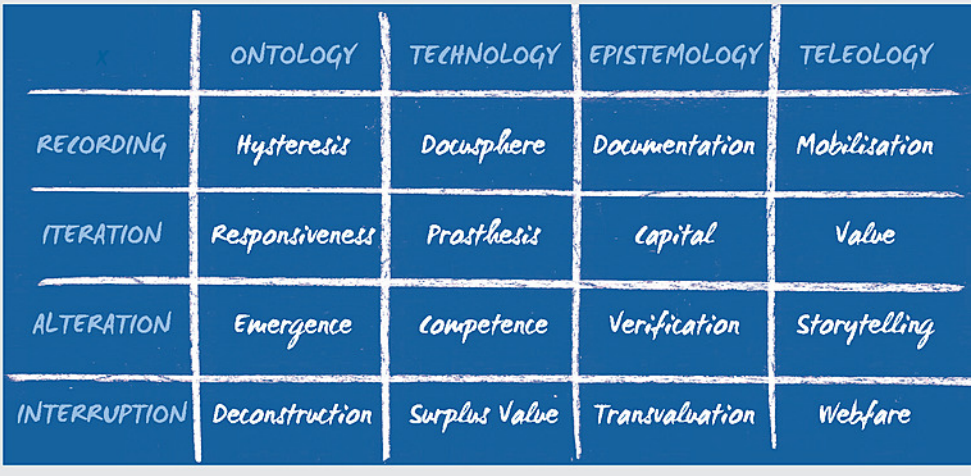
Maurizio Ferraris

Doc-Humanity



Reality and Hermeneutics 2

Mohr Siebeck

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Bonn Studies in the New Humanities

2

Maurizio Ferraris

Doc-Humanity

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Original title: Documanità. Filosofia del mondo nuevo by Maurizio Ferraris.

The series *Reality and Hermeneutics* is supported by the *Faculty of Arts and Humanities*, *University of Bonn*, in cooperation with *The Institute for Philosophy and the New Humanities*, *New School for Social Research*, *New York*, and the *East Asian Academy for the New Liberal Arts*, *University of Tokyo*.

ISBN 978-3-16-161666-2 / eISBN 978-3-16-161667-9
DOI 10.1628/978-3-16-161667-9

ISSN 2751-708X / eISSN 2751-7098 (Reality and Hermeneutics)

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliographie; detailed bibliographic data are available at *http://dnb.dnb.de*.

The book was typeset by Gulde Druck in Tübingen using Times typeface. It was printed on non-aging paper and bound by Hubert & Co. in Göttingen.

Printed in Germany.

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Prologue: The New World

The short century, which began in 1918 and allegedly ended in 1989, actually lasted a little longer than usual: 102 years. Indeed, the 20th century really ended in 2020, and the 21st century started this year. Or, if you prefer, the short century was followed by a *very* short one, lasting thirty-one years, and now we are entering the 22nd century. However you want to look at it, this is a new century, a new world, and also a new humanity – in fact, humanity is not something that has been defined once and for all, but an open project. What entitles me to such seemingly misplaced optimism, you may ask? Am I blind to the looming dangers and the ongoing crisis? Of course not, but for that matter an illustrious colleague like Augustine of Hippo wrote *The City of God* while under siege by Genseric, as the entire world was collapsing all around him. Rest assured, I have a different project in mind here, not only because unfortunately I am no Augustine, but especially because transitional periods, like unhappy families according to Tolstoy, are each unhappy in their own way. The point is to understand where this unhappiness comes from, and to find ways of translating it into confidence in the future, instead of letting pessimism or nostalgia paralyse our efforts. Now, however little we may think of ourselves, and however justified we may be in judging the crooked timber of humanity, the fact remains that signs of progress abound, and neglecting them would be a crime against ourselves and future generations. These signs may not be blatant, but this is only natural, since no age has ever been able to read, from the beginning, the tables of the law that would govern it. But precisely for this reason it is necessary to try and grasp the traces of the future in the confused fabric of the present.

First sign: the documedia revolution. For some decades now, we have been witnessing a revolution. This is not a political and ideological revolution like those that took place around the First World War, but a technological revolution, which is much more radical because it does not depend on people's beliefs, but on the tireless labour of machines. Specifically, the core of this revolution is the Internet, which, regardless of any short-term enthusiasm or execration, has introduced a degree of automation destined, in an indefinite period of time, to finally free humanity from the burden of toil and alienation. And this is not because of some form of industrial philanthropy, but simply because, unlike humans, ma-

chines have no rights, no dreams, no nightmares, no neuroses, no hunger, no thirst, no fatigue, no boredom, no divorces, no shared expenses, no retirement, and no ideas – and if they die, they can rise again.

So, there is nothing wrong in thinking that artificial intelligence was invented to take away our jobs: that is exactly right (on the other hand, as we shall see, it is not true that machines will eventually take over in general). Robotics and domotics are experimenting in home care and the military, but the real goal is the automation of all production. Indeed, it is hard to deny that automation is the destiny of a process that may take many years, but which has already been underway since the first hominid used a bone as a club or a lever, enhancing its strength with a rudimentary mechanism. There has been no turning back since then. So let's take this for granted – after all, it is a comforting thought, given that no one regrets mines or assembly lines, or even just the office manager strolling among the typists, tapping his watch. And let us consider that, just as those jobs have disappeared or are disappearing, so too will the delivery people, the on-demand workers, and all those who do the micro-jobs required by artificial intelligence insofar as it is not yet sufficiently developed, although very ready to learn. This is a dramatic and potentially hopeless situation, which heralds a crisis incomparable to any other known to humanity. Such a crisis cannot be addressed by mourning the past, but requires understanding the present in its singularity and originality.

At the end of the 18th century began the world of industrial capital: it produced goods, generated alienation and made much noise, that of factories. Then came financial capital, which produced wealth, generated adrenalin and made a modicum of noise, this time in stock exchanges. Today, a brand new capital is coming forward, thanks to a technology that did not exist before (though it manifests the essence of the capitalisation that constitutes the social world): this new capital produces documents, generates mobilisation through automation, and makes no noise. Compared to financial capital, it is richer and even more influential on the creation of value, on social relations and on the organisation of people's lives – and I am not just talking about their professional existence, of course, as it is prone to blur the distinction between life and work.

This capital is revolutionary and is linked to a *technological* transformation, the kind that took us from the chipping of the first flint to the Bronze and Iron Ages, to the exploitation of steam. I call the ongoing change "documedia revolution" because it is based on the intersection between the increase in documentality, i.e. the production of documents as a constitutive element of social reality, and the growth of the media, which today no longer work as one-to-many but as many-to-many. While the environment of the industrial revolution involved factories and working-class towns, the milieu in which production takes place today

is the Web, i.e. a potentially ubiquitous place. This transformation (which implies a generalisation: factories are somewhere, the Web is everywhere) easily explains the radicality of the changes that have taken place in the last few years. This revolution is the largely accidental result of the dizzying increase in means of recording, comparing and profiling humanity – that is, the capital of acts that humans perform in the world.

