‘activities that harbour modes of perception and intellection, comparable to those that each culture gives to the individual by instruction [*dressage*], by means of their education’ (2015, 21). In short, culture and technics are two different kinds of activities of ‘human manipulation [*manipulation humaine*]’. This is how Simondon translates

the English expression *human engineering*: ‘They are precisely the techniques of human manipulation, for they act on human beings, whether directly, in the case of culture, or through the intermediary of the environment, in the case of activities that are generally called “technical”’ (2015, 18).

In Simondon’s terms the conflict between technics and culture is derived from the conflict between two *different technical levels*: ‘pre-industrial’ and ‘industrial’. On the pre-industrial level, technics are ‘concatenations of means in the service of intra-cultural ends’; and on the industrial level, technics ‘opens technologies to a great autonormative gesture with an evolutionary meaning that modifies the human species’ relation to its environment’ (Simondon 2015, 20–21). Simondon’s purpose is to emphasise the nature of the two different technical levels. The two ‘technics’ have different normative and regulating contents. And via organisation the two levels can be brought into productive contact with one another to produce the axiological component of the technical mentality.

In Simondon’s concept of the ‘technical mentality’, ‘mentality’ encompasses cognition, affect and will. The ‘technical mentality’ is not conceived of as ‘individual’, but on the contrary as endowed with a ‘collective dimension’. In this sense, ‘technical mentality’ can be conceived of as an intermediate dimension between technics – conceived as technicity – and culture. Technical cognitive schemas, technical affective tendencies and technical values, develop together. Thus, technical mentality can be conceived as a sort of ‘transcategorical’ amplifier of technicity. Simondon defines it as

... a transcategorical knowledge [...] [that] leaves aside the problem of the atemporal nature of beings and of the modes of the real; it applies to their functioning; it tends towards a phenomenology of regimes of activity, without an ontological presupposition that is relative to the nature of that which enters into activity. (Simondon 2012b, 3)

The ‘technical mentality’ in fact works as a ‘bridge’ between technicity and culture, in the process of constituting the ‘technical culture’.

The technical mentality possesses interior coherence in the cognitive sphere; this coherence gives it the power to offer paradigms useful in every domain of human culture. For instance, the scheme of the ‘simple machine’, formulated in seventeenth-century mechanics, worked as a paradigm for the Cartesian conception of the functioning of logical thinking. For Descartes, the human way of thinking was operatively analogical to the functioning of a ‘simple machine’. The concept of a ‘*transfer* [of force] *without losses*’, attributed to the simple inner functioning of the machine, was hereby applied to a different domain, such as the one of philosophy, without losing its coherence. This example illustrates how Simondon defines technical mentality from a cognitive point of view as transcategorical knowledge.

But affective tendencies, spread by the technical mentality, do not have the same coherence as found in the cognitive domain. For Simondon there exists a sort of inner conflict in the affective domain of the technical mentality. This conflict is derived – as in the case of the relation between culture and technics – from the difference between the two different approaches to technics. The one is ‘pre-industrial’ and the other ‘industrial’. In the pre-industrial affective conception of technics, the inventor and the manufacturer of the technical reality (i.e. the technical object) coincide with each other: the inventor in the pre-industrial context is actually the same person who constructs the technical reality. Here, the inventor is the ‘normative principle’ of the process of constructing the technical reality. But in industrial technics, the inventor is not the same person as the manufacturer; the process of realising the technical reality depends on different workers, each of whom has a precise task to attend to. The fragmentation of industrial labour does not simply cause worker alienation, but also inventor’s alienation in relation to technics.

