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Death and Complexity*

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Abstract: There is no such thing as a science of death, although there is a science of life, as it happens. Death is not so much the subject matter of science but an experience, and death experiences we find abundantly in the literature. Now, experience is told not so much in a scientific tenure but as a narrative. Within the framework of bioethics, death comes closer, particularly what is usually known as end-of-life dilemmas, *i.e.*, palliative care, a most sensitive arena, if there is any at all. This paper argues about the interplay or dialogue between death and complexity science. It claims that the knowledge of death is truly the knowledge of life and provides three arguments that lead to the central claim. The first argument is very much close to a kind of heuristic for knowing about death, while the second shows the challenge of knowing death. The third one consists of a reappraisal of death within an extensive cultural or civilizing framework. Lastly, some open-ended conclusions are drawn.

Keywords: Life; Near-Death Experiences (NDE); bioethics; complexity theory; culture

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* Research article

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Muerte y complejidad

Resumen: No existe cosa tal como una ciencia de la muerte, sin embargo sí existe una ciencia de la vida, por suerte. La muerte no se trata de un asunto de ciencia sino de una experiencia, y experiencias de muerte abundan en la literatura. De hecho, la experiencia se cuenta no tanto en un tono científico sino más bien como una narrativa. Dentro del marco de la bioética, la muerte se aborda de una manera más cercana, particularmente en los que se conocen como dilemas del fin de la vida, por ejemplo, el cuidado paliativo, una arena muy sensible, si es que la hay. Este artículo discute sobre la interacción o el diálogo entre la muerte y la ciencia de la complejidad. Afirma que el conocimiento de la muerte en verdad es el conocimiento de la vida y da tres argumentos que llevan a esta afirmación central. El primer argumento es muy cercano a un tipo de heurística por conocer acerca de la muerte, mientras que el segundo expone el reto de conocer la muerte. El tercero consiste en una reevaluación de la muerte dentro de un amplio marco cultural o civilizador. Por último, se esbozan algunas conclusiones abiertas.

Palabras clave: Vida; Experiencia Cercana a la Muerte (ECM); bioética; teoría de la complejidad; cultura

Morte e complexidade

Resumo: Não existe uma ciência da morte como tal, contudo sim existe uma ciência da vida. A morte não se trata de um assunto de ciência, mas sim de uma experiência, e experiências de morte abundam na literatura. De fato, a experiência se conta não tanto em um tom científico, mas sim como uma narrativa. No âmbito da bioética, a morte é abordada de uma maneira mais íntima, particularmente no que se conhece como “dilemas do fim da vida”, por exemplo, no cuidado paliativo, uma arena muito sensível, sim é que a há. Neste artigo, discute-se sobre a interação ou o diálogo entre a morte e a ciência da complexidade. Afirma-se que o conhecimento da morte em verdade é o conhecimento da vida e são apresentados três argumentos que levam a essa afirmação central. O primeiro argumento é muito próximo de um tipo de heurística por conhecer sobre a morte, enquanto o segundo expõe o desafio de conhecer a morte. O terceiro consiste em uma reavaliação da morte dentro de um amplo referencial cultural ou civilizador. Por último, são esboçadas algumas conclusões abertas.

Palavras-chave: Vida; Experiência Próxima da Morte (ECM); bioética; teoria da complexidade; cultura

Introduction

The recent crisis caused by Covid-19 around the world has been a chance to re-state a crucial issue, namely, the relationship between life and death, not to mention health and death. Of course, numerous countries know particular experiences where such an agonistic relation is a concern in everyday life, due mainly to military, political, sanitary, or economic reasons, in addition to delinquency. However, such circumstances are to be situated within a larger framework provided by history, philosophy, and some sciences and disciplines.

Traditionally, the Western world has not had *explicit* knowledge of death. Medicine, from the outset, has been conceived ever since Hippocrates and Galen as a negation of death and the open striving for life and health. In other words, death has been known negatively, namely, as fear, pain, sorrow, or deep affliction. The history of the Western world has largely been a history of wars, epidemics, pandemics, invasions, and violence. The literature about these subjects is ample and extensive. There have also been notable moments of thinking, art, creativity, discovery, and innovation; it would be just supine to ignore this. Glorious moments and experiences are both materialized and expressed in people such as Bach, Beethoven, Rubens, Lavoisier, Mendeleiev, Planck Picasso, or L. Freud, to mention a few. As for death, it has been a matter of grief, particularly in the West (40).