When watching a video online one may feel like one is dealing with a more interactive television, but in reality there is a whole Copernican revolution between using an analogue and a digital medium. In the first case, we passively watch the video, so much so that we often fall asleep. In the second case, so to speak, it is the video that watches us, keeping track of our habits and preferences, the comments we make, the people to whom we send the link, the frequency with which we revisit it, etc. The Web then pushes us to take action, so much so that I don't think anybody ever fell asleep in front of the mobile phone, unless they used it as a TV set – but even then, unlike the TV set, the mobile phone impassively noted down the time, the day, and many other things. The fact that 90% of all documents currently stored in the world have only been generated in the last two years[1] is thus difficult to prove, but intuitively reasonable. In Europe, in the United States, and progressively all over the world – with an enormous competitive advantage for China, which has almost one and a half billion inhabitants and, above all, one billion mobile phones – everyday acts that until very recently would have disappeared into thin air are now being recorded and, as I will demonstrate at length in this book, turned into capital.

Second sign: from prod-humanity to doc-humanity. This is another sign that may not be apparent at first, but constitutes the starting thread of the tangle that I will try to unravel in this book. To those who, with legitimate concern, speak of the end of labour and therefore of employment, and to those who fear the dystopia of machines taking over as humanity falls, I propose a simple reflection: What is the point of machines without humans? What is the point of production without consumption? The growth of automation has brought about a revelation of something that had hitherto remained hidden in the workshops of *homo faber*. That is, there are very few functions in which a machine cannot replace a human being, but not *consumption*, be it material (machines need energy, but they can also do without it, whereas organisms, including humans, die if deprived of it) or spiritual (one can imagine a machine producing symphonies, but not a machine enjoying them).

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[1] SINTEF, *Big Data, for better or worse: 90% of world's data generated over last two years*, in "Science Daily" (2013, May 22): www.sciencedaily.com/releases/2013/05/130522085217.htm [12/11/2020].

If production was at the heart of industrial capital, which was made of matter, then consumption is at the heart of documedia capital, which is made of memory. Machines can produce infinitely more and better than humans, but no machine can ever consume *in the place of* a human. Instead, every human is capable of consuming, and indeed must necessarily do so to stay alive. For this very reason, consumption, with its physiological urgencies and the social mobilisation it entails, provides a purpose for the entire productive system, which would otherwise be meaningless. So, consumerism is not just the dirty word that has been deprecated, I am not sure how sincerely, over the last few centuries, but should be seen as the great engine of human growth. Reciprocally, the non-automated functions of consumption, which cannot be automated precisely because they are exclusively human and organic, are the future of value production. Mechanisms, in fact, consume only in a metaphorical or at least derivative sense: a car without fuel does not die, a human without food eventually does. As for non-human organisms, they satisfy their needs through processes that have nothing to do with consumption, as they are not part of a technical and economic cycle (when they are, it is again with a view to human consumption: farms, pets, etc.).

But why should consumption be equated with production? This is the crux of the whole argument, and the answer is simpler than it may seem: because it generates documents. For a long time, production demanded physical effort and entailed alienation, but this is no longer necessarily the case. Prodhumanity, the humanity that toils in fields and workshops, as crucial to the industrial age as it was for the ten thousand years before it, is still with us. But we are already seeing the rise of doc-humanity, a humanity whose greatest function is to produce documents about itself – be they minor documents such as the data about our online activities, or major documents such as spiritual or cultural products. All these documents are essential for the profiling of needs and behaviours, the resulting automation of production, and the rationalisation of distribution, with the consequent lowering of prices.

If understood in its true structure, the documedia revolution thus brings about a virtuous circle between the automation of production generated by the collection of documents produced by humans, and the world of life where human acts, which feed the production of documents, take place. On the one hand, automation enables the recording, archiving, profiling and reuse of human life forms. What we call "artificial intelligence" is just that. On the other hand, the whole process receives nourishment, meaning and purpose from the fact that there are human agents, mortal organisms that, unlike machines, have an irreversible end (death), and can therefore attribute an end (purpose) to machines, for example to oxygenate us in intensive care units. Try to imagine an intensive care unit without humans: it would be meaningless, and one would wonder whether it would

be worth keeping. Now think of a Web without humans, and you will see the essential role that each of us plays with respect to automation, mainly fed by the profiling of human behaviours and needs operated by Internet platforms.

In short, production, as the mechanical part of humanity, is destined for automation, while consumption, as a properly human fact, cannot be automated in any way, for reasons that are not ethical but ontological. Consumption is not only the cooperation of users in production: it is the ultimate goal of all production. If humankind were to suddenly find itself without needs to be satisfied through consumption, the whole documedia system would implode. Consumption accompanies us until our last day, and even afterwards, if we have made onerous requests for our burial. In this framework, consumption is not the modern surrogate of capital vices, but an organic need inserted in a socio-technical context, which generates all kinds of reinforcement, supplementation and metamorphosis of need that turn it into desire, ambition, luxury, waste, culture. Yet this crucial circumstance will remain hidden until consumption is reconceptualised as labour.

Third sign: mastery and slavery. The third sign also needs to be understood, else humanity will continue to be reduced to the victimhood of voluntary servitude. We no longer need workers (good for them), but we do need humans, including those humans who until not long ago only recognised themselves as producers. The exclusion of workers from production in no way means that humans are no longer able to produce value. Machines always need someone – a living being and most often a human – to give them a purpose. This holds for anything – a watch, a knife, a cheese grater, a computer, a mobile phone. Try to imagine a world without humans, and ask yourself what purpose a mystery novel or a battery charger would have then. Herein lies the enormous and underestimated power of humanity. It is possible that sooner or later there will be a mechanical way to produce and distribute anything, but even a perfect machine would be utterly useless in the absence of humans. Which means, if you think about it, that we are quite literally the masters of steam, the lords of machines, although for some reason – usually related to a wish to absolve ourselves of our own inertia or faults – we are mostly inclined to think of ourselves as slaves to automation.

It is up to us to bring about a conceptual revolution, a turnaround in the way of thinking that has accompanied us through the long but not infinite time when humans were primarily producers. This is less and less the case today, for the reasons I have hinted at here and which I will analyse at length in this book. But precisely because we are living organisms, and in particular organisms that are systematically connected to technological devices, we must understand that without us, without our needs, without our urgencies, without the boredom and anguish deriving from the knowledge that we possess a limited lifespan, autom-

ata would be meaningless. In the same way, we must become aware of the fact that, precisely because, fortunately, machines will gradually cover the vast majority of productive needs, humankind will have to rethink its being-in-the-world as mobilisation. And we will have to understand the unprecedented value of that mobilisation, which has effectively taken the place of labour and must therefore be recognised and remunerated. In the light of this, we need a transvaluation of all values and all labours: a transvaluation with no Walhalla, a transformation of a traditional worldview that, although ancient, is not necessarily just.

In other words, the master-servant dialectic must be revived, and to do so we must overturn the misleading assumption that we are masters of nature and slaves to technology. As for our supposed mastery over nature, Covid-19 is a perfect illustration of how easily nature overpowers us – not to mention that, even in normal circumstances, we all eventually die, whether in a hundred years or in a minute. And herein lies the reason for our dominion over technology. This is a point that requires reflection, because what is at stake is our freedom. Now that the gods and the devil are no longer presentable candidates, an even more serious problem than theodicy has arisen. If there is no single principle to which the world can be traced back, for better or worse, whom are we to blame for our misfortunes? The question makes no more sense, from a secular point of view, than the one that inspired theodicy, but, unlike the latter, it has produced a large number of answers, all of which have the defect of distracting us from the analysis of actual reality, and which usually agree in viewing us as slaves to technology. Yet this is a slavery that we have only ourselves to blame for. If someone points a gun at me, I am not a slave to the gun, but to the person holding it. Blaming the Internet for populism is like blaming the radio for Nazism. And talking about the government of algorithms is no different from thinking that the intention to kill Caesar lied in the daggers and not in the conspirators. Humans are not slaves to technology or abstract systems: these are excuses for those who command and those who obey. They can, of course, be slaves to other humans, and their first duty is to emancipate themselves, through political action and philosophical understanding.

Fourth sign: the humanity to come. The fourth sign, lastly, concerns the new world opening up before us and its original characteristics, starting with the centrality of education. This is where we must start. The more humanity progresses, the more sensitive it becomes to injustice and inequality, the more the demand for human rights and the duty to meet these demands are pushed forward. And all this is due, first and foremost, to an essential philosophical reason that is often not given sufficient attention. There is no "human nature" as such: humanity is not something that has been defined once and for all, and consequently the rights (and corresponding duties) of human beings are not set in stone. They are not

written in some Neolithic cave, they are not carved in the tablets of the law brought down from Sinai, nor are they displayed in bronze on the walls of Rome, a city rightly considered a symbol of civilisation, but which accepted slavery as a normal condition. Human nature, as well as its rights and duties, is a matter of historical becoming, and curiously enough, those who have condemned ethical relativism as a source of moral leniency or social injustice, undermining the good old values, have failed to consider that those values were not so good – indeed, they were far worse than our own. As there is no end to research, let alone to the history of human education, our current values will undoubtedly appear insufficient and limited to our future descendants, but the latter will still owe us gratitude, whereas we have the human, all too human, right to envy them a little.

The modern world, thanks to automation, has managed to satisfy the needs of an increasing number of human beings and, contrary to what is often claimed, our fundamental problem is not war or hunger. I do not say this to downplay these issues (every death matters, and in fact the only thing that matters is death), but to indicate where the real urgency lies. What we need most in the new world is *education*, understood first and foremost as the ability to produce a humanity that does not feel submissive or lost in the world it has created. So, what stands out as the fundamental necessity for the new world – which will not be paradise with the consequent eternal tedium, but which will certainly be better and fairer than the world we have left behind – is the shift from concern for production to concern for education. Let us not forget: Socrates did not say that a life without production is worthless; he said that a life without research is worthless, and, in productive terms, he did not work a day in his life. That is where we must aim, and if we look at the world without prejudice we will notice that we are closer to that goal than in any historical era before, certainly more so than in Socrates' own.

When Keynes wondered what one should do with one's free time he was thinking of other people – as for him, he knew perfectly well how to occupy it: read, write, attend international conferences, converse, dance and flirt with his Bloomsbury friends. If there is a desirable destiny for humankind, it is that, in a relatively long time, a similar form of life will be granted to every human being. And such a destiny cannot fail to come, for history does not go backwards. Webfare, the digital welfare system that I propose in this book, must pass through education, which will teach us to find new names and new forms, more tolerant and just, for the human needs for security, identity and projection into the future that in the past have been recognised in those old names. And above all, it will teach us how to transform the time given to us by automation into an opportunity for progress. The Web would thus cease to be the machine of discontent, and would become an instrument of emancipation. This, after all, is what it was sup-

posed to be in the initial and naive dreams of its inventors, and this is what it can and must become again.

One very last point before concluding this already overlong introduction. I am sceptical, to say the least, of any criticism that does not come with an alternative, of any deconstruction without reconstruction. What we need is not yet another book about growing inequality, new forms of poverty, the end of labour, the dictatorship of machines and the panopticon state; if anything, we need ideas to avoid all this, because the conditions for doing so are in place today more than in any other time in history. The idea is more or less the following: "You don't like communism? You don't like capitalism? You don't like Webfare? Fine. But then tell me what is wrong with these things, and above all clarify what you *do* think is right. While you're busy thinking about it, let me explain why, in my opinion, we are better off today than we have ever been before, and how we will be better still, if we acknowledge (which you don't) that the path we have been on for a million years is the right one". That is what I will do in the next few pages, if you have the patience to follow me.

Instructions For Use

This work aspires to re-propose a philosophical system. Indeed, the use of systems has fallen into disuse in the last two centuries, for reasons that remain to be clarified and are far from obvious. If, as I believe, from philosophy one expects totality, or at least something like it, then the only alternative to the negative totality of the fragment is the system, or at least the adoption of some form, open and modular as it may be, but a form nonetheless.

The sequence of books that make up this volume suggests that ontology, with its fundamental vehicle, recording, corresponds to book 1; technology, with its fundamental vehicle, iteration, corresponds to book 2; epistemology, with its fundamental vehicle, alteration, corresponds to book 3; and teleology, with its fundamental vehicle, interruption, corresponds to book 4. This structure is repeated in the four chapters of each book, so that all chapters 1 deal with ontology, all chapters 2 with technology, and so on. The same applies to the four paragraphs that make up each chapter, obviously with the modifications resulting from their location.

	Chap. 1 Ontology	Chap. 2 Technology	Chap. 3 Epistemology	Chap. 4 Teleology
Book 1 Recording	1.1	1.2	1.3	1.4
Book 2 Iteration	2.1	2.2	2.3	2.4
Book 3 Alteration	3.1	3.2	3.3	3.4
Book 4 Interruption	4.1	4.2	4.3	4.4

By way of example, 1.3 as well as 2.3, 3.3 and 4. 3 deal with epistemology, except in the first case I talk about knowledge relating to ontology (the solution to the mystery of the commodity form), in the second case about knowledge relating to technology (capital as the vehicle of epistemological progress), in the third about knowledge relating to epistemology (a metaphilosophical reflection on

how truth is formed), and in the fourth about knowledge relating to teleology (the struggle for the recognition of mobilisation as a production of value, i.e. the solution to the mystery of labour).

This structure obviously allows for a traditional reading, which is still the one I recommend, if only because it is guided by that tenuous but tenacious thread of the author's intention, and corresponds to a custom established in a great many cultures – although, as we know, at least half the world reads in other ways. According to this tradition, "reading a book" means starting with the first letter at the top left of the first page and ending with the last letter at the bottom right of the final page. This way of reading – which is a regulative ideal that has never been actually implemented fully: one always skips letters due to saccadic movements, if not entire pages or chapters due the dullness of the topic – would entail the following path: in 1 I deal with the documedia revolution, i.e. the ongoing transformation brought about by the Web; in 2 I deal with the anthropological revelation resulting from this revolution (my thesis is in fact that technology does not bring alienation, but a revelation of who we are); in 3 I deal with speculation, i.e. the metaphysical foundations common to both the revolution and the revelation; and in 4 I deal with transvaluation, i.e. the conceptual transformation and political action necessary for a fair redistribution of the social and economic gains generated by the documedia revolution.

This progression, however, is only one of the many possible or complementary uses of the present text, which aims at providing a theoretical matrix to understand the transformation in progress and to explore the future that, hopefully, awaits humanity, or rather, doc-humanity. Indeed, doc-humanity is what we are beginning to turn into, now that the production of goods is reserved for machines and all that remains for us humans to do is generate documents about who we are, what we want or do not want, what we know or think we know. Here are some of these alternative uses.

The first is to read any of the chapters according to whatever interest guides the reader (the documedia revolution for 1, anthropology for 2, speculation for 3 and politics for 4). This would be a non-arbitrary reading, responding to the Hegelian problem of "where to start?" in a system: one starts wherever one wants to and continues coherently. By way of example, those who start from 4, i.e. transvaluation, would immediately come up against the fundamental political proposal of the book, that of a webfare system, i.e. the redistribution of the surplus value produced by the Internet platforms. This would be the practical outcome of recognizing user mobilisation as labour that should be remunerated in terms of welfare, i.e. financial support for consumption, education and invention, which are the specific characteristics of humans as opposed to automata.

Going backwards, the proposal would be substantiated by the metaphysical foundation underlying the capitalisation of human mobilisation and the production of surplus value, namely hysteresis, the fact that acts are transformed into objects, i.e. into actual or potential commodities.

Thus, going back to 2, one would find the anthropological foundation of the mutual dependence between humans and Internet platforms, whereby the latter are the contemporary prototype of the technical complement that constitutes the only defining trait of human nature. At the same time, this supports the fundamental argument for webfare, namely that without human input, technology, and in this case Internet platforms, would be useless and inert, as they would lose their entire *raison d'être*.

At this point, coming to 1, the reader would have the political, metaphysical and anthropological coordinates to understand the documedia revolution in its entirety and depth, without being misled by the surface notions that often condition our understanding of the Web, starting with the idea that the Internet is an infosphere of communications rather than a docusphere that records the world of life, transforming it into profiling, automation and distribution.

Obviously, other access routes are also possible, depending on the readers' interests: those who start from 1 would privilege the ontology of the present, the situation in which we are now (which is why I started from there, following an *ordo naturalis* that immediately and necessarily turns out to be an *ordo artificialis*); starting from 2, on the other hand, one would have access to the structural characteristics of the human being (where "structural" does not mean "natural", since they presuppose a relationship with technology from the outset). Starting from 3, on the other hand, one would find a metaphysical perspective called upon to illuminate the technological, political and anthropological contemporary situation. And, of course, the order to be followed by those who start from 2 and 3 could be progressive (2, 3, 4), inverted (3, 2, 1) or desultory (2, 4, 1).

The second method one could adopt is a thematic reading, which would privilege chapters instead of books. For example, those interested in teleology could read all chapters 4: this path would go from the mystery of labour in 1.4 (a question arises about the purpose of human mobilisation) to the genesis of value in 2.4 (value is what, in a system, indicates a direction), to the explicit reflection on the meaning of teleology in 3.4, up to the revolutionary *telos* of a society freed from labour and emancipated by knowledge in 4.4.

Those who instead favour the issue of technology could start from the examination of the Web as docusphere, that is, as a technological field of document production (1.2), and then broaden the perspective by seeing the docusphere as a particular case of a more general phenomenon, i.e. the human adoption of prostheses (2.2). Still following the leitmotif of technology, in 3.2 readers would find

an alternative answer to the conceptualism according to which theoretical understanding is necessary to grant practical competence. The chapter illustrates the opposite: a competence that does not necessarily come with understanding, and which constitutes the fundamental characteristic of technology. Precisely because there can be competence without understanding, 4.2 illustrates the mechanism of surplus value. This derives from the fact that the Web, like any technical device, is not a transparent infosphere (in which the documedia surplus value and the mystery of labour could not take place), but an opaque docusphere generated by competence without understanding, which indeed explains the formation of surplus value.

On the other hand, those who wish to start from ontology should begin with the fundamental character of the Web, namely hysteresis (1.1), i.e. recording and its resources; following with the fundamental character of the human being, namely responsiveness (2.1), i.e. the fact of being an organism systematically connected to mechanisms and technological prostheses. They would then move on to the fundamental character of all natural and social objects, namely emergence (3.1), i.e. the fact that the genesis of reality as we know it (or believe we know it) does not consist in a construction driven by principles but precisely in an aleatory bottom-up process made possible by the superabundance of time and space. Finally, these readers would come to the fundamental character of politics (4.1), which consists of deconstruction, i.e. not the critique of the existing state of affairs, but the criticism of the partial or misleading ideologies that prevent us from grasping the emancipatory resources hidden in the existing state of affairs (in our case, the documedia revolution).

Finally, turning to the thematic choice of epistemology, one would start from the fundamental character of the documedia transformation, i.e. the increase in documentation and the consequent solution to the mystery of the commodity form (1.3). One would then move on to capital as a prerequisite not only for the accumulation of value, but also for the growth of knowledge (2.3), following with the process of verification as a technological tool (3.3). Finally, one would come to transvaluation, i.e. the political and cognitive change in the understanding of the existing state of affairs resulting from knowledge of the processes (4.3).

The third possible approach is a structural reading, which does not privilege disciplines but the dialectical movements underlying reality, which constitute various articulations of hysteresis as a fundamental metaphysical principle. Thus we have recording, which corresponds to the manifest character of hysteresis (1.1), to the docusphere as the sphere of recording of social acts (1.2), to documentation as the productive consequence of the docusphere (1.3), and to mobilisation as a vital movement that is transformed into value through recording (1.4).

Then we have iteration, i.e. the technical possibility that arises from recording (what is recorded can be iterated), and which generates the phenomena of responsiveness (2.1, the alliance between organisms endowed with irreversible processes and mechanisms capable of indefinite iteration), prosthesis (2.2, where the prosthesis is an instrument of iteration), capital (2.3, capital being precisely the outcome of iteration and the largest of prostheses) and value (2.4, which arises only within a system of iterations and capitalisations that define its worth, meaning and desirability).

Then there is alteration, i.e. the aleatory process whereby an iteration can deviate from undifferentiated repetition to produce something novel, for better or for worse. The starting point, therefore, is the process of emergence (3.1), which is precisely an area of alteration, i.e. the genesis of something qualitatively new. One then moves on to competence (3.2), i.e. the technical instrument of both iteration and alteration; following with verification (3.3), i.e. the reflective understanding of alteration. Finally, one comes to narration (3.4), i.e. the ability to recognise, in the succession of alterations, a historical becoming that carries meaning.

Finally, we have interruption, namely the suspension of the process (paradigmatically, the death of organisms as an irreversible event), which is what makes the process interesting, since it is the urgency of a finite life beset by need that gives value to the system I have outlined. Here one would start with deconstruction (4.1, the contestation of the usual ways of thinking as a fundamental critical concern), moving on to analysis (4.2, the anatomy of surplus value). Then one comes to action (4.3, the transvaluation whereby every form of value production must be considered labour) and redemption (4.4, webfare as the restitution to the mobilised of the surplus value they have produced). All these actions are marked by interruption because they can only make sense to mortals. Indeed, political action and irrevocable decision-making would be inconceivable for immortal beings, including those which most manifestly populate our world, namely machines.

In addition to the ones outlined so far, of course many other readings remain open. I will simply point them out in broad strokes, but I will not dwell on them, because I am convinced that these possibilities, offered by a combinatory table like the one above, are where readers may find conclusions and paths that I have not thought of, and which for this very reason are more likely to apply to a new world that, by definition, cannot be anticipated.

The first is a diagonal reading, for example the succession that from 1.1 leads to 4.4, not following the pre-established order but proceeding from hysteresis (1.1) to prosthesis (2.2), to verification (3.3), to webfare (4.4). Obviously, one could start from the bottom, that is, from 4.4, or from the bottom left corner,

following the diagonal that from deconstruction leads to mobilisation, or vice versa. Of course the diagonal reading can be partial, involving only some boxes, i.e., for example, privileging the connections between competence (3.2) and capital (2.3). Also, one could choose not to start from the corners of the square but from the second or third ones (for example with the triplet of docusphere, 1.2; capital, 2.3; and narration, 3.4).

The second is a modular reading, following paths that readers can shape according to their own interests or needs. One could move like a knight in chess and go from prosthesis (2.2) to transvaluation (4.3), mobilisation (1.4), deconstruction (4.1) or narration (3.4). Or one could follow correlations between non-contiguous boxes, as in the case of answering a specific question. For example: what is the right narrative to unmask the injustice of surplus value without falling into the trap of a negative philosophy of history? Here my choice would be to start from 3.4. (narration) and come to 4.2 (surplus value) via 4.1 (deconstruction of false beliefs) and above all 2.3 (examination of the true nature of capital).

Finally, one could simply engage in the close reading of a single box. One does not have to drink the whole barrel to determine whether the wine is good and, above all, one can have the very legitimate urge to reach a conclusion, for instance by linking the general theme of the book to one's own expertise. Those interested in political economy might focus, I suppose, on 4.2, and those who want to argue for a different conception of labour on 4.3; an economist interested in exposing the naiveté of a philosopher might examine 2.3, and an analytical philosopher wishing to point out the conceptual shortcomings of a continental philosopher might avoid wasting time reading the whole book (not that they would do that, anyway), and might want to only look at 3.3.

That said, of course, there is always the sovereign option available to every reader, which is not to read at all: I will never know, dear *Hypocrite lecteur, – mon semblable, – mon frère!*

1. Revolution: What Is the Web?

We are not slaves to the Web, but to our laziness, or more precisely to our sloth, which prevents us from seeing that in the battle between humans and the Internet it is humans who necessarily have the upper hand, as long as they want to. In fact, there is the evidence of millennia in which humans lived without the Web – not to mention the well-founded, albeit infrequent, suspicion that the Web, without humans, would be perfectly pointless: the Web needs us, our lives, our curiosity, our haste, our consumption. We have the upper hand and we don't know it. How can this be? Perhaps we have not yet understood what the Web is. For decades, in order to capture an essence that is probably still undefined, "the Web" has been called a number of names that are always different, partial, esoteric: the virtual world, collective intelligence, internet, big data, artificial intelligence ... In short, we are composing a collective poem made up of books, essays, articles, debates, and posts singing the thousand names of Vishnu, whose essence, however, remains unknown. The question of the thousand names of Vishnu is not just a theoretical problem. It is obvious that when faced with something whose essence is unknown, one cannot but have inadequate answers. The expression "wrestling with the fog" is probably the one that best suits the many reactions to this hidden god. While interpretations conflict, Vishnu, as he should, continues his course undisturbed. So what is the Web, in a nutshell?

Let us start from the one point on which all interpretations converge, namely that we are facing a revolution. However, this agreement is short-lived, as it is broken as soon as it comes to defining the nature of this revolution. Everyone agrees that it is not only a technological revolution, but also a political, economic and social one[1]; and there is broad and almost miraculous consensus that this revolution is the fourth. The point is, though, that there is no agreement on the three that came before it, which is obviously no small matter. For some, it is the fourth industrial revolution.[2] For others, it is a far more radical revolution, affect-

[1] M. Bunz, *The Silent Revolution. How Digitalization Transforms Knowledge, Work, Journalism and Politics without Making Too Much Noise*, Palgrave Macmillan, London-New York 2013; J. Lanier, *Who Owns the Future?*, Simon & Schuster, New York 2013.

[2] M. Zuazua, *The Fourth Industrial Revolution Will Change Production Forever. Here's How*, in "World Economic Forum", 18 January 2019. In this framework, the first revolution

ing first and foremost the way we think and see the world: it can be compared to those triggered by Copernicus, Darwin, and Freud,[3] and amounts to another wound to our narcissism: Copernicus removed the Earth from the centre of the universe, Darwin demonstrated that we descend from apes, Freud revealed that consciousness is merely the tip of an unconscious iceberg, and Turing showed that machines can think much better than we can.[4]

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would be based on water, the second on electricity, the third on information technology and electronics, and the current one on a fusion of technologies that blurs the distinction between physical, digital and biological. However, this analysis has two limitations. The first is that it considers the current transformation as a variant of the industrial revolution, whereas it actually shakes its very foundations, starting from the relationship between production and consumption. The second is that it confines the event we are dealing with to a narrow chronology, whereas it potentially has the same scope as humanity's transition from the status of hunter-gatherers to that of breeders and farmers.

[3] L. Floridi, *The Fourth Revolution. How the Infosphere is Reshaping Human Reality*, Oxford University Press, Oxford 2014.

[4] It seems to me that this genealogy amounts to a confused and ambitious heraldry, for two reasons. Firstly, it derives from Freud's narcissistic assertion, as he not only considered the unconscious to be his discovery (which is obviously false), but above all, he presented it as a wound to the ego, whereas, as everyone can see, it is exactly the opposite: it is indeed unbridled narcissism and limitless egotism, where one talks about one's dreams over and over and one's *gaffes*, slips, actions and omissions are viewed as full of meaning. This, however, is a problem for Freud and his alleged revolution. As for Turing's revolution, it is simply untrue that we had to wait millennia to realise that machines can think better than humans. Our remote ancestor who first carved a bone to track the phases of the moon had understood, well before Turing, that the human mind is much weaker and more unreliable than external memory. Those who – in a collective process that is difficult to locate in space and time – gave rise to writing, calculating devices, and calendars reached the same conclusion. The abacus is certainly not a sophisticated instrument, yet it allows arithmetic calculations far beyond the reach of a normal human mind. And the same goes for pen and paper: Euler used to say that his entire mathematics was concentrated in the pencil with which he made calculations. To those who object that if you give a pencil to a monkey, the latter won't get much out of it, I reply that the same would happen if you gave the monkey a Turing machine. Moreover, if the revolution really consisted in the discovery – and gradual acceptance – that we are social animals endowed with language, it would be a problem, because it would not be a revolution. "Today, we are slowly accepting the idea that we are not standalone and unique entities, but rather informationally embodied organisms (*inforgs*), mutually connected and embedded in an informational environment, the *infosphere*, which we share with both natural and artificial agents similar to us in many respects. Turing has changed our philosophical anthropology as much as Copernicus, Darwin and Freud." (L. Floridi, *The Logic of Information: A Theory of Philosophy as Conceptual Design*, Oxford University Press, Oxford 2019, p. 210). Did we have to wait for Turing? It seems to me that Aristotle, along with a plethora of others, philosophers and non-philosophers alike, had already said this when referring to Homer: "man is by nature a political animal, and a man that is by nature and not merely by fortune citiless is either low in the scale of humanity or above it (like the 'clanless, lawless, hearthless' man reviled by Homer, for one by nature unsocial is also 'a lover of war') inasmuch as he is solitary, like an isolated piece at draughts. And why man is

For me, instead, this revolution depends on the exponential increase in recording[5] that justifies the concept of "doc-humanity". Although more than one in two human beings does not yet have a mobile phone, there are 23 billion connected devices, more than three times the world's population. This connection produces more documents every day than all the factories in the world, and drives automation and production: a huge amount of acts, contacts, transactions and traces encoded in 2.5 quintillion bytes. Hence the answer to the question: what is the Web? The Web is the largest recording system that humankind has ever developed,[6] which explains the scale of the changes it has brought about.

But why is recording so important? And, more importantly, why is there so much of it now? As is often the case, the current revolution had a modest and accidental origin, and lies in a difference between analogue and digital that may easily go unnoticed. In the analogue world, first there is a message and then, if at all, there is recording. More often than not, recording does not take place – think of the billions of hours of radio and television viewing that have left no trace except a faint memory in the audience,[7] to say nothing of the trillions of words tossed about in history and prehistory. In the digital world, recording precedes communication,[8] and more generally every interaction with the network leaves a trace of itself, contributing to an enormous growth of documents – especially the documents we call "big data". The latter are in fact metadata or meta-documents, traces of our activity that we unintentionally leave behind, recording the place and date of creation of the document, who has seen the document, the reactions

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a political animal in a greater measure than any bee or any gregarious animal is clear" (Aristotle, *Politics*, 1253a, 2–8). I would say that, if anything, the present confirms, with unprecedented evidence what we have known for a long time – much like a Viennese doctor found the behaviour of some of his patients to encompass the same tragic and deplorable phenomena already well known to the ancient Greeks. What is true of Oedipus is true of the Web: philosophers, both ancient and modern, teach that man is an animal with language and a social animal, and smartphones and social networks are the best proof of this.

[5] M. Ferraris, *L'esplosione della registrazione*, in *Filosofia del digitale*, ed. by L. Taddio and G. Giacomini, Mimesis, Milan-Udine 2020.

[6] Something that cannot be measured, which makes you think. This was already impossible at the end of the 20th century: R. Albert, H. Jeong, A.L. Barabási, *Diameter of the World-Wide Web*, in "Nature", 401, 6749, 1999, pp. 130–131.

[7] Consider that until the 1970s, the archives of television stations were systematically wiped – the BBC did this until 1978, and even now it has no obligation to keep records, according to http://en.wikipedia.org/wiki/Wiping [11/03/2022].

[8] B. Bachimont, *Between Formats and Data: When Communication Becomes Recording, in Towards a Philosophy of Digital Media,* ed. by A. Romele and E. Terrone, Palgrave MacMillan, Basingstoke 2018; cf. also B. Bachimont, *Patrimoine et numérique. Technique et politique de la mémoire*, Institut National de l'Audiovisuel, Bry-sur-Marne 2017. See also the works of Bernard Stiegler, e.g. *La société automatique*, Fayard, Paris 2015.

it has caused, etc. In a Jules Verne-like dream,[9] everything can become a document.[10] Moreover, thanks to digitalisation, the status of manipulable signs is not only given to numbers and letters, but involves sounds, images, and behaviour, completing the functional homology between the mechanical part of the mind and artificial intelligence. The fact that everything can be documented, and that this documentability is one – i.e. it follows a uniform standard – has changed the world with the same violence of a war in peacetime.

1.1. Hysteresis

So far I have described the technical aspect, which is also a keystone supporting the whole transformation. But the metaphysical question remains: why is recording so important? Why does it change things so much? In order to answer this question fully, I suggest talking not so much of a boom in recording, but rather of a boom in hysteresis, from *hysteron* ("after"). The term, which is widespread in various fields of natural sciences and technology, and which has had some sporadic application in the social sciences,[11] generally indicates a phenomenon of delay whereby a previous event affects the present, and must therefore be taken into account. Quite simply, it is the straw that breaks the camel's back, although not quantitatively greater than the previous ones, but capitalising on

[9] In 1895, two Belgian jurists decided to collect universal knowledge and catalogue it with a system that is still in use today, which they called Universal Decimal Classification, establishing the standard and format of bibliographic records, as well as the chests of drawers that collect them. They were Paul Otlet, son of a major industrialist, and Henri-Marie La Fontaine, who won the Nobel Prize for Peace in 1913. Their practice was guided by a theory, which in 1934 resulted in Otlet's *Traité de documentation*, based on the principle that everything can be documented. Otlet dreamt of the day when everyone would be able to access this immense archive from home: books, catalogues and documents would be accessible via television, which was taking its first steps in the 1930s. In this vision, in effect, the Mundaneum becomes a Panopticon. What Otlet did not foresee in his prophecy is that the generation of documents would be automatic thanks to the Web, and that it would be the users themselves who would produce documents through their searches and activities.

[10] S. Briet, *Qu'est-ce que la documentation?*, Édit, Paris 1951. In addition to Briet, a fundamental text for the modern definition of documents is, indeed, P. Otlet, *Traité de documentation. Le livre sur le livre. Théorie et pratique*, Mundaneum, Bruxelles 1934. See also R. Pagès, *Transformations documentaires et milieu culturel*, in "Review of Documentation", XV, 3, 1948; M.K. Buckland, *What is a "document"?*, in "Journal of the American Society for Information Science" (1986–1998), 48, 9, September 1998; R. Day, *The Modern Invention of Information: Discourse, History, and Power*, Southern Illinois University Press, Edwardsville 2001.

[11] I.D. Mayergoyz, G. Bertotti (ed. by), *The Science of Hysteresis*, 3 voll., Academic Press, Cambridge (MA) 2005.

their accumulation. What I propose, however, is a speculative generalisation, intended to show the whole range of meanings and, above all, of processes that are hidden in recording and in the resulting delay effect. As is often the case, what is closest and in plain sight ends up being hidden, or more precisely, goes unnoticed. The Web has had the merit of explicating the implicit and making the obvious manifest.

Hysteresis is in fact the premise of the most varied everyday practises and commonsensical concepts: from the idea that children inherit genetic traits (and sometimes a fortune) from their parents, to the power of exercise in the achievement of bodily or spiritual goals, to the principle that every promise is a debt and that those who know more are more likely to learn further. This applies to every field, but is particularly evident in the social world, which cannot exist without hysteresis – without documents, memories, traditions, language.

Suppose that while reading a word, you forgot the words that came before it. What you would read then could be neither true nor false ("false" in itself, taken in isolation, is neither true nor false). If, moreover, one considers that every language is a coded system, which receives meaning from the position its components occupy in the whole, "false", without a network, would not even make sense. Instead, in a network I not only know what "false" means (that which is opposed to true), but I also know that it can be translated as *falso*, *faux*, *falsch*… Likewise, I know that "but" does not mean "tub" even though it is made up of the same letters in a different order, etc. Take this principle to economics, kinship, law, morality, etc. and you will find it unchanged. This too is fairly obvious, but it conceals a principle that, again, is so obvious as to be imperceptible, namely the fact that without recording, the network would not hold, whether it be a physical network (requiring the cohesion of atoms, molecules, and higher components) or a natural, artificial, cultural, social, neural network.

One may ask why I adopt the proud or presumptuous (or at any rate unusual) name of "hysteresis" instead of speaking, quite simply, of "recording". My answer, besides calling attention to a ubiquitous and omnipotent phenomenon that yet goes unnoticed, consists in a paraphrase of what Spinoza said about the body[12]: no one has yet established what hysteresis is capable of in itself. In other words, experience has not yet taught any human what the laws of technology and society alone allow hysteresis to do and not to do, without the intervention of Consciousness, Ideology, or Intentionality. Underestimating its metaphysical scope has led us to appeal to magical entities, i.e. benign or evil beings to which we have superstitiously attributed power over our lives and that we can very well

[12] B. Spinoza, *Ethics*, book III, proposition 2, note.

do without. Perhaps these deities do not have such power on their own, but only as the hypostasis of a fundamental function, namely recording.

To stick to this paraphrase, no one knows the machine of hysteresis so well as to be able to explain all its functions, not to speak of the many attitudes observed in artificial intelligence that far exceed human sagacity, or the many actions that we perform in the social world without knowing what we are doing. These examples clearly show that hysteresis, by its very nature, can do a number of things that the mind itself marvels at. As far as the body is concerned, the mystery is still largely unsolved. As for hysteresis, the documedia revolution is allowing us to see things more clearly, showing that recording does much more than we commonly believe. To indicate this "something more", I have resorted to the rather exotic name of hysteresis. I will now analyse its four main functions: recording, iteration, alteration, interruption.

1.1.1. Recording: the network before the network

Let us begin with recording, i.e. the seemingly trivial element. In the *Statesman*,[13] Plato goes into a complicated description of the weaving of wool in order to determine the nature of what he calls *symplokè*, an interweaving or net. And even the most patient reader wonders why he goes to such lengths on matters that are, frankly rather uninteresting. However, little by little, the issue becomes clearer. Plato already spoke of this network in the *Sophist* as the ability to carry out cohesive, unconnected, sensible reasoning, and at the same time to connect being and non-being, thus giving life to the divine.[14] This network is the core of the art of leadership and any political technology that manages to resolve contradictions or smooth out differences. In other words, the network came long before the Web, or, conversely, the Web has come to fill a deep need in humanity. Let us reflect on this for a moment.

Today, when we speak of "the net", we immediately think of the Web, whereas a few decades ago we would have thought of something else – of football nets or fishing nets, of safety nets or, more appropriately, of what the Web is today, namely knowledge and society understood as a network that unites people. If we think about it, however, this latter conception of the Web suggests that there has always been such a thing, or at least that there is no humanity without a Web, or at least that a humanity without a Web is not destined to go far. In fact, the origin of humanity is not to be sought in some heaven-sent endowments that would have made us sociable – we are not too sociable even now – collaborative, and

[13] Plato, *Statesman*, 278b.

[14] Plato, *Sophist*, 259c–260b.

intelligent. It should rather be sought in the creation of networks that, by allowing transmission and exchange, have enabled the evolutionary leap that distinguishes us from non-human animals otherwise so similar to us: language, institutions, technology, economics, politics, history. All this cannot exist without a network, i.e. without a code, without an archive and memory, without the possibility of transmission from one individual to another and from one generation to another. That is why, as soon as it came into being, the Web appeared as the most natural thing in the world. And that is why, looking into today's network, which acts as a magnifying glass compared to those that preceded it, we can understand our origins with astonishing clarity and evidence.

Now, what holds the Web together? Recording. In fact, Plato also spoke about this: in *Timaeus*,[15] he theorised about the *chora*, which literally means "space", "place", "location" (it is still a very common name for Greek villages), but which in a metaphysical sense indicates an "intermediate kind", and consists in a great capacity for hysteresis. The demiurge builds the world with ideas, but these ideas need to have an extension in space and a position in time, and the *chora* meets this requirement. Since the appearance of the Web, first in computers, then in telephones and watches, and now in the environment, it is as if the *chora* has become, if not visible, at least conceivable – thus overcoming Plato's difficulty, that of a "third kind" that is neither sensible nor intelligible. The Web, and the recording it brings with it, is just this: a space in which the past is repeated by matter and remembered by memory, with such power that it transforms it into something qualitatively different. The commutation and profound solidarity of space and time are revealed in the circus whereby time cannot but become spatialized, just as a voice, which is time, becomes space as soon as it is written.[16] The fact that there is no being without time therefore means that there is no being without space and that space and time are two functions that derive from an original delay. This makes possible both the perception of the moment and memory, expectation, and the experience of space, which in turn is permanence in time.[17]

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[15] Plato, *Timaeus*, 49a 6–51a 5.

[16] J. Derrida, *Ousia and Gramme: Note on a Note from Being and Time*, in *Margins of Philosophy*, trans. by Alan Bass, University of Chicago Press, Chicago 1982.

[17] The role of the imagination in the evolution of the human species has been rightly stressed (Y.N. Harari, *Sapiens: A Brief History of Humankind*, Random House, New York 2014). But why speak of imagination rather than hysteresis? What if the transfiguring power lies precisely in hysteresis, with a cycle and a scope that are not limited to humanity, but invest the entire genesis of the universe? Something happens, for example my fingers press some keys or the sun shines on the drying rack, and some time later, when my fingers have stopped typing and the sun has set, what I have written remains and the clothes are dry. In other words, the effects have outlived their causes. We find this normal, and if need be, we take an interest in the search for causes, and perhaps, if we are in the mood for metaphysics, we say that the real glue of the

I will discuss these metaphysical implications at length in 3. For the moment, let us concentrate on an examination that is directly functional to understanding what the Web is.

1.1.2. Iteration: from living labour to dead labour

Let us leave the physical world and turn to the sublunar world, without neglecting an obvious and inescapable fact: if something is preserved, it can be reused, and there is no need to start all over again. This is the principle underlying the processes of acculturation and capitalisation, and it is clearly what drives humans to spend time and energy building technological devices. The effort required to build a shovel is repaid by the resulting enhancement of our shovelling. This obviously does not only apply to shovels – we have always known this, but now we see it better than ever. Our very remote ancestor who chipped a flint to make a scraper did so with an eye to a long iteration of performance that would alleviate his toil. Likewise, our smartphone, which keeps track of our most frequent

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universe is causality. That is not true: the real glue is postponement, perpetuation and transformation, which explains why memory loss is such an atrocious fate, why a society without documents amounts to so little, and why a quantitative increase in hysteresis, which is among other things what makes a hard disk work, has changed the world, and above all has revealed its true essence.

