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Volume 7

Care in Technology

Xavier Guchet

ISTE

WILEY

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To Bernadette Bensaude-Vincent, who taught me a lot
In testimony of friendship

Innovation and Responsibility Set

coordinated by
Robert Gianni and Bernard Reber

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Foreword

A good number of the works that combine innovation and responsibility[1], science and society, or even ethics and new, emerging or controversial technologies do not really take the technologies themselves seriously, nor their relationships to humans and the environment. To be more precise and less unfair, they still base themselves upon dualisms: nature/technology, technology/life, technology/humans, humans/nature, subject/object. What they are desperately lacking is an informed, balanced, and plausible philosophy of technology. However, this well-documented work by Xavier Guchet, who leads an interdisciplinary team at the University of Technology of Compiègne, member of the Sorbonne University Alliance, offers not only a strong thesis, but is backed up by a panorama as broad as it is assembled to good use. I emphasize the fact that his immersion in a university of engineers gives even more credit and plausibility to his work. This book is not only addressed to philosophers, but to engineers and any person who takes account of our technological environments[2], sometimes as threats, sometimes as sources of revelation and solutions, but also with a role to play in our definition as humans.

First of all, we have here a state of the art of the most interesting approaches to the philosophy of technology, ranging from Greek philosophy, especially that of Aristotle, to contemporary work. Configurations of the debate which we have inherited from ancient times have not lost their relevance. Against the Sophists who enthusiastically welcomed the development of technology considered from the perspective of an infinite progress, Plato's metaphysics already indicated this danger

1 For a general overview see Sophie Pellé and Bernard Reber, *From Ethical Review to Responsible Research and Innovation*, ISTE and Wiley, 2016.

2 One approach that strives to combine technology and ethics is that of Armen Khatchatourov, with the collaboration of Pierre-Antoine Chardel, Andrew Feenberg and Gabriel Périès, *Digital Identities in Tension, Between Autonomy and Control*, ISTE and Wiley, 2019.

of unlimited variation of forms in the *polis*, by separating Being and becoming, and submitting the latter to the unchangeable order of the former. Even more, Aristotle had already domesticated technology in a quadruple principle of limitation that prevents a collapse into excess: by form (formal cause), by the "implicit forms" of the material (material cause), by the ultimate purpose (final cause) and by the corporeal possibilities of the living being (efficient cause).

Xavier Guchet therefore presents the broad progress of the biological philosophy of technology, whose connecting thread is the concept of the externalization of life in technology, with great names as Ernst Kapp, Alfred Espinas, Henri Bergson, Edouard Le Roy, André Leroi-Gourhan, Georges Canguilhem, and some lesser known such as William Morris, John Dewey, Lewis Mumford, Laszlo Moholy-Nagy, Gilbert Simondon, whose common feature is that they have considered technology from the point of view of its links with life, with the theme of projection of the organs or of externalization. This also concerns René Descartes, Karl Marx, Arnold Gehlen, Helmuth Plessner, Jose Ortega y Gasset, Paul Alsberg, Francisco Varela, Pietro Montani and Bernard Stiegler. It is gratifying that the *Innovation and Responsibility* set of books devotes several pages to the French philosopher of technology Gilbert Simondon, quite unique in this field and little known in the English language, at least in a form which is not solely exegetic.

One of the originalities of this discussion is the presentation of the Kantian conception of technology as a decisive philosophical reading of the divorce between technology and life, as it was emerging in the 18th century. Kant's genius is to have endorsed this divorce, while indicating, as if in negative space, the conditions for it to be surpassed. Far from continuing to conceive technology, as had been done before him, as *organon*, he proceeded to a split in the very concept of technology in parallel with another, that between organic life and the life of any singular rational and moral person. Technology points toward the representation of goals, but it also sinks into the depths of the body to the point of lodging in the automatism of the living machine. It is somewhat mechanical and somewhat finalized, between causation and purpose. We can understand this "somewhat" as "at the same time".

Companionship with Kant allows Xavier Guchet to discuss the work of Dewey on the aesthetic experience as a perception of the relationship between my action and its effects in the world, between the things I manufacture and the relations that these things will forge with other beings in the world, or recent research in bio-aesthetics. This is the case for example with Montani who sketches a third way, that of the concept of institution, between the heteronomous constitution of the subject and the forms of its experience through technology and the absolute self-constitution of the subject. The concept of institution allows us to say that the subject is not self-created and what brings it into existence is not a set of structures imposed upon it by

a foreign authority. The subject does not belong to itself without experiencing a sort of heteronomy.

Similarly, Xavier Guchet's book casts a critical eye over the project of the *Encyclopédie,* following the historical philosopher Michel Foucault in his course at the College of France (1976), but which Kant might also have shared: far from being only a political or ideological opposition to the monarchy and to a form of intransigent Catholicism, the *Encyclopédie* is a political and economic operation of homogenization of technological knowledge according to four mechanisms for the disciplining of knowledge and technical know-how: a selection separating knowledge into legitimate and non-legitimate; standardization and hierarchization of dispersed knowledges and a pyramidal centralization which allows control over them. If the Encyclopedists cannot be accused of having opened the way to industrial technology or even to the scientific organization of labor, Diderot and his partners had already initiated, in some respects, the expulsion of the craftsman from his know-how of experience, by a formalism that drew up an organization of knowledge and technological practices entrusted to the care of a new category of experts, a certain type of logicians, as Diderot writes.

These conceptions are only traces of history; projects such as following the traces of Amazon employees, which Guchet describes and aptly denounces, are of the same vein.

In the relationships between ethics and technology, he is very interesting in the reconfigurations to which he invites us, through his assiduous and precise examination of philosophers of technology, including the "Constitutive/Constituent Anthropological Technology" current, very well represented in his laboratory at Compiègne, as well as the four currents of the biological philosophy of technology which he discusses and distinguishes.

One of the main theses is as follows. It is often and too readily admitted that there is, on the one hand, a positive technology oriented to care and, on the other, a negative technology, animated by the aim of mastery slipping into predation toward all forms of biological as well as social and subjective life. However, according to him, a thought of care in technology includes two fundamental requirements: understanding the technological relationship of human beings to the world according to the category of *insertion* and not that of mastery, and never forgetting the capacity of individuals for autonormativity[3]. His intuitions have a long history since these are the Greek analyses of medicine, with their "square of care" which is designed to impose itself as the whole set of guiding principles for the practice of engineers and

3 In the series *Responsible Research and Innovation* see the book by Marc Maesschalck, *Reflexive Governance for Research and Innovative Knowledg*e, ISTE and Wiley, 2017.

designers today. This square of care in the design of technology, which he will detail with the support of a large portion of the traditions of the philosophy of technology, is based on the following principles:

Care results from a double movement of incorporation and insertion of natural processes into the operations of human action.

The human being fulfils its nature as a living being in making a technician of itself. Technology repays its "debt to life", to quote Simondon, by letting itself be guided by the goal of a fulfilment of life, that is to say of value-creating activity once we recognize the value of non-human living beings. Here he is particularly indebted to Dagognet, Simondon and Dewey.

The technological object gains an aesthetic dimension when it is no longer a detachable tool which is transportable everywhere, but a reality inserted into both the natural and human worlds, and when it gives rise to a sense of technological beauty.

The imperative of knowledge.

These practical principles do not allow us to determine in advance what is entailed by care in each situation. They are only regulatory, to employ Kant's terminology. In effect a thought of care in technology is a matter of reflective judgement, and not of the faculty of determinant judgement.

He convincingly shows a large limitation in the ethics of care[4]. Intending to "care for nature" without taking the fight onto the ground of the design of technologies and of the technical organization of chains of production, is to fatally leave intact the distribution of the sensible which defines the social and political order of the moment; even worse, it is to let carelessness flourish, where production process is kept invisible.

Against very superficial conceptions of the idea of responsible innovation which do not question the ultimate goal of these policies and merely encourage and accelerate the passage of fundamental research toward industrial applications while ensuring in advance their "social acceptability"[5], this book goes much further. If responsible innovation conceived in such a fuzzy manner does not guard against the

4 In a complementary way, see Sophie Pellé's book, *Business, Innovation and Responsibility*, in which she interrogates conceptions of responsibility, available in the *Responsible Research and Innovation* set of books.

5 For a more economic critique of this failing see Nikolova Blagovesta, *The RRI Challenge. Responsibilization in a State of Tension with Market Regulation*, ISTE and Wiley, 2019.

creation of new vulnerabilities, and if the human remains outside nature, one may understand that some advocate surpassing this conception through an innovation which is oriented by care. Yet his critique, inspired by Dewey, in some way takes the opposite tack to this critique: the human is an instrument for the improvement of the natural world. Care thus consists of acting technologically in such a way that nature is fulfilled, improved, and optimized according to its own potentialities, and not by reference to the interests of a subjectivity cut off from the world.

Bernard REBER
December 2020

Introduction

> Humanity by itself creates much devastation. A highly technologized humanity, intelligently technologized through a network, which has a geographical sense, is much less dangerous for nature than humanity by itself.
>
> Gilbert SIMONDON

A nagging question haunts our era: can we yet avoid the major ecological disruptions that more than two centuries of industrialization based on fossil energies seem to have rendered inevitable? It is in fact more and more widely recognized that these disruptions, which there is every reason to believe will have disastrous consequences for all of life on Earth (including humans), will occur no matter what we do today to prevent them. We may, at best, limit their magnitude somewhat, provided however that the major industrialized countries take drastic measures without delay – which seems unfortunately not to be the most probable option as evidenced by the tepidity of the (at best, modest) advances made by the international conferences on the environment that have been held for many years.

Should we consider the question as definitively closed, and think that our technological choices have completely committed us on an irreversible path to planetary ecological disaster? Must we even go as far as to consider, with François Jullien for example (Jullien 2004), that the technological relationship with the world as it has been conceived and developed in the western world, and whose model we have inherited from the ancient Greeks, is essentially the expression of a will to mastery of nature, the outcome of which, to the extent that our technological activity acquires more and more powerful means of action, could only be the predicted disaster which we must face today?

