

Automatic Society 1: The Future of Work – Introduction

by BERNARD STIEGLER

translated by DANIEL ROSS¹

The following is the introduction to the first volume of Bernard Stiegler's most recent work, La Société automatique, 1. L'Avenir du travail, published by Fayard in 2015. The second volume, subtitled L'Avenir du savoir, is forthcoming. This translation is published with the generous permission of the author.

Rational objectivity, technical objectivity and social objectivity are now linked tightly together. To neglect one of these aspects of modern scientific culture is to enter the sphere of utopia.

G. Bachelard

We untiringly construct the world in order that the hidden dissolution, the universal corruption that governs what "is" should be forgotten in favor of a clear and defined coherence of notions and objects, relations and forms – the work of tranquil man. A work that nothingness would be unable to infiltrate and where beautiful names – all names are beautiful – suffice to make us happy.

M. Blanchot

These motors must be very different from all the others. It seems logical to suppose that Morel designed them so that no one who came to this island would be able to understand them. But the difficulty in running the green motors must stem from their basic difference from the other motors. As I do not understand any of them, this greater difficulty disappears. [...] And what if Morel had thought to photograph the motors...

A. Bioy Casares

¹ Prometeo researcher, Yachay Tech. This publication was sponsored by the Prometeo Project of the Secretariat for Higher Education, Science, Technology and Innovation of the Republic of Ecuador.

Functional Stupidity, Entropy and Negentropy in the Anthropocene

The strangest thing about this remarkable return of “humankind” into history is that the Anthropocene provides the clearest demonstration that, from an environmental point of view, humanity as a whole does not exist.

C. Bonneuil, J.-B. Fressoz

1. What transpires between 23 June and 23 October 2008

In an analysis of Google’s business model in *Wired* on 23 June 2008, Chris Anderson showed that the services provided by this company – which are based on what Frédéric Kaplan has called *linguistic capitalism*² – operate without any reference whatsoever to a theory of language³.

Continuing with a form of reasoning similar to that he applies to the epidemiology of Google, Anderson comes to the conclusion that what is referred to today as “big data”⁴, consisting of gigabytes of data that can be analysed in real time via high performance computing, no longer has any need for either theory or theorists – as if data “scientists”, specialists in the application of mathematics to very large databases through the use of algorithms, could replace those theoreticians that scientists always are in principle, regardless of the scientific field or discipline with which they happen to be concerned.

Four months later, on 23 October 2008, Alan Greenspan appeared before a Congressional hearing to explain the reasons behind the financial catastrophe unleashed after the subprime crisis of August 2007. His defense consisted in arguing that the scale of the crisis was due to the misuse of financial mathematics and automated calculation systems to assess risk, mechanisms established by digital trading in its various forms (from subprime to high frequency trading):

It was the failure to properly price such risky assets that precipitated the crisis. In recent decades, a vast risk management and pricing system has evolved, combining the best insights of mathematicians and finance experts supported by major advances in computer and communications technology⁵.

² Frédéric Kaplan, “Quand les mots valent de l’or. Le capitalisme linguistique”, *Le Monde diplomatique* (November 2011), available at: <<http://www.monde-diplomatique.fr/2011/11/KAPLAN/46925>>. See also: Kaplan, “Linguistic Capitalism and Algorithmic Mediation”, *Representations* 27 (2014), pp. 57–63.

³ Chris Anderson, “The End of Theory: The Data Deluge Makes the Scientific Method Obsolete”, *Wired* (23 June 2008), available at: <http://archive.wired.com/science/discoveries/magazine/16-07/pb_theory>.

⁴ This being what is referred to with the expression “data deluge”.

⁵ Alan Greenspan, “Greenspan Testimony on Sources of Financial Crisis”, *The Wall Street Journal* (23 October 2008), available at: <<http://blogs.wsj.com/economics/2008/10/23/greenspan-testi>>.

Greenspan also stressed that such approaches had received legitimacy via the Nobel Prize for economics⁶ – his intention being to assert that, if there is blame is to be apportioned, it ought not fall only upon the president of the U.S. Federal Reserve: the whole apparatus of computerized formalization and automated decision-making undertaken by financial robots was involved, as well as the occult economic ‘theory’ that supported this legitimization.

If this market paradigm had until August 2007 “held sway for decades”, if computerized formalization and automated decision-making had been imposed *in fact*, this

whole intellectual edifice, however, collapsed in the summer of last year because the data inputted into the risk management models generally covered only the past two decades, a period of euphoria⁷.

The ideologues of this “rational risk management” undoubtedly had no awareness of the limitations of their datasets, and this would include, I hasten to add, Greenspan himself. They assumed that “historic periods of stress” had occurred only *because financial instruments did not exist during these periods*, or because competition was *not yet* “perfect and undistorted”. Such was the concealed theory operating behind these robots, robots that supposedly “objectify” reality and do so according to “market rationality”.

Not long after Chris Anderson’s article, Kevin Kelly objected that, behind every automated understanding of a set of facts, there lies a hidden theory, whether there is awareness of it or not, and, in the latter case, it is a theory *awaiting formulation*⁸. What this means for us, if not for Kelly himself, is that *behind and beyond all fact, there is a law*.

Science is what goes beyond the facts by *pleading [excipant]* for a law: it posits that there *can always be an exception* (and this is what “pleading” the case for a law means: asserting the law of the exception) to the *majority* of facts, even to the *vast majority* of facts, that is, to virtually all of them, an exception that *invalidates the law* (that invalidates its apparent coherence). This is what, in the following chapters, we will call, alongside Yves Bonnefoy and Maurice Blanchot, the *improbable* – and this is also the question raised by black swan theory, as posited by Nassim Nicholas Taleb in a manner closer to the epistemology of statistics, probability and categorization⁹.

mony-on-sources-of-financial-crisis/>.

⁶ «A Nobel Prize was awarded for the discovery of the pricing model that underpins much of the advance in derivatives markets», he explained.

⁷ Ibid.

⁸ Kevin Kelly, “On Chris Anderson’s The End of Theory”, *Edge: The Reality Club* (30 June 2008), available at: <http://edge.org/discourse/the_end_of_theory.html#kelly>.

⁹ Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007).