Alienated labour and new ethics

In his attitude to alienation, Simondon implicitly is quoting from Georges Friedmann’s book *Le travail en miettes* (1956), when he states that ‘the iterative and fragmentary regime of the task of the operator in industrial production is an “anatomy of work”’ (2012b, 7). For Simondon (2014, 333),

Friedmann's book was a major reference in regards to the alienation of labour. Simondon's criticism of Durkheim's optimistic views on the relationship between the division of labour and the possible development of an organic solidarity within the Fordist mode of production, were derived from Friedmann. According to Friedmann, the 'solidarity of workers' cannot be reduced either to the organic or the mechanic forms of solidarity theorised by Durkheim (1956, 130), because no modern form of labour can create by itself 'a network of permanent connections, an organic solidarity', because all 'phenomena of solidarity [...] emerge in forms for the explanation of which Durkheim's categories are irrelevant' (1956, 141). The assertion in that the specialisation of the working functions had become much more alienating than Durkheim had ever foreseen: his 'normal' conception of 'organic solidarity' necessitated an awareness of the individual worker, that Durkheim himself – Friedman adds – would be bound to have to 'consider as "abnormal" for most of the forms assumed by labour in our society' (Friedmann 1956, 140). 'Technological' divisions have dispossessed labour of the very ground from which a collective awareness could ever emerge *within* the workplace.

Simondon concludes that technics itself has become an alienated reality because of the alienated nature of industrial organisation and its conception of labour: inventor and worker are both alienated, and *therefore* their products, that is to say technical products, tend to be alienated from culture. But we do face a conflict between two different normative realities here, that is to say industrial technics (and its implicit conception of labour) and culture. To reconcile culture and technics, Simondon does not propose returning to a pre-industrial conception of labour:

However, trying to return to directly artisanal modes of production is an illusion. The needs of contemporary societies require not only large quantities of products and manufactured objects, but also states that cannot be obtained by means of the human body and by the tool. This is because the temperatures, the pressures, the required physical reactions, the scale of the conditions do not match those of human life. (2012b, 8)

On the contrary, Simondon thinks that a possible solution for the conflict can be obtained from an empowerment of industrial production itself, pushing it to its own limits of rationalisation:

It is in this very emphasis on industrial production, in the deepening of its characteristics that an overcoming of the antithesis between the artisanal modality and the industrial one can be studied with a greater likelihood of success. (2012b, 8)

This to be achieved by developing a technical mentality in the domain of values, able to push its own normative power as far as to establish a new ethics; this is why Simondon insists that his analysis of technical mentality leads to axiology: through the technical mentality new values should develop and spread in the social system.

The new ethics would empower the technical mentality in the domains of the will and of social values; Simondon states that its basic criterion is *sincerity*. To be sincere the technical reality must not be masked under useless 'decoration' that hides its inner technical normative power. But sincerity is not specifically a value of technical mentality: it is borrowed from traditional ethics and cannot specify the originality of technical mentality. According to Simondon, the real value carried on by 'the manifestation of cognitive schemas, affective modalities, and norms of action', which characterise technical mentality can be defined by a single criterion: 'that of the *opening*' (Simondon 2012b, 13). Simondon wrote in his course on *Psycho-sociologie de la technicité* that: 'an open technical object is neotenic, it is always, to a certain extent, in a state of construction, like a growing organism' (Simondon 2014, 61). Thus the key to the technical mentality is openness; a technical reality is open, if its own processes of concretisation can be continued, perfected and completed. There are no pre-established and exogenous boundaries or prohibitions. The new ethics, based on the values of the technical mentality, will be founded on an open and modifiable normative regime. And according to Simondon, the post-industrial age offers an unprecedented opportunity for these values to impact social organisation itself.

Simondon's work often intersects with Friedmann's humanist Marxism in trusting in a possibility for institutional intervention in a 're-evaluation of labour [...] at three levels (intellectual, social, moral)' by means of the reconstruction of popular culture and a polytechnic education of the

ruling class (Friedmann 1956, 254). Simondon thought that technical reality could expand into a network structure capable of crossing different cultures and creating 'a concretisation much more rooted than the one it destroys' (2012b, 300). In *Technical Mentality* Simondon maintained that the alienation caused by the shift from the artisanal to the industrial organisation of production can only be overcome in the name of a further industrial 'rationalisation', meaning:

