



# Rights Without Earth: Dynamics of the Nature/Law Chiasm in Outer Space

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## Abstract

This essay orbits around an anthropological-cognitive question: who (and what) is the human being to whom human rights should be recognized and with reference to whom these rights are to be tailored in outer space or on other celestial bodies? It is commonly accepted that human rights are universal and therefore must also be applied in outer space or off-Earth environments. The question, however, is whether it is plausible to ontologically postulate the human being independently of its relationship with its environment. The answer provided here is negative. The terrestrial ‘human’ cannot be assumed to be identical to the ‘extraterrestrial human’. This conclusion is articulated from a relational and enactive approach to understanding what the body-mind unity is in the human species. Being—in this case, human being—cannot be considered as distinct from the relational-experiential dimension from which it gushes out in evolutionary terms. And since the evolution of human ‘nature’ is inseparable from the cultural activity of the species *Homo sapiens*, mediated by the use of language, extraterrestrial humans must be considered a cultural product. If by ‘natural’ we mean something eternal, immutable, ontologically predetermined once and for all, then the ‘human nature’ on which human rights and their application in outer space are based cannot necessarily be ‘unnatural.’ Conversely, from an enactive perspective, off-Earth naturalness is inescapably the consequence of what the mind–body unity does and will do. This draws a line of continuity and circularity between being and ought-to-be, between is and ought, which in outer space comes to the foreground with particular clarity. On the other hand, the exceptional environmental conditions in outer space should be considered as a laboratory for understanding the human condition on Earth. The extreme instability and precariousness of life in outer space demonstrate the adaptive import of human beings’ ability to communicatively universalize (to be intended as the ongoing process of *universalis-ing*) their experience through language and the interpenetrative relationship extant between cognition, end-oriented experiential disposition, interactional meaning-making and human rights self-reflexive practice. The answer to the initial question could therefore be: the nature of the human beings to whom human rights

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must be applied in outer space lies in the future that the above question calls on them to simultaneously mold and discover... including through a determination of the meaning of human rights and their application in outer space. This article aims to investigate this reflexive anthropological circle and its unfolding between Earth and the spaces beyond the sky.

**Keywords** Human rights · Outer space · Enaction · Semiotics · Is-ought · Embodiment · 4E

## 1 On What Lies Before the Politicization of Outer Space

Why rights without Earth? What does that mean? If human beings will continue to exist outside Earth, why should they not have rights? Undoubtedly, living conditions in outer space could alter and even compromise the enjoyment of rights compared to what happens on Earth. However, is it not true that the 1967 Space Treaty<sup>1</sup> ensures international cooperation so that astronauts—and therefore all human beings in outer space—do not suffer any danger to their lives and health? That they are considered envoys in a space that is a province of humankind? [213] And that space exploration must be carried out in a spirit of cooperation, for exclusively peaceful purposes and through the renunciation of any weaponry that could cause harm to other human beings on Earth or in outer space?

The answers to the previous questions are, and must surely be, positive. This is because it must be so according to the Space Treaty. Actually, it would perhaps be preferable to simply say ‘because it should be so.’ Legal scholars, however, go even further. They argue that human rights as a whole must apply in outer space—subject to limitations arising from the particular conditions of that experiential space. At this point, some might imagine—based solely on the title of this article—that the observations I am about to proffer here will take a political bent. The latest developments in the ‘outer space affair’ seem to suggest that the good intentions expressed in 1966 with UN Resolution 2222 are in danger of becoming a relic; after all, following in the footsteps of the UN itself.<sup>2</sup>

The space race and the potential exploitation of celestial bodies, not to mention the prospects for colonizing Mars, seem to have entered a critical phase. Space no longer seems to be the *final frontier* (to evoke a famous television series) of human efforts to understand the universe that hosts their lives. The frontier line seems to have recently transmuted into the curve of financial profits that can be derived from the exploitation (even if only potential) of space, celestial bodies, and the minerals that could be extracted from them and brought back to Earth. Unfortunately, the pursuit of money tends to undermine, sooner or later, the spirit of cooperation, exploiting and subju-

<sup>1</sup> See <https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>. The literature on the Space Treaty is immense. Among the most recent works providing an overview of space law, are: [16, 17, 28, 105, 127, 168, 225, 257, 258, 261].

<sup>2</sup> In this regard, some interesting and multifaceted considerations can be found at <https://www.crisisgroup.org/sbr/global/sb13-ten-challenges-un-2025-2026>.

gating knowledge until the seeds of conflict begin to sprout.<sup>3</sup> Neoliberalism—the main global fundamentalism of our time [19]—has been waging a relentless war on basic research for years. Anyone involved in the cognitive endeavors related to outer space, mainly astronomers and physicists, is well aware of the ruthlessness of the economic profit law. No prospect of income related to research, no funding. This logic has gradually taken hold in public institutions as well, or alternatively, has led governments to cut funding for them.<sup>4</sup> This is why some scholars, almost out of desperation, have tried to take the path of compromise or dissimulation. This means that they have pretended to join the ranks of supporters of companies dedicated to the economic exploitation of celestial bodies or orbital space. All in the hope that the connection between outer space and profit might lead to a few more crumbs being allocated to basic research. From these situations, it is possible to draw a lesson in ethnography from the world of contemporary research.<sup>5</sup> Unfortunately, I fear that those who have sought to provide instrumental support to the ‘outer space business’ with the intention of serving science will be deeply disappointed, if not outraged. Ultimately, despite attempts to bring about their transmutation, scientists (genuine ones) are not entrepreneurs.<sup>6</sup> Needless to say, what is set out in the 1967 Outer Space Treaty is of little consequence in this regard. Things have changed in practice, and the world’s governments seem to favor the transformation of outer space into a (future) giant business venture—and therefore into a place of conflict rather than a frontier to explore the ‘*natural mysteries*’ of the universe [77].

In the recent past, Barack Obama was the first to depart from the cooperative and non-appropriative standards of the Outer Space Treaty. His *selfish* example was followed by many, first and foremost Donald Trump in his first term,<sup>7</sup> as well as numerous other countries.<sup>8</sup> As a consequence, a controversy is currently ongoing over the classification of celestial resources as ‘commons’ and the possibility of applying capitalist logic in their exploitation or, alternatively, to equitable and redistributive

<sup>3</sup> In a vast critical literature, see in this regard the in-depth and thoughtful research carried out by [187].

<sup>4</sup> For some recent academic ‘threnodies’ on cuts to public funding for astronomical and space fundamental research, see <https://aas.org/press/aas-statement-nasa-cuts>; <https://www.scientificamerican.com/article/nasa-quietly-ends-financial-support-for-planetary-science-groups/>; <https://www.ox.ac.uk/news/2026-02-02-expert-comment-cuts-fundamental-research-will-hurt-uk-s-leadership-astronomy>.

<sup>5</sup> A kind of review of the various aspects of ethnographic research applied to the field of outer space can be found in the recent study by [242].

<sup>6</sup> Some signs or clues in this direction are beginning to emerge.

<sup>7</sup> See <https://www.federalregister.gov/documents/2020/04/10/2020-07800/encouraging-international-support-for-the-recovery-and-use-of-space-resources>. As for recent developments, see <https://www.whitehouse.gov/presidential-actions/2025/12/ensuring-american-space-superiority/>.

<sup>8</sup> See, for example, the US Commercial Space Launch Competitiveness Act of 2015, the Luxembourg Act of 2016, United Arab Emirates, Federal Law No. 12/2019, and the Japanese Act of 2021. One of the most recent regulatory ‘milestones’ moving in this direction is Law No. 89 of June 13, 2025 (“Provisions on the Space Economy”). But see also the UNCOPUOS guidelines and the reports of the Working Group on Legal Aspects of Space Resource Activities (2023–2025), developed within the Committee on the Peaceful Uses of Outer Space (COPUOS) and the Office for Outer Space Affairs (UNOOSA): <https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/space-resources/index.html>; and the Artemis Accords: <https://www.nasa.gov/artemis-accords/>.

mechanisms between different countries and their communities.<sup>9</sup> In an essay I published some years ago [197], in which I addressed the issue of coexistence between people of different cultures in outer space, I asserted that a new capitalist phase in the configuration of relations between humanity and outer space was beginning. My basic consideration—then confirmed on numerous occasions during discussions with experts in the field—was that humans did not yet know how to effectively obtain the resources present in space and celestial bodies but were already squabbling over who should appropriate them and how. Almost eight years later, I must admit that not only has there been no progress in acquiring a self-reflexive awareness of the condition of human beings outside Earth, but that the situation has, if anything, worsened. At present, not only do the media talk about space solely in terms of business, but also the issue of human rights out there and their enjoyment seems to have focused almost entirely on political aspects. It is sufficient to type the string ‘human rights in space’ into any online search engine to bring up a long list of links to various types of texts, from news articles to essays published in academic journals. Almost unanimously, all the authors of these legal texts assert without reservation that human rights also apply outside Earth even while taking into account the particular conditions of existence in outer space from a thoughtful anthropological perspective.