2. *Mettre Paris en bouteille*

The ideology of perfect and undistorted competition has been and remains today the discourse of neoliberalism, and this includes the discourse of Alan Greenspan, who spoke in these terms during his 2008 Congressional testimony:

Had instead the models been fitted more appropriately to historic periods of stress, capital requirements [for funds held in financial institutions] would have been much higher and the financial world would be in far better shape today, in my judgment.

But what this comment obscures is the fact that “with *ifs*, one could bottle Paris”¹⁰. For had these capital requirements “been much higher”, the model would simply never have developed. And this model developed precisely in order to conceal the systemic insolvency of *consumer capitalism* (that is, of “growth”), a form of capitalism afflicted for over thirty years by the drastic reduction in the purchasing power of workers, as demanded by the conservative revolution – and by financialization, in which the latter fundamentally consists, and which makes it possible for countries to become structurally indebted, and hence subjected to an unprecedented form of blackmail that indeed resembles a racket (and which we can therefore refer to as mafia capitalism)¹¹.

The application of this model based on the “financial industry” and its automated computer technologies is intended both to capture *without redistribution* the capital gains generated by productivity and to conceal, through a computer-assisted financial fraudulence operating on a worldwide scale, the fact that the conservative revolution has broken the “virtuous circle” of the Fordist and Keynesian compromise¹².

With the conservative revolution, then, capitalism becomes *purely computational* (if not indeed “purely mafiaesque”). Max Weber showed in 1905 that, on the one hand, capitalism was originally related to a form of incalculability the symbol of which was Christ as the cornerstone of the Protestant ethic, the latter constituting the spirit of capitalism¹³. But he showed, on the other hand, that the transformative dynamics of the society

¹⁰ *Translator's note*: this is a French proverb: “Avec des *si*, on mettrait Paris en bouteille”.

¹¹ «Tax havens, offshore companies, corruption, trafficking... While politicians may want to reform it and make it more ethical, the globalized economic and financial system continues to adapt itself even more to “mafia” behaviour. Why do relations and forms of porousness develop between “healthy” economies and mafia economies? How is it that the mafia intersects every kind of institution? Is it not, ultimately, inherent to capitalism?» Nathalie Brafman, “Mafia, stade avancé du capitalisme?”, *Le Monde*, 15 May 2010, available at: <http://www.lemonde.fr/idees/article/2010/05/15/mafia-stade-avance-du-capitalisme_1352155_3232.html>.

¹² This Fordo-Keynesian “compromise” is itself based on looting the countries of the South (something generally forgotten by the defenders of this ‘compromise’), which leads to those limits uncovered by the Meadows report – released in 1972 by four MIT researchers, Donella Meadows, Dennis Meadows, Jørgen Randers and William W. Behrens III – (the looting of the South leading to the depletion of resources), and by René Passet in France (who describes the growth of negative externalities, which has today become obvious in the hyper-exponential effects of the Anthropocene), all the while destroying the libidinal economy, a point to which we shall return in the first chapter of this work (see p. XXX ff.).

¹³ Max Weber, *The Protestant Ethic and the Spirit of Capitalism* (London and New York: Routledge, 1992).

established by this “spirit” consists in a secularization and rationalization that irresistibly thwarts it – we may call this the *aporia of capitalism*¹⁴.

We shall see that, as contemporary capitalism becomes *purely* computational, concretized in the so-called data economy, this aporia is exacerbated, this contradiction is “realized”, and in this way it succeeds in accomplishing that becoming without future referred to by Nietzsche as *nihilism* – of which Anderson’s blustering assertions and Greenspan’s muddled explanations are symptoms (in the sense given to this term by Paolo Vignola)¹⁵.

3. What is hidden in France Ten Years From Now

Anderson’s storytelling belongs to a new ideology the goal of which is to mask (while itself remaining masked) the fact that with total automatization a new explosion of generalized insolvency is readying itself, far worse than that of 2008: the next ten years will, according to numerous studies, predictions and “economic assessments”, be dominated by automation.

On 13 March 2014, Bill Gates declared in Washington that with software substitution, that is, with the spread of logical and algorithmic robots controlling physical robots – from “smart cities” to Amazon, and passing through Mercedes factories, the metro and trucks that deliver to supermarkets from which cashiers and freight handlers are disappearing, if not customers – employment will drastically diminish over the next twenty years, to the point of becoming the exception rather than the rule.

This thesis, which has been explored in depth over the last few years, has recently come to the attention of European newspapers, firstly in Belgium in *Le Soir*, which in July 2014 warned of the risk of the loss of half of all the jobs in the country “within one or two decades”, then in France: it was taken up again by *Journal du dimanche* in October 2014, in an article that warned, on the basis of a study the newspaper commissioned from the firm Roland Berger, of the destruction by 2025 of three million jobs, equally affecting the middle classes, management, the liberal professions and the manual trades. Note that the loss of three million jobs represents an increase in unemployment of about 11 points – an unemployment level of 24%, without counting “part-time” or “casual” employment in those figures.

Ten years from now, and regardless of how it is counted, French unemployment is likely to shift to between 24% and 30% (the Roland Berger scenario being relatively optimistic compared to the forecasts of the Brussels-based think tank Bruegel, as we shall

¹⁴ On these questions, see Bernard Stiegler, *The Decadence of Industrial Democracies: Disbelief and Discredit, Volume 1* (Cambridge: Polity, 2011).

¹⁵ Paolo Vignola, *L’attenzione altrove. Sintomatologie di quell che ci accade* (Naples: Orthoes Editrice, 2013). And see the lecture, “Symptomatology of desire”, 2013 summer academy of *pharmakon.fr*, available at: <http://pharmakon.fr/wordpress/academie-dete-de-lecole-de-philosophie-de-pineuil-le-fleuriel/academie-2013/>.

see below). Furthermore, all of these studies warn of the eventual demise of the Fordo-Keynesian model, which organizes the redistribution of the productivity gains hitherto obtained through Taylorian automation in the form of purchasing power acquired through wages.

Hence this forebodes an *immense transformation*. Despite this, the report submitted by Jean Pisani-Ferry to the French president in the summer of 2014 as part of a “government seminar” had *not one word to say* about these literally overwhelming prospects – that are transformational for any macro-economics to come.

France Ten Years From Now does, of course, discuss employment, but in a wheedling tone, amounting more or less to the statement: “Let us set modest, realistic goals: in terms of employment, let’s aim to be in the top third of similar countries”¹⁶. And it goes on and on in these tepid terms for two hundred pages, never mentioning the possibility that employment will be drastically reduced and on the contrary asserting:

[T]he goal must be full employment. As far as we can see today, this is the normal way in which the economy functions. Any other social condition becomes pathological and involves an unsustainable waste of skills and talents. There is no reason to give up this expectation, given that for a long time we experienced a situation of very low unemployment and that some of our neighbors have today returned to such a situation¹⁷.

According to the Commissioner General of France Stratégie¹⁸, we should reaffirm the goal of full employment, however we should do so in a “credible” way – but through what, in fact, amounts to an extraordinarily tenuous form of reasoning:

To set this target today for 2025 would not be deemed credible by the French public, which has suffered decades of mass unemployment. A goal that is perceived, rightly or wrongly, as being too high, could have a demotivating effect. It is better, as the Chinese proverb says, to cross the river by feeling for each stone. Furthermore, the problem with setting goals in absolute terms lies in not taking into account the global and European economic situation. Reasoning in relative terms avoids this pitfall. In this spirit, we can aspire to return sustainably to the top third of European countries in terms of employment¹⁹.

The claims of *France Ten Years From Now* are contradicted by Bruegel, the Brus-

¹⁶ See France Stratégie, *Quelle France dans dix ans? Les chantiers de la décennies* (Rapport au Président de la République, June 2014), p. 36: «[T]he problem with setting goals in absolute terms lies in not taking into account the global and European economic situation. Reasoning in relative terms avoids this pitfall. In this spirit, we can aspire to return sustainably to the top third of European countries in terms of employment. Given our knowledge that we are currently placed in the middle third and have, a few years ago, found ourselves in the bottom third, this would represent a very substantial improvement».

¹⁷ Ibid., p. 35.

¹⁸ Jean Pisani-Ferry was appointed Commissioner General of France Stratégie on 1 May 2013.

¹⁹ Ibid., p. 35.

sels-based policy research institute that had been headed by Pisani-Ferry himself, until his appointment as Commissioner General of France Stratégie. Bruegel argues, through Jeremy Bowles and by taking note of the figures given by Benedikt Frey and Michael Osborne²⁰ at the Oxford Martin School, that Belgium could see 50% of its jobs disappear, England 43%, Italy and Poland 56% – and all this, according to *Le Soir*, “within one or two decades”.

At the time he submitted his report (in June 2014), Pisani-Ferry could not have been unaware of these forecasts made by the very institute he helped found in 2005. How did he allow himself to dissimulate in this way? The reality is that, like Greenspan, he internalized a calamitous situation that he continues to misunderstand thanks to a deeply flawed analysis, thereby preventing France from taking stock of a highly dangerous situation:

[C]ashiers, nannies, supervisors, even teachers [...], by 2025 a third of jobs could be filled by machines, robots or software endowed with artificial intelligence and capable of learning by themselves. And of replacing us. This is a vision of the future prophesied by Peter Sondergaard, senior vice president and global head of research at Gartner²¹.

We shall see that this “vision” is shared by dozens of analysts around the world – including the firm Roland Berger, which released a study arguing that,

by 2025, 20% of tasks will be automated. And more than three million workers may find themselves giving up their jobs to machines. An endless list of sectors is involved: agriculture, hospitality, government, the military and the police²².

To conceal such prospects is a serious mistake, as noted by an associate of Roland Berger, Hakim El Karoui:

«The tax system is not set up to collect from this one section of wealth generation (the digital), and the redistribution effect is therefore very limited».

Warning against the risk of social explosion, the partner at Roland Berger calls for «anticipating, describing, telling the truth [...], to create a shock in public opinion now». Otherwise, distrust of the elites will increase, with serious political consequences²³.

²⁰ Carl Benedikt Frey and Michael A. Osborne, “The Future of Employment: How Susceptible Are Jobs to Computerisation?”, 17 September 2013, available at: <http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf>.

²¹ “Vous serez peut-être remplacé par un robot en 2025”, BFMTV (10 October 2014), available at: <<http://hightech.bfmtv.com/logiciel/vous-serez-peut-etre-remplace-par-un-robot-en-2025-839432.html>>.

²² “Les robots vont-ils tuer la classe moyennes?”, *Le Journal du dimanche* (26 October 2014), available at: <<http://www.lejdd.fr/Economie/Les-robots-vont-ils-tuer-la-classe-moyenne-696622>>.

²³ BFM Business stresses that «the productivity gain generated by the mechanization of these tasks will

4. Entropy and negentropy in the Anthropocene

To anticipate, describe, alert, but also to propose: these are the goals of this book, which envisages a completely different way of “redistributing the wealth generated by the digital”, to put it in the terms of Hakim El Karoui. Is a different future possible, a new beginning, in the *process of complete and generalized automatization to which global digital reticulation leads?*

This question must be posed as that of the passage from the Anthropocene, which at the end of the eighteenth century established the conditions of generalized proletarianization (something that Adam Smith himself already understood), to the *exit* from this period, a period in which anthropization has become a “geological factor”²⁴. We will call this exit the *Neganthropocene*. The escape from the Anthropocene constitutes the global horizon of the theses advanced here. These theses posit as first principle that the *time saved by automatization must be invested in new disautomatization capabilities*, that is, of the *production of negentropy*.

Analysts have been predicting the end of wage labour for decades, from Norbert Wiener in the United States to Georges Friedman in France, after John Maynard Keynes himself warned of its imminent disappearance. Marx, too, explored this hypothesis in depth in a famous fragment of the *Grundrisse* known as the “fragment on machines” or the “section on automation”.

This possibility will come to fruition over the next decade. What should we do over the course of the next ten years in order to make the best of this *immense transformation?*

Bill Gates has himself warned of this decline in employment, and his recommendation is to reduce wages and eliminate various related taxes and charges. But lowering yet again the wages of those who still have jobs can only increase the global insolvency of the capitalist system. The true challenge lies elsewhere: *the time liberated by the end of work must be put at the service of a culture of automata capable of producing new value and of reinventing work*²⁵. The *culture of disautomatization made possible by automatization* is what can and must produce negentropic value – and this in turn requires what I have previously referred to as the *otium* of the people.²⁶

save 30 billion euros in tax revenue and budget savings, and generate the same amount of private investment, according to the study. Companies would also pay out 60 million euros to equip employees and machines. Thirteen billion euros of purchasing power would then be liberated, in the form of dividends or lower prices. But in the long term, the population would be at risk of forced inactivity». “Trois millions d’emplois détruits par les robots?”, BFM Business (27 October 2014), available at: <<http://bfmbusiness.bfmtv.com/emploi/trois-millions-d-emplois-detru-842702.html>>.

²⁴ For a historical reconstruction and a critical analysis of the concept of the Anthropocene, we can refer to the work of Christophe Bonneuil and Jean-Baptiste Fressoz, *L’Événement Anthropocène* (Paris: Le Seuil, 2013).

²⁵ We refer here to the title of the book by Dominique Meda and Patricia Vendramin, *Réinventer le travail* (Paris: PUF, 2013). We shall take up a dialogue with this work in chapter XX, pp. XXX–XX.

²⁶ See Bernard Stiegler, *The Decadence of Industrial Democracies: Disbelief and Discredit, Volume 1* (Cambridge: Polity Press, 2011), pp. 81–5 and 116–9.

Automation, in the way it has been implemented since Taylorism, has given rise to an immense amount of entropy, on such a scale that today, throughout the entire world, humanity fundamentally doubts its future – and youth even more so. Humankind’s doubt about its future, and its confrontation with unprecedented levels of youth worklessness [*désœuvrement*], rises up at the moment when the Anthropocene, which began with industrialization, becomes “conscious of itself”.

Coming after the Holocene, a period of 11500 years marked by relative climatic stability [...] which saw the emergence of agriculture, cities and civilizations, the Anthropocene [...] begins with the industrial revolution. We did indeed then enter into a new geological age of the Earth. Under the sway of human action, “Earth is currently operating in a *no-analogue state*” (Paul Crutzen and Will Steffen, “How Long Have We Been in the Anthropocene Era?”)²⁷.

That the Anthropocene has become “conscious of itself”²⁸ means that human beings have more or less developed a consciousness of belonging to the Anthropocene era, in the sense that they feel “responsible”²⁹ – something that became visible in the 1970s. After World War Two and the resultant acceleration of the Anthropocene, a “common consciousness” of being a geological factor and the collective cause of massive and accelerated entropization via mass anthropization began to arise, hence prior to the formulation of the concept of the Anthropocene itself (in 2000) – a fact that Bonneuil and Fressoz highlight by referring to speech delivered by Jimmy Carter in 1979:

Human identity is no longer defined by what one does, but by what one owns. But we’ve discovered that owning things and consuming things does not satisfy our longing for meaning. We’ve learned that piling up material goods cannot fill the emptiness of lives which have no confidence or purpose³⁰.

It is striking that an American president here declares the end of the American way of life. Bonneuil and Fressoz recall that this runs counter to the discourse that would ap-

²⁷ Bonneuil and Fressoz, *L’Événement Anthropocène*, p. 32. And see Paul J. Crutzen and Will Steffen, “How Long Have We Been in the Anthropocene Era?”, *Climate Change* 61 (2003), p. 253, available at: <http://stephenschneider.stanford.edu/Publications/PDF_Papers/CrutzenSteffen2003.pdf>.

²⁸ This is what Bonneuil and Fressoz call into question in their book (*ibid.*, p. 68 and p. 92), and we shall see why in *La Société automatique. 2. L’Avenir du savoir* (forthcoming). In summary they show that, from the beginning of the Anthropocene, the consequences of industrial anthropization are the issue. But this has been censored by economic and political actors using everything in their power – including lobbying, control of the media, and so on – to thwart the growth of this consciousness. Bonneuil and Fressoz show that today many scientists and philosophers are complicit in this dissimulation of the *primordially political* dimension of the Anthropocene.

²⁹ Bonneuil and Fressoz, who refer to the “grand narrative” of the history of industrialization, then critique ideological simplification. We will return to this critique in *Automatic Society, Volume Two: The Future of Knowledge*.

³⁰ Jimmy Carter, speech delivered 15 July 1979, cited in *ibid.*, p. 173, transcript available at: <<http://www.pbs.org/wgbh/americanexperience/features/primary-resources/carter-crisis/>>.

pear with Reagan:

[a discourse] in favour of a restoration of U.S. hegemony and the deregulation of polluting activities [...] [even though] Carter's speech indicates the influence [...] acquired in public space by the critique of consumer society.

In recent years and especially after 2008, this "self-consciousness" of the Anthropocene has made clear the *systemically and massively toxic* character of contemporary organology³¹ (in addition to its insolvency), in the sense that Ars Industrialis and the Institut de recherche et d'innovation give to this term in the general organological perspective³².

This pharmacological toxicity becomes a common consciousness, a sense that factors that, hitherto, we believed were progressive, have now inverted their sign and are a precipitating cause of the spread of human regression. The Anthropocene, whose history coincides with that of capitalism, thus presents itself as a process that begins with organological industrialization (including in those countries thought of as "anti-capitalist"), that is, with the industrial revolution – which must accordingly be understood as an *organological revolution*.

5. The completion of nihilism and the entry into the Neganthropocene

The Anthropocene era is that of industrial capitalism, an era in which *calculation prevails over every other criteria of decision-making*, and where algorithmic and mechanical becoming is concretized and materialized as logical automation and automatism, thereby constituting the advent of nihilism, as computational society becomes an automatic and remotely controlled society.

The confusion and disarray into which we are thrown in this stage – a stage that we call "reflective" because there is a supposedly "raised consciousness" of the Anthropocene – is a historical outcome in relation to which new causal and quasi-causal factors can now be identified that have hitherto received no analysis. This is why Bonneuil and Fressoz rightly deplore "geocratic" approaches that short-circuit political analyses of that history that begins to unfold with what they call the Anthropocene *event*³³.

³¹ See Bernard Stiegler, *What Makes Life Worth Living: On Pharmacology* (Cambridge: Polity Press, 2013).

³² See "Organologie", in "Vocabulaire d'Ars Industrialis", in Bernard Stiegler, *Pharmacologie du Front National*, followed by Victor Petit, *Vocabulaire d'Ars Industrialis* (Paris: Flammarion, 2013). On IRI, see: <http://www.iri.centrepompidou.fr/?lang=en_us>.

³³ Bonneuil and Fressoz, *L'Événement Anthropocène*, p. 83. The "Anthropocenologues" divide the Anthropocene into three stages: the industrial revolution, post-Second World War, called the "great acceleration", and the period in which the Anthropocene is thematized as such (see pp. 66–9). Bonneuil and Fressoz discuss these analyses, frequently challenging them in order to politicize them, treating the Anthropocene as a properly historical, that is, political, event. And they propose a different approach, in terms of the Thermocene, Thanatocene, Phagocene, Phronocene and Polemocene. We shall return to

To Bonneuil and Fressoz's historical and political perspective, however, we must add that, as a result of this event, what philosophy had denied in a structural way for centuries has now become clear, namely, that the artifact is the mainspring of hominization, its condition and its destiny. It is no longer possible for anyone to ignore this reality: what Valéry, Husserl and Freud posit between the two world wars as a new age of humanity, that is, as its pharmacological consciousness and unconsciousness of the "world of spirit"³⁴, has become a *common, scrambled and miserable* consciousness and unconsciousness. Such is ill-being in the contemporary Anthropocene.

What follows from this is an urgent need to redefine the noetic fact in totality – that is, in every field of knowledge (of how to live, do and think) – and to do so by integrating the perspectives of André Leroi-Gourhan and Georges Canguilhem, who were the first to posit the artificialization of life as the starting point of hominization³⁵. This imperative presents itself as a situation of extreme urgency crucial to politics, economics and ecology. And it thereby raises a question of *practical organology*, that is, of *inventive* productions.

We argue that this question and these productions necessarily pass through (and we will show why) a complete reinvention of the world wide web – *the Anthropocene having since 1993 entered into a new epoch* with the advent of the Web, an epoch that is as significant for us today as were railways at the beginning of the Anthropocene.

We must think the Anthropocene with Nietzsche, as the geological era that consists in the devaluation of all values: it is in the Anthropocene, and as its vital issue, that the *task of all noetic knowledge becomes the transvaluation of values*. And this occurs at the moment when the noetic soul is confronted, through its own, organological putting-itself-in-question, with the *completion of nihilism*, which amounts to the *very ordeal of our age* – in an Anthropocene concretized as the age of planetarizing capitalism.

It is with Nietzsche that, after the Anthropocene event, we must think the advent of the Neganthropocene, and this must be thought as the transvaluation of becoming into future. And this in turn means reading Nietzsche with Marx, given that the latter thinks, in 1857, the new status of knowledge in capitalism and the future of work, in the section of the *Grundrisse* known as the "fragment on machines" or on "automation", a section in which he also discusses the question of *general intellect*.

Reading Marx and Nietzsche together in the service of a new critique of political economy, where the *eco-nomy has become a cosmic factor on a local scale (a dimension of the cosmos)* and therefore an *eco-logy*, must lead to a process of *transvaluation*, such that both *economic values* and those *moral devaluations* that result when nihilism is set loose as consumerism are "*transvaluated*" through a new value of all values, that is, by *nege-*

this remarkable and fertile work in *L'Avenir du savoir*.

³⁴ Confronted with what Bonneuil and Fressoz call the *Thanatocene* – see *L'Événement Anthropocène*, p. 141.

³⁵ And Leroi-Gourhan already drew the conclusion highlighted by Bonneuil and Fressoz, namely, that there is no unity of the human species. See p. XXX and *ibid.*, p. 89.

tropy – or negative entropy³⁶, or anti-entropy³⁷.

Emerging from thermodynamics about thirty years after the advent of industrial technology and the beginning of the *organological revolution* lying at the origin of the Anthropocene, both with the grammatization of gesture by the first industrial automation and with the steam engine³⁸, the theory of entropy redefines the question of *value*, if it is true that the *entropy/negentropy relation is the vital question par excellence*. It is according to such perspectives that we must think, organologically and pharmacologically, both what we are referring to as the *entropocene* and what we are referring to as *neganthropology*.

6. The question of fire and the advent of thermodynamics

The *kosmos* is thought at the dawn of philosophy as identity and *equilibrium*. Through this opposition posited *in principle* between an equilibrium of ontological origin and the disequilibrium of corruptible beings, technics, which in fact constitutes the organological condition, is relegated to the sublunary as the world of contingency and of “what can be otherwise than it is” (*to endekhomenon allos ekhein*), and thereby finds itself as such excluded from thought.

The Anthropocene, however, makes such a position untenable, and consequently constitutes an epistemic crisis of unprecedented magnitude: the advent of the thermodynamic *machine*, which reveals that the human world is one of *fundamental disruption*³⁹, inscribes processuality, the irreversibility of becoming and the instability of equilibrium in which all this consists, at the heart of physics itself. All *principles* of thought as well as action are thereby overturned.

The thermodynamic machine, which posits in *physics* the new, specific problem of the dissipation of energy, is also the industrial technical object that fundamentally disrupts *social organizations*, thereby radically altering “the understanding that being there has of its being”⁴⁰ and installing the era of what is referred to as “technoscience”. As it consists essentially in a *combustion*, this technical object, of which the flyball governor will be a key element at the heart of the conception of cybernetics, introduces the *question of*

³⁶ Erwin Schrödinger, *What is Life?: The Physical Aspect of the Living Cell* (1944), in *What is Life, with Mind and Matter and Autobiographical Sketches* (Cambridge: Cambridge University Press, 1992).

³⁷ Francis Bailly and Giuseppe Longo, “Biological Organization and Anti-Entropy”, *Journal of Biological Systems* 17 (2009), pp. 63–96.

³⁸ But this makes sense only if accompanied by the grammatization of *savoir-faire* as what leads to what Marx in the *Grundrisse* called automation.

³⁹ This is the reality of what Heidegger called the *Ereignis* of “modern technics”, that is, of the industrial revolution, of the “calculation of the calculable” and of its *Gestell*, of its enframing. See Martin Heidegger, *Identity and Difference*. Yet this is precisely what Heidegger fails to think.

⁴⁰ This is how Heidegger describes *Dasein*, that is, “the being that we ourselves are”: *Dasein* is the being which has an understanding of itself, and that this understanding, which changes with time (which is *geschichtlich*, “historical”), and which, as constantly changing, puts into question – this being-in questions governing all ways of being, including as the refusal to “ask itself questions”.

fire and of its pharmacology both on the astrophysical plane (which replaces cosmology) and the plane of human ecology.

The question of fire – that is, of combustion – is thus inscribed in the perspective of both physics and anthropological ecology at the heart of a renewed thought of the cosmos *as cosmos* (and beyond Kantian “rational cosmology”): the Anthropocene epoch can appear as such only starting from the moment when the question of the cosmos itself becomes the question of combustion in thermodynamics as in astrophysics – and in relation, via the steam engine, with that eminent *pharmakon* that is domestic fire as the artifice par excellence that Prometheus brings to mortals, and of which Hestia takes care⁴¹.

As physical problem, the techno-logical conquest of fire⁴² puts anthropogenesis – that is, organological, and not just organic, organogenesis – at the heart of what Whitehead called *concrecence*, and as the *local technicization of the cosmos*. This local technicization is relative, but it leads to *conceiving the cosmos in totality on the basis of this position* and on the basis of this *local opening of the question of fire* as the *pharmakon* of which we must *take care* – where the question of *energy* (and of *energeia*) that fire (which is also light) harbours, posed on the basis of the organological and *epistemological* revolution of thermodynamics as reconsidered by Schrödinger, constitutes *the matrix of the thought of life as well as information, and as the play of entropy and negentropy*.

Establishing the *question* of entropy and negentropy among human beings as the *crucial problem* of the everyday life of human beings and of life in general, and, finally, of the universe in totality for every form of life, *technics* constitutes the matrix of all thought of *oikos*, of habitat and of its law. Is it not striking from such a point of view that at the very moment when Schrödinger was delivering the lectures in Dublin that will form the basis of *What is Life?*, Canguilhem was asserting that the noetic soul is a technical form of life that *requires new conditions of fidelity in order to overcome the shocks of infidelity* caused by what we ourselves call the *doubly epokhal redoubling*?⁴³

7. The Anthropocene as succession of technological shocks and the neganthropic role of knowledge

What Canguilhem described as the infidelity of the technical milieu⁴⁴ is what is encountered as *epokhal technological shock* by the organological and pharmacological be-

⁴¹ On this subject, see the courses of *pharmakon*.fr.

⁴² This would be the true *Ereignis* of what Heidegger called *Gestell* – but this is not Heidegger’s own point of view. In the “second Heidegger”, *Ereignis* designates the advent of what he also calls a “turn” (*Kehre*) in the “history of being”, and that he characterizes by the installation of what he calls *Gestell* (literally, “installation”), which is the “situation” arising from “modern technics” that he understands fundamentally in terms of the domination of cybernetics.

⁴³ The notion of *epokhe* is set out repeatedly in the three published volumes of *Technics and Time* and in various other works, in particular in *What Makes Life Worth Living: On Pharmacology*.

⁴⁴ On this subject, see Georges Canguilhem, *The Normal and the Pathological*, and my commentary in *What Makes Life Worth Living*.

ings that we are as noetic individuals – that is, intellectual and spiritual individuals. This shock and this infidelity derive fundamentally from what Simondon called the phase shifting of the individual. The phase shift of the individual in relation to itself is the dynamic principle of individuation.

We have developed the concept of “doubly epokhal redoubling” in order to try and describe how a shock begins by destroying established circuits of transindividuation⁴⁵, themselves emerging from a prior shock, and then gives rise to the generation of new circuits of transindividuation, which constitute new forms of knowledge arising from the previous shock. A techno-logical *epokhe* is *what breaks with constituted automatisms*, socialized and *capable of producing their own dis-automatization* through appropriate *knowledge*: the *suspension of socialized automatisms* (which feed stupidity in its many and varied forms) occurs through the *putting in place of new, asocial automatisms*, through which the second moment of shock (as the second redoubling) produces new capacities for dis-automatization, that is, of negentropy itself fostering new social organizations.

Knowledge always proceeds from such a double shock – whereas *stupidity* always proceeds from automaticity. Recall here that Canguilhem posits in principle the more-than-biological meaning of *episteme*: *knowledge of life* is a specific form of life conceived not only as biology, but as *knowledge of the milieus, systems and processes of individuation*, and where *knowledge is the condition and the future of life exposed to return shocks and its vital technical productions* (organogenetic productions, which it secretes in order to compensate for its default of origin).

Knowledge [*connaissance*] is constituted as the therapeutic knowledges [*savoirs*] partaking in the *pharmaka* in which consist the artificial organs thus secreted. It is immediately social, and it is always more or less transindividuated in social organizations. Knowledge of *pharmaka* is also knowledge through *pharmaka*: it is thoroughly organologically constituted, but also wholly and originally internalized – *failing which it is not knowledge, but information*. This is why it does not become diluted in “cognition”: hence the cognitive sciences, which are one such form, are incapable of thinking knowledge (that is, of thinking *themselves*).

We must relate the organo-logical function of knowledge such as we understand it on the basis of Canguilhem, and as necessitated by the technical form of life, to what Simondon called the knowledge of individuation: to know individuation is to individuate, that is, it is to *already no longer know* because it is to *de-phase*.

Knowledge [*connaissance*], as the knowledge [*savoir*] that conditions both psychic and collective individuation of knowing, “always comes too late”, as Hegel said, which means that it is not self-sufficient: it presumes *savoir vivre* and *savoir faire* that always exceed it and that are themselves always exceeded by technical individuation, which generates the technological shocks that constitute epochs of knowledge.

⁴⁵ On transindividuation, see Gilbert Simondon.

In socializing itself, knowledge increases the complexity of societies, societies that individuate and as such participate in what Whitehead called the concrescence of the cosmos, itself conceived as a cosmic process that generates processes of individuation whereby entropic and negentropic tendencies play out differently each time.

In the Anthropocene epoch, *from which it is a matter of escaping as quickly as possible*, the questions of life and negentropy arising with Darwin and Schrödinger must be redefined from the organological perspective defended here, according to which:

1. natural selection makes way for artificial selection;
2. the passage from the organic to the organological displaces the play of entropy and negentropy⁴⁶.

Technics is an *accentuation of negentropy*. It is an agent of *increased differentiation*: it is “the pursuit of life by means other than life”⁴⁷. But it is, equally, an *acceleration of entropy*, not just because it is always in some way a process of the combustion and dissipation of energy, but because *industrial standardization* seems to be leading the contemporary Anthropocene to the possibility of a destruction of life as the burgeoning and proliferation of differences – as the biodiversity, sociodiversity (“cultural diversity”) and psychodiversity of singularities generated *by default* as psychic individuations and collective individuations.

