

Governing progress: From cybernetic homeostasis to Simondon's politics of metastability

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Abstract

In this article we analyse the idea of progress and show that, since its early-modern inception, it has relied on a twofold commitment. On the one hand, it rests on a project of mathematical modelisation of natural and social reality, deterministically conceived. On the other hand, it requires the production of a stable social order capable of implementing that model. This stance, we argue, is still dominant and defines the '(hyper-)modern condition'. Following Gilbert Simondon, we take the cybernetic notion of dynamic stability ('homeostasis') as paradigmatic of the hyper-modern condition. As we explain, this core notion has covered multiple epistemic domains, including the social sciences, and contributed to reformulate the modern idea of progress within the terms dictated by neoliberal governmentality. The connection we establish between cybernetics and neoliberalism will eventually allow us to use Simondon's theory against both. In our view, Simondon's concept of 'metastability' supports an alternative understanding of progress based on the ideas of social change and the government of normative invention, which includes the opening of social systems to a future beyond their own preservation.

Keywords

cybernetics, homeostasis, metastability, progress, Simondon, Wiener

Introduction

In the theory of the artificial body politic Hobbes elaborated relying on modern mechanics, the idea of progress signalled a path for human beings that required a safe space of

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social stability, security and happiness, to be granted by his political *automaton*: ‘Felicity is a continual progress of the desire, from one object to another. . . . The cause whereof is, that the object of man’s desire, is not to enjoy once only, and for one instant of time; but to assure for ever, the way of his future desire’ (Hobbes, 2012, p. 150). Three centuries later, this time inspired by cybernetics (Oliva, 2016), Hayek imagined a similar automatic system in which ‘the correspondence of expectations that makes it possible for all parties to achieve what they are striving for . . . is brought about by a process of learning by trial and error’ operating through ‘what cybernetics has taught us to call negative feedback’ (Hayek, 1982, II, pp. 124–125). In our view, both these statements rely on an onto-epistemological stance that assumes the ‘primacy of being over becoming’ (Koyré, 1966, p. 13, n.5). This stance implies a commitment to reducing natural and social reality (ontology) to the mathematisable structures that are used to explain it (epistemology), and calls for political power to grant the progressive implementation of scientific models of order. The concept of progress is – such is our claim here – based on the idea of a dynamic but ‘stable’ order as both its condition of possibility and goal.

The article will support this claim relying on the French philosopher Gilbert Simondon’s radical attempt to critique the cybernetic notion of dynamic stability (‘homeostasis’) and develop the concept of ‘metastability’. Simondon, most known as a philosopher of technics for his *Of the Mode of Existence of Technical Objects* (1958/2017), carries on the lifetime project of reform of the social sciences inspired by a critical ‘reform’ of the cybernetic paradigm (Simondon, 1958/2020, pp. 674–699; Simondon, 2019). In his main work, *Individuation in Light of Notions of Form and Information* (1958/2020), he provides a full onto-epistemology of systemic processes of ‘individuation’ that he conceives as alternative to both the accounts provided by the Aristotelian and Gestalt notions of form, and the cybernetic notion of information. Simondon deems a ‘reform’ of cybernetic concepts as fundamental to his project and, as we are going to explain, a critique of the notion of progress plays a crucial role in it.

In several instances Simondon challenges the ‘mythical’ idea of progress born in early modernity out of an ‘illusion of simultaneity’, which ultimately reduces all apparent development to ‘a fixed state’. For Simondon this idea of progress is ‘mythical’ for two reasons. Firstly, because it implies an idea of unidirectional change (‘false entelechy’) that hides all the alternative futures (‘rich virtualities’) potentially present at each ‘stage’ of development. Secondly, because it relies on a misguided conception of a universal chain of causes and effects that ‘masks the very reality of invention’ (Simondon, 1958/2017, p. 122). The idea of progress is, in short, as teleological and deterministic as the mechanical world picture it is rooted in: it depicts a fixed development towards a prescribed end-state which excludes the possibility of any radical change and invention. In this article, we are going to explore such a claim following Simondon’s own suggestion that this misplaced understanding of progress – rooted in the scientific depiction of the natural order as ‘uniform, necessary, universal and analytical’ first elaborated in the ‘deterministic age’ (Simondon, 2015, p. 274) – was still present in the cybernetic sciences of his time, along with an updated attempt to combine determinism and teleology. Highlighting a substantial continuity among these stances, we shall refer, beyond Lyotard, to a ‘(hyper-)modern condition’, thus preferring the prefix hyper- to post- and stressing the connections between the early modern and contemporary ‘condition’.