The issue of human rights seems to be less clearly defined when it comes to equal access to resources and their distribution among the peoples of the Earth. What is most striking about it is the overall tone of the discussion. It seems to be carried on in a manner entirely reliant upon the almost universal conviction that the preconditions for a possible conflict over resources and the prerogatives of individuals or individual groups will be more or less similar to those existing on Earth. In my opinion, however, this is a truly dumbfounding datum.<sup>10</sup> Most scholars (especially those in law, but not only) seem to utterly overlook that ‘human’ rights, at least as they are understood on Earth, are destined to become ‘unnatural (human) rights in space.’ The way in which they refer to the potential contents of human rights as they will be experienced in outer space—from *habeas corpus* to privacy, from freedom to health, from equality to human dignity or freedom of expression—seems to correspond to the same semantic and pragmatic coordinates of ‘Earthly rights’ [53, 140].

More recently, some have questioned the limitations that the enjoyment of Earth-based human rights might suffer in the difficult living conditions of outer space [21, 22, 224]. In light of this, they question the need to subject Earth-based regulations to a kind of exception, which could shape a sort of *lex specialis*.<sup>11</sup> However, the logic underlying this proposal is always and in any case that of the exception. The discussion remains at the level of political conflict between different or opposing interests, whose semantic stuff relies on a sort of essentialized human subject, almost ontologically taken for granted, if not reified in a quasi-eternal and omnipresent icon. “*Human beings, wherever they are, remain human beings*”: this is the ‘basso ostinato’ that seems to be at the heart of the main current debates on human rights in space

<sup>9</sup> See [37, 49, 164, 195].

<sup>10</sup> This assessment, on the other hand, seems to be echoed even in the title of the special issue in which this article is to be included: “Un-natural (human) rights in space.”

<sup>11</sup> See [118]. In this regard, it is interesting to read a recent post (October 9, 2024) by a young scholar [229].

outside Earth (including Mars).<sup>12</sup> In my opinion, these works are interesting more for what they do not address than for what they explicitly state. Their content focuses on the repercussions of space activities for the enjoyment of human rights on Earth rather than outside it. Hence, the main issues of concern relate to the responsibility of states for the activities of astronauts that could harm the interests of other states, the allocation of mining rights to resources beneath the surface of celestial bodies, the economic interests and equal access of states and private companies to those and other (potential) extraterrestrial resources, the implications of extraterrestrial debris for the safety of those living on Earth, the possibility of using space technology for military purposes, issues of jurisdiction arising from international law, its scope of application, and even the legal problems arising from the relationship between human beings/bodies and AI agents [184], etc. In short, topics that seem to be ‘perfect food’ for strict positive jurists. All this—and it is really very little—is accompanied by the high-sounding and confident assertion that international law and human rights have extraterritorial validity and applicability. Consequently, there is no reason why they should not also be implemented outside Earth. Of course, few of these texts fail to mention the limitations imposed by the specific environmental conditions of outer space. What is most striking, however, is that in most cases these refer to issues of jurisdiction, applicability of law, territoriality, and economic/commercial rights. When referring to the concrete enjoyment of human rights, on the other hand, while showing great sensitivity to so-called third- and fourth-generation rights (from the fight against gender discrimination to the right to food, from the right to privacy related to cybersecurity to the protection of disabilities),<sup>13</sup> limitations on the enjoyment of these rights outside the Earth are almost always represented as if they were due to external, exogenous factors. Once again, even in these appreciable legal portrayals, human beings seem to be assumed as tokens of an a priori essence. The underlying idea, although not explicitly stated, seems to be that of a human ontology denoted in universal terms: where ‘universal’ is to be understood as ‘*valid throughout the universe.*’ Given the prevalence of this epistemic attitude, an almost inevitable question arises: why is this eco-anthropological blindness so deeply rooted and persistent?

<sup>12</sup>To avoid misunderstandings: in saying this, I am referring to legal literature, not anthropological [121, 166, 167] literature, and even less so to science fiction. Nonetheless, the Earth-centrism found in the field of law at least partly influences space ethics [97] and astroethics. Although for different reasons, some astroethicists also believe that the fundamental ethical and moral issues on Earth also apply in outer space [240, 241]. However, I will return to astroethics—in particular, whether [241] or not [41, 42] it can be separated from astrobiology—as well as to the different voices of astro-ecology [18, 141, 182, 183] in a footnote later on; an overview on ‘Space Ethics’ can be found in [170]. Nevertheless, I would like to emphasize that there are exceptions even among legal scholars. See, for a salient example, [30]. Her essay is forward-thinking and makes an insightful reference to the idea of “nature” in the concepts of ‘natural’ and “human rights.” It enshrines a valuable warning, although—as I hope to show implicitly in the following pages—it still appears too lukewarm or generic to balance/counteract the current trends toward an “Earth-style and blind economization” of outer space.

<sup>13</sup>See, for example, the website of JUS AD ASTRA ( JUS AD ASTRA: <https://www.jusadatra.org/Home.html>), an association explicitly dedicated to defining a new list of human rights gauged on the off-Earth conditions of life. The website also includes links to articles of interest related to the general subject-matter of JUS AD ASTRA: <https://www.jusadatra.org/Documents.html>.

I believe that the answer to the question just posed lies in psycho-cultural reasons. After all, isn't the a priori configuration, both cognitive and normative, the epistemic presupposition of human rights, as well as their original claim in 'natural law' terms? Doesn't the 'naturalistic' argument coincide in some way with the original rhetoric of human rights? And isn't it the same vision that still permeates the collective imagination, even though today these rights have been codified by international law and, consequently, by the constitutional law of democratic states based on the rule of law? At this point—which is also the threshold beyond which the line of inquiry I will propose in this article will distance itself from issues of immediate political interest—some further questions arise that, in my opinion, cannot be evaded:

1. Why does the debate on human rights outside Earth not take into account the 'matter of fact' that, along with the environment surrounding human activities, human nature is also subject to change?
2. Why is the human being considered something essentially distinct, a priori, from its relationship with the environment, even when that environment is radically different from Earth: that is, from what originated the evolution of the biological nature of the *human species*?

The answer to the above questions is both simple and complicated. In order to formulate it, in my opinion, it is necessary to bring to the surface a cultural gist that is deeply nestled in modern political and legal discourse. I am referring to the nature/culture dualism and the normative and politically counterfactual use—rooted in the Aristotelian-Thomistic tradition—of the idea of 'naturalness' as an axiological standard [29, 30, 246, 255]. Despite the forest of dualisms that modern epistemology has produced in order to emancipate the use of 'scientific reason' from theology, both political and natural, it has never completely freed itself from the synonymous use of the adjectives 'natural' and 'good.' Following this equivalence, the essence or categorization of existing items is endowed with something of axiological import: put more simply, that which exists is intrinsically good. Consequentially, it is good/right that it exists according to its natural essence. Altering this natural essence is illegitimate, as it is against nature.<sup>14</sup> This *continuum*—which is also a conflation—between nature and ethics has been the subject of fierce criticism from modern epistemology itself. This is because identifying what is good with what it constitutes a mere tautology and therefore a mystifying discourse. It conceals the attempt, but also a general human tendency, to pass off cultural products as natural. In this way, what is subjective can be presented as objective by socially dominant subjects and imposed on everyone else. Put more generally, the 'cultural' is disguised as natural. The identity of the most powerful is 'sold' (and therefore enforced) as universality, the sole measure of the world and, therefore, also of the Other. It is an old argument, well known to all. Colonialism, the 'flagship' of modernity, fed on it abundantly, thus betraying modern

<sup>14</sup> Like it or not, in one way or another, this is the issue at the heart of the question of human enhancement and its anthropological and moral legitimacy addressed by space ethics. On human rights in the Thomistic (and neo-Thomistic) tradition see [151] and, for an intriguing criticism of human rights discourse within the same philosophical-legal approach [150]. A vast collection of essays on the subject is available in [4].

epistemology itself in a sensational way. It spread despite the criticism that modern Western thought itself gradually developed and directed against its resilience.

The paradox underlying this story is that the ‘naturalistic’ discourse proved indispensable to Western modernity in order to emancipate itself from the structures generated by the previous conjunction between natural theology and political theology. The pre-modern social world and its imaginaries were ingrained in a cosmology that saw God as the guarantor and creator of all that exists—including the extant power and socio-political structures. In order to dismantle the latter, it was necessary to draw on and rely on a different premise of legitimacy. Thus, nature replaced God. Of course, this was not a completely *de-deified* nature. In the background remained the idea of a possible, remote divine creation/origin. Simply, it and its essential characteristics were placed in a time prior to the social and political structures corresponding to the order that was to be challenged. In some ways, the previous order was depicted as a degeneration of the state of nature, which should instead be recognized and reinterpreted as such by reason. A reason—of course—that was *implicitly* assumed as a gift from God, even though it was independent of the individual denominations that in turn claimed to be the sole and authentic interpreters of His will. Grotius can be considered a sort of father of modernity (legal and political) both for having proposed a political-legal synthesis of this approach and having brought together all the strands of the debate that had developed during the Middle Ages on the so-called ‘universals.’ Grotius’ post-theological natural law/rationalism found its interlocutors/prosecutors in Hobbes<sup>15</sup> and Locke, who entrusted human understanding of the laws of nature, and therefore of natural rights, to the use of reason (natural or innate)—albeit with different nuances. Their French revolutionary successor, the most influential voice of the European Enlightenment, was Rousseau. He considered the state of nature to be a condition in which it was possible to enjoy human prerogatives, subsequently ‘configured’ as natural rights. These natural rights—the same ones that gradually became ‘human rights’—could be claimed as universal rights against the society of the *Ancien Régime* responsible for the corruption of the original natural state. Over the centuries, as already mentioned, natural rights have been transformed into universal human rights and have been positivized, i.e., incorporated into existing law and international treaties, and thus into international *jus cogens*, and even earlier into modern and contemporary liberal democratic constitutions.