It is in this very emphasis on industrial production, in the deepening of its characteristics, that an overcoming of the antithesis between the artisanal modality and the industrial one can be studied with a greater likelihood of success. And this not only generally and superficially but also by means of what, within the industrial organization of production, has pushed to its extreme limits, the specialized fragmentation of human information: the rationalization of work through a series of methods of which Taylorism was the first. (2012b, 8)

It is clear that the rationalisation of industrial production does not represent a monstrosity for Simondon. More precisely, it is the only way through which the values implicit in the invention and knowledge of technical objects can become compatible with culture, operatively and affectively. This goes beyond the partial 'compatibility' achieved by artisanal labour at the level of small social systems characteristic to of the technical age. Indeed 'rationalisation' does not mean 'reduction' to the rationalisation of production, but amplification of affective, cognitive and social connections. Simondon pictures the age of informative and energetic networks not only as an era that reconciles nature with industrial technics – because 'the industrial modality [...] takes leave of the industrial centre in order to extend itself through nature' (2012b, 9) – but also as an era having new normative powers, diffused by technical mentality in the domain of values. This fact returns also in his conception of labour in post-industrial historical contexts, such as of energetic and informative networks. In the post-industrial context, the inventor reconciles himself with manufacturer and worker:

The distance between the inventor, the constructor, and the operator is reduced: the three types converge towards the image of the technician, this time both intellectual and handy, who knows at the same time how to calculate and how to install a cabling. (Simondon 2012b, 10)

In this sense, the technical mentality – embodied by the technician (or perhaps in present commonplace: 'the knowledge worker') – works as a sort of *tertium quid* between two different normative realities – culture and technics – aiding in the communication between their respective fields. This is represented in a technical mentality wherein new technical values develop and work on as paradigms before being introduced into culture generally. In *Du mode* Simondon offers a more precise definition of this new figure of the inventor-manufacturer-worker, that is to say, of this intellectual and manual technician, hereby restoring in an explicit way the notion of organisation. Simondon calls this new figure of the inventor the 'engineer of organisation'. This kind of engineer 'should be a sort of sociologist and psychologist of machines, living in the midst of this society of technical beings of which he is the responsible and inventive consciousness' (Simondon 2012a, 14). The notions of 'organising amplification' and 'technical mentality' are to be implemented by this figure whose crucial contribution consists in activating invention against closure. Invention is in this sense the common denominator of Simondon's variegated analysis of organisation, because it fulfils the proper 'organisational' role, namely the emergence of relationships deprived of pre-established finality. The organising aptitude of these technicians lies in encompassing the whole of the technical processes of the post-industrial period, and it fosters a change in the nature of labour: in post-industrial production, labour ceases to be alienated, as in the case of industrial labour, as its actors no longer live in alienated conditions.

Concluding

Simondon has called for the transformation of a system grounded in 'rational' means/ends analysis, into a system grounded in *metastable* functioning as a value intrinsic to the technical mentality. Simondon champions what might be termed an 'economy of functioning', as opposed to an 'ethics of productivity [*morale du rendement*]'. In fact, a new kind of 'communitarian ethics' is

emerging here (Simondon 2005, 526).⁶ The expanding process of such an ethics entails a 'communitarian resurgence': 'this notion [...] affects every educational system, every effort, every job':

A civilisation of productivity, despite the civil liberties it apparently allows to individuals, is in fact extremely constraining and prevents their development since, simultaneously enslaving the human being and the machine, it realises through the machine a constraining communitarian integration. (Simondon 2005, 527)

For Simondon, 'functioning' requires the opening of the system, beyond all dynamics depending on pre-established correlations between means and ends. From this perspective, the problem of providing a technical-political regulation of the human is the problem of regulating a field essentially lacking in pre-established nature and finality:

The human being is set free from her/his condition of being subjugated to the finality of the whole by learning how to produce finality, how to organise a finalised whole that she/he judges and appreciates, in order not to passively suffer a de facto integration. (Simondon 2012a, 146)⁷