The destruction of sociodiversity results from short-circuits of the processes of transindividuation imposed by industrial standardization. We shall see in the conclusion of this work that anthropology understood as entropology is the problem that Claude Lévi-Strauss succeeds in recognizing but not in thinking – he does not succeed in posing this as the question of neganthropology, that is, as a *new epoch of knowledge* embodying the task of entering into the Neganthropocene. This is what leads Lévi-Strauss to abandon the political dimension of all anthropology.

The Anthropocene is a singular organological epoch inasmuch as it generates the organological question itself. It is in this way retroactively constituted through recognizing itself, where the *question* posed by the Anthropocene is how to *exit* the toxic period of the Anthropocene in order to enter the curative and care-ful – and in this sense economizing – epoch of the Neganthropocene. What this means in practical terms is that in the Neganthropocene, and *on the economic plane, the accumulation of value must occur exclusively with respect to investments that we shall call neganthropic*.

We call *neganthropic* that human activity that is explicitly and imperatively governed – via processes of transindividuation that it implements, and which result from a criteriology established by retentional systems – by negentropic criteria. The neganthropiza-

⁴⁶ This cannot but radically affect ecological science, and not just ecological politics, but it does so by inscribing the political event at the very heart of the science of the living in its negotiation with the organized non-living and with the resultant organizations.

⁴⁷ This is the point of view I defend in *Technics and Time*, 1, p. 135.

tion of the world breaks with the care-less and negligent anthropization of its entropic effects – that is, with the essential characteristics of the Anthropocene. Such a rupture presupposes the overcoming of anthropology as conceived by Lévi-Strauss, through a neganthropology that remains entirely to be elaborated.

The *question* of the Anthropocene, which bears within it its own overcoming, and bears the structure of a *promise*, is emerging at the very moment that, on the other hand, is witnessing the establishment of the *complete and general automatization and automation* made possible by the *industry of reticulated digital traces*, where the latter seems to make this promise untenable. To hold on, that is, to hold good to this promise, is to hold on, precisely, starting from those neganthropic possibilities opened up by *automation* itself: it is to think this industry of reticulation as a new epoch of work, as the end of the epoch of “employment”, given that the latter is ultimately and permanently compromised by *complete and general automation*. And it is to think this industry as the ‘transvaluation’ of value, whereby «labour time ceases and must cease to be its measure, and hence exchange value [must cease to be the measure] of use value»⁴⁸, and where *the value of value become neganthropy*. Only in this way can and must the passage from the Anthropocene to the Neganthropocene be accomplished.

8. Smartification

Since 1993, a new global technical system has been put in place. It is based on digital tertiary retention, and it constitutes the infrastructure of an automatic society to come. We are told that the data economy, which seems to concretize itself as the economic dynamic generated by this infrastructure, is the destiny of this automatic society to come.

We shall show, however, that the “destiny” of this society of hyper-control (chapter one) is not a destination: it leads nowhere other than to nihilism, that is, *to the negation of knowledge itself* (chapter two). And we will see, first with Jonathan Crary (chapter three), then with Thomas Berns and Antoinette Rouvroy (chapters four and five) why this automatic society to come can constitute a future – that is, a destiny of which the negentropic destination is the Neganthropocene – only on the condition of overcoming this “data economy”, which is in reality the diseconomy of a “dis-society”⁴⁹ (chapter six).

The current system of the industrial exploitation of modeled and digitalized traces precipitated the entropic catastrophe that is the Anthropocene as a destiny that leads nowhere. As 24/7 capitalism and algorithmic governmentality, it hegemonically serves a *hyper-entropic* functioning that accelerates the rhythm of the consumerist destruction of the world while installing a structural and unsustainable insolvency, based on a generalized stupefaction and a functional stupidity that destroys the neganthropological capaci-

⁴⁸ Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy (Rough Draft)* (London: Pelican, 1973), p. 705.

⁴⁹ Jacques Généreux, *La Dissociété* (Paris: Le Seuil, 2006).

ties that knowledge contains: unlike mere competence, which does not know what it does, *knowledge is an intrinsically negentropic cosmic factor*.

We intend in this work to show that the reticulated digital infrastructure that supports the data economy, set into place in 1993 with the world wide web and constituting the most recent epoch of the Anthropocene, can and must be inverted into a neganthropic infrastructure founded on *hermeneutic* digital technology in the service of dis-automation, that is, based on *collective investment* of the productivity gains derived from automatization in a culture of knowing how to do, live and think insofar as this knowledge is essentially neganthropic and as such produces new value that, alone, is capable of establishing an era bearing a new solvency that we call the Neganthropocene (chapters seven and eight).

The current infrastructure is rapidly evolving towards a society of hyper-control founded on mobile devices such as the *smartphone*, domestic devices such as the *web-connected television*, habitats, such as the *smart house* and *smart city*, and transport devices, such as the *connected car*.

Michael Price showed on 31 October 2014 that the connected television is a tool for the automated spying on individuals:

I just bought a new TV. [...] I am now the owner of a new 'smart' TV [...]. The only problem is that I'm now afraid to use it. [...] The amount of data this thing collects is staggering. It logs where, when, how and for how long you use the TV. It sets tracking cookies and beacons designed to detect 'when you have viewed particular content or a particular email message.' It records 'the apps you use, the websites you visit, and how you interact with content.' It ignores 'do-not-track' requests as a considered matter of policy. It also has a built-in camera – with facial recognition. The purpose is to provide 'gesture control' for the TV and enable you to log in to a personalized account using your face⁵⁰.

What will occur with the connected clothing that is now appearing on the market?⁵¹

In addition, Jérémie Zimmermann highlighted in an interview in *Philosophie magazine* in September 2013 that the smartphone has led to a real change in the hardware of the digital infrastructure, since the operations of this handheld device, unlike either the desktop or laptop computer, are no longer accessible to the owner:

The PCs that became available to the broad public in the 1980s were completely understandable and programmable by their users. This is no longer the case with the

⁵⁰ Michael Price, "I'm terrified of my new TV: Why I'm scared to this thing on – and you'd be too", *Salon* (31 October 2014), available at: <http://www.salon.com/2014/10/30/im_terrified_of_my_new_tv_why_im_scared_to_turn_this_thing_on_and_you_d_be_too/>.