In any case, human or natural rights are *recognized* by the state and its legal system. They are therefore implicitly or explicitly assumed as something that pre-exists or is a prerequisite for liberal democratic legal systems and their legitimacy.<sup>16</sup> From this

<sup>15</sup>In an immense literature, see [247]. For an interesting discussion on Hobbes’ approach to the relationship between law, nature and reason, see [104]; as for the ‘natural theological’ backdrop to Locke’s approach to natural law and natural rights and duties, see [36, 103, 169].

<sup>16</sup>This aspect is common to all transcendentalist approaches that have developed since Kant’s ethical formalism and his *Metaphysics of Morals*. An interesting trace of ‘naturalness,’ also present in rationalist-transcendental and normativist-discursive approaches to human rights, can be found in the recent proposal for both a transcendental natural law (which in some ways echoes Hegel on this issue) and a transcendental anthropology proffered by [239]. See also the reference to Cassirer, Arendt, Apel, Habermas, Rawls, Donnelly, Hölsle, Höffe, Frost, etc., in *ibid*. For an interpretation of human dignity that is neither ontological nor formalistic-aprioristic, but rather agentive-generative, I refer to [208] and the considerations presented therein.

point of view, the ‘naturalistic’ or ‘pre-state’ character of their existence and assertion remains a constant feature of contemporary legal and political discourse. The need to invoke, with greater or lesser transparency, the ‘nature’ inherent in human rights corresponds to their political function, which is to guarantee and critique the political power embodied in state institutions. Unfortunately, it also carries with it a peril of essentialization or reification. In some ways, considering human rights as pre-existing to the legal system of the state and as prerequisites for its legitimacy makes them simultaneously an end and a limit of democracy. Here I will not dwell on Kantian ethical formalism, nor on contemporary discursive-normative projections, since they all rest, more or less covertly, on anthropological preconditions that the experience of outer space profoundly alters. Out there—to express my thoughts in nutshell—the *a priori* lies in the future.

The original ‘naturalness’ of human rights has left its footprint on the rhetoric surrounding their presentation, as well as on the psycho-social perception of their semantic and experiential scope. Despite the multicultural controversies<sup>17</sup> that marked the 1990s and the first decade of the new millennium, that naturalness is often cloaked in a sort of ontological eternity. The other side of this aura of eternity is a search for certainty that finds its appeasement in it. Thinking of human rights as something dependent on the environment and circumstances, rather than as facets of a perennial nature that is somehow transcendent with respect to variations in time and place, compromises the solidity of the expectation of certainty placed in them. This, in my opinion, is one of the most significant reasons underlying the blindness to the radical contextual change that outer space presents with regard to the semantic and pragmatic habits inherent in terrestrial interpretations of human rights. However much it must adapt, human nature will remain unchanged. It must remain the same and so must *human* rights—or at least that seems to be the common belief.

What would remain of human rights if we admitted that the inherent signification of human nature depends on the external environment, and vice versa? These questions raise profound concerns that perhaps go beyond the human capacity to endure or live with doubt, and certainly beyond the common capacity to combine cognition and politics. This issue looms large, silently casting its shadow over any attempt to venture into an adaptive rethinking of human rights outside the Earth. This is also because admitting that human rights semantics are not immune to the environment would undermine the aspiration to their universality or, rather, to the universality of the essentialized schemes through which they are interpreted and, often, imposed by dominant groups on the most vulnerable. If, in outer space, we were compelled to discover that the universality and eternity of human rights have nothing to do with human nature (whatever it may be), the power of that discovery would also be transmitted to Earth [97, 232]. Both the most powerful and the most vulnerable, albeit for different reasons and fears, are simply frightened by such a cognitive-political perspective. As long as possible, As far as possible, many therefore consider it preferable

<sup>17</sup>In this regard, criticism based on so-called Asian values, for example, has played a relevant role. In any case, the issue of the universality of human rights and their future—a subject that is highly controversial today and, unfortunately, extremely topical—is addressed in an almost infinite number of publications among which see, at least: [1, 10, 15, 32, 45, 48, 78, 95, 106, 108, 109, 126, 162, 174, 188, 189, 219, 220, 223, 228]. Although somewhat dated, for a general overview, see the collection of essays proffered by [92].

to adopt the ostrich strategy. Burying our head in the sand and pretending nothing is happening is currently considered the best solution.

Meanwhile, debates on space exploration, colonization, and the economic exploitation of its potential resources for the benefit of Earth are becoming increasingly prominent in the media and on the political stage. These ‘Star Wars’ are described, planned, prepared, and discussed as if earthly customs were destined to remain unchanged in their essence.<sup>18</sup> What leads many people to project this mantle of homogeneity is probably the image of money: its formal character, which almost transcends all differences; its ability to translate all diversity into an equivalent, even at the cost of denying it, of amputating what looks semantically/categorically not commensurable. Obviously, everything is easier if you use human rights, their corresponding fixed patterns spread across the Earth, like ‘legal currency cuts’ [215, 216]. And so it is that many already imagine the mutual claims to human rights among future space individuals as clashes between antagonistic subjects fighting for ‘objects’ distinct from what they are and have always been (on Earth). The problem, which renders all these ‘gravity-free fantasies’ virtually meaningless, is that humans continue to focus on ‘objects’ and perhaps on how they might change in outer space without considering the main issue: who will be the subjects competing for them? In more general terms, who and what is the human being outside of Earth? [196]. Is it the same ‘figure’ implicitly underlying human rights? Does it have the same presumed universal ‘nature’ that forms the backdrop to the ‘molar’ and descriptive content that populates the semantic spectrum of statements on human rights?

In the following paragraphs, I will attempt to illustrate, relying on an enactive psycho-cognitive approach, that outside Earth, many of the assumptions about the human body and the space it interpenetrates become problematic and need to be reset for basic adaptive reasons. These reasons, on the other hand, are the same ones that underlie the experiential categorizations coextensive with semantic/pragmatic habits and the patterns included in terrestrial conceptions of human rights and their ‘terrestrial landscape of actualization.’

Before proceeding, however, I think it is appropriate to provide a brief clarification. I am aware that discussing ‘nature’ or ‘naturalness’ in relation to human rights may seem obsolete today. An even more critical judgment could be cast on my considerations on the resilience of naturalistic discourse within contemporary conceptions and positivization/institutionalization of human rights. However, imagining oneself outside Earth and observing everything—including history—through the eyes of an ‘outsider,’ or through the Apollo’s eye,<sup>19</sup> puts everything in a different perspective. The extraterrestrial gaze also functions like a time-lapse camera. Continuity and distinctions are being reshaped in unexpected and unprecedented ways. From *that* outside, the demand for universality/eternity of human rights reveals all its links with a past that, from that distance, no longer seems so remote. I am referring to the past of human imaginaries linked to the idea of creation, to an ontologizing propen-

<sup>18</sup> See in this regard [20, 54, 191, 192, 244]. Multifarious critical remarks to the ‘Earth/Outer’ Space analogical approach can be found in [96, 159, 165, 206].

<sup>19</sup> The reference is to the title of Cosgrove’s wonderful book *Apollo’s Eye: A Cartographic Genealogy of the Earth in the Western Imagination* [47]. See also [46, 75].

sity that transforms the present into an instantiation of the eternal, the contingent into a reflection of timeless essences, immune to change. From without, even Linnaeus' taxonomic classifications appear to be strongly influenced by creationist ontologism presented as 'natural reason' [207]. From that perspective, the very cognition of 'historicity,' that is, the perception of history, is shrinking. Hence, the semantic continuity between what was once labeled 'natural law' and today's normative universalism of human rights emerges with amazing clarity. Despite the epistemological break laid down by the modern divide between facts and values,<sup>20</sup> between nature and ethics, from an anthropological point of view, cultural content, particularly with regard to categories relating to the semantic rhythm of everyday life and thereby its legal 'scores,' does not seem to have changed much. And, after all, not even the basic semantic order relating to the relationship between the individual and the environment has changed radically—at least until a few decades ago. However, what is being questioned in space is precisely the constellation of ganglia, the crucial nodes of that anthropological order. This is somehow similar to what is happening—albeit much more slowly and on a smaller scale—on Earth due to technological innovation and in relation to which humanity is demonstrating enormous difficulties in understanding and readjusting (including with regard to the interpretation and scope of human rights).

Off-Earth space makes everything that has long been taken for granted in human experience—even the basic patterns and devices of human power over the Other than Self—variable and therefore *visible*. This change requires a recalculation—so to speak—of the entire fabric of semiotic relations that give stability to the means-ends relationship in different areas of life. The pervasive change in these underlying relationships means that even the distinctions and categorical boundaries themselves are affected. What constitutes an individual, a body, food, a tool, together with the related cognitive and pragmatic habits, becomes unstable and fluid. And it is precisely in this sense that the relationships between 'nature' and 'culture', facts and values, being and ought-to-be, enter a phase of transfiguration as a result of their transposition to extra-terrestrial environments. At that cognitive level, the implicit merges with the natural and vice versa. In this situation, the problem lies precisely in the fact that environmental changes with respect to Earth make the implicit explicit even if unexpected, and almost inconceivable on the basis of previous 'terrestrial categorizations.' Such 'made-explicit' implicitness therefore requires conscious recategorizations. However, this result cannot be achieved except on the basis of conscious and, moreover, goal-oriented activity. Nevertheless, it should be noted that this task is nothing new.

Despite the assumptions of modern epistemology and the related divides between primary and secondary properties, the external and the internal, mind and world, objective and subjective, facts and values, etc., there is no categorization activity that has ever been carried out (implicitly or explicitly) independently of axiological-teleological criteria. Categories and their tokens encapsulate purposes into their morphological structure, concealing them in the umbra that is cast by the dazzling evidence of cognitive and pragmatic garments constructed and stabilized by inter-

<sup>20</sup> As for my position on this subject, I refer to [199–201, 203] and the bibliographical references provided therein.

subjective communication. Nonetheless, the obviousness/immediacy of such ‘being evident’ is a cultural construct. There is no boundary between what lies within the categorical spectrum and what is left outside that is not traced on the basis of axiomatic compasses. Values and purposes are not supplements or functional appendices determined a posteriori with respect to concepts and their semantic-categorical structure. The categorical/morphological boundaries of objects, for example, are also genetically defined from a perceptual point of view on the basis of values/purposes, both biological and cultural.

Sensory perceptions, in turn, are not a given but are themselves the result of the interaction between organism and environment. The mind does not dwell outside this relationship but is instead integrated into it, acting as its medium. This is why every human being perceives based on what they already know (in the broad sense, i.e., not in its purely speculative, conscious, or symbolic meaning). And what each person knows depends in turn on what they do, including through their body and the interactions between the body and the elements that populate the life environment. However, I will return to this aspect later for further examination. At this point, the above remarks serve primarily to explain the epistemic distance and, at the same time, the cognitive depth from which I intend to analyze human rights, their history, and the relationship between universality, culture, and ‘nature’ as challenged by environmental conditions outside the Earth. When grasped at this anthropic level, far removed from everyday controversies—however vital they may be—the ‘human’ inherent in human rights is truly difficult to observe critically. In this regard, it is understandable that the need to open a discussion at this level of depth is nevertheless perceived as an ‘earthquake’ capable of upsetting everything, of erasing all certainty, all moorings to a well-established, acceptable and normal standard of living. Ultimately, the fear may be that of losing everything, of being left without words, precisely those words that give semantic rhythm to rights and their inclusion in everyday life. The same words through which people who are fortunate enough to live in acceptable conditions are able to answer the questions ‘who am I?’, ‘what is my place in the world?’, ‘what can I argue against those who want to do me harm?’ Nonetheless, clinging to the past, to the certainties of the past in an evolving environment, can only produce an indomitable heterogeneity of ends, even more overwhelming than any alteration of the existing order. Maybe, something other than the semantic habits currently embedded in the words of ‘human rights’ rulings, different from their stiffening essentializations, should be recognized as the source of universality, of an invented nature—which is perhaps the most genuinely human one. Something that should be sought in the processive origin of universalization, namely what is understood as a collection of results, ‘objects’ of knowledge and, therefore, data. I am referring to the universal capacity to carry forward the process of universaliz-*ing*. Something absolutely indispensable in outer space and increasingly so on Earth too, both to remedy the scourge of the ethnocentric and instrumental use of human rights, and to defuse the temptations of the West—led by today’s US—to rid itself of them because they no longer serve the interests of Western neoliberal capitalism.

## 2 Body, Environment, and Embodiment: A Relational/Enactive Approach to the Metamorphic Core of the ‘Human’ and the Universality of its *Un-natural* Rights

Addressing the issue of the universality of human rights from an exo-terrestrial perspective requires focusing on the processes of universalization that underlie the production of meaning and signification. For humans, processing meanings involves the linguistic dimension, even if this is not the case for all living species. In semiotic terms, meaning cannot be considered exclusively coextensive with symbolic language and its use [226]. However, the *invention* of symbolic language and its constant use by the *homo sapiens* also directly affects the biological aspects involved in determining meaning and its characteristics. In this regard, suffice it to point out that the development of language—which is undoubtedly a cultural invention—has evolutionarily marked the evolutive transformation of the human brain, specifically with the formation of Broca’s and Wernicke’s area (and much more). Put differently, the emergence of language has produced a circular and cumulative evolutionary effect on brain morphology [64, 116]. Language, on the other hand, is inherent in verbal communication and, therefore, in a specific mode of interaction between humans. Interaction conveyed by language, in turn, has produced further evolutionary effects, especially in terms of managing relationships with the environment. The modes in which human beings relate to the environment also affect their use of language because those relationships are conveyed and embodied into human behavior through the linguistic medium [143, 144].

Relying on the brief considerations just outlined, it can be said that, both phylogenetically and ontogenetically, the environment is embodied through mind and language.<sup>21</sup> The process involves a profound and pervasive interpenetration whose implications are inscribed in the morphology of both the human body and the planetary landscape. This implies not only that the environment is embodied through mental and linguistic activities, but also that the mind is progressively and processively incorporated. However, that is not all. When adopting an ecological outlook [71, 160], it can be said that the living environment is also increasingly ‘mentalized’ through the mediation of human bodily activity, which in turn is driven by mental patterns and scripts. This relational dynamic has a vast semiotic component. The body and its relationships with the environment are managed by the mind on the

<sup>21</sup> See [130]. I am referring here to the notion of ‘ecological niche’ reinterpreted in a semiotic sense. According to this reformulation, the niche is a space or an experiential cognitive system (habit) for the (provisional) stabilization of semiosis, which is to be understood as production aimed at the emergence of a Peircean interpretant or meaning. See, in this sense, [5]. In my theoretical perspective, however, the category ‘niche’ is declined in ‘chorological’ terms, that is, trans-spatial and trans-categorical [203, 207]. Consequently, the profile of ‘situatedness’ connected to the notion of ‘niche’, even when defined in semiotic terms, must be considered independently of physical-spatial proximity, but in strictly semiotic-chorological terms. In other words, chorological proximity refers to a semantic-spatial and time *continuum* that can be entirely distinct from physical-geographical or chronological proximity. Furthermore, in my perspective, ‘semiotic niches’ represent the point of convergence of different magmatic flows of an omnidirectional relational pluriverse [207]. All of this, as I will try to illustrate, is extremely relevant, in anthropological terms, for the application to off-Earth life experience of the 4E approach, and specifically the paradigm of the extended mind or distributed cognition.

basis of operational patterns (only partly guided by symbolic-representative activity), which are gauged on elements and situations displaced in time and space in some cases at a great distance from the so-called ‘here and now’ physically occupied by the individual organism. What inhabits the ‘elsewhere’ and the ‘remoteness’ is utilized by the mind–body unit to enactively and proactively coordinate with the environment.<sup>22</sup> This use occurs through the processing and elaboration of signs, which serve as means of processing the unfolding of the individual organism’s activity.<sup>23</sup>

Categories can be considered as epitomes and, at the same time, as buoys/sign-posts or stepping-stones through which the conscious and non-conscious parts of the mind–body unit (try to adaptively and processively) orient the organism in the environment.<sup>24</sup> Each stage of the categorization process corresponds to enactive adjust-

<sup>22</sup>Some psychologists have raised doubts about the compatibility between the enactive and proactive aspects involved in categorization and the adaptive cognitive-pragmatic management of already memorized categories. This issue is otherwise labeled, by those who adopt the radical enactivist approach (REC), as the *continuity problem*. In this regard, see more recently [55]. I cannot dwell on this specific topic here. However, regarding the different positions on this matter, see [7, 73, 100, 112, 120, 173, 177, 227, 260]. With specific regard to the issues discussed here, a particularly interesting position on the relationship between proactive affordances, the ecological approach to cognition and embodiment, and enactivism can be found in [177]. For an attempt to give solutions to the gap between the enactivist-phenomenological approach and the ecological-psychological one based on affordance theory, see also [102: pp. 202 ff.], although I do not agree with his proposal for a ‘multilevel approach’ with a distinction between disciplinary fields [102: pp. 208–09]. In my view, this proposal risks precluding the circularity that can also be found from an enactivist perspective between language and the processes of incorporation of experience. In this sense, see recently [83]. As I will show below, my position depends on the semiotic approach, which establishes from scratch a *semiotic continuity* between mind and world. A conclusion which, moreover, Fuchs himself [83] seems to reach by adopting the term ‘sign’ to explain the continuity between embodied models and metaphorical-categorical transpositions [128] of such models at the linguistic level, and vice versa. In this sense, see also the relevant contribution proffered by [55], even if it is developed within an interpretative paradigm not espoused here, which considers organisms as “operationally closed systems that maintain their own organization” through functional exchanges with the environment. On the auto-poietic framework of this approach, shared by both [157], as well as [142], see the considerations outlined below.

<sup>23</sup>The whole question of the contrast between enactivism (especially the so called REC–Radical Enactive Cognition–and psychological ecology or interpretations of the mind as an agency of sense/meaning-making can be epitomized in the critique of representationalism: that is, the idea that meanings (or, as some say, concepts) are processed by and within the brain rather than through action. In this regard, by way of example, see [176]. Non-representationalism, however, is a widespread philosophical-epistemological position with many nuances. The semiotic approach adopted here does not entirely exclude the existence/use of representations and their role in cognition, without separating them in any way from action, but rather the opposite. In the sense of overcoming the anti-representationalism of ERC by including Peircean semiotics in the enactivist perspective see [5, 79, 137, 138]; from another perspective based on bodily simulation and Peirce’s notion of ‘icon’ see also [50].

<sup>24</sup>This eminently semiotic approach seems to be in line with what Fuchs [83]—like many others—has recently asserted in an attempt to achieve the scaling from embodied unconscious motor patterns to the communicative and symbolic-linguistic domain. In this sense he asserts that the transposition from embodied motor schemata to the linguistic level can be addressed and explained as follows: “I propose that it can be based not only on an embodied, but also an enactive or interactive understanding of language. According to this view, the idea of concepts as fixed containers or schemata appears too static; rather, they should be seen as variable tools for navigating the landscapes of embodied and social interactions. The primary role of abstract words, then, would not be as signs corresponding to given schemata of metaphorical understanding. Rather, they are means of participating in the social world, which are derived from embodied experience in the way I have shown above, but extend into the realm of shared meanings, emotions, interactions, projects and expectations; in other words, they are means of participatory sense-

ments/transactions—that is, the result of bidirectional and interpenetrative bodily/environmental processes—and encapsulates the cognitive-pragmatic recipe—as it were. What is relevant to underscore in this regard is that sign activity in humans is intensely mediated by language and, therefore, by communication.

Communication is a common element in the elaboration and transmission of adaptive patterns among many animal species. The signs used by the mind–body unit to guide the organism in its environment involve, in many species and to a greater extent in humans, relationships with other individuals belonging to other species, but mainly to the same species, community, or family group. This is also because individual goals, by virtue of communication, are achieved through coordinated actions in space and time, and therefore through harmonious management of the body in order to achieve specific goals [6]. These teleological coordination patterns also involve the items that populate the environment, which in this way acquire the status of means for the unfolding of relational patterns of interaction with the environment. The objectivity of the world is nothing more than the communicative intersubjectivity assumed by the items that populate it as they are transformed into means. In other words, what is denoted by objectivity is the object-means rather than the hypothetical noumenon placed beyond the reach of the activity of living beings, and specifically of humans. This objectivity is bestowed upon it because the means is an integral part of the multidirectional transformation that the mind/body unity and the environment engender through the unfolding of vital activity.<sup>25</sup>

Following the interactional view just illustrated, it makes no sense to talk about a possible distinction between nature and culture.<sup>26</sup> It can be used heuristically to distinguish between what can be considered more stable or permanent and what varies. However, this distinction is semantically imprecise and completely devoid of ontological significance. Being active, both mentally and physically, is the medium through which living beings, and specifically humans, shape and develop their nature—of which the environment in which they live is like one of the parts of a bilingual dictionary (albeit infinitely open to rewriting or intrinsically incomplete). Culture, or rather, the exercise of the ability to produce culture, is an integral part of the activity described above and therefore also of the unremitting process through which the nature of individual organisms self-remold—it is to be iterated: both phylogenetically and ontologically. In this regard, I will try to provide an example.

Let me tell something about the ‘bow’ and, more importantly, its *in-vention*. Certainly, no one would label it as ‘natural item.’ If we think of a primitive bow, we must at least refer, in sequence, to: the activity of carving wood, the procedures for bending

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making.” These words, from my point of view, are extremely relevant because they bridge the gap between psycho-cognitive interpretations and philosophical interpretations of enactivism. This is because the latter are more in tune with the semiotic paradigm developed by Peirce. However, I will return to this topic in more detail below.

<sup>25</sup>In order to provide some essential references for the semiotic-anthropological and cognitive approach proposed thus far, I would like to refer to a few texts that I hope will serve as a bibliographic compass: [57, 66, 67, 69, 72, 76, 226].

<sup>26</sup>Although I do not agree with the constructivist approach in all its implications, I still consider it useful to consider the theoretical proposal put forward by [149]. Regarding the relationship between nature and culture from an anthropological and epistemological point of view see [63–65, 114, 116].

it using fire, the creation of gut strings to connect the ends of the so-called limbs, the production of plant-based strings necessary to stiffen the central part of the bow near the handle, the material (usually wood) necessary to build the arrow, the material to be chiseled in order to shape the arrowhead, the bird feathers to be placed at the other end of the arrow to stabilize its direction after it is released, the physical ability to bend the bow, coordination of the muscular activity of the arms, the entire body of the archer, eyesight, the mental ability to identify a target and proactively bring it closer through the planning and concrete execution of aiming and shooting procedures, etc. I could go on, but this list should suffice to show that the bow is not an object in itself but has ‘become’ one because it encapsulates all the activities necessary for its invention, production, and use. These activities involve the transformation of both the surrounding environment and the human organism. The mind–body unit is inherent in the bow. We can distinguish the latter, dissociating the object ‘bow’ from ourselves as something external, only because the activities of production and use of it have become socially and intersubjectively stabilized as means.

To be clear, the image of the bow or other sensory-driven representations related to it are merely signposts or switches to activate experiential habits stored in memory (and in its relationships with the environment). In this sense, I adopt a non-referential but moderately non-representationalist approach. From my point of view, representations are also operational means, but they cannot be reduced to morphologically isomorphic figurations of what is out there [3, 67, 214, 245]. Representations contribute to the relational co-production of meaning together with environmental dynamics. However, they do not encapsulate any content that coincides with ‘meaning’ or with anything that can be considered ultimately ‘meant’ in and of itself.<sup>27</sup> This is also due to the fact that in a world understood as a relational magma, *meaning* remains open, evolving, decentralized, infinitely renewable, never definitively standardizable, never ‘just a human affair’ but relationally external. The meaning of the bow is therefore fully incorporated, as it corresponds to the dynamic relationships that it bridges between organism and environment, both retrospectively and prospectively [5]. However, the ‘story’ does not end here.

<sup>27</sup>In this regard, I must distance my position from [55: nt. 29]. They propose identifying both the ascertainment of the existence of standards of satisfaction or truth and their qualification as ‘contentful mental processes’ as linguistic-communicative games. This would be an idiomatic mode of transformation of cognitive processes that has taken place in the human species: as such, an emergence of the evolutionary process concomitant with the achievement of a certain degree of complexity. Although this is a clever move to get around the hard problem of ‘content,’ I fear that it falls halfway between a pseudo-evolutionary tautology and a skilfully disguised ontologization or reification of the term ‘meaning’—a trait that can also be found in critiques proffered by the advocates of REC: see [110, 111] and, symmetrically, Baggio 2025: 39]. From a certain point of view, [55] seem to position themselves halfway between Wittgenstein’s *Philosophical Investigations* and James’s *Varieties of Religious Experience*. Content, representations, eudaimonistic or alethic standards ‘happen’ even if they are not true, and what it is more, they also have consequences. Although this position appears epistemologically contradictory to me, it would be extraordinarily inspiring and shareable if it led, with Buddha or Calderon de la Barca, to conclude that ‘*la vida es sueño*’ (life is a dream). But with one proviso, namely that the meaning of our living/dreaming ‘lies dynamically’ far beyond it and our representations of it. In this context, I believe I can identify a point of profound convergence with what is proposed by [55: § 6]. I would just like to add that it will be extremely interesting to follow the developments in the research of these two extraordinarily interesting scholars.

The bow is the result of the selection, for operational purposes, of certain salient aspects/items of the world surrounding human beings. In this sense, it functions as a sort of relational crossroads. However, it should be borne in mind that all the elements that contribute to the construction of a (traditional) bow can be taken as components of other relational and experiential networks, once again both retrospectively and prospectively. These relational networks are in turn subject to incorporation through their inclusion in other teleological chains, i.e., in other weavings of semiotic means-ends relationships. The body itself, understood as an operational medium in the dynamic interface between organism and environment, is a relational convergence point and, at the same time, a sort of weighted synthesis between different possible teleosemiotic directions/paths [6, 138]. In this sense, it could be said that the body is (at least potentially) ubiquitous because it is the existential synthesis of all the operations semiotically distributed through the space–time fabric that are self-reflexively instrumental to its concrete existence. On this basis, it can also be inferred that language (and therefore even the so-called ‘linguistic reference’) is only apparently stipulative or conventional.<sup>28</sup> Words have a genesis and a development entirely linked to their function as an operational medium in the management of relationships between organisms and the environment [6, 45, 72, 161]. Pronouncing a word means eliciting the activation of a series of proactive cognitive and pragmatic patterns in the organism, which in turn arise from the unfolding of enactive processes. The usability of one word rather than another has to do with the compatibility between the neural/operational patterns it elicits, which in turn embody the environment and externalize/excorporate the mind–body unity. From a certain point of view, therefore, pronouncing, assembling, or inventing words means shaping *operational worlds* in the body-mind units of all those who participate in communication and in the (semio-material) environment they experience. The ‘multifarious matter’ of these worlds goes far beyond the word or its morphological-categorical explications corresponding to the essential definitions of Aristotelian derivation. Instead, it consists of all the pragmatic implications, straddling neural schemas/textiles and the world, which are coextensive with the experiential and relational instances that underlie, and are epitomized by, words/categories. Whether this occurs through bodily modifications induced by imaginative stream or through pragmatic activities actually carried out makes no difference to the embodied nature of the meaning conveyed by words and, therefore, to the ways in which they are employed for communication and adaptation.

That said, the time has not yet come for the bow to disappear from the scene and its explicative unwinding. The inherent nature of the bow is also closely linked to the morphological structure of the human body. To realize this, one need only consider the impact of the bow on a phylogenetic level. Its use has not only profoundly changed the relationship between the human species and the environment—specifically other species [130]. By profoundly altering the possibilities for self-defense and predation, it has also adaptively empowered human individuals with relatively fragile bodies, allowing them to survive and procure food. All this has had immense evolutionary implications. The bodies of today’s *homo sapiens* bear within them ‘the imprint of

<sup>28</sup> For a useful critical exposition of the referentialist approach in this regard, see [64].

the bow', summarizing all the consequences of its invention, presenting themselves biologically, and therefore naturally, as the result of cultural 'manipulation.'<sup>29</sup>

The bow is anything but a prosthesis that leaves the morphology of the body intact. It is a sign/means that has modified both the morphology of the environment and of human bodies throughout history. But what can be said about the incorporation of the bow from a phylogenetic point of view and at the macro level, also applies at the micro level, that is, from an ontogenetic point of view and with respect to the transactional processes of incorporation of objects throughout the life of individual subjects [66, 113, 147]. In this regard, however, I must observe that the attempt by some cognitive psychologists, including those trained in enactivism, to distinguish between *concrete* incorporation of bodily prostheses in the strict sense and the processes of incorporation connected with skillful mastery of tools is highly questionable. Although readers familiar with texts on human rights may find this topic too specific or exotic compared to the 'question of rights in outer space,' I think it is extremely important and clarifying to address it, albeit briefly. This is because embodiment processes are crucial to understanding and assessing the scope of ontogenetic changes that can be induced in astronauts and, more in general, in human beings by life outside the Earth. For the reasons explained above, every ontogenetic change, or in any case every change affecting the relationship between cognitive and bodily patterns on the one hand, and adaptation to the extra-terrestrial environment on the other, has enormous implications for the definition of what is 'human' and 'anthropologically universal.'

With specific reference to the core topic of this article, I think it is extremely useful to focus on incorporation from two perspectives, namely psycho-cognitive and semiotic. I will start with the first and then move on to the second.

Recently, the topic of embodiment has been addressed by focusing on so-called prostheses, their functional connection to the body, and the actions—particularly

<sup>29</sup>In this regard, from an anthropological-philosophical point of view, see Gehlen's [93] interpretation of human beings as a 'deficient beings' (*Mängelwesen*), who have developed a techno-culture aimed at producing their 'discharge/exoneration' (*Entlastung*), for better or worse, from facing environmental challenges through morphological transformations of their (deficient) bodily morphology; and Anders [2], who was a sort of *alter-ego* of Gehlen. Anders developed the idea that humans were marked by a kind of inferiority compared to the machines they themselves had created and, as a result, became afflicted by profound alienation, which in turn generated a sense of Promethean shame (*Prometheische Scham*) towards one's own artifacts. I cite these two authors because the dialectical relationship between their positions anticipates and embodies the paradoxical condition of space astronauts and its interpretation through the spectrum of human rights. Morphological-natural incompleteness and Promethean shame are two sides of the same coin, albeit incompatible ones, and this is minted in the approaches of these two authors. At the same time, it stems from the idea that human biology and cultural activity, epitomized in artifacts, are ontologically and dualistically separate. In this sense—as I will try to show later—I believe that the 'Material Engagement Theory' developed by [146–148] can be of support by virtue of the *operational continuum* that it 'weaves and traces' between biology and culture, incompleteness and the becoming of the human beings through their transactional and mutually transformative relationships 'with and through' the environment. When applied to the experience of outer space, MET takes on an extremely broad and profound semiotic-chorological projection that forces us to 'dynamize' whatever we mean by 'body,' 'environment,' and 'artifact.' See also [5]. The anthropological path, partly parallel to the MET, traces a long chronological trajectory of approaching it and detaching from a 'mentalized' conception of meaning. Below are just a few of the key stages in this process: [11, 33, 34, 94, 115, 117, 123, 134–136, 158, 236, 249]; more in general see [248]. I would just like to add a reference to the relationship between food as a 'relational non-thing' and the becoming of human beings [207].

motor activities—performed by the body. The debate has also been developed including the various ways in which tools can serve as prostheses in a broad sense. The issue is obviously not just linguistic. The problem is not simply a matter of determining whether one object rather than another can be classified in the lexical category ‘prosthesis.’ What is at stake is understanding the processes of dynamic/functional incorporation of external objects/tools managed by the mind–body unit in relation to the performance of motor activities or, in any case, actions that pragmatically unfold through space. Although the terminology is still rather fluid, two criteria are often invoked to determine whether or not incorporation has taken place: *a*) the creation of a body schema relating to the use of the object; and *b*) the ‘transparency’ of the object itself in the activity performed by the mind–body unit. In other words, one could speak of effective incorporation when an instrument is integrated as a prosthesis in bodily activity, so as to be ‘experienced and perceived’ as one with the body itself—in a dynamic-symbiotic relationship.<sup>30</sup>

More in general, I must emphasize that when talking about ‘psycho-physical perceptions’, one cannot ignore environmental conditions and the means–ends connection that is coextensive with the relationship between organism and environment. The way humans categorize objects in the world, including their own bodies and what is external and/or internal, derives from their conversion into signs and, therefore, from their interpretation in relation to the construction of adaptive/transformational/transactional cognitive and pragmatic habits. Despite Husserl’s speculations on the self-perception of one’s limbs, a finger of the hand, for example, can be external or internal depending on the cognitive-motor perspective adopted in relating to it and the intrinsic purposes of that perspective. This is because it is the ends that qualify the finger/sign as a means. On the other hand, the multisensory/synaesthetic ‘setup’ of perception implies that even an object (e.g., a rubber hand) or another person’s limb can be perceived as one’s own when observed under certain conditions.<sup>31</sup> This phenomenon depends on the fact that conscious perceptions are already the result of the interpretation of external stimuli mediated by the body,<sup>32</sup> which is carried out by the brain in the 500  $\mu$ s (milliseconds) [139] between the onset of the stimulus and its conscious perception.<sup>33</sup> During that time frame, stimuli are transformed into signs and, therefore, into means to which a ‘signification’ is attributed in relation to the biological and/or cultural purposes integrated into the processing habits managed by the mind–body unit. We perceive based on what we have learned and therefore know. In this sense, perception is always the result generated in an interpenetrating way by external and internal eliminatory conditions, together with interpretative patterns, both proactive and engendered in an enactive way by the relationship between organism and environment. Of course, this also applies to the parts of the body involved in the processes that accompany both motor and goal-oriented cognitive/pragmatic

<sup>30</sup> In a vast literature see at least [59, Ataria, Tanaka, 88], and more specifically [44, 61, 62, 86, 88, 89, 171].

<sup>31</sup> See [38, 119, 122].

<sup>32</sup> I have discussed the relationship between vision, bodily proprioception and gravity during air flights in another essay to which I refer in full: see [205: p. 317, note 7].

<sup>33</sup> Some considerations parallel to those proposed in the text, albeit from a variety of perspectives, can be found in [234, 102: pp. 202 ff., 138, 5].

activities. This is why the above criteria of ‘transparency’ and ‘the elaboration of body schemas’ should not be interpreted according to ontological schemes or overly anchored to the reification of the morphological structure of the body understood as a self-bounded unit distinct from the environment. For this reason, I believe that the debate on the transparency and non-transparency of instruments in relation to external objects and, more generally, to environmental conditions is not useful for grasping the process underlying what is called ‘incorporation.’ Actually, the distinction between *transparent* and *non-transparent* use of the tool in order to qualify its use as a case of incorporation or not seems to be based on a latent and implicit reification of corporeality and even proprioception. In my view, however, transparency is not only conditioned by the *concrete* [171: § 3], almost physical-material continuity of the tool with respect to the body, but also by the level of awareness of the surrounding conditions that allow the functioning of psycho-cognitive models activated (also) through brain activity.

The boundary conditions, the relationships with the environment, and what we might call the ‘reactions’ of the environment that are part of these relationships, are an integral part of cognitive patterns and habits. These are the result of constant interpenetration between the mind–body unit with environmental conditions. In this sense, the body, cognitive schema, and the external environment cannot be imagined as *divorced*. Ultimately, this is precisely the pivotal epistemological premise of enactivism [90]. According to this theoretical perspective, the ‘individual items’ that we are used to identify in the world are to be understood as instances, crossroads of the multidirectional relational flow that dynamically overdetermines their emergence and gives existential rhythm to their interactions. Instead of thinking about ‘individual things’, we should therefore get used to ‘seeing in their place’ relational flows and temporary (in the sense of never definitive or eternal) dynamic convergences.<sup>34</sup> On the other hand, it is to be observed that if enactivism is interpreted not in semiotic and interpenetrative terms, but in more strictly functionalist terms (relying excessively on autopoiesis and self-differentiation of organisms understood as systems [142, 157]) combined with classical phenomenological approach [147, 234] it can lead to a hypostatizing and reifying of the morphological-material features of corporeality. In my view, however, this is not ontologically separate/separable from the environment. This separation-differentiation can be configured for heuristic purposes, but it

<sup>34</sup>This epistemological outlook is in line with the transformative character of Peircean semiosis and Dewey’s experiential transactionalism. However, it should be noted that there are some interpretations of enactivism that show a marked phenomenological derivation. This means that, despite the reference to Merleau-Ponty, these interpretations retain a marked tendency toward ontologization, which nevertheless betrays a certain degree of difficulty in excluding essentializing morphologizations or, in simpler terms, ‘discrete things’ from their theorizations and interpretations of the phenomenal world. This does not imply that they deny relational interpenetration. In many cases, however, it seems that this still unfolds through relationships between ‘things’ or ‘individual items’ in which the precisely relational dimension is now considered stabilized or phenomenologically ‘exhausted’ and, therefore, endowed with and guaranteed by ‘ontological stability.’ In many cases, it must be said that the difference in the importance attributed to relationality corresponds to the different areas of research of scholars who use the enactivist approach. On average, psychologists seem less willing than philosophers or semioticians to emancipate themselves from the view of the world as a ‘universe of things/items’—that Aristotle ‘implanted’ in the Western way of thinking—coupled with the phenomenological first-person perspective [234, 235]. A vision—it must be confessed—that is very difficult to shake off in everyday life and practical conduct.

holds nothing ontologically definitive. Failing to understand this aspect, in my opinion, implies providing a hyper-Husserlian view of enactivism which, combined with functionalism, can lead to oxymorons and inconsistencies.<sup>35</sup>

As mentioned above, when certain boundary conditions are removed, one quickly realizes that even limbs can be perceived as foreign, paradoxically not incorporated. The experience of astronauts in microgravity conditions shows exactly this. They *must re-incorporate* their limbs because they have lost ‘transparency’ with respect to their motor patterns and the semio-pragmatic habits in which these are integrated.<sup>36</sup> In other words, they must re-establish continuity between the cognitive apparatus (considered as a body-mind unit), the patterns it employs to adapt to the environment and constitute itself through this adaptation, and their own limbs (taken not only statically but dynamically, i.e., as parts of sensorimotor activity). This means that even on the Earth the transparency, invisibility, or the silent presence of environmental conditions, are mutable. But this effect of imperceptibility/transparency is nothing more than continuous training with them, their being—to a certain extent—an integral part of tried and tested patterns that have become habits.

In this regard, it might be useful to interview a musician who is required to change instruments or types of instruments frequently to understand both how transparent a musical instrument can become and how the category ‘instrument/tool’ can lose its (previous) *semantic clarity/transparency*.<sup>37</sup> In this regard, I would like to share my personal experience as a pianist.

Today, grand pianos from many brands feature very similar actions. The long-term commercial success of Steinways around the world and their prevalence in concert halls has even led to a sort of ‘Steinwayization’ of most piano brands. But that’s not all. The prevalence of Steinway pianos in concert halls makes it a little easier for pianists to adapt. Of course, it is true that every instrument is different from the others. However, the similarities between Steinway instruments simplify things for pianists. Without leaving the circle of the most famous piano-making houses, even contemporary Bösendorfer pianos (especially the *Vienna Concert* series) seem to have become ‘Steinway-ized’—albeit retaining some sound differences. I realize that this statement

<sup>35</sup> A very conducive explanation of this problem and its phenomenological roots is provided by [102: pp. 202 ff.], which deals with the incompatibilities between ecological psychology and enactivism.

<sup>36</sup> As for astronauts’ experience I refer to [197]. See also [124, 237, 238, 9, 186, 221]. See also <https://c.ordis.europa.eu/project/id/833135/it>. For more on the methodology of the ethnographic approach to the astronauts’ experience, see [3].

<sup>37</sup> Some interesting observations about the experience of musicians and the process of incorporation of their instruments can be found in [44]. Nonetheless, as a musician, I must confess that I do not agree with the autobiographical interpretations proposed by this author regarding the experience of ‘playing an instrument.’ Regarding the relationship between space, body, and musical experience, I refer to other studies [211]. More generally, I must say that her distinction [44: pp. 74, 78] (but see also, more in general, 59) between body schema, body image, and body (and related incorporations) seen as mutually exclusive experiences, and therefore classified as conceptually distinct, seems to be challenged precisely by the experience of astronauts. As mentioned in a previous essay on the outer space human experience [197], astronauts often report asking their colleagues “Please look at me and tell me if I’m wrong,” referring to a sort of loss or weakening of the proprioception involved in bodily activities. Proprioception, understood in a dynamic sense and integrated into goal-oriented activities, seems to be subject in outer space to a learning process that is managed intersubjectively and communicatively, and which is then destined to become a habit.

might infuriate Bösendorfer's manufacturers, but even thirty years ago, their pianos were very different from today's models (i.e., more different from Steinways built from the 1940s onwards). However, it is also true that those who try to play pianos from the early twentieth century (even Steinways themselves) may have completely diverse experiences. Some pianists candidly say they have to relearn how to play.

I myself have had such an experience. Accustomed to playing contemporary pianos with contemporary Renner-Steinway actions – or in any cases very similar to Steinway-Renner standards—I perceived a huge difference when approaching a wonderful Blüthner Jubilee from the eve of the 20th-century. Everything had to be readjusted and even relearned... with huge consequences on the very way of thinking about music. As I adapted to the new instrument, remarkable metaphorical transformations took shape in my musical imagination. It is interesting to note that both I and other musicians who have (re-)started playing early 20th-century pianos use the same expression found in astronauts' accounts. The typical expression they use to describe their approach to life in microgravity is: "we have to relearn everything, almost as if we were newborns again" [124, 197].

The experience of pianists seems to call into question the distinction between the incorporation of *concrete things* and the skillful mastery of a tool [61, 62, 171]. From a (quasi-)morphological point of view, the piano is never transformed into a physical prosthesis—this is undisputable. Nevertheless, its 'transparency' for pianists is very high<sup>38</sup> [44, 152, 153]. Mediated by hearing, the relationship with the instrument—a beast that can reach almost three meters or even more—results in an almost total mimetic-dynamic interpenetration. More descriptively, this means that the pianist should feel as if their fingers are almost merging with the keys and acting in total relaxation, producing the sensation of moving without using muscle strength, as if they were touching (as Couperin would have said)<sup>39</sup> the keys thanks to the force of gravity alone.<sup>40</sup> This is even more so with string instruments such as the cello or violin.<sup>41</sup> The instrumentalist thinks about the sound, not the individual movements of their fingers or body. Fingers and other parts of the body move accordingly. The 'sound perception' experienced by the instrumentalist is a total and comprehensive (if

<sup>38</sup> In this regard, see [44]. But more generally with regard to the plasticity of body representation and the way in which the use of tools can influence the relationship between body image and body schema see [152, 153].

<sup>39</sup> The reference is to François Couperin's work '*L'art de toucher le clavecin*.'

<sup>40</sup> This psycho-physiological posture is accompanied by a cumulative increase in the background management of the physical side of musical performance. Playing becomes art (as Claudio Arrau would have said [107]) when one no longer thinks about the physical but only about the musical result, the sound. At that stage of skillfulness, the performance habit is completely integrated into the brain's activity, and the pianist can afford to focus solely on sound production, while the body-brain unit will unconsciously do everything necessary to 'give substance' to the pianist's imagination. In some cases, musicians who know a piece well may even stop thinking about the sound as such and replace/accompany it hermeneutically in their imagination, even during performance, with metaphorical images. The image of a herring on a plate (taken from traditional Russian phraseology) that Sviatoslav Richter used to describe his approach to performing Prokofiev's Sonatas 8, second movement remains famous. The reference to Richter's interpretative metaphor is proffered by Lazar Berman [13]; or in a short excerpt [14], translated into Italian, from the aforementioned volume.

<sup>41</sup> See [44: pp. 69] and the reference to Rostropovich, the famous cellist, who recounts his relationship with the cello.

not also overdetermining) phenomenon, within which they can retrospectively distinguish fingers, instrument, body, mind, and sound coming from the instrument. What the musicians hear is not the same as what the listener hears. They also hear through and by virtue of the affordances (and their synesthetic implications) produced by thinking about the sound result they produce through their own activity. On the other hand, what they think while playing is already embedded in their relationship with the instrument, their skill transformed into habit. This habit does not produce bodily patterns that persist solely in relation to the activity of playing music. Neural plasticity means that skills acquired in one cerebral area are transferred (in metaphorical-spatial terms) to other areas of the brain and, in general, to experience and meaningful activity [178–180, 211].<sup>42</sup> In light of this, I believe that stating that a piano is not comparable to a concrete prosthesis for the lower limb, since it does not attach to the body and does not produce a psycho-physical effect of material-dynamic continuity, emphasizes apparent morphological aspects that conjures up a sort of naïve realism. Although reluctantly, I must say that the importance attributed by this approach to what *is materially attached to or can be detached from the body* depends on categorizations perhaps endowed with aesthetic value. Even in this sense, however, it seems to be driven by certain past experiences categorized according to (Western?) empirical common sense. To put it diversely, the distinction between concrete prosthesis and skillful mastery of instruments sounds like a theoretical deduction relying mainly on culturally established perceptual customs.

As I will try to show more clearly below, from a semiotic point of view, physical proximity or distance, as well as detachability or material continuity with the body's morphology, are not particularly relevant in distinguishing between what is a prosthesis and what is a 'mere' instrument.<sup>43</sup> The apparently ontological stability of the morphological structure of the human body lies in the meaning that the parts of that body have in relation to the organism's overall adaptive activities with respect to the environment. The construction of a fixed taxonomy of these activities is, therefore,

<sup>42</sup> I must point out here that Ojala [178]—in his extraordinarily committed and detailed work inspired by Peirce—combines the semantic spatialization of music with the theory of conceptual spaces [91], which—despite attempts by the author and his followers to coordinate it with pragmatism—is incompatible with the approach adopted here: see [211].

<sup>43</sup> This topic has begun to be studied from a very interesting perspective, related to the paradigm of the so-called 'extended mind,' with reference to its ethical and, consequently, legal implications: see [101] and, in particular, [256] and [259]. The fundamental problem addressed in these studies is that of so-called 'cognitive bloating' connected to the extended mind thesis. The objection raised to this paradigm is that if the mind is extended to anything external to it, then the notion of the extended mind becomes so vast and inclusive as to be useless. To avoid this problem, some authors have proposed certain interpretative restrictions: among these are [84, 87, 217, 218] They propose a metaphorical expression to define what would be appropriately considered as integrated into cognition and what would remain only an external means. The expression is 'ownership.' This attempt, which is analogous to the one aimed at establishing an ontological categorical distinction between prostheses and tools, is semantically untenable [39, 256, 259] and difficult to defend from a semiotic point of view [5]. The condition of astronauts and their vital dependence—as I will attempt to show—on what lies spatially and chronologically distant from them provides a sort of 'experimental verification laboratory' for the co-ownership hypothesis proposed by [256], as well as those based on the idea of participatory sense-making [56] or symbiotic cognition based on 'functional integration' and 'task-dependency' [230]. I would just like to add—with sincere modesty—that it would be urgent and essential to combine the enactivist approach and 4E cognition [175], on the one hand, with anthropological thinking concerning the social ecology of the individual and their cognitive attitudes, on the other.

the flip side of morphological structure—although we often do not realize this. However, these taxonomies are inevitably subject to change as soon as the overall environmental conditions—which, from an enactive-relational perspective, also include the adaptive values of the organism—change. But this is exactly what happens in outer space where astronauts experience, for example, microgravity conditions. In this context, the meaning of the stimuli that the organism receives depends on the overall environmental and cultural conditions, i.e., on the habits of managing the means-ends relationship: including the habit of changing one's habits, perhaps the most relevant characteristic of human beings as a 'symbolic species' [52]. 'Meaning-ends relationship' is, however, another way—perhaps more attentive to the transformative profile of adaptation processes—of indicating the motor-teleological patterns that constitute the content of the taxonomies of activities on the basis of which some suggest distinguishing between what is a 'prosthesis' and what is an 'instrument'. Those patterns in space also vary in relation to the satisfaction of the organism's primary needs. Distinguishing between what is natural and what is artificial by referring to the combination of 'bodily-morphological component' and 'taxonomically essentialized type of activity' out there makes little sense.

Utterly artificial and inorganic mechanisms that are distant from the body ensure, for example, that astronauts can breathe or maintain a body position in space that is essential for survival (think of so-called space walks outside the spacecraft or space station). The sequences of incorporation into space correspond to different semiotic patterns compared to what happens on Earth. These semiotic patterns in turn generate the creation of new categories and behavioral scripts, thus renewing ways of molding the dynamic-relational experiential dimension that can be defined as 'space-body.' Under these conditions, the very distinction between what is close and what is distant in relation to the body, considered morphologically and physically, undergoes profound changes in meaning.<sup>44</sup> Physical proximity will most likely be replaced by functional and therefore semiotic-teleological proximity. The ubiquity of semio-pragmatic projections included in activities such as breathing, for example, sees every action performed by the individual organism here and now as tightly linked to activities performed by other mind-body units placed at a great distance in physical space. The mind, but also, operationally, the body, thus appear to be involved in a network of multi-situated and distributed phenomenal relationships. There is nothing artificial about this, not least because those relationships are functional to the satisfaction of needs that any 'earthly taxonomy' would define as 'natural.' The point is that what seems striking and even artificial-*unnatural* in space takes on this feature only as a result of the change in environment/organism relationships and the reflexive feedback chains that enactively accompany their adaptive transformation. Changes in meaning and the reshaping of activities involving the incorporation of space and the excorporation/externalization of the organism are two sides of the same coin. But that coin is minted by the *continuum* extant between nature and culture or—to put it more traditionally—the rhythm of their interpenetration.

<sup>44</sup> See, in this regard, [85: p. 90 ff., 233: p. 27]; from a semiotic perspective [5]. Moreover, consider the notion of 'distal engagement' developed and proposed by [27].

What happens in space, however, shows us what also happens on Earth in the processes of incorporation and excorporation and, consequently, also in the production of meaning. As I will illustrate, this is particularly relevant in relation to the enactivist approach, which identifies a deep and pervasive connection between the generation of meaning and the extensive metaphorization of motor patterns (particularly those present in the activity of the motor and premotor cortex) that ‘govern’ the movement of the human body in space [51, 83].

In light of the above arguments, I believe that, beyond the tendency to emphasize morphological appearances [62, 171], the semio-pragmatic connections between means and ends play an important role in relation to the daily motor activities of most human beings. In this sense, there is no doubt that a leg and its very presence are more important for a person’s survival than the combination of a piano and fingers. However, strictly functionalist discourse laden with cultural connotations based on human body morphology or common social structures does not say much about the process of incorporation itself, nor about the broad vital implications it may have. Human activities in various fields develop skills that often prove to be of ‘existential importance’ in other fields as well. From a semiotic point of view, it could be said that the semiotic key of certain adaptive processes is potentially transferable ubiquitously—even from a psychomotor point of view and with reference to the corresponding cognitive and adaptive patterns. Physical proximity, on the other hand, cannot—I believe—be taken as a decisive criterion. An artificial leg—according to the point of view of those who defend the concrete incorporation of individual tools [58, 60]—will certainly seem ‘more incorporated’ than a wheelchair [44]. However, the distinction is based on elements of ‘relevance’ that are actually secondary or, in any case, once again strongly influenced by current and context-related cultural habits.<sup>45</sup> Conversely—just to provide another example—the level of incorporation of another person’s body mediated by remote chat is extraordinarily powerful, as well as emotionally pervasive. I have personally ascertained this process in the experience of e-Health connected to the administration of palliative care.<sup>46</sup>

The above remarks have enormous anthropological, political, and legal significance that goes far beyond the immediate cognitive aspect. Boundary and surrounding conditions can become invisible even if they do not become morphologically part of the body—albeit this is true only from an epistemic perspective, which is actually mainly focused on sight.<sup>47</sup> The occurrence of this ‘invisibility’ relativizes the idea of the incorporation of concrete things on the one hand; on the other hand, however, it

<sup>45</sup> In this regard, I believe that the research conducted by [233] on the continuities extant between ‘Radical Embodied Cognition’ (REC) and the metabolism inherent in the relational dynamics between humans and the environment—as conceived by Marx and Engels—is of great interest. Quoting Marx [154: p. 37], he argues: “What makes human beings stand out is not a specific organ, nor a specific skill, but the fact that ‘they begin to produce their means of subsistence, a step which is conditioned by their physical [i.e., corporeal] organisation. By producing their means of subsistence men are indirectly producing their material life’”: [233: 17–18]. I believe it is extremely intriguing to follow up Marx’s words—quoted by [233]—with the observations made by [68: Ch. 2, § 1].

<sup>46</sup> See [202, 209].

<sup>47</sup> In this sense, a human, and specifically ‘Western’, epistemological habit is at stake. In many cases, non-Western cultures do not classify spatial experience based on sight; not to mention animal species other than humans.

makes us understand how much the external space/environment is dynamically internalized in categorical schemes.

Furthermore, the same invisibility/transparency is at the root of spectacular expressions of epistemic violence, often unconscious, at least as far as their origins are concerned [25, 31, 80, 163, 190, 197, 212]. The space that is semantically defined according to our purposes and populated with items that are teleologically transformed into tools/means becomes practically imperceptible. It is part of the agent's body, of their bodily consciousness. This is also because goals/ends are often transformed into habits integrated into the self-perception of the morphology of one's own body parts. Any semanticization of space that is at odds with one's own purposes/ends is therefore interpreted as an intrusion into one's own body.<sup>48</sup> As a consequence, the invisibility of space, and specifically of other people's space and bodies, will make the reaction against other people's bodies all the more violent. In this regard, we could speak of a sort of spatial intolerance: where the category of space is to be understood as the relational synthesis of the body's experiences in external space and the dynamics of mutual adaptation to it brought about by the mind–body unity.

When we talk about 'space,' we are always talking about bodies in relation to space [193, 194]. When we talk about bodies, we are always talking about space in relation to bodies. The relationship comes before both spatial and categorical distinction. The 'continuum' comes before the 'distinction.' Now, as already observed, that *continuum* is inherently relational. The violence that arises from the unawareness/transparency of the space/environment experienced by human beings when they encounter other human/spatial circuits is due, in many cases, to the fact that differences can be overcome or relativized by force. This means, in other words, that they can be ignored because ignoring them does not prevent one's own patterns of adaptive spatialization from imposing themselves and surviving the clash. As colonial history teaches us—but, to tell the truth, not only colonial history—entire cognitive-spatial universes can be wiped out by the blind and destructive activity of one group or individual against another.<sup>49</sup> There are conditions in which the variation in the environmental or internal coordinates of the relationship is so destabilizing that the combination of ignorance and violence immediately proves to be adