Introduction

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One has to think living beings in all of their empirical complexity and carefully specify the precise limits of the definition one uses to deal with them. It is also necessary to be open to conceptions of living beings that are quite different from the ones being used by Westerners. Finally, one has to be aware of the complex and overdetermined ways that Western cultures qualify what could be alive. For them, an agent is alive if and only if it has DNA. The spread of the spectrum of the activities through which living beings are shown to human beings (through cultures and times) is very large. Today, our cultures, Western ones as well as that Eastern ones, try to conceive of disturbing machines that could be alive (in the most extreme versions) or that could simulate living beings (in the less extreme versions). Through this interdisciplinary dialogue, what is at stake is to avoid the belief that anthropology should only be interested in 'representations'. On the contrary, through inquiries at the level of ontology, anthropology's program of research comes closer to a philosophy that is eager to explore the fields of the possibilities of what it means to be 'alive', as well as the relative relevance of such anthropologists and philosophers to understand the contemporary world and

live within it. This special issue of *NatureCulture* on 'Life under Influence' has its origin in a multidisciplinary workshop that was organized by Dominique Lestel at the Maison Franco-Japonaise in Tokyo, in which all contributors to this issue participated.[1] Its starting point was to grasp the challenge of the question of the 'living' and of 'life' in contemporary culture. This challenge has two main components, which are intertwined but never exactly merge with the other. The first one deals in a privileged fashion with explanatory principles that cultures, both Western and non-Western ones, elaborate in order to make sense of such a complex phenomenon as life. The second component is the one that is linked to contemporary technological and scientific innovations, which markedly reshape what one thinks it means to be 'alive' and offers the opportunity to consider particular phenomena and practices in non-Western cultures. 'Life' and 'Living Being'. To choose one term and not the other is far from anodyne. The one who speaks of 'life' supposes that it exists as a universal phenomenon, a material, organizational or spiritual principle that can be characterized from necessary and sufficient causal conditions that each culture would be able to appropriate by themselves in their own way—Western culture being not an exception. The one who speaks of 'living beings' is more attracted by the complexity of a protean phenomenon, which cannot be grasped except through the very conditions of the practices that are supposed to demonstrate that someone or something is alive. One of the interests of this issue is that it allows free expression of these two points of view and establishes an interface between them. One of us (Pitrou) suggests that even if we take into account the multiplicity of conceptions of life, we cannot avoid the fact that life processes do exist, which all human beings are able to recognize more or less as such in their environments. Without necessarily being a universal substratum, these phenomena—especially the desire to know them—suggest that one would be able to discover regularities and homologies. The other one (Lestel) adopts a firmly constructivist perspective that insists more upon the multiplicity of forms and relations that living beings make emerge in the world, a situation that makes useless any reflection about 'what is life'. Truly, these two conceptions are incompatible with each other, but it appears to us that it is more important to maintain this theoretical divergence instead of trying more or less to artificially erase it. The question of the discordance between the 'life' and 'living being' approaches also has the advantage of giving consistency to a phenomenon that is not only a multidisciplinary concern but one that crosses professional fields: scientists, scholars, artists and engineers are interested in it. Biologists have had a monopoly on theorizing life for decades. The situation has

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now become less monolithic—and the development of the 'Artificial Life' programs is a good example of this. From the point of view of the philosopher, to think about 'life' and 'living beings' has become a game that largely departs from the traditional field of biology—even if biologists still say fascinating things about life, significantly renewing both their approaches and their ambitions through the development of synthetic biology, for example, which puts them on a path to entirely unexplored regions. The complexity of what is at stake explains the dual aspect of the phenomenon of life, which both refers to what we are trying to understand and what we are eager to build. For anthropologists, the question of life has always been one that spans cultures; it is not merely a feature of our deep technological century. However, the tremendous progress in nanotechnologies, biotechnologies and information and communication technologies noticeably transforms the situation and pushes us in directions that are at once potentially dangerous and hopeful. In other words, our capacity to deeply transform the phenomenon of life, and not only some of its occurrences, is an unprecedented situation in History. Why do we show *now* such an interest in life and living beings? No doubt many explanations could be given. We might reasonably point out that this interest is being aroused at a time in which questions of life and of living beings have become hot topics in relation to power—political power, social power and economic power. We see this both in its factual impoverishment of life because of the breakdown of biodiversity, and in the growing awareness of the complexity of life with the rise of molecular biology, particularly with the evolutionary developmental ('evo-devo') theory and the emergence of a technology of life more ambitious than we have ever seen before. We also have to keep in mind that we are so much interested in life and living beings today because they constitute the last frontier that contemporary hyper-capitalism has not yet conquered even if it yearns to do so. Life and living beings nevertheless do not only constitute the last frontier (to mobilize a notion so important in the history of the United States), they also organize by themselves a resistance—among other things—through the ethical questions they arouse.

While the distinction between life and the living is crucial in philosophy, it appears that the social sciences in general, and anthropology in particular, have paid little attention to it. This explains why, too often, the terms 'life', 'living' or 'being alive' appear as synonyms, although they refer to distinct realities and different levels of analysis. Most likely, this is the reason why discussions about animation have become so central in the debate on the understanding of living things; while interesting, the question of animation only concerns one aspect of vitality. 'To be animated' and 'to be alive' are not synonymous because animation is only one phenomenon among the plurality of vital processes that should be

addressed: reproduction, growth, senescence, and death—to name but a few examples. And, at a deeper level, in order to avoid using 'life' as a general and semantic notion, it is crucial to distinguish between 'being alive' and 'making alive'.

Therefore, if one wants to be thorough, it seems that every theory of life—*emic* as well as *etic*—should be accompanied by a reflection on the multiplicity of relations that can be established between living beings. Symmetrically, this effort in highlighting interactional dynamics should lead to investigations of how humans conceive of the mechanisms that 'make living beings live' and make them act as they act. In order to take these two dimensions into account, a pragmatic approach is probably the most fruitful way of examining the diversity of agencies mobilized in relationships between living beings. Rather than trying to define an essence by asking, 'What is life?', the relevant questions are thus: What makes a living being alive? Even: How can humans make and sustain a living being? What forms of bonds are established between living beings? What does a living being do (or wish to do) with another living being? What can humans do (or wish to do) with it? In order to be able to tackle these questions in the same analytical framework, the notion of construction appears very appropriate. First, it can designate the categories of action used to 'make' the living, in 'archaic' biotechnologies, as well as in contemporary practices (robotics, grafts, synthetic biology, genetics). Therefore, the challenge is to determine how the assemblage of heterogeneous elements, organic or not, allows for the creation of hybrid beings that possess a certain autonomy. Beyond this logic of fabrication, construction refers to the fact that the interactions between living beings are also the object of an elaboration. Similar to the powers at work in manufacturing, the potentials opened up by the diversity of relations between beings invites us to adopt a broad definition of what it means to be 'alive' or 'to live' in order to avoid being locked in dichotomous categorizations: natural/artificial; biological/non-biological; living/non-living. By bringing new insights into this twofold modality of construction—interaction and manufacturing—the articles in this issue emphasize that the problem we should be addressing is ultimately about building ecosystems in which living beings and artifacts coexist.

In *Life as a Making*, Perig Pitrou starts from a seemingly simple hypothesis to analyze the relationships between life and technology. With the exception of a few borderline cases, and on a human scale, vital processes are visible in human bodies or in the environment in which they operate. By contrast, the mechanisms that produce these phenomena remain invisible, so that humans are led to formulate inferences, more or less explicitly, to render the mechanisms intelligible. In this context, the objective of the anthropology of life developed by

Pitrou aims to study the variations, in time and space, of the conceptions of life and of the living associated with these inferences—theories, more or less formalized, more or less systematized, which societies elaborate in order to articulate them with each other.

In order to establish a comparative framework that can link these theories and inferences, his contention is that it is instructive to consider 'Life as a making'. Based on his ethnographic investigation among Amerindian populations of Mexico, the author suggests that the technical activity through which humans exert their power over the material world is often used as a metaphor of the action by which life shapes the body of living beings, and organizes their functioning. Insofar as there is a great diversity of technical practices invented by humans, this article proposes a first inventory to track the correlations between techniques and conceptions of life. By addressing practices such as handicrafts, production (and reproduction), engineering, crafts, bioart or biodesign, the challenge is not only to consider the technique as a metaphor. If technical activities are used to think vital processes, they are also mobilized to act on living beings and treat them as artifacts. Consequently, looking at life from the standpoint of manufacturing also leads to investigate the plurality of forms of interactions that humans establish with living beings, whether they are treated as objects shaped by craftsmanship, machines, programs, etc.

It is precisely this interactional dimension that Dominique Lestel scrutinizes in *How Machines Force Us to Rethink What It Means to Be Living*. Instead of defining the living being by biological functions or seeking to assign an essence to life, he proposes we explore 'the living as an existential contract'. What is at stake is less to draw up a (finite) list of the attributes that characterize life than to examine the (mental, affective, etc.) conditions in which one person considers another being as alive. Engaged under the auspices of William James and Alan Turing, this resolutely pragmatic and interactional approach leads to a redefinition of the living being ('a being that is considered as such by another living being'). To explore this possibility, the analysis engages on two levels, individual and social. Individually, it is first of all the psychological and emotional mechanisms that must be taken into account. While many cognitive studies investigate systems of inferences that categorize living beings, Lestel argues that feelings and emotions—such as love, in his article here—are even more deeply involved in the construction of interactions. It is therefore a whole set of expectations, desires, intentions and resistances that the inquiry must highlight if the complex nature of the attachments that develop between beings is to be comprehended. Beyond the reduction of vital processes to biological functions, exploring this ambiguous space of hybrid communities tends to make the

living/non-living boundaries porous. Or, to put it more appropriately, it leads to an extensive definition of sociability, understood as a chain in which living beings or artifacts are likely to be connected to others in common interactions, so that objects without vitality—in the biological sense—turn out to be animated within interactions. While exploring the psychological and emotional underpinnings which organize the relations between humans and nonhumans, it is thus the description of a 'life under influence' that Lestel offers in order to grasp the living in its relational dimension. This expanded descriptive framework enables us to examine what the living do, what we do with them, what they make us do, what we want them to do, and so on.

The articulation between the individual level and the social level is also at the heart of the text that Goro Yamazaki devotes to the corporeal and institutional transformations that organ transplantation causes in Japan. The possibility of fragmenting the body into several elements, in order to reassemble them in other living bodies after the death of an individual, leads us to view life as a manufacturing process. In this case, the question of the emergence of vital processes from scratch is not raised; however, as in synthetic biology, the biotechnologies involved in this type of operation allow humans to partially overcome the inevitability of the vital process—namely death—by decoupling the functioning of certain organs from that of the organism taken as a whole. This is only possible thanks to the intervention of heavy technological devices, so that it is less the disappearance of the body as an organic unity that should be investigated than the complex construction of a biotechnological body. However, as the author writes: 'To understand these conditions, the relationships between self, others, body parts, technology, and society must be rethought'.

Indeed, while requiring a rethinking of life as a corporeal existence, grafts oblige us to re-articulate the relations between living beings, especially as they are governed by social rules. While the anonymity that accompanies organ donation produces a disconnection between the families of deceased donors and the recipients, some collective activities, studied by Yamazaki, aim at re-establishing continuity. All human societies have developed rituals to accompany the passage from life to death, redefining the bond between the living and the dying. However, the multiplication of transfers of organs has created a new situation: it forces to think both the disappearance of a being and the fact that one part of it continues to exist in another body. The (bio)technological innovations thus create an unprecedented physical and social reality, as well as a new rituality whose purpose is to articulate discontinuity and continuity. For instance, during the Bridge of Life Day (*Inochi Kizuna no Hi*), donor families gather with recipients to stage both the memory of the loss (on embroideries reminiscent of the memory of

the deceased) and the unity of the group that ensures survival after the death of the individuals. Similarly, sports competitions involving recipients under the eyes of donor families appear to be concrete manifestations of a sort of contract between these two groups and a commitment by the survivors to live as properly as possible with the organs of the deceased. Here again, the fact of considering life as a manufacturing process does not prevent it from being treated as an eminently relational and social phenomenon, involving both relationships and individuals in their bodies, among members of a society.

Whether one is interested in the imbrication of vital processes in technical processes or in their imitation by artifacts such as robots or artificial intelligence devices, the relationships that humans have with other living beings are highly dependent on the cultural contexts in which they develop. This is one of the issues Paul Dumouchel addresses when he analyzes popular culture productions in order to determine why robots are allegedly more acceptable in Japan than in the West. To answer this question, he suggests that one should take into account the autonomy that these technological devices are meant to imitate—and, in short, to question the dimension of the living that they objectify. By pointing out that a robot can be defined on the basis of two criteria ('First, an engineering mechanical criterion: an autonomous automated device; and second, a social functional criterion: that works in our place') he demonstrates, once again, that a twofold approach—in terms of manufacturing and interaction—is the most appropriate way to understand a device that imitates the living, and therefore to develop a definition of what it means to be alive.

From this perspective, which studies how automated artifactual elements fit into a network of relationships, the author distinguishes between those robots that appear as individuals, and those that appear as systems on the contrary. He argues that the differentiated appreciation of robotics in Japan and in the West is grounded in the fact that the judgments regarding machines do not deal with the same aspects. The general acceptance of robots in Japan may well be accounted for by the presence of individualized robots, with whom interactions are clear and defined, as opposed to robots that act in organized systems of relations—partly invisible—that threaten the autonomy of humans and arouse suspicion, as movies such as *The Matrix* have illustrated. This confirms that the definitions of life depend on the technical universe in which relationships between living beings and artifacts emerge—relationships that are never univocal, but involve a plurality of interactions, depending on the scales.

This is also one of the lessons taught in the article by Thierry Bardini, devoted to the possibility of redefining life on the basis of the notion of virus, which similarly invites us to reflect on the convergence between the biological

and the technological. It is not only a question of asserting, as is commonly the case, that computer viruses develop like biological viruses, as if they were used as metaphors first and foremost. Bardini's ontological proposition is bolder because it invites us to think that these two forms of virus oblige us to overcome the opposition between artificial life and natural life. By mobilizing contemporary works in virology as well as Gilbert Simondon's philosophy, the core of Bardini's thesis is to show that a theorization of consequent life must articulate the question of relationship and that of individuation. The analytical yield of the notion of transduction thus appears valuable to study the specificity of what a virus is. In its biological manifestation, it appears in fact to be interacting with its environment, composed of other viruses or other living beings, but also in relation to itself: 'one could say that viral transduction effectively describes this minimal *internal resonance of the living*, in this very way that viral existence consists exactly in the perpetual relation of the internal *milieu* and the external *milieu* that the individual operates inside itself'.

Considering life through this tension between the self and the environment offers a way of escaping an essentialist view of vital processes, treating them as continuous combining operations taking place on several scales, from which effects of thresholds—sensed as more complex forms of organization—emerge. In this 'evolutionary tinkering'—to quote François Jacob—it is clearer why a technological virus operates in a similar pattern as that of a biological virus. It is not only that the procedural features that allow a viral computer system to develop correspond to a form of self-organization that can define what life is. At a deeper level, as the experiments in synthetic biology seem to suggest, the very idea of a continuity between technological devices and vital processes becomes less and less fantasy—even if there is still a long way to go. Therefore, the 'viral life', as Bardini defines it, leads to a conceptualization that integrates life in all its complexity and diversity since it makes it possible to think it as a phenomenon that is both individual and systemic, artificial and natural.

Through these few examples, we understand how defining life requires that we undertake, both theoretically and descriptively, to extend our field of investigation beyond that which the field of biology has progressively objectified within the natural world. By studying living beings jointly from the point of view of manufacturing and interaction, this issue of *NatureCulture* aims to encourage us to approach life based on the analysis of hybrid ecologies—human, animal, plant and machine. From this standpoint, hybridization refers to the fact that organisms are composed of heterogeneous elements and that they are involved in various forms of interactions. These are all the more varied as they serve to think biological as well as social relations, as the examples tackled by the various

authors prove: love & *philia* (Lestel), production & generation (Pitrou), predation & collaboration (Dumouchel), parasitism and symbiosis (Bardini), gift & exchange (Yamazaki). As Bardini's text suggests our implied understanding of what life and living are determine the process by which we individuate living beings, while at the same time establishing relations between living beings and between the living and the non-living. Within these 'agentive configurations', the anamorphic dimension, if one may say, must also be taken into account in order to grasp how the polarities of participation (passive/active) vary according to the perspective adopted to describe them.