What Simondon calls 'human engineering' is not primarily concerned with the effects of technosocial interventions, but rather with the threshold conditions and normativity of social becoming. Human engineering does not go very far, according to Simondon, if it is limited to the organisation of 'organs of command and control'. It must reach 'the foundation of the communication between human being and machine' (Simondon 2012a, 341).⁸ That is, the foundation of the culture of the human group, which is the 'part' of the human being-machine relation within which one of the two terms has been produced (the machine), and the other is permanently modified (man). In short, 'human engineering' for Simondon is less concerned with procedural organisation than with the integration of technical progress within the cultural milieu of the social system.

Simondon's study of the modes of existence of technical objects is aimed at developing a pedagogy of the technical mentality, in order to institutionalise the openness of the technical system. Crucial are the collective processes of individuation from which invention can emerge within the human techno-symbolic milieu of 'culture' (Bardin and Menegalle 2015, 15–16). Labour hereby becomes a real 'technical activity' (Simondon 2012b, 341), contributing to build the 'collective reality we name transindividual because it creates a compatibility [*couplage*] between the inventive and organising powers of different subjects' (Simondon 2012b, 342). Simondon aims at producing cultural integration wherein the relations with different technical objects entails a feedback effect on the understanding of one's culture and of others.⁹

Deprived of this 'reflexive' purpose and effect on culture, one comes either to a regressive rejection of technology or a technocratic attitude that in fact imposes the values of one single culture against all others. Only a diffused technical mentality can prevent, in Simondon's view, the rejection of new technicities as they intrude the normal functioning of the system, and permit, on the contrary, the integration of new technicities as the germ of political and social invention.

Notes

1. Simondon's 'allagmatic theory' resonates at Royaumont in Wiener's reference to a previous day's discussion 'with a small group', on 'how to transform the function into a structure and vice-versa' (Wiener 1965, 131).
2. This development was consistent with the assumption that an allagmatic theory 'must be in relation to the theory of information, which concerns the translation of temporal sequences into spatial organisations' (Simondon 2005, 238).
3. See Blanco and Rodriguez (2015) for a discussion of the wide disciplinary range covered by Simondon's philosophy of information, with a special stress on its actuality.
4. In fact, although the notion of 'amplification' often recurs in Simondon's texts, it will never gain the epistemological centrality which characterises the notion of transduction in *Individuation*. The same applies to the concept of 'organising amplification', although still present, for instance, in the course *Formes et niveaux de l'information* (1970–1971), where Simondon proposes again the three typologies of amplification (Bontems 2006, 323).
5. When posthumously published, the manuscript was dated 1960, but its actual draft date is a matter of scholarly debate. See Carrozzini (2011) for an analysis of the concept of 'technical mentality' throughout Simondon's

courses on general psychology and his reflections on technoaesthetics. A thorough analysis of its implications has also been offered to the English reader in De Boever et al. (2012).

6. Simondon's use of the term 'communitarian' has at the same time a psycho-sociological and biological meaning. It refers to 'closed' groups whose established normativity tends to be unchanging. It is usually opposed to the notion of 'society', conceived as a group characterised by a dynamic normativity open to further transformations. Simondon elaborates his theory in relation to Bergson's *Les deux sources de la morale et de la religion* (1932). See, in particular the *Note complémentaire* (Simondon 2005; 503–527).
7. See Bardin (2015), chapter 12 on regulation and invention as crucial to Simondon's political thought.
8. A relation Simondon describes in the same original mix of Cybernetics and Gestalt characterising the jargon of *Individuation*: 'for an information to be exchanged, the human being must possess a technical culture: a whole set of forms which, encountering the forms carried by the machine, create a signification' (2012a, 341–342).
9. 'In order to consider a stranger through culture, one must necessarily have observed out of her/himself, objectively functioning, the relation in which two beings are strangers one to another' (Simondon 2012a, 203).

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