This paper explores the complexity of death. However, such an expression is not to be taken in the sense of hardship or as an adverb or adjective. Instead, within the framework of complexity theory, it has a precise meaning aiming to bring forth several features such as uncertainty, unpredictability, emergence, surprise, non-linearity, and fluctuations. I shall revisit them later. The complexity of death is to be grasped from the outset in sharp contrast with life; thus, generally speaking, we do have a science of life, and yet we do not have, and seem to be far away from, a science of death. Science appears here as a problem rather than a clear-cut reference, and it must be tackled

and solved. This is the primary purpose of this paper. The crux is that in its deepest sense, science cares about neither experiences nor beliefs, and so it has been since its origins in the 16th century until now, even throughout the different scientific revolutions. Consequently, it will be argued that some ground must be found that allows the interplay between both extremes, namely, science and experiences –the latter always provided as a first-person account.

The complexity of death consists primarily of the intertwining between science and narrative, two disjunctive approaches when viewed from mainstream science. Here I shall argue that opposite to that disjunction, it is time we surpassed that juxtaposition. Understanding and explaining do not have hierarchized, preferably achieved, or *a priori* ways. In other words, they are not a matter of regions, sections, or parcels. When it comes to thinking and understanding, as well as explaining, we work with a weave of concepts, languages, approaches, and takes. Death is a phenomenon that makes it possible to open the doors for bringing together concepts and metaphors, more accurately, logics and tropology.

One enthralling field is those experiences known as near-death experiences (NDEs) that can be found in every past and present culture on Earth (1). The standard way bioethics has dealt with death until now is precisely the so-called end-of-life dilemmas. Culturally speaking, the NDE seems to be the standard approach to death, something that must nonetheless be taken *cum grano salis*.

Bioethics arises as that kind of discipline where some intertwining between concepts and *tropoi* is possible. Indeed, bioethics stands at the border among sciences, disciplines, practices, and narratives. It is neither a mostly health-sciences-related field nor a distinctively humanistic and ethical arena. Bioethics has risen and lies somewhere in the middle of natural sciences, health sciences, and human sciences and has deepened and enlarged its domain of concerns. In this paper, I take such developments for granted (2).

From the outset, bioethics is to be understood not on a principle basis—which can be appropriately named as “normal bioethics”—in the Kuhnian sense of the word regarding “normal science” and “mainstream science.” Instead, bioethics will be here understood in the most comprehensive and yet most deepest sense of global bioethics, which entails a concern for life and health regarding human beings and nature. Normal bioethics is primarily anthropocentric. I shall argue *en passant* that the complexity of death concerns a stance that surpasses the sheer human experience as we know it. Global bioethics allows for different bridges with complexity theory (3-4). It is in this sense that we take it.

Accordingly, the first section below will be centered on the main paths that clear up our understanding of life. A detour will be necessary to come to terms with death. The next step pivots on the complexity of grasping death. It should be clear that there is no direct or straightforward path to explaining death; hence, indirect assumptions are to be considered. Traditionally, science does not seem much concerned about indirect inference. The following section brings to the fore an implicit, although not trivial acknowledgement: human beings are usually biased by their cultural tradition and surroundings, which should by no means be taken for granted. The three sections outlined serve as preliminary arguments leading to this paper's core, presented in the fourth section. I argue that the complexity of death is, as paradoxically as it may appear at first glance, the very complexity of life. Various considerations will be taken into account therein. At the end, some open-ended conclusions will be drawn. The characteristic of open-ended conclusions followed from every question and issue defines this paper; in other words, it is much more than just a methodological assertion.

The complexity of the knowledge of life

It is not easy to diagnose death (5), not to mention defining or understanding it. One of the most serious issues in science in general and in

neurosciences and medicine in particular is determining death, more exactly when a person can be considered dead. Such, I argue, is both an ethical and a scientific issue. Literature tells about numerous cases in the past where people were buried alive because they were thought to be dead.

Two basic modes of death have been primarily identified, namely, brain death and body death (41). After years of experience and study, medicine has come to define death as brain death (2). The trouble, however, lies in the right moment to declare it. There is still debate about this point. The importance of determining or diagnosing death has to do with a number of issues. In medicine and bioethics, it is about using some organs from the corpse for transplantation, a most delicate question from many viewpoints. For the family and relatives, it may be a matter of mourning, memories, and decisions. For society and the state, it is a concern for statistics and fiscal affairs. Several other examples can be easily mentioned.