This book aims to answer these questions in the negative, showing on the contrary that the western conception of technology is historically articulated with a genuine requirement of care for things and beings. It is true that with the Industrial Revolution, this requirement seems to have deserted our technological action. The latter seems since then to have been controlled only by the power of calculation (*metron*) and seems no longer subject to what should have yet remained the guiding principle of all technological activity: the faculty of *metrion*, that is to say of fair measure, of suitability and of care – which faculty precisely cannot be reduced to the rationality of calculation. How have we come to so radically dissociate technology from care, *metron* from *metrion* – and especially, how to reintroduce *metrion*, correctness and care, into our technological activity? Can we reforge the frayed links between technology and care?

I.1. Care for nature

The need to develop technologies which are more "respectful of nature" is very widely shared among the general public but also among engineers and designers, who consider themselves more and more concerned by environmental issues (especially in the case of students who, notably in France, have over the last few years developed a growing awareness of their present and future responsibility in the matter[1]). The effort to introduce the aim of protecting nature into the activities of engineering and technological design has in fact a long history. The concepts of *green* design, eco-design or *sustainable* design also show a significant change in the openness of technological design to ecological issues in the 1980s and 1990s, reflecting more exactly the fact that this openness has gone hand in hand with an increasingly radical and comprehensive understanding of the responsibility of engineers and designers in ecological matters (Madge 1997).

The links between technological design and ecological thinking are older still. Thus, some of the great figures of the Bauhaus such as Walter Gropius (its founder) or László Moholy-Nagy in the 1930s had already forged contacts with representatives of the ecological sciences in London, where they had emigrated following the closure of their school in Germany by the Nazis (Anker 2010). The reflection on design integrated ecological questions very early on.

The current context is marked by the success of a new mobilizing watchword, which is currently bringing together a growing number of initiatives intended to get the industrialized countries to adopt a less destructive relationship to nature. This watchword is expressed in terms of a fairly simple imperative: *we must take care of*

1 See for example the "Student Manifesto for an Ecological Awakening" in French, https://pour-un-reveil-ecologique.org/fr/ (accessed February 4, 2020).

nature. The expression "take care of nature and of people [may indeed appear as] a new watchword of late modernity. It responds to a social crisis [as well as] an environmental crisis" without precedent (Pierron 2013b). We would thus be in the process of moving from a society whose priority is the search for well-being to a care society (Rodotà 1995, p. 103). Businesses themselves compete in order to win the Grand Prize for Caring, as far as the most trivial acts of consumption – buying recycled toilet paper, for example (Puig de la Bellacasa 2012) – which now seems to relate to taking care of nature[2].

Beyond the excitement that it inspires in advertising executives, care for nature has found important theoretical developments in moral philosophy, more precisely in the so-called ethics of care (Laugier 2012). In opposition to a long tradition of moral philosophy for which the subject cannot be moral unless recognized to be rational, autonomous and free, the ethics of care argue that humans constitute themselves as moral subjects in their vulnerability and in the relations of dependence which flow from it. Vulnerability and dependence are therefore not only accidents which may occur at certain critical moments of life (early childhood, old age or disease); they are our lot. Our moral life is based primarily on our ability to attract attention to, and to pay attention to, everything that allows the ordinary of our lives and which, literally, nourishes us (Pelluchon 2019a). The ethics of care thus put the emphasis on what we do not generally see, on what is rendered invisible by denial of attention, that is to say on everything that makes our lives possible and supports them on a daily basis. However, as noted by Sandra Laugier, indifference, or even negligence and recklessness "in relation to the consequences of our daily actions on the surrounding environment" is expressed more and more today in terms of carelessness (Laugier 2012). In making its irruption into environmental ethics, care does not however limit itself to adding, to the ethical issues centering on the "intrinsic value"[3] of nature or on rational calculation of the consequences of our actions upon it, a generous and caring attitude. Environmental care expresses more essentially the recognition of our dependence on nature – a dependence which, for

2 Incidentally, it is not altogether new that human relationships to nature, in industrial societies, should be envisaged by the standard of care, as evidenced for example by the curricula of education on nature in the elementary schools of Western Europe, which have combined at least two ways to teach nature to children throughout the past century: although the scientific and instrumental conception of nature has massively infused the curricula of secondary education, in contrast the primary schools have never really abandoned leading children, by observation, to create an experience and a conception of nature oriented by caring concerns (Postma 2006, p. 3).

3 Catherine Larrère thus emphasizes the existence of an incompatibility between, on the one side, the environmental ethics which proclaim the concepts of intrinsic value and wild nature (wilderness), still dominant on the North American continent, and on the other side the ethics of care for nature (Larrère 2012).

most authors, primarily has a contextual[4] meaning which, moreover, is in no way a characteristic specific to the ethics of *care*.