What we see at work in the (hyper-)modern condition is the same twofold onto-epistemological *reduction* that was operating in early modernity: the reduction of reality to calculable structures (either conceived in deterministic or probabilistic terms) and the reduction of science to an operation of calculation (either algebraic or statistical). On the one hand, reality is deterministically conceived in terms of structured elements developing over time according to fixed ‘laws’ that predetermine the outcome of such development. On the other hand, this whole process is conceived as, in principle, entirely describable in terms of a combinatory of elements within a pre-given syntaxis. Thus, the production of scientific knowledge is a process of verification and decision that takes place within a field of research entirely mapped on the basis of a set of pre-established ‘proof principles’ (Bailly & Longo, 2011). This twofold onto-epistemological reduction creates a system entirely formalisable, whether in logical or mathematical terms, which mirrors the uninterrupted chains of causes and effects connecting every single element or event to the deterministic whole they belong to. The idea of progress as continuous development of human knowledge and society relies, in short, on an imagination of nature, human nature included, in the shape of a world of ‘realised’ geometry (Koyré, 1966, p. 301). The kind of scientific knowledge that sustains such a vision can only be formalised on the basis of the assumption that a calculability of the whole is possible, at least in principle, with no exceptions. This generates an idea of progress conceived as the development of a predetermined order – an initially given set of elements and rules (or natural ‘laws’) – determining the unrolling of natural and human history. The principle directing this development is one of preservation and expansion of the initial order, and each moment in time is the necessary result of every preceding moment and the condition of the future.

In this article we take cybernetics as paradigmatic of a crisis in the (hyper-)modern condition and the idea of progress it entails. In several epistemic domains, paradigms originally derived from cybernetics are currently being reconsidered if not dismissed. The idea of living being propounded by molecular biology which opened the century of the genome (Kay, 2000) is being criticised by ‘organismal’ biology in the light of the inherent ‘historicity’ and variability of the organism (Soto et al., 2016). Against the hardware/software model that has dominated neurosciences for a few decades, a tendency of studying the brain and neurosynaptic structures through the concept of plasticity is gaining pace (Malabou, 2008). In mathematics, a rethinking of modelling practices is being elaborated that shifts the focus from ‘dynamical structuralism’ (Thom, 1972/1975) to the ‘heterogeneous virtual’ (Sarti et al., 2019). In all these examples what is being challenged is the very idea of a dynamic development aimed at delivering more and more complex forms of homeostatic equilibrium. We believe that a step forward beyond this idea of progress should critically point out what cybernetics left unquestioned, namely radical transformation and invention, also in the social field. Our suggestion is therefore to start from Simondon’s critique to cybernetics and reconceptualise the concept of progress as the emergence of social invention from a metastable system full of potentials. The two sections of the article are thus devoted to the two different understandings of progress implicit in Wiener’s concept of homeostasis and in Simondon’s concept of metastability.

The first part of the article focuses on the concept of homeostasis, and notably on the way this was elaborated by Norbert Wiener. We do not intend to overlook the variety of

theoretical positions testified by the complex history of the cybernetic institutions and canon (Kline, 2015; Le Roux, 2018; Scott, 2004), but our focus allows us to pinpoint the elements through which the cybernetic project has contributed to the idea of progress as a developing order that heavily influenced conceptions of government widespread in the social sciences (Heyck, 2015; Rodríguez, 2019; Tiqqun, 2020). We will claim that this is a model of government still based on the ‘mythical’ idea of progress as teleological and deterministic attacked by Simondon. It prescribes homeostasis, that is the dynamic preservation of a stable equilibrium which, when breaking down, is set to be restructured according to the same invariant principles – an idea also fully in place, as we aim to explain, in neoliberal governmentality. Such a hyper-modern art of government is well captured by Rouvroy as the ‘art not to change the world’ (Rouvroy, 2016).

The second part studies Simondon’s concept of metastability – a ‘stability far from equilibrium’ opposed to the idea of ‘dynamic stability’ implied by Wiener’s concept of homeostasis – against both the cybernetic and neoliberal understanding of government. Many scholars have analysed and elaborated on Simondon’s attempt to ‘reform’ the cybernetic concept of information (Hui, 2015; Iliadis, 2013; Mills, 2016), but fewer studies have stressed the political relevance of his attempt to provide an ‘axiomatic of the human sciences’ alternative to the version promoted by cybernetics (Bardin, 2015; Guchet, 2010), which will allow us to stress the (hyper-)modern roots of the latter. Simondon’s concept of ‘metastability’ drives our critique to the hyper-modern idea of government and the very concept of progress it is based on, thus indicating a path *after progress*. In our view, this path does not prescribe the abandonment of the concept of progress as such, which would restate the relativist stigma of the postmodern age. It rather invites us to rethink progress in non-teleological and non-deterministic terms, as something that requires a new idea of the government of political and social invention.

The cybernetic order: Progress and homeostasis

Cybernetics has been differently qualified by its interpreters. It has been classified as the archaeology of a specific epistemic domain – whether of the cognitive sciences (Dupuy, 2009), informatics (Breton, 1990) or automata theory and artificial intelligence (Dertouzos & Moses, 1980). It has been more widely conceived as the techno-scientific (Segal, 2003; Triclot, 2008) and cultural (Breton, 1997; Day, 2001) context in which the concepts of, and discourses on, information and communication originated and circulated (Kline, 2015; Sfez, 1992). It has been valorised as an attempt to question anthropological categories and challenge the human/machine dualism (Haraway, 1991; Hayles, 1999). Last but not least, it has been classified as a science drawing its worldview from the military technology and research it was rooted in and the actualisation of technocratic thinking (Edwards, 1996; Galison, 1994; Geoghegan, 2012). All these studies fail to question the elements of continuity that bind cybernetics to the onto-epistemological stance inaugurated by classical mechanics and its political implications. A brief historical excursus will allow us to make this explicit, and hence to interrogate cybernetics as an attempt that, despite its original features, does not exit the hyper-modern condition and reproduces the conceptions of progress and political order embedded in it, especially via the concept of homeostasis.

From the mind of Descartes' benign God to Newton and Leibniz's clockwork universe, through Laplace's demon, and up to the ideal worlds depicted in Hilbert and Frege's logical formalisations, we recognise the tracts of the same onto-epistemological stance, elegantly criticised by Bachelard as based on 'philosophical factors of easy unification such as the creator's unity of action, nature's unity of plan, or logical unity' (Bachelard, 2002, p. 26). This onto-epistemological stance includes a narrative about the interconnection of scientific and social progress exemplarily displayed in the following passage from Laplace:

All these efforts in the search for truth tend to lead it [*l'esprit humain*] back continually to the vast intelligence which we have just mentioned, but from which it will always remain infinitely removed. This tendency, peculiar to the human race, is that which renders it superior to animals; and their progress in this respect distinguishes nations and ages and constitutes their true glory. (Laplace, 1814/1986, pp. 3–4)

This framework meets its crisis in the nineteenth century, when thermodynamics and statistical mechanics serve as a prelude to the twentieth-century attacks on the early-modern worldview later carried forward by the biological and evolutionary sciences, as well as by the theories of relativity and quantum mechanics (Prigogine & Stengers, 1985). Since its inception, and even before Wiener had given it its name, cybernetics was openly challenging the ontology established by modern science – mechanicism, stable equilibrium, linear development – by rehabilitating the very category of finality to describe homeostatic equilibrium as non-mechanistic, dynamic and adaptive (Ashby, 1940; Rosenblueth et al., 1943). This is not to say cybernetics ever aimed at a rehabilitation of the classical idea of final cause. It rather complicated the radical opposition between determinism and teleology that had marked the emergence of the mechanical world picture in the first place. In fact, cybernetics aimed at explaining teleological behaviour as an emergent property of deterministic systems in what we will call a 'mechanistic teleology'.

In Wiener's mind, the advent of cybernetics was meant to break with the clockwork universe of classical mechanics 'in which everything happened precisely according to law, a compact, tightly organized universe in which the whole future depends strictly upon the whole past'. Defining information as 'measure of order', cybernetics could conceive developing systems as constantly recalibrating the variables and functions they relied upon. The image of 'a rigid deterministic world' was to be wiped out thanks to statistical mechanics – 'the first great revolution of twentieth century physics' – and the idea of a contingent universe would strike back in the agenda of science (Wiener, 1954/1988, pp. 7–12). The concept of feedback was formed by rethinking concepts such as behaviour, purpose and teleology (Rosenblueth et al., 1943) in order to explain the capacity of a system to adapt its functioning and 'goals' on the basis of new information gathered from the environment. This new idea of organisation was initially applied by cyberneticians to machines, but it was 'intimately connected' with the concept of homeostasis elaborated by the American physiologist Walter Cannon (1926), via the French physician Claude Bernard's (1878) notion of an organism's 'internal milieu' (Wiener, 1953/1985b, p. 391; 1951/1985a). Homeostasis described the mechanisms of automatic

regulation through which an organism could maintain a healthy state of equilibrium in its internal milieu by balancing reactions to and actions on the 'external milieu'. As Canguilhem summarised, it was 'Claude Bernard who generated Cannon, who generated Rosenblueth next to Wiener' (Canguilhem, 2000, p. 82). Arturo Rosenblueth, a student of Cannon's and close to Wiener (to the point of being the dedicatee of *Cybernetics*), indeed represented 'the intellectual bridge' between the physiological concept of homeostasis and the cybernetic concept of feedback (Cooper, 2008, p. 425). Homeostasis and feedback were thus indissolubly embedded in the interdisciplinary ambitions of cybernetics, which included covering biological, technical as well as social systems.

However, Wiener's cybernetics hardly abandoned the framework inaugurated by modern science and its epistemological attempt to provide knowledge and command over an objective natural field. The stable functioning of all 'teleological' systems endowed with a feedback mechanism was driven by the same kind of determinism that characterised non-teleological systems. The general theory of information pursued by cybernetics was meant to provide the same formal description of the functioning of all systems (Ashby, 1956). In short, cybernetics continued with other means the twofold onto-epistemological reduction carried on by modern science. From this perspective, the Galilean-Cartesian revolution can be considered not only the dawn of modern science, but also of a narrative of science connected to an onto-epistemological stance that finds in the cybernetic revolution a displacement, a reformulation on the same formalistic and deterministic grounds. As Simondon nicely put it, cybernetics aimed at drafting 'a new *Discourse on the Method*' (Simondon, 2016, p. 197), in what was perhaps the last formidable, systematic attempt to preserve the onto-epistemological stance inaugurated by modern science. Wiener's non-deterministic ontology was in fact mechanical determinism in disguise, still implying a twofold onto-epistemological *reduction*: the reduction of reality to calculable structures and the reduction of science to an operation of (statistical) calculation. This reduction, we are claiming, is a hyper-modern variation of the early-modern ideas of progress as 'stable' development and government as the production of order sustained by the concept of homeostasis.

The concept of homeostasis offers a dynamic description of the functioning of all kinds of systems that seriously challenges a 'static' understanding of equilibrium. A homeostatic system does develop its initial state, and its organisation is subject to a variety of modifications resulting from the feedback signals collected through its mechanisms of regulation. Examples of feedback mechanisms span a variety of fields, such as technology (thermostats, steam engines, anti-aircraft gun servo-mechanisms following their targets), physiology (blood pressure or body temperature regulation in a changing milieu) and economics (price variation related to financial fluctuations). However dynamic, such systems' development is oriented by invariant 'laws' and the overall necessity to preserve a degree of internal stability and equilibrium, and it is, in principle, mathematically foreseeable – if statistically, that is, within a defined margin of error. The concept of homeostasis thus does not allow *any* questioning of a system's conditions of stability and goals, it only allows for a 'dynamic' preservation of stability within the given conditions of possibility and established goals. In this sense Ashby's claims that 'there is no such thing as "good organization" in any absolute sense' and yet to any system 'its own organization will always, by definition be good' (Ashby, 1962, pp. 262, 273)

expose a tension that is at the very core of the cybernetic concepts of homeostasis and organisation. Homeostasis represents thus a ‘mechanistic teleology’ which is descriptive and normative at the same time. Defining organisation as (dynamic) stability, implies assuming homeostasis as both a scientific model describing the functioning of all systems, and the actual norm prescribing their immanent telos.

We believe this ‘mechanistic teleology’ is rooted in a hyper-modern version of the same old onto-epistemological reduction, which pertains to first-order cybernetics’ concern with ‘observed systems’, as well as to second-order cybernetics’ focus on ‘observing systems’ (Von Foerster, 1979). In first-order cybernetics, the functioning of regulatory mechanisms can only be optimal when aleatory phenomena – classified as ‘noise’ – are adequately kept under control and ideally eliminated by the system. Second-order cybernetics is perhaps more refined in recognising the beneficial role played by ‘noise’ in system self-organisation processes (Ashby, 1962; Atlan, 2011; Von Foerster, 1960) and the importance of the amplification or even radical reconfiguration of the system’s functions. However, the whole theory is still focused on the system’s conditions of existence, for the purpose of which the system is only allowed to ‘choose the form of determinism that guarantees its continued existence’ (De Latil, 1956, p. 313). This is why we are claiming that cybernetics does not exit the deterministic horizon of the hyper-modern condition and the conception of progress therein. Rather, it reinforces the idea of progress as a development of more and more complex forms of order granting stability, and recruits ‘the uncertainty and the contingency of events’ within its ‘incomplete determinism’ (Wiener, 1954/1988, pp. 8, 11) as allies in the defence of the ‘dynamic’ order of things.

Such a concept of organisation was mainly formulated in terms of information and communication theory applied to neurophysiology, but it rapidly expanded over several epistemic domains, the social sciences included. The colonisation of the latter by cybernetic concepts was not at all immediate, as one might think looking at the great number of social scientists (Gregory Bateson and Margaret Mead above all) who participated in the Macy conferences on cybernetics that took place in New York between 1946 and 1953 (Heims, 1991). However cautious not to take this analogy at face value, and wary of the risks this would entail (Wiener, 1961/2019, pp. 39–41, 226–228), Wiener himself acknowledged that ‘the social system’ is ‘an organization . . . bound together by a system of communication, and that it has dynamics in which circular processes of a feedback nature play an important part’ (Wiener, 1961/2019, p. 35). Following Wiener’s intuition in disregard of his own warning, multiple attempts were carried out by social scientists (within institutions and associations more or less openly inspired by cybernetics) to apply cybernetic concepts to their specific epistemic domains. Psychology, anthropology, economy and sociology were the loci of a variety of such attempts. Rodríguez (2019) refers, for instance, to structural anthropology, systemic psychology, symbolic interactionism, as well as Luhmann’s functionalism. Many of these approaches have drawn on cybernetic concepts and terminology, which in itself would justify our aim to trace a theoretical link between cybernetics and social theory. Our polemic target in this piece is, however, the theoretical core of what Michel Foucault (2008) called neoliberal governmentality. By this we understand the contemporary form of political rationality we see as emblematic of the hyper-modern condition formerly embodied in cybernetics and in its attempt to govern progress.

In our view, the cybernetic concept of organisation enlightens the theoretical and practical shift from state sovereignty and classical liberalism to neoliberal governmentality. The crisis of the modern state's sovereignty becomes evident in the inability of state institutions to reduce to a unitary and stable order the proliferation of local and global conflicts in complex societies. Cybernetics offers instead the model of a constructivist conception of government capable of regulating the network of automatic mechanisms present in society. This should not be taken as a straightforward identification of cybernetics and neoliberalism, but rather as the mark of a deeper onto-epistemological connection that went beyond Wiener's own intentions. Wiener was indeed highly critical of any 'faith' in free competition as 'homeostatic process' (Wiener, 1961/2019, p. 220). Nevertheless, when neoliberals looked for a remedy to the state of permanent crisis of liberalism, what they aimed at was an 'epistemic revolution' (Mirowski & Nik-Khah, 2017; Ouellet, 2016) whose premises resonated strongly with the cybernetic diagnosis concerning the crisis of modern science. At the very origins of neoliberalism, before cybernetics was even born, Hayek claimed that the growing complexity of social reality had made all neoclassical theories of equilibrium inadequate and any deterministic political planning an impossible and potentially dangerous task (Hayek, 1937/2014). A few years later, he explicitly invited the study of self-organising systems through 'what cybernetics has taught us to call negative feedback' (Hayek, 1982, II, p. 125). Far from fully exploring the genealogy of the concept of homeostasis, our intention here is to show that the cybernetic understanding of organisation *as* homeostasis can offer a key to the dynamic but ultimately stable conception of social systems and progress implicit in neoliberal governmentality.

The point of government in a neoliberal perspective is neither to limit the freedom of initiative, nor to assume that social stability depends on an invisible hand, but rather to carry on a detailed regulation of liberties for the sake of the 'spontaneous' equilibrium of the markets. An incessant work of data extraction through ever perfected algorithms sets the conditions of possibility of the subjects' behaviour – economic actors, ideally self-employees – and orients it towards the preservation of the system's dynamic stability. Social change is thus governed and reduced to the hyper-modern idea of progress, conceived as a variation within the parameters deemed necessary for the reproduction and survival of the system. All the 'irrational' noise that is not immediately reducible to progress thus conceived is either silenced or – once neutralised – included in the pattern as a risky and unforeseen opportunity to perfect the system's survival (Castel, 1991; Dean, 1998; Ewald, 1991). More radically, these elements are normatively integrated in the system's core dynamics in the form of an ethics of flexibility (Fraser, 2003) establishing the 'good' functioning of governmentality.