We have not any straightforward and certainly not an immediate definition or experience of death. Therefore, a detour is compulsory before we gain some clarity about death. Such a detour leads us to consider some primary sources to get to know death as they appear in the outlook of sciences and disciplines. We will turn to these before making explicit what they entail vis-à-vis the complex relationship between life and death.

Some primary sources for knowing about death are the following:

- Medical anthropology in general and clinical anthropology in particular. The accounts of people's experiences and narratives in the borderline of death seem to provide some patterns. Among them, it is the story of a tunnel that attracts them fast, seeing the light, the sensation of peace, love, and enormous joy, and, many times, meeting with relatives and family members that were dead long ago. Some see and hear choruses, while others see a paradisiac landscape. People find themselves with the same body, but lighter, and when looking back at their own terrestrial body, they do not

experience anything like regret or pity for the corpse. Most of time, when they come back, they enter their earthly body with a sensation of shock or something similar.

Meaningful as they are, several doubts arise on the interplay of neurosciences, cognitive science, and psychology, mainly concerning such experiences and descriptions. It is well known that under several circumstances, the brain produces endorphins, endopsychosins, and enkephalins that very much produce the same experience registered as NDE. Being as it might be, medical anthropology is a trustful source for accounts of what has been called other life beyond our own here on Earth.

- History, especially in the *École des Annales*, has been extremely helpful in understanding death from a historical standpoint. The studies reveal that death is experienced and conceived as a frightening experience rejected by the history of the Western civilization, from ancient Greece until now. Ph. Aries has written several very well documented books that shed light on the fact that from the end of the Middle Age to the end of the 1800s, culture rejected death in all sorts of ways. Contradictorily, death was known due to epidemics, wars, violence, prosecution, and many other circumstances, as either an individual or collective phenomenon. The various pandemics and wars certainly fostered such an attitude, which severely began to change in the 20th century and continues to change in this 21st century.

Death was traditionally a matter of worry in the West that caused denial, rejection, sublimation, and rationalization, which are various forms of negation, as it is well known. We can say exactly in this context that there are other cultures and civilizations in which death is conceived and experienced in peace, even with particular joy and certainly wisdom (3-6). The West has traditionally conceived such knowledge as sort of primitive and definitely not scientific. The tenure of what science means here is an

empirical science, subject to experimentation, reproducibility, and objectivity. Along with this research line, Delumeau (6) has made it clear that the primary relationship with death in the West has been fear and rejection (1).

- History of religion and comparative religions, including the study of myths, is one more trustful source for knowing about death in general. Undoubtedly the works by M. Eliade (5-43-44) stand out as solid acquaintances that immediately bring to the fore the following: various accounts of death as an experience have been given around the globe that permit both distinguishing and differentiating patterns, behaviors, relations, and attitudes toward, say, spirits, lights, gods, dead people, and the living people themselves. For sure, no single or unique story exists about it. Instead, bounty of colorful, diversified stories with many arrays, are to be taken into account, which immediately entails that death experiences and stories about death lack something such as unanimity, universality, or objective appraisals. If so, a second thought becomes necessary. We shall come back later to this point.

In the meantime, it should be noted here that the account and understanding of death are culturally determined. People say that they experience what is common ground within the framework of their history and culture. If true, then something such as a universal meaning of death, a universal experience of transcendence, is not tenable at all. Rather than solving a problem, this creates more trouble. No safe conclusion can be drawn here apparently.

There are two groundbreaking texts on the subject with which scholars are very familiar. The first one is *Bardo Thodol*, known in the West as *The Tibetan Book of the Dead*, which literally translates as *Liberation through Hearing during the Intermediate State*. The other one is the *Egyptian Book of the Dead*. These two stories can be placed as the second source for getting acquainted with the dead, albeit strange for the general culture in Western societies.

- An intercultural approach, also known as a dialogue among civilizations. Perhaps the best one is the Institute *Mind and Life*, book Varela (7). It is about bringing together different traditions, accounts, and ways of explaining is more than fruitful. One could probably have some comments about the Institute; however, what is meaningful is the very spirit of uniting cultures, *i.e.*, religious and scientific of about death (45); in other words, assembling various traditions, worldviews, *Weltanschauungen*, expectations, and experiences both enhance and foster a complexity approach to what otherwise would be a biased understanding of nature and human frailty. Several other related works can be mentioned, such as (8-11).

Overall, I would like to highlight the claim that a science of death should be possible, something that is the explicit subject of a section here below.

Life accepts and is grounded on a variety of viewpoints, not always congruent with each other. Achieving a universal, undistinguished and shared view of the world and the universe is, to say it briefly, a dream that has already been dreamt, even by classical or modern science. However, richness, diversity, alterity, and multiplicity are the hallmarks of life, whether from a genetic, biological, or cultural standpoint. Then, the Babel Tower can be seen much more as a blessing rather than a curse. This heterogeneity, I shall highlight, is an achievement, not a loss. Complexity theory is precisely about the acknowledgment of such a fact. The opposite leads straightforwardly to reductionism.

The complexity of life's knowledge is closely intertwined with one of life's most crucial, limited experiences: death, an experience that drastically changes our standard way of living daily.

If complexity is about life, what about death?

By and large, the most complex system, phenomenon, or behavior ever is life, *i.e.*, living beings. Understanding life properly means grasping life

as we know it very much as also life as it could be possible. Such a distinction is at the same time a scientific and a philosophical take that aims at broadening and deepening the understanding of life. Initially, such a twofold and parallel distinction originated at the onset of artificial life, a computational and philosophical research program set out initially in 1989 (12). Artificial Life is one of the sciences of complexity.

In this sense, the claim has been made that the sciences of complexity are the sciences of life, although the inverse cannot be rightly said. Fig. 1 provides a solid panorama about the references or hints that help get the right view about the complexity of life. Such hints are (the order is unimportant here): computational biology, symbiogenesis, biological computation, networks biology, quantum biology, epigenetics, eco-evo-devo, synthetic biology, and systems biology. As it can be easily inferred, nowadays biology openly admits strong theoretical works, and not just research in the fields, as used to happen. Biology pervades complexity, indeed, for it has overly become a cross-disciplinary approach, to say the least.

Besides, some critical projects wherein several of these hints converge are, firstly, the global bacteriome project that begun in 2013 and was closed in 2017. The other one is the global virome project that started in 2018 and is set to be achieved in 2025. Both have brought brand-new lights that are currently redefining life as we did know it. We are actually facing a radical reappraisal of life that is going to change the standard view we inherited. Just as a rapid overview, human beings are holobionts, the rule in nature is eusociality, and endosymbiosis appears as the most robust explanation for life. As for the origins of life, it has been established that life creates the conditions for its emergence and, at the same time, sustains it. These are highly counterintuitive assertions. Figure 1 summarizes this outlook. Digging into it would distract us from the main subject of this paper.

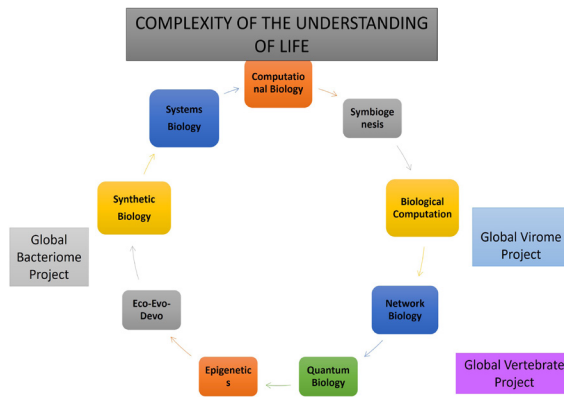


Figure 1. References and Arrays Explaining the Complexity of Life

Source: Own elaboration

It is not necessary for this paper to deepen into each of the references that help grasp the complexity of life. It is sufficient to say that they serve as landmarks for having a robust understanding and explanation of life. Briefly said, we do have a science of life that comprises different approaches, many of them closely intertwined—say, a Darwinian and a Lamarckian approach, for instance. Biology, in general, can be said to have become a robust science that does not depend any longer on physics or chemistry as conditions of possibility (13). This subject would take us on a different track, though.

It may be enough to assert that bioethics is not possible in any sense without a clear interplay of the array presented in Figure 1. It has become a scientific and philosophical imperative: we ought to have a solid view of what life is and what it entails and comprises. The core here is that whereas there is a science of life, we do lack an analogous science for death. This paper attempts to bridge such a gap.

Now, how do we have a sound account of death? The focus has been mainly on NDES. Accordingly, it appears that:

1) Death is not the ultimate word. It is just a transition or passage to a presumably higher order. Surprisingly, there is something else beyond our earthly experience, regardless of whether the dying person or the person who experienced such an event believes in god, transcendence, or has any religious belief. The bibliography about

this point is relatively extensive and increasing;

2) If so, death does not exactly exist, say as a (final) state, but it is/would be momentum toward a brand-new and different kind of life. I leave aside here any judgment about what has been said about that afterlife. Such an account is just taken for granted. The reason is that what has been defined as death is, in this light, a sheer *instant* that opens a new gate. Such is precisely the limit of this study.

There is no science of death if by such a term we think of empirical science, *i.e.*, science subject to objectivity, universality, a clear-cut method, and the reproducibility of the experiment, let us say. Each account of NDES is singular, even though there may appear some culturally determined patterns.

Death is essentially the subject of narratives and experiences, not of specific and well-established methods, and certainly not some that can be falsified, for example, when the person that has experienced an NDE comes back and gains consciousness. Either the listener or the reader may trust it or not. Scientific criteria such as testability, contrast, verifiability, and falsifiability fall short.

Yet, within the framework of the philosophy of science, several other criteria have been brought to the fore regarding the plausibility and trustfulness of a theory, explanation, or argument not restricted to the canonic considerations set out by conspicuous members of the Vienna Circle (14). One of such “new” criteria, for example, is beauty. A theory can be said to be true if, at the same time, it is beautiful. Beauty here is both an aesthetic and mathematical criterion (15). It can be safely said that beauty, as evidence for a scientific theory, remains unknown, apparently for standard science regulations and methodologies. Voilà! This is the most thrilling feature, which opens wide the doors for complexity theory, indeed.

As it appears, trust is a crucial argument, and trust is led, so to speak, by beauty. Traditionally, family and relatives have rational grounds for trusting. Science, though, does not care about beliefs, trust, or first-person experiences and

accounts. At its best, beliefs, narrations, and experiences are just a matter of philosophy, which is indeed the case with phenomenology, for instance. In its most robust sense, science has concentrated on the outside world ever since the history of Western civilization. On the other hand, philosophy and fiction do know about first-person accounts, and narration and experiences are not strange. A couple of remarks are to be made here.

Firstly, the assumption that science is basically possible thanks to concepts and logic is more ideological than rigorous. Good science is the problematic and yet intelligent endeavor to mix up logics and tropology or literary devices, *i.e.*, concepts and metaphors. Some examples of *tropoi* or literary devices are anaphora, asyndeton, epistrophe, euphemism, hyperbole, irony, simile, metonym, and paradox. I shall later argue that a good account of the world and human experience in general needs both ingredients, namely, logic, and tropology. Intelligence can be said to consist of the creative hybridization of logics and *tropoi* or literary devices.

Secondly, contrary to what has been claimed, particularly since Descartes and Kant, philosophy and science are not juxtaposed realms. Before Descartes, the opposition between science and philosophy did not exist. After Kant and Descartes, many scientific and philosophic endeavors stand out that do not oppose or hierarchize one of them despite the other. An example in this regard is quantum physics; Einstein (16), Bohr (17), Heisenberg (18), and Schrödinger (19-20), after having developed quantum mechanics, which is the hardcore of quantum physics, wrote different texts showing that their scientific achievement had profound philosophical implications. Another example is Husserl's phenomenology, where both philosophy and science—for instance, logics, mathematics, psychology, and history—are closely intertwined with philosophy. That is exactly what phenomenology is about. Several other cases can be easily mentioned where Descartes' and Kant's distinction and preferences are not followed.

Consequently, a presumed “science of death” is from one extreme to the other a science of inner experiences, it appears, and not so much a science of the outside world. *Vis-à-vis* the status of scientific knowledge, this is a most challenging argument. In any case, a rational or truthful, or sufficient account of death is to be provided since it is a necessary experience for human beings and living beings in general.

The crux of the argument here is that there is not any *ignoramus et ignorabimus*. In other words, the best of knowledge and wisdom lies in the acknowledgment that there are no limits for human understanding, and it is always susceptible to giving an account of the ineffable. I clarify this statement below.

Complexity theory can be understood in a two-fold way; on the one hand, it is the rejection of the four dominant characteristics of Western thought: dualism, mechanicism, determinism, and reductionism. The sciences of complexity are entirely defined as a critique and overcoming of that kind of episteme. On the other hand, complexity theory is revolutionary science, for instance, in the Kuhnian sense of the word, and henceforth as spearhead science, it bears some features that do not coincide at all with modern science or classical philosophy.

Classically, the world and nature were explained on the grounds of the senses and natural perception. Reality was traditionally conceived as what is grounded on the senses; namely, it was really what can be seen, touched, heard, and so on. The reasons that sustain such an attitude have been sufficiently studied (21). Unlike the first scientific revolution, the second and the third scientific revolutions (22) deal with increasingly and highly counterintuitive systems, dynamics, and phenomena. Life is definitely one of them. Suffice to note that as a scientific research program, life emerged only in 1944 thanks to Schrödinger's famous book (23).

Rightly said and understood, life is something that we do not perceive, and it cannot be perceived either. Life is imagined, intuited, experienced, but never heard, seen, or touched. When, for instance, we say to someone that he or she is our life, we

mean many emotions and feelings, bounty idealizations, wishes, and dreams, but never an empirical and at-hand reality. And yet, we do mean something that goes beyond the very utterance: “life.” In any case, culturally speaking, everyone understands the *situation*, the experience.

A different take along the same argument is the following: cosmology, a very recent science born only after 1964, clearly shows that the universe is nowhere; in other words, the universe is not a little bit to the left or a little bit above. Thus, we can safely say that science studies realities that are nowhere and at no time. According to the standard explanation known as the theory of inflationary big-bang (24), such a particular stance is the universe.

Several other examples could be easily mentioned, but digging into the various cases and phenomena would divert us from our main concern. Nonetheless, it becomes evident that spearhead science both demands and provides a quite different mindset than the one that largely prevailed in the history of humankind. That is exactly the reason why we can safely speak of scientific revolutions. It is namely a revolution in how we understand and explain nature, reality, and the universe, for instance.

One further example of complexity science’s characteristics arises from the sciences of complexity, namely, non-classical logics (25). More particularly, the issue has to do with the logic of fiction, one of the non-classical logics (26). Accordingly, some realities do not exist but need to exist to be real. Such are, for example, the case of King Lear, Raskolnikov, Madame Bovary, or Anna Karenina. They do not exist in the practical sense of the word, yet undoubtedly, we readers or audience feel, suffer, laugh, or yielding with our experiences and avatars. Fictitious realities are real, indeed. Such is the magic, if you wish, of poetry, literature, music, and the like.

Evidently, such assertions would be a sort of scandal for a scientist in the strict sense of the word. Without further ado, we can indeed claim that reality is not, and cannot be reduced to, the senses in the empirical sense and that some

realities surpass the realm of natural perception, *i.e.*, natural language in its most immediate sense.

In any case, let us highlight this: non-classical logics, scientific cosmology, and life sciences are good sciences.

A final remark: the language of classical science was made under three requirements, namely, commerce, description, and love conquest. Indeed, commerce was the activity that fostered modernity for long, from discovering the Americas to world navigation to our days. At the same time, a new world emerged that needed to be described; the language of the time allowed such descriptions. Finally, courtship was and remains highly important in the life of society. The common denominator of these three main activities of the modern world is that they needed and created a concrete language centered on the senses, taking natural perception as its rationale.

Life essentially surpasses such a concrete and senses-based language—and the same can be said about understanding and explaining death.

A reappraisal of death in a cultural framework

There is nothing ineffable for human knowledge. Instead, the ineffable can be appropriately said, if not in a given language, then always in other languages and translations. Such is the strength of the spirit, indeed. The only constraint lies in the perimeter of a given language, the knowledge of other languages, and the capacity to translate the contents and forms into another language; if so, the issue sends us further away to the ecology of languages.

NDES have been recorded in nearly any culture and society worldwide (27). I want to suggest an analogy. The study and explanation of life, *i.e.*, the living beings, recognize that life is a plural phenomenon, and its plurality can be said to be genetic, natural or biological, and cultural. The rationale of life is diversity, and more precisely biodiversity, not to mention megadiversity (28). Moreover, the study of life comprises from extremophiles, including bacteria, viruses, fungi,

and parasites, to plants, animals, human beings, and even the ongoing research program known as artificial life at large, which includes simple and swarm robotics. In other words, life does not consist of one single form of expression, in one uppermost organism or species, and certainly not in a preferred or hierarchical behavior. If so, then the experience of death cannot be reduced either to one singular cultural experience and account. Several patterns can indeed be identified about NDES, yet a variety of experiences and interpretations can be accounted for simultaneously.

The richness of literature, so to speak, constantly sheds different lights upon a series of familiar and still different characters, situations, places, and events. By and large, literature, including theater, music, and poetry, provide a seemingly wider and richer insight into reality and the possible than what standard science does. Whereas science could be to some extent confined in a set of, say, equations, formula, experiments, logics, and methods, the arts at large, including photography, dance, architecture, cinematography, cannot be as easily reduced to or comprised in the same tenure.

Good science, good philosophy, and good art are rooted in a given cultural and historical framework. Still, arts, science, and philosophy can cross the cultural and historical boundaries and become universal altogether with their deep situational roots. This is a general statement easy to argue for in history and the philosophy of science, for instance, and yet, very difficult to achieve for every scientist, philosopher, and artist. Here is a most sensitive paradox, albeit a non-trivial one. The metaphor of the tree has once and again been mentioned in the literature: the height of a tree is proportional to the depth of its roots.

Surely, comparative literature, comparative religion, and the intertwining between history in general and microhistory (29) are some examples of invaluable research in that they enrich with nuances what otherwise would appear as flat and linear.

Fear and fright before death is not a universal experience. Anthropology shows numerous people

and cultures in which they celebrate death; for instance, they dance and feast on the dead even for several days. In the West, such a relationship has never existed. On the contrary, death has classically been a matter of despair, sorrow, pain, and sadness, if not fear, too (30). It can be sufficient just to point out that difference. The considerations about the reasons for feasting and celebrating death remain outside the scope of this paper.

Moreover, within every culture, there are many attitudes, beliefs, experiences, and accounts of life and death. The ultimate rationale for life and death, I shall argue, is every single individual. After all, we all celebrate a newborn baby or the passing away of a beloved one or an acquaintance. For all the rest, it remains a matter of sheer statistics, the most insensitive of sciences and disciplines.

The reality of the individual, however, is not to be confused with begging for individualism. In the first case, we can refer to the most basic unit of life that can be exemplified in various forms: a living cell, an organ, a tissue, an organism, a given person. As for individualism, it claims that only the individual knows, feels, acts and is free or guilty. Such an argument has been rightly expressed in the philosophy of science as the twofold methodological and ontological individualism. The differences between them are not relevant here.

A sound understanding of the individual in the first sense conceives everyone as an interface and not an ultimate reality. The individual as ultimate reality is a strong belief in the Western civilization and, it can safely be said, a kind of pathology (31).

Culture, in general, is weaved with a plurality of languages. The richness of a given culture is directly proportional to the variety of living languages. When there is one language that tends to overcome and even silence other languages in a society, we encounter violence and brutality. In our days, vis-à-vis scientism, such a situation could be easily tested as the tendency of propositional language—the kind of “S is P” language—to overcome and subdue all other languages. Scientism is a severe malaise of culture, as it happens.

The liveliness of a society consists precisely of a sort of polyphony among languages in which there is not any given one that is starring despite the others, but all play a joint screenplay, so to speak, enhancing, extending, and making life as much possible as it is imaginable. It appears that death has been much more an issue among the arts and humanities rather than in science. If this is the case, then a moral can be drawn from such circumstance, namely, death can be accounted for in the form of music (see Schubert's *Death and the Maiden* (Quartet No. 14) or Mahler's *The Song of the Earth* (1908-1909) in music; Ingres' *The Death of Leonardo da Vinci* (1818) or Louis David's *The Death of Socrates* (1787) in painting; Shakespeare's *Hamlet* or *King Lear* in theater, among many others).

Any language can be translated into any other one, even though not literally, of course; such a pretention is trivial. If in the case of natural languages, learning a foreign language properly means learning an entire worldview and mode of relating to the world, rather than just a system of codes, words, and sentences, learning other languages entails being able to experience the entire world and nature differently and expressing them in quite novel expressions.

The ecology of languages exhibits an array comprised by the languages of atomic physics (the standard model), quantum physics, astronomy, chemistry, genetics, mathematics, logic, biology, the various languages of the social and human sciences, music, poetry, short stories, theatre, photography, drawing, dance in its various expressions, ballet, opera, philosophy, mimicry, computation science, and information technologies at large, to mention a few. Wishfully, an intelligent, creative, and open-minded person should be open to them and, if not, should learn and master them.

On a different level, it should also be desirable to learn, besides one's own native cultural patterns and standards, other cultures (7-42-46), which is what the dialogue among civilizations is all about. The world is lived and experienced in manifold ways by Buddhists, Catholics, Christians, Islamists, atheists, agnostics, tribal groups, black

people, gays, lesbians, or transgender people, for example. Life abounds in diversity, indeed.