For all that, the meaning and even the relevance of the injunction to take care of nature are debated (Gaille 2013; Hess 2013). Thus, can we unify care for humans and care for nature in one and the same concept of care, or are there several kinds of care (Pierron 2013b)? Can we export "concepts explored in relations with humans to relations with nature" (Pierron 2013a), by so doing deriving concern for nature and for the world, in its widest extension, from care as it is deployed in inter-human relations, and not the reverse[5]? There is no unambiguous and consensual response to these issues. We must state in fact that extending care beyond individual interactions, toward a care for the world in its entirety, does not necessarily lead to care for nature. Thus, in a book devoted to examining the conditions of care for the world, Elena Pulcini (2013) explains that only a transformation in our concept of the subject can allow us to overcome the "pathologies" of the globalized world (exaggerated individualism, communalist temptations). We must do away with the self-referential and sovereign subject of modernity, dominated by Promethean *hubris* and narcissism, to conceive a subject that is relational, vulnerable, and dependent on others, but also assuming its responsibility with respect to the vulnerability of others. However, Pulcini says nothing with regard to how this relational subject relates with non-human natural beings, and with nature in general. Care for the world certainly implies, as a basic condition, the preservation of life. However, the object of care is not, according to Pulcini, life as such, and even less nature, but the world of human intersubjectivity.

Based on these difficulties some argue that even the idea of care for nature is suspicious and that upon consideration, it is based on very weak philosophical grounds. French philosopher Aliénor Bertrand (2013a, 2013b) thus points to the distortion of principle which exists between the "type of philosophical anthropology" that underlies care and the "naturalism" which guides the relationship with the nature of industrial societies. By naturalism, Bertrand here understands naturalist ontology as defined by anthropologist Philippe Descola (2005): it is a mode of identification of the existing beings which rests on the attribution to all of the same "physicality" (meaning that all beings in the world, living or not, are held to be dependent on the same physico-chemical laws, their behavior can always be explained with reference to these laws) but on the attribution of different "interiorities" between all the existing beings: thus, only humans are assigned a soul, a consciousness or a spirit, all the other existing beings deprived of this. The very

4 "The theme of care allows a pragmatist and particularist treatment of environmental issues, beyond the major principles and incentives to moralise or to (un)assign guilt" (Pelluchon 2019a, p. 14).

5 Pierron J.-P. 2019, pp. 104–105, citing F. Worms.

concept of "nature" is, in fact, unknown to all human groups which distribute ontological attributes among existing beings according to other identification schemes. The concept of nature therefore has only meaning in reference to a particular ontology, naturalism, suspected of having served as a foundation for so-called modern science and technology, and consequently of having paved the way to a mode of development based on the depredation of the environment. How could the concept of "nature" in these conditions become the reference term for an attitude to care with regard to the living and the environment? Naturalist ontology has led us, we Westerners of the industrial era, to conceive in a very impoverished manner our possible relationships with nature; it is inevitable that the concept of care for nature inherits this poverty and in no way allows us to reorient our attitude towards it. In sum, "the problems raised by natural resources are subsidiary in relation to the issue of values … they only arise, in fact, from within a generally anthropocentric conception of the relationship of humanity to nature[6]". "To enact all the changes that would put us on the good path, whether on the level of the fight against global warming or as regards animal welfare… it is important to change our representations of animals and of the place of the human in nature…" (Pelluchon 2019b). The anthropocentric conception classically situates the human outside nature, and assigns to the latter only an instrumental value, which tends to justify the behavior of unlimited exploitation[7]. For us to show more care in regards to nature, we would first of all have to deal with this conception of humanity isolated and cut off from nature, that we replace the human being within the entirety of relations that it has with its environment, and that we cease to consider nature simply as a "background in front of which we perform our activities" (Pierron 2013a).

To assume that human beings are not cut off from nature is equivalent to remembering that this being, who likes to define itself above all by its reason, its intelligence and its freedom, does not yet cease to be a living creature among living creatures. If societies that have chosen industrialization have ransacked nature, it is because the humans in these societies have ceased to think of themselves as living beings and have made of themselves, in the words of André Leroi-Gourhan, a "dematerialized image". They have imagined themselves as separated from the community of beings that they form with all living creatures on Earth, and have assumed the right to exercise over these, and over nature in general, unlimited domination. As Claude Lévi-Strauss also said, "We started by cutting man off from nature and establishing him in an absolute reign. We believed ourselves to have thus erased his most unassailable characteristic: that he is first a living being. Remaining

6 Hess cited by Pierron (Pierron 2013c).

7 It should be noted however that anthropocentrism does not necessarily imply a predatory attitude in respect to nature. "Weak" anthropocentrism may only assign to nature an instrumental value, without justifying its exploitation: this value may be aesthetic, cognitive, etc., which requires a protective rather than destructive attitude.

blind to this common property, we gave frein rein to all excesses" (Lévi-Strauss 1976, p. 41). To reconnect with a conception of the human being as a living being among other living beings should in sum lead us, in a way logically, to put care in our relationships with nature.

The question of how to get out of naturalistic ontology, if that is indeed what it is all about, while retaining the term that it has posed in relation to humans, namely "nature", remains at this point. The question of how it is possible, concretely, to "change anthropology", as by decree, also remains entirely open.