From an ontological point of view, hysteresis is therefore particularly important, because it allows the macroscopic level of cosmology and the mesoscopic level of anthropology to be united in a single principle that conforms to everyday experience, and thus to what physicists and philosophers call the "anthropic principle"; and it even applies to the microscopic level of subatomic particles, which contrast with many of our mesoscopic experiences, but which cannot do without hysteresis, the force that allows them to interact, and which physicists identify in what, using a technological metaphor, they call "gluons", the post-its of being, the UHU of the universe. However, these difficulties have an advantage, and put us on the right track. As we have just seen, Plato defines space as *chora*, a third genus, an intermediate kind between form and matter, and describes it as a capacity to hold and at the same time to take the forms of everything, thus also being able to iterate and alter. Plato identifies it with various metaphors – including, of course, that of writing – which converge to designate the *chora* as an invisible and amorphous medium, capable of keeping track of everything as absolute hysteresis. Here it is important to note the fundamental difference between the *chora* and the *archai* of the Presocratics and the numbers of the Pythagoreans. The latter were in fact physical principles (water, for example), or purely intellectual ones, such as numbers, called upon to explain the harmony of the world. Whereas the *chora* is precisely an intermediate principle, a "third genus" that stands between the sensible and the intelligible, whose only property is that of keeping track of the forms of ideas, transforming them into sensible entities (*Timaeus*, 48e–49a). This willingness to collect impressions means that the *chora* is never something actual, *always* remaining only in potency, in order to receive the forms that come from the ideas (*Timaeus*, 50b–51b). On closer inspection, Plato's description of space is also a possible solution to the aporia of time in Aristotle. If the latter did not consider it, it is because, as we know, he viewed relation as the

contacts, does not behave differently: it gives us, the distant great-grandchildren of that flint chipper, a chance to iterate and reduce effort. The iteration that results from recording (what is recorded can be repeated) therefore allows for capitalisation, it makes use of what has been recorded. Without going too far, let's think of the "copy and paste" process in document formation[18]: less effort is made, less time is spent and, at least on the machine's side, fewer mistakes are made.

Turing's secret[19] lies here after all: why struggle to understand what can be repeated without too much effort? Why waste time learning mathematics when

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weakest of the categories (because it "is in the lowest degree a substance and a real thing"; *Metaphysics*, 1088a 22–24 and 30–35). This very fact, which is apparently a limitation, nevertheless allows us to account for the status of space and time, which have the strange condition of being and not being at the same time, because a fully-fledged being or non-being would lead to insoluble aporias. It is necessary to find an intermediate dimension, which Aristotle defines as "relation", and which could be more appropriately indicated as "trace", because a trace has the characteristic of being, at the same time, present, insofar as it is a trace, and absent, referring to something not present, just as ashes are traces of wood that no longer exists. Here again, the writing metaphor seems quite adequate to account for this intermediate element between being and non-being, and this is demonstrated by the frequency with which it appears on the philosophical scene when dealing with these matters. As Kant rightly observes (I. Kant, *Critique of Pure Reason* [1781, A / 1787, 350 B]), if our thought, in representing a spatial line or a temporal course, were to lose the previous representations (points in space or instants in time), not only we could not construct that representation and the thoughts that accompany it, but the first and fundamental representation of space and time could not take place either. Therefore, a retention is necessary, but this refers to the representation of time and space, and not to space and time as such, so that "representation" here has the same ontological weakness as "trace" and "relation". And this weakness, far from being a flaw, makes retention an excellent candidate for solving the difficulties considered so far. The notion of "space-time" that has been imposed in the physics of the 20th century seems to unify and resolve the paradoxes by placing hysteresis, i.e. the possibility of keeping track, memory as matter and matter as memory, at the origin of the universe. Memory is born together with the universe. Time is not external to matter, it is a dimension *of* matter. As Mathematical Physics professor Lamberto Rondoni put it: "If matter had been *in* time, when the Big Bang happened, being unable to interact with anything, the universe would not have evolved. It would have been like an isolated atom, no matter how big or small. Instead, matter, space and time are one. There is no space outside the universe, just as there is no time before or after the existence of the universe" (personal communication).

[18] M. Carpo, *The Second Digital Turn. Design beyond Intelligence*, The MIT Press, Cambridge (MA) 2017.

[19] Cf. especially D.C. Dennett, *From Bacteria to Bach and Back*, Penguin, New York 2017. By the same author, see also *Can Machines Think?*, in *How We Know: Nobel Conference XX*, ed. by M.G. Shafto, Harper & Row, San Francisco 1985; *The Intentional Stance*, MIT Press, Cambridge (MA) 1987; *Darwin's Dangerous Idea,* Penguin, New York 1995; *The Evolution of Culture*, in "The Monist", 84, 3, 2001, pp. 305–324; *Who's on First? Heterophenomenology Explained*, in "Journal of Consciousness Studies", 10, 9–10, 2003, pp. 19–30; *Freedom Evolves*, Penguin, New York 2003; *From Typo to Thinko: When Evolution Graduated to Semantic Norms*, in *Evolution and Culture*, ed. by S. Levinson and P. Jaisson, The MIT Press,

you can simply iterate processes? The work of a copyist or an accountant is much more onerous, tedious and fallible than that of reproducing a digital document or using an electronic calculator. This reduction of effort is clearly analogous to the automation of processes introduced by steam and its successors in the industrial revolution, except that it can be exercised in much more complex and sophisticated domains, and requires much less material. Indeed, today we need much less material, and therefore also less energy, to repeat (to iterate) compared to analogue days. Should anyone object that the Web involves a high consumption of electrical energy, think of how much electrical, mechanical, organic energy and raw materials were needed to build and manage the Library of Congress in Washington with its 164 million volumes.

This capitalisation is already present in human and animal experience[20]: this produces facilitations whose result is the prevalence of the most frequent, and therefore statistically most probable, experience – a process identical to the autosuggest function in our smartphones, or the training of search engines. This process, which transfers reinforcement learning to machines,[21] underlies dictation, self-driving vehicles, training for complex performances, and the perfecting of machine translation. On the one hand, this explains why automata are now able to carry out such complicated tasks, especially translation: we now have an archive of unprecedented dimensions, which is constantly being supplemented by human contributions. On the other hand, the advantages of this archive are also evident for human agents, who have a larger number of signs to manipulate. And nothing is thrown away. Even mistakes become useful as we instruct the machine *not* to repeat them, whereas an amnesic machine would be condemned to relapse.

Iteration, or at least iterability, since not everything that is recorded is iterated, is a distinctive element of the documedia revolution. And that is why, between the minimalism of the industrial revolution and the maximalism of the narcissistic wound in the heart of humanity, I believe that neither is the most correct genealogy of the fourth revolution. In my view, the latter is not a change in the way

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Cambridge (MA) 2006, pp. 133–145; *My Body Has a Mind of Its Own*, in *Distributed Cognition and the Will: Individual Volition and Social Context*, ed. by D. Ross, D. Spurrett, H. Kincaid and G.L. Stephens, The MIT Press, Cambridge (MA) 2007, pp. 93–100; *Competition in the Brain*, in *What Have You Changed Your Mind About?*, ed. by J. Brockman, HarperCollins, New York 2008, pp. 37–42.

[20] It is described with reference to the human psyche in S. Freud, *Project for a Scientific Psychology (1895)* in *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume I (1886–1899): Pre-Psycho-Analytic Publications and Unpublished Drafts,* Stanford University Press, Stanford 1950, pp. 281–391.

[21] H.S. Seung, *Learning in Spiking Neural Networks by Reinforcement of Stochastic Synaptic Transmission*, in "Neuron", 40, 6, 2003, pp. 1063–1073.

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