The government of progress is thus resolved in the incessant operation of protection, management and promotion of homeostatic mechanisms deemed capable of self-regulation, but in fact selected and – if necessary – substituted with others, offering a more inclusive and complex capacity of adaptation to the macro-mechanism of the market. This macro-mechanism is the undisputed horizon that imposes to political power the task of providing a homeostatic equilibrium functional to its progressive implementation. With its 'soft' determinism and immanent teleology the market thus appears to be a hyper-modern version of the clockwork universe theorised in early-modern mechanical

science, and the vector of a similar onto-epistemological reduction of social reality to a mathematical form. And this reduction still relies on a 'mythical' concept of progress alighting an 'illusion of simultaneity' that hides a plurality of paths by projecting the 'eternal present' of the market on all possible futures.

Simondon: Progress and metastability

The connection we have established between cybernetics and neoliberalism will allow us to use Simondon's concept of 'metastability' against both of them. Although acknowledging Wiener's invention of the term (Simondon, 2014, p. 236), Simondon elaborated the concept of metastability drawing on Canguilhem's work and in explicit contrast to the cybernetic concept of homeostasis. Metastability describes systems macroscopically stable but internally characterised by an uneven distribution of potentials and hosting processes that make that stability only apparent. Metastable systems enjoy a 'stability far from equilibrium' in which the aleatory 'encounter' with a minimal quantity of energy or information can trigger a brusque alteration of equilibrium, and lead to the invention of new structures and hence to a new 'metastable state'. The notion of metastable equilibrium marks the project of an 'axiomatic of human sciences' Simondon presents in explicit opposition to the cybernetic theory of society, questioning at the same time the notion of homeostasis and the deterministic ontology the latter relies upon (Simondon, 1958/2020, pp. 697ff.). Briefly sketching Simondon's project will allow us to outline the theory of government he elaborates in contrast to Wiener's, and explain how this may be used as an antidote to the neoliberal conception of government and the hyper-modern condition it shares with cybernetics. Simondon's concept of 'metastability', we will argue, can support an alternative understanding of progress based on the idea of government as the facilitation of normative invention.

In his social theory, Simondon expands on Canguilhem's study of social normativity. Canguilhem's starting point is a critical reading of the biological modelling of society adopted within the French sociological tradition. In that paradigm the sociologist is asked to define the 'normal type' and provide the politician, the social physician, with the task of re-establishing the 'normal state', independently of the way society 'appears to itself' (Durkheim, 1924, p. 54). Canguilhem provides a decisive critique to the organic model and a radical turn to its political implications. What he considers socially 'pathological' is not the deviation from normality, but, on the contrary, the very normalisation of a 'stable' form of equilibrium. Relying on the work of the German neurologist and thinker Kurt Goldstein, he assumes that, both organically and socially, 'the healthy state, much more than the normal state . . . is the state which allows transition to new norms', while 'pathological constants' are 'repulsive and strictly conservative' (Canguilhem, 1991, p. 228) and in fact typical of a form of life stuck in its own 'narrowed milieu' and incapable of further normative invention (Goldstein, 1995, p. 188). Simondon welcomes Canguilhem's advice to consider society in its own terms, as 'neither machine nor life' (Canguilhem, 2002), and takes it a step further, also attacking the technological modelling of society theorised by cybernetics.

Simondon detects in Wiener's cybernetic theory of society an attempt to reduce the complexity of social systems to the technological model of the 'automaton'. For

Simondon automata are emblematic of the hyper-modern condition – they represent a rigidly deterministic understanding of change that *de facto* cancels it: ‘the automaton is entirely given in its initial state, it functions but does not become’ (Simondon, 2016, p. 401). ‘Direct adaptation’ and ‘structural stability’ are the hallmarks of ‘the perfect automaton’, and ultimately rely on the same normative assumptions implicit in the concept of ‘homeostasis’ that Wiener’s technological model implicitly sets as the ultimate goal of social organisation. Simondon reverses this value judgement while questioning the epistemic value of the model itself. The very study of technical objects shows that ‘automatism’ describes ‘a rather low degree of technical perfection’ and its idea is in fact a myth rooted in ‘economic or social’ thinking rather than in technical knowledge (Simondon, 1958/2017, p. 17). In social theory, the ideas of automatism and homeostasis, although describing a crucial aspect of social dynamics – that is the closure within ‘a stereotypical, hypertelic and involutive adaptation’ – fail to grasp the ‘constructive and creative adaptation’ of societies. While for Wiener homeostatic stabilisation defines both the core functioning and the goal of social systems, for Simondon a degree of social homeostasis is both a prerequisite of society – the ‘rate of automatism’ that grants ‘stability and cohesion’ – and a problem (Simondon, 1958/2020, pp. 422–423).

Wiener’s hyper-modern renewal of the Hobbesian myth of a political ‘automaton’ is, from Simondon’s perspective, an epistemological mistake and a political danger. Statistical mechanics hinders a proper understanding of processes harbouring a ‘margin of indeterminacy’ (Simondon, 1958/2017, pp. 147–159) that can only be understood through a ‘non-probabilistic method’ (Simondon, 1958/2020, p. 697), and the myth of the automaton surreptitiously becomes a goal whose actual realisation would destroy the very system it was supposed to save. A perfect ‘automatic’ homeostasis, far from solving the problem of social regulation would substitute the social system’s ‘tense’ metastability with the kind of dynamic stability that ultimately leads the system to exhaustion. The self-destructive goal of automatism is in fact the cancellation of any ‘margin of indeterminacy’ with the result that ‘there is no longer any possible variation; the functioning repeats indefinitely’ (Simondon, 1958/2017, p. 152) until entropy consumes all the residual potentials, leading to the ‘resolution of all tensions’, that is ‘death’. For Simondon, on the contrary, a system only keeps working and developing as long as it ‘conserves the tensions in the equilibrium of metastability instead of nullifying them in the equilibrium of stability’ (Simondon, 1958/2020, p. 226).

It is on this basis that Simondon sketches his theory of government as an alternative to Wiener’s. Playing a biological model against Wiener’s normative assumption that ‘a good homeostatic regulation is the ultimate purpose of societies, the ideal that must animate every act of government’ (Simondon, 1958/2017, p. 162) Simondon theorises government as an act of normative invention relying on existing social automatisms but exceeding them. An ‘act of government’ for Simondon should be ‘grounded in homeostases so as to develop itself and to continue its coming-into-being, rather than remaining perpetually in the same state’ (p. 162). Governing is ‘inventing’ solutions aimed at making the system ‘metastable’, that is open to further invention, rather than contributing to reproduce the ideal order imagined by social theory and imposed by politics as a goal.

Many critics of neoliberal governmentality, and in particular of its ‘algorithmic’ version, have been inspired by Simondon. This is evident in their stressing the importance

of creating spaces of political conflict in which social invention – the ‘transindividual . . . coupling between the inventive and organisational capacities of several subjects’ (Simondon, 1958/2017, p. 258) – can take place against the dominant neoliberal neutralisation of subjectivity and conflict (Rouvroy & Berns, 2013; Stiegler, 2016). The idea of ‘progress’ may appear to be embedded in precisely the stance these theorists are criticising, but we believe that Simondon’s concept of metastability allows for a different idea of progress. In neoliberalism, the market’s ‘spontaneous’ continuation is paradoxically assumed as the goal of politics, which entails the reduction of progress to a sequence of preventive social adaptations to ever-emerging ‘local’ risks within the naturalised framework of the market. Thus, the neoliberal promotion of risk-management ethics – a lifestyle informed by constant planning, resource management, etc. – is one of the most powerful ideological tools for the preservation of social homeostasis within the market economy. This government of behaviour is capable of de-activating the potential reinvention of social forms. ‘Governmentality’ thus conceived is not simply a matter of preventing the risk of a radically disruptive event, it is about governing its possibility as such. The ‘progressive’ mechanisms of social reproduction governed by the market’s open dynamics thus entirely absorbs what is a completely different kind of ‘risk’ represented by human inventiveness and imagination, which Simondon theorises under the label of metastability.

The ‘risky’ politics of metastability theorised by Simondon is based on the assumption that progress conceived as the ‘invention of new goals’ makes radical novelty possible. This concept of progress is based on an understanding of social systems as inherently metastable because of the ‘fairly dangerous’ automatism characterising the human being, who ‘always risks inventing and equipping new structures’ (Simondon, 1958/2020, p. 423). This is not to say that Simondon resorts to a vitalist view on the exceptionality of life over matter or some sort of social evolutionism. Rather, he theorises ‘invention’ as an emergent property of the bio-technical nature of human beings and societies. This tendency towards invention is for Simondon embedded in the partial indeterminacy or ‘historicity’ that, in his ontology, defines all systems and processes (Bardin, 2021, pp. 36–37). At the level of human natural and social (i.e. ‘transindividual’) ‘historicity’, technical activity is not a mere vector of technological progress, it is an actual challenge to existing social norms. Human ‘progress’ takes place at the scale of the ‘metastable’ system formed by ‘human beings and the world’ and mediated by technical objects whose functioning exceeds all efforts of symbolisation (Simondon, 1958/2017, p. 168). Progress thus conceived is not a triumphal march, it is the result of a disharmonious relationship between biological patterns that vary in the very long term of natural history, the quick accumulation of technoscientific innovations, and the social rhythm of culture that attempts to render these processes compatible with its institutional present (Simondon, 2010). This is neither ‘progress conceived as a march in a direction fixed in advance’, nor a process of ‘humanisation of nature’, but rather an aleatory process of ‘naturalisation of humans’ mediated by the ‘techno-geographical milieu’ they keep inventing (Simondon, 1958/2017, p. 58).

This notion of progress entails a political risk because it leaves political practice without a safety net. In this open dynamic, the emergence of finality and hence of social invention is grounded on the structural lack of control of technical reality that nurtures

the very possibility of human freedom: ‘Man [*sic*] frees himself from his situation of being enslaved by the finality of the whole, by learning how to create finality . . . as not to have to be passively subjected to a *de facto* integration’ (Simondon, 1958/2017, p. 119). This is what, according to Simondon, cybernetics itself teaches us, but crucially missing the point that risk cannot be recaptured within the existing social norms and mode of production. On the contrary, risk conceived as a structural margin of indeterminacy (‘historicity’) is embedded in technical activity, and a constant challenge to the whole ‘system of values’ (Simondon, 1958/2020, pp. 414–415). We believe Simondon’s concept of metastability opens in this sense to the possibility of moving beyond the paradoxical conflation of determinism and teleology theorised within the hyper-modern idea of progress, ultimately shared by cybernetics and neoliberalism, and allows to ‘think together nature and excess, technology and revolution’ (Toscano, 2012, pp. 107–108). It thus calls for an alternative theory of government.

Governing progress, in Simondon’s sense, is part of the collective effort of inventing mediations and solutions in which science and politics can play a crucial role if they do not reduce the reality of non-symbolic processes to their – also scientific – imagination. This kind of government will have more to do with the ‘invention’ of new technical and cultural possibilities than with the dreamed regulation of the existent by a philosopher-king (Simondon, 1958/2017, pp. 161–163). Such inventions run, of course, the risk of failure, but this is precisely where their political value lies. Simondon’s concept of progress does not allow acts of government a safety net offered by social theory predictions. On the contrary, Simondon’s social theory certifies that not running the risk of normative invention is equal to suffering a different kind of defeat, the defeat of accepting an allegedly ‘progressive’ politics that, as a matter of fact, reaffirms the norms codified by the theory and resists radical change. This is precisely how Wiener sees progress grounded on the idea of the dynamic stability (homeostasis) of ‘local and temporary islands of decreasing entropy’, which ‘enables some of us to assert the existence of progress’ (Wiener, 1954/1988, p. 36). Instead, Simondon’s vision is condensed in an ethical formula that critically mirrors Wiener’s statement by reversing it, and postulates that ‘there are no lost islands in becoming, no domains eternally closed in themselves’ and ‘each gesture’ is an act of invention within a (metastable) network that connects past and future (Simondon, 1958/2020, p. 377). This ethical gesture is inherently political, it requires the active consideration of entropy and death as part of a system’s functioning, and the assumption of social invention as the core of an idea of progress to be formulated *beyond* the hyper-modern condition.

Conclusion: Governing progress

If one assumes the exhaustion of the (hyper-)modern idea of progress, one is also deprived of the theoretical background that has long informed the mechanical understanding of social dynamics, an understanding that still informs neoliberal governmentality. A critique of the concept of homeostasis that grounds this idea of progress, we have claimed, allows for a different approach. In this sense, our article firstly offers a historical contribution by exposing the onto-epistemological stance that underpins much theorisation of early modern science and cybernetics, liberalism and neoliberalism.

Secondly, it aims to show that Simondon's concept of metastability opens the path for a reformulation of the idea of progress within a framework that sees partial indeterminacy (or 'historicity') at the core of social dynamics and their government. From this perspective, knowing the social and acting politically means favouring the 'metastable' tension that enables scientific *and* political invention, defying the automatic defence of a mythically established social order. Governing progress therefore requires the radical endorsement of change, which includes the contemplation of death and failure as a necessary part of it, and therefore the opening of social systems to a future beyond the mere preservation of their own existence.

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