However, apart from these thorny questions, would this planned change in our conception of the human being suffice to make the very notion of a care for nature? Nothing is less certain.

I.2. The two-layered model of care

That there is a close link between, on the one hand, the fact that the human is a living being – which makes it dependent on various conditions to meet its vital needs – and, on the other hand, the fact that it has an essential relationship to the care applied to the maintenance and provision of these conditions, has been widely stressed by the ethics of care[8]. This link is highlighted, incidentally, in a fable which comes to us from a Latin author named Hygin, which Heidegger relates in paragraph 42 of *Being and Time* (Heidegger 1962, p. 242):

> Once when 'Concern' [who is also care, *Cura*] was crossing a river, she saw some clay: she thoughtfully took up a piece and began to shape it. While she was meditating on what she had made, Jupiter (Jovis) came by. 'Concern' asked him to give it spirit, and this he gladly granted. But when she wanted her name to be bestowed upon it, he forbade this, and demanded that it be given his name instead. While 'Concern' and Jupiter were disputing, Earth (Tellus) arose and desired that her own name be conferred on the creature, since she had furnished it with part of her body. They asked Saturn [that is, Time] to be their arbiter, and he made the following decision, which seemed a just one: 'Since you, Jupiter, have given its spirit, you shall receive that spirit at its death; and since you, Earth, have given its body, you shall receive its body. But since 'Concern' first shaped this creature, she shall possess it as long as it lives. And because there is now a dispute among you as to its name, let it be called *homo*, for it is made out of *humus* (earth).

8 And not only by them, by the way; many other philosophies have established this link, including those of the ancient Greeks, as we will see.

Commenting briefly on this fable, Heidegger notes that Concern or Care is not envisaged only as that to which the human *Dasein* remains committed during its entire life and as that which constitutes it, but that "this priority of 'care' emerges in connection with the familiar way of taking man as compounded of body (earth) and spirit" (Heidegger 1962, p. 243).

The meaning of the fable is that the human being will only be a composite of body and spirit at its death, and at this time only can the sharing between Jovis and Tellus be made; before this, what defines the human is the fact that it lives, that it is a living being. As a living being, the human is one, not split, care being precisely that which prevents the split between its natural and not-natural parts. Care, in terms of the human being, means above all else refusing any form of split between the body and the spirit: there is not, on one side, care in the sense of purely technological caregiving, with an objectivized body as its area of intervention; and on the other side care in the sense of taking care, attentive to the human being as spirit and free will. Care cannot be two cares, it is a unity or nothing at all[9].

This requirement of unity in care, an indivisibility of caregiving and taking care, has been particularly pronounced in the field of medical ethics, except however that these two aspects of care, although not separate, are not so much merged into a truly unitary care. There are two layers of care and they are clearly hierarchical. It has in effect become a commonplace to recall that the therapeutic act in the technical sense of the term, that is to say caregiving (cure), is devoid of any moral value if it is not inserted into a more essential relationship of care which envelopes it. The greatest risk is that, while thus conceived according to a two-layer model, care becomes precisely two quite distinct and unrelated cares – and even worse, that care within the meaning of caregiving will eventually prevail over care within the meaning of taking care. As psychoanalyst Donald W. Winnicott deplored at the beginning of the 1970s, "Cure, in the sense of remedy, successful eradication of disease and its cause, tends today to overlay cure as care" (Winnicott 2017, p. 192). However, as stressed by the preface writers of an Italian collective work (Donghi and Preta 1995), the risk of splitting care and giving priority, as Winnicott deplored, to cure as remedy over care, results specifically in an inability to properly pose the problem of the relationships between body and spirit, and their unity. In other words, a relationship of reciprocal implication is forged here between, on one hand, the

9 The reading that Warren T. Reich proposes of Hygin's fable certainly emphasizes the existence of a tension in care – tension between care as a burden and care as solicitude. By its physical and telluric nature, care is a load, a burden; by its spiritual nature, it is solicitude. This reading, however, does not affect the unity of care; it does not mean that there is not one but two cares; there is a single care. However, any care implies this internal tension (Reich 1995).

conception of the human as a living being – but in the sense of a being composed of body and spirit unified by care – and on the other hand, a two-layer conception of care.

However, this two-layer conception of care, well documented in the field of medical ethics, does not confine itself there: it is also found in the invocation of care for nature and it leads to a blurring of its meaning. Not, incidentally, that any idea of care for nature should invariably find its only possible model in medical care (Pierron 2019). Thus, van Rensselaer Potter, one of the theoreticians of the concept of bioethics, considered that medical bioethics, far from being possibly the basis for a global concept of care by extension of the care due to humans to the care due to nature, was on the contrary only a shrinkage of a broader concept of bioethics, linking human health and health of the environment (Gaille 2013). That being said, the need to establish a hierarchical relationship between cure and care now extends to the whole set of activities where care is required. The penetration of the ethics of care into environmental ethics illustrates this phenomenon of extension: we are required not only to interact in a prudent and careful manner with nature, but also to assume that these interactions are of a moral scope and that, therefore, we are morally obliged to comply with the values of prudence and fair measure.

In its most general sense, the idea of care for nature therefore points towards the same two-layer conception of care as that of medical ethics. It is still a matter, here as there, of conceiving care as a single care; however, this care does indeed have two layers in a hierarchical relationship. On the one hand, there is the properly technical level of care, which is the care that we must take of natural things if we are to succeed in our undertakings, in order to avoid the misfortunes of the man of Song. Mengzi, a Chinese philosopher of the 4th century B.C.E., a follower of Confucian thought, tells us that "a man of Song[10], distressed to not see his plants growing fast enough, had the idea of pulling on them from above. Returning home in haste, he said to his people: "I am tired today, I have been helping the corn to grow long" (Mencius, 1970, p. 190). On hearing this, his son rushed to go to see, but the shoots had already dried. Here is an unwise technical act, harmful due to lack of attention and care brought to the specific needs of the plants; but there is also, on the other hand, the moral layer of care, which must provide technical acts of care with their guiding values. The two-layer conception of care extends to nature particularly when it is assigned an intrinsic and not only instrumental value[11]: moral respect for nature must regulate the technical acts that are deployed.

10 One of the Chinese states of the so-called Spring and Autumn period.

11 The concept of the intrinsic value of nature, as well as its relationship to care for nature, will be discussed later.

I.3. The intellectualist conception of technology

There is moreover a conception of technology implicit in the two-layer model of care. This model is in fact underpinned by three assumptions affecting the relations between human life, technology, and care. The first assumption is that human life can be summed up in two dimensions which are difficult to definitively articulate: life is understood on the one hand according to the dimension of the being-in-life, and on the other hand, as a life of the mind. We are "first of all" living beings according to Lévi-Strauss, which means that we are "subsequently", also, something else than living beings. We are not cut off from nature, certainly, but that does not mean that we have absolutely no exteriority in relation to it.

The other two presuppositions of the two-layer model of care relate to the very concept of technology. On the one hand (and thus the second presupposition), technology is defined as the whole set of means available to us to be able to intervene in nature, both inert and living, from a point of view exterior to it. This conception of technology is intellectualist. Technology is the means by which intelligence intervenes upon nature as upon an external, receptive material.

On the other hand (third presupposition), technology as such, or at least a certain type of technology, is considered to be incompatible with care. The two-layer model of care, affirming the unity of all care, is certainly unequivocal: no relationship of care cannot be conceived without technology. A negligent action, performed without precaution and devoid of any real involvement of the one who performs it, is not in the service of care. A gesture that is not careful, that is to say which is not executed with the required technique (which is learned and requires training) cannot be caregiving – such is the message of the parable of the man of Song. Caregiving requires competence. That being said, when technology refers no longer to modestly equipped know-how but to the innovations of chemical and mechanical industry, for example, its relationship to care appears less obvious, more external, and more conflicted. In sum, there are two conceptions of the relationship between care and technology: a relationship of necessary implication on one hand – there is no care without the security of a controlled and properly equipped action, whether it is care for humans or care for nature; on the other hand, a relationship of exteriority in principle, making problematic the possibility of caregiving when the concept of technology signifies, to continue the example, the devices of mechanical industry and chemical products.

The first assumption, affecting both contradictory meanings of the concept of life, is absolutely essential and commands the other two. Indeed, it is because life, in humans, is regarded as dual, consisting of a subject pole (intelligence, the spirit) and an object pole (the body, the being-in-life), that technology must inevitably be understood according to the same division: it is an emanation of the subject pole and

it applies to the object pole from a point of view external to it. An intellectualist concept of technology is the result of a bifurcated conception of life in humans. In addition, to the extent that its intervention targets the object pole, that is nature as the theatre and support of the vital processes, technology has an ambivalent relationship to care: certainly there is no care without technology, but the risk of a dissociation between performing cure and taking care is widening as technologies become technosciences.

I.4. From design of nature to care for "ordinary nature"

These three presuppositions thus constitute the unthought-of dimension of the two-layer model of care. However, in the light of the foregoing considerations, it appears more and more doubtful that this model can provide a satisfactory theoretical base for the idea of care for nature. The example of permaculture illustrates quite well the difficulty of transposing this model of care onto nature. Permaculturists[12], however, explicitly put care for nature and for humans at the heart of their system of values. They claim to have a holistic conception of the human being, refusing to separate "the body, the affective and emotional sphere, the intellect, the spiritual[13]". Therefore, they seem to exceed any bifurcated vision of care: care for the body is inseparable from care for the spirit, and care for human beings from care for the earth. "*Care for the earth. Care for people. Fair share*": the motto of permaculture gestures toward a unitary vision of care, and toward a non-dual conception of human life. However, the continuum of care seems to be contradicted here by the prioritization of the concept of design. Permaculturists speak in fact of a real change of paradigm. Their analysis is as follows: historically, human groups have grown up in highly diverse habitats. This accumulated

12 Permaculture is a method of agriculture theorized in the 1970s by the Australians Bill Molisson and David Holmgren. The initial motivation of Molisson and Holmgren was to propose an alternative to intensive agriculture, in which the search for higher yields by the massive artificialization of environments has resulted in the exhaustion of microbiological life present in the soil and, eventually, the sometimes dramatic decline of their fertility. The services that are normally rendered by these microorganisms (degradation of the bedrock to create humus, input material nitrogen, etc.) have thus had to be substituted by other means, including by the provision of chemical inputs. In contrast to these artificializing industrialist approaches, permaculture proposes to return to bio-inspired agricultural practices, capable of taking advantage of natural functions. Nature has in effect given birth over the long term to ecosystems that are extremely complex and robust, based on the existence of multi-level relations of interdependence between many elements, mineral as well as organic: a permacultural farm aims to reproduce this complex network of elements in interaction at all orders of magnitude. See e.g. (Hervé-Gruyer 2018).

13 See the website of the Bec Hellouin permacultural farm – https://www.fermedubec.com/la-permaculture/notre-philosophie/ (accessed November 25, 2018).

experience is a wealth of which permaculture intends to take advantage, drawing on traditional knowledges and know-how. On the whole, however, the growth of the human population on Earth was more like a fumbling adventure than a conscious plan. In place of this globally blind human expansion, the permaculturists intend to substitute a planned habitation, supported by specific knowledge relating to the environment and to the operation of living beings. It is now a matter of thinking of habitation from the viewpoint of design – to propose a "permacultural design". However, if we can understand what permacultural design entails at the level of the farm or even of the territory, what becomes of this vocation of designer when the scale of intervention becomes the Earth itself (care for the Earth)? Must we admit that the human must become the chief designer of global nature? This would be a strange way to defend the idea of care for nature. It is hard to see in any case how we would escape the ambition of becoming masters and owners of nature. "How can one set oneself up as a designer of the world while acknowledging that one is subject to it?" asked Vilèm Flusser (Flusser 1999).

A dual conception of the human; an intellectualist conception of technology; the idea that some technologies are in essence contradictory to care (permaculturists ban mechanization as well as chemical inputs from their farms): permaculture remains well and truly dependent on the two-layer model of care and its assumptions, which leads to a difficulty in rendering robust the goal of care for nature or, in the terms of the permacultural philosophy, care for the earth.

In sum, Aliénor Bertrand sees clearly when she stresses how much the idea of taking care of nature risks surreptitiously returning to a dualistic anthropology – even that one which, in seeing humans as beings outside of nature due to their reason or their spirit, has led to the most predatory behaviors in respect of the natural world. The sincerity of permaculturalists is of course not in question here, and neither are the truly caregiving modalities of their relationships with the cultivated land. That being said, they seem to continue to conceive of the human according to a duality of perspectives, as living beings belonging to nature in their organism, but not in their technological intelligence. Humans belong to nature, but they remain designers of nature. They must simply create a better design for it.

How to get out of this impasse in order to better understand the conditions of a more caring technological action? For what should this action be caring, if not for nature taken globally? A possible answer comes from one current of environmental ethics, the ethics of so-called "ordinary" nature, whose diagnosis is almost that which we have just established: considering all of nature as an object of care, especially by giving it an intrinsic value, in no way leads to escaping from the dualism of the human being and nature; on the contrary, it leads to a hardening of this dualism because the human, despite the assertion that it remains a living being

among living beings, appears engaged in a confrontation with nature which has nothing to do with the dialogue of the living being and its milieu. As emphasized by French philosopher Rémi Beau (2013), the shift of environmental ethics toward the concept of care for ordinary nature (i.e. to care, not for nature, but for natural things in our daily environment), could then allow us to dispense with the double conception of a human being which despite everything remains outside of nature, and of a nature without humans.

I.5. Technology, life and care

Let us summarize. The concept of the human as composed of body and spirit unified by care became closely linked to the two-layer model of care, as well as to an intellectualist conception of technology. In this theoretical framework, technological intelligence has a vocation to reconfigure the world – to design it. The only way in this case to guard against the excesses and ravages of technology is to impose upon it a limiting framework, but from outside: ethics seems to have today the function of providing this. Technology is in itself foreign to the values of caution and modesty inherent in care: the imperative of care must necessarily be imposed by an external and overhanging instance.

What however of the relationship between technology and care, once abandoned not only the dualistic conception of human life, but also the two-layer conception of care and the intellectualist conception of technology? As a matter of fact, the philosophical literature on care is almost completely silent on this subject. It still very often proceeds from an attitude of foreclosure in respect of technologies: here these are, so to speak, never questioned in their possible relationship to care, even if some philosophers of care, as we will see, are moving in some respects toward this questioning.

The intellectualist conception of technology seems to act, even today, as the common basis for debates on the relationship between care and technology – even though the non-intellectualist, rather vitalist, conception of technology as *Organon*, that is to say as an extension of a living body acting on its surrounding environment, remained unchanged overall over a very long historical period, ranging from the ancient Greeks (who had rigorously established this definition) until the century of the Enlightenment. In what conditions exactly, and why, did this transition occur? What have been the implications of this for the thought of technology, and for the conception we have of the relationship between humans and nature? We will attempt in this book to make a chronology, exactly, of the historical mutations that have led us to make technology a kind of "unthought-of" of care.

We will thus clarify what conception of technology, breaking with the intellectualist framework within which it still very often remains defined, can orient toward a more careful and caring attitude in respect of nature. What does it mean to think of technology otherwise than based upon intelligence, but as we will see, based upon life? Does this not lead to a counter-intuitive, even disturbing, conception of technology? Does a vitalist conception not mean in effect defending a purely and simply anti-rationalist position? We will show that this is not the case, and conclude by explaining the guiding principles, which are perfectly rational and capable of guiding the work of engineers, for a conception of technology alternative to its intellectualist definition.

This book is therefore a book of philosophy of technology. More precisely, it intends to demonstrate that the problem of knowing how to orient technological design towards the care of all existing beings and of the world cannot be solved only by choosing materials and processes that are more "respectful of nature". This problem engages a global philosophical reflection on technology, which French philosopher Jean-Yves Goffi emphasized at the end of the 1980s (Goffi 1988) that it had always gathered, since Plato, three inseparable dimensions: a phenomenological or ontological dimension, consisting of a description of technical reality through its various manifestations (tools, instruments, machines, gestures, practices, operations, etc.); an anthropological dimension signaling towards the idea that every technique finds its true raison d'être and its ultimate meaning in the necessity of satisfying vital needs; and finally an evaluative dimension. What characterizes contemporary philosophies, Goffi wrote at the time, is a relative fragmentation of this approach. Evaluative, anthropological and ontological approaches are often dissociated: few are the unitary philosophies of technology (Goffi 1988, 52-53). According to Goffi, this situation could be explained by the gradual rise in importance of the evaluative perspective, which has pushed the other two dimensions into the background. The current philosophy of technical artefacts, to which we shall return later, undeniably strives to overcome this imbalance and to regain a unitary conception of the technical fact, by integrating the ontological and evaluative dimensions to a greater extent. However, the anthropological dimension remains to this day the poor relation of philosophical analyses of contemporary technology. The present work is intended to fill this gap. In sum, this book is a book of philosophy of technology, the objective of which is to respond to the following questions: in what sense can we speak of "care in technology"? For there to be care, is it not necessary for there to be a subject to dispense care? According to what concept of care then can we speak of technologies able to perform care by virtue of their very design, if that is indeed what we mean? What meaning can be given to the concept that seems to emerge here, and which seems at best self-contradictory, at worst devoid of meaning: that of an objectified care, reified in technology – that is to say of a care which no longer operates through the activity of a subject who provides care?

One might object to the great naivety of this exercise, or even to its profound ignorance of the real mechanisms that have historically led to the depredation of nature. Can we really believe, we might say for example, that it is due to the persistence of a dualistic anthropology and a two-layer model of care that plastic waste accumulates in hundreds of thousands of tons in the oceans (Eriksen *et al.* 2014), thus forming what we might call a new continent – a continent of waste? Behind this phenomenon, and many others of the same kind, lie not anthropological or philosophical postulates, but quite certainly actors, including industrial ones, who have taken decisions based on their interests. French philosopher Grégoire Chamayou (2019) has recently highlighted the role of brewery and soft-drink industrialists of as early as the 1930s, in the United States, in promoting disposable cans and bottles which came to replace the old system of recoverable and reusable containers (a system based on deposits). The industrial lobbies have worked very well and they certainly have a role in the explosion of astronomical quantities of waste which must now, in fact, be recycled. Let us cease to beat about the bush and point the finger directly at the problem – not in the heaven of philosophical ideas about humanity and about care, but in the strategies of the major industrial players.

This objection is unstoppable, and it must be clear: no miracle recipe will come out of these analyses and, of course, it is above all through struggles and the efforts of regulation that things will change. Bergson warned us: a more frugal mode of life, one therefore less detrimental to nature, would have to go through a very deep moral reform. However, such a reform being apparently unattainable, "we must be content with shifts and submit to more and more numerous and vexatious regulations" (Bergson 1935, p. 274).

There is always an aspect of our daily lives by which, whatever our goodwill and our sincerity, we produce a defect of care. Manufacturing and using a smartphone or a computer, taking a plane trip, turning on electricity inevitably involves a defect of care, since these technological objects or gestures depend upon industrial clusters which are deleterious to natural environments and humans that are sometimes very distant from us. There is no loophole, even if otherwise we promote *low tech* philosophy or agriculture without chemical inputs. We have built our habitation of the world upon the (de)predation of nature; we can without doubt be less (de)predatory, but we can hardly stop being so altogether. But this thought must not discourage us. It in no way prevents us from defining the theoretical conditions and practical principles of caring technological action, to implement as much of it as possible in the aim of reducing the (de)predation exerted upon nature and upon living beings in general. This book has no other ambition than to indicate what these conditions and principles are.