⁵¹ See Christophe Alix, "Des tee-shirts connectés franco-japonais à la fibre sportive", *Libération* (7 December 2014), available at: <http://www.liberation.fr/economie/2014/12/07/des-tee-shirts-connectes-franco-japonais-a-la-fibre-sportive_1158732>.

new mobile computers, which are designed so as to prevent the user from accessing some of the functions and options. The major problem is the so-called baseband chip that is found at the heart of the device. All communications with the outside – telephone conversations, SMS, email, data – pass through this chip. More and more, these baseband chips are fused with the interior of the microprocessor; they are integrated with the main chip of the mobile computer. Now, none of the specifications for any of these chips are available, so we know nothing about them and cannot control them. Conversely, it is potentially possible for the manufacturer or the operator to have access, via these chips, to your computer⁵².

For his part, the physicist Stephen Hawking, in an article appearing in *The Independent* on 1 May 2014 co-authored with Stuart Russell, Max Tegmark and Frank Wilczek, stated that «AI may transform our economy to bring both great wealth and great dislocation». ⁵³ The authors observe that, if we undoubtedly have a tendency to believe that, «facing possible futures of incalculable benefits and risks, the experts are surely doing everything possible to ensure the best outcome», we are wrong. And they invite us to measure what is at stake by considering one question:

If a superior alien civilisation sent us a message saying, ‘We’ll arrive in a few decades,’ would we just reply, ‘OK, call us when you get here – we’ll leave the lights on?’ Probably not – but this is more or less what is happening with AI.

They point out that the *stakes are too high to not be given priority and urgency at the core of research*:

Although we are facing potentially the best or worst thing to happen to humanity in history, little serious research is devoted to these issues outside non-profit institutes.

Referring to the work of Tim O’Reilly, Evgeny Morozov talks about “smartification” based on “algorithmic regulation” that amounts to a new type of governance founded on cybernetics, which is above all the science of government, as Morozov recalls⁵⁴. I have myself tried to show, provisionally, that in a way this constitutes the horizon of Plato’s *Republic*⁵⁵.

⁵² Jérémie Zimmermann, “La surveillance est massive et généralisée”, interview in *Philosophie magazine* (19 September 2013).

⁵³ Stephen Hawking, Stuart Russell, Max Tegmark and Frank Wilczek, “*Transcendence* looks at the implications of artificial intelligence – but are we taking AI seriously enough?”, *The Independent* (1 May 2014), available at: <<http://www.independent.co.uk/news/science/stephen-hawking-transcendence-looks-at-the-implications-of-artificial-intelligence--but-are-we-taking-ai-seriously-enough-9313474.html>>.

⁵⁴ Evgeny Morozov, “The rise of data and the death of politics”, *The Guardian* (20 July 2014), available at: <<http://www.theguardian.com/technology/2014/jul/20/rise-of-data-death-of-politics-evgeny-morozov-algorithmic-regulation>>.

⁵⁵ See the courses of *pharmakon.fr* from 2012–13 and 2013–14.

Morozov cites O'Reilly:

You know the way that advertising turned out to be the native business model for the internet? [...] I think that insurance is going to be the native business model for the internet of things⁵⁶.

Morozov's central idea is that the way we currently organize the collection, exploitation and reproduction of what we are here calling *digital tertiary retention* rests on the structural elimination of conflicts, disagreements and controversies:

[A]lgorithmic regulation offers us a good-old technocratic utopia of politics without politics. Disagreement and conflict, under this model, are seen as unfortunate byproducts of the analog era – to be solved through data collection – and not as inevitable results of economic or ideological conflicts.

We shall see how Thomas Berns and Antoinette Rouvroy have analyzed, from a similar standpoint, what they themselves call, in reference to Michel Foucault, algorithmic governmentality – whereby the insurance business and a new conception of medicine based on a transhumanist program both have the goal of “hacking” (that is, “reprogramming”) not only the state, but the human body⁵⁷. Google, which along with NASA supports the Singularity University, has invested heavily in “medical” digital technologies based on the application of supercomputing to genetic and also epigenetic data – and with an explicitly eugenic goal⁵⁸.

9. The goal of the present work

Morozov points out that net activists, who have become aware of the toxicity of “their thing”, are nevertheless manipulated and recuperated by “algorithmic regulation” through non-profit organizations that intend to “reprogram the state”:

[T]he algorithmic regulation lobby advances in more clandestine ways. They create innocuous non-profit organisations like Code for America which then co-opt the state – under the guise of encouraging talented hackers to tackle civic problems.

⁵⁶ Tim O'Reilly, cited in Morozov, “The rise of data and the death of politics”.

⁵⁷ See Jean-Christophe Féraud and Lucile Morin, “Transhumanisme: un corps pieces et main-d'oeuvre”, *Libération* (7 December 2014).

⁵⁸ “The company 23andme [...], a subsidiary of Google, run by the wife of Sergey Brin, filed for a patent for a method that would enable the creation of a “bébé à la carte”, thanks to the selection of gametes from donor eggs and sperm, provoking outrage among bioethicists. Nevertheless, the startup continues to offer its customers a genetic analysis service for families for \$99, based on a saliva sample». Féraud and Morin, “Transhumanisme”.

Such initiatives aim to reprogramme the state and make it feedback-friendly, crowding out other means of doing politics⁵⁹.

Morozov calls for the elaboration of a new politics of technology – one that would serve left-wing politics:

While many of the creators of the internet bemoan how low their creature has fallen, their anger is misdirected. The fault is not with that amorphous entity but, first of all, with the absence of robust technology policy on the left.

We fully share this analysis: the goal of this work is to contribute to establishing the conditions of such a politics through its two volumes on the neganthropic future of work and of knowledge as the conditions of entry into the Neganthropocene – where this is also a matter of *redesigning the digital architecture* and *in particular the digital architecture of the web*, with the goal of creating a digital hermeneutics that gives to controversies and conflicts of interpretation their negentropic value, and constitutes on this basis an economy of work and knowledge founded on intermittence, for which the model must be the French system designed to support the so-called “intermittents du spectacle”.

⁵⁹ Morozov, “The rise of data and the death of politics”.