The arena of culture and cultural studies appears as both suggestive and provocative. As it is observed, the argument in this section runs as an analogy. The diversity of accounts of life, including the importance of languages, has severe implications for an account of death. I list hereafter some immediate consequences:

- An account of death is feasible under the proviso that such an account be not reduced to empirical science.
- Science, in general, can learn from other characters and figures in the ecology of knowledge.
- There is not a starring voice in the landscape of understanding and explaining nature, the universe, life—or death.
- Intelligence and sensitivity consist of the capacity for learning and translating any given language into others.
- The complexity of death corresponds with the complexity of intertwining concepts and metaphors.
- Death is the subject of polyphonic accounts whose challenge upon all of us is their trustfulness and truthfulness.

The knowledge of death is the knowledge of life, indeed

The knowledge of death is perfectly doable—no question about this. The trouble remains as to the consistency of such knowledge. I have suggested that one additional criterion is beauty, the beauty of an account—an astonishing claim when viewed from positivism. Consistency refers further to the trustfulness and truthfulness of an account, as mentioned.

In this text, it has been argued that life is not aware of death, and certainly not as an end-of-the-road kind. Notwithstanding, most living beings suffer after losing someone dear: from human beings “down” to dogs, horses, and birds, as has been observed.

Biologically speaking, life, in general, is aware of death from the onset in two ways: apoptosis and necrosis. The latter is death that supersedes a living system from the outside. I shall not concentrate on this because it does not shed any light on death and dying. Instead, the focus lies on apoptosis, a natural phenomenon where life produces the death of, say, a cell, a tissue, and sometimes even an organ to prevent and care for the entire organism's health (32). Homeostasis and metabolism are the fundamental processes through which it becomes manifest that health and life are defined vis-à-vis the organism's life as a whole.

The organism creates and recreates itself permanently. Each day a human body "sees" about 1.2 kg of cells dying. In one year, a person loses the equivalent of his or her body mass. In other words, the organism, *i.e.*, life, is an unceasing process of creation and re-creation of itself. Death, *i.e.*, apoptosis, is a sort of by-product to make life always more possible. Straightforwardly said, life is not aware of death; it produces death to live further in as many ways as possible (4).

NDES are equivalently earthly experiences but highly enhanced, as mentioned in the various accounts (33-37). The differences are seemingly not so much in nature as in degrees. For instance, the body feels lighter; peace is stronger, love is superlative, light seems not to be adequately described, music is Bachian but at a higher level. Death is and has been read vis-à-vis life; in other words, it is still, to some extent, a set of earthly experiences and accounts that gives sense to the various stories about the afterlife, even though as it happens many times, language seems to fall short of the descriptions. One strong reason that explains such a characteristic is that apparently, there is still some subtle arrow of time that prevails in the sense that earthly experiences do not vanish at all but are gathered within a more powerful and more profound stance. If true, this is the most striking and important conclusion that has ever been openly brought to the fore, to the best of my knowledge.

For example, knowing about death in the form of NDES elucidates life as a whole. Such, I will argue,

is not so much a matter of science or philosophy but rather of wisdom. From this standpoint, there is no opposition and certainly even less a hierarchy between science in its most potent and most refined sense and, say, philosophy, the human sciences, or the arts. The world, nature, and life can be understood in multiple ways, knowing that each one provides a sound account that can perhaps be complemented and sometimes contrasted by several others. In sum, unlike Heidegger, for example, it is life that gives meaning to death, not the other way round.

Open conclusions

The knowledge of death is indeed a knowledge of life since death does not exactly exist. Such is the main argument of this paper. For some, death is the ultimate limit since there is nothing else beyond life, *i.e.*, beyond this world. For others, it entails a possibility: entering the memory of a society or culture and, in other words, entering history. It, however, is marked by randomness. As M. Merleau-Ponty argued, entering history means having other people in the future talking about us (38). On the other hand, for several others, death is the transition to the afterlife, for there is an afterlife (basically) because they believe there is one.

Bioethics is one of the arrays within the ecology of knowledge in which death arises as a necessary and even unavoidable issue, particularly in that spectrum called end-of-life dilemmas. Certainly, bioethics is still in its infancy (39), no question about it. Nonetheless, it can shed new light on the ecology of knowledge on one proviso, namely, that bioethics possesses solid knowledge of life via current biology, as shown above.

This paper has claimed that death is a by-product of life; it is nothing in itself or by itself. It is life that gives any meaning to death, not the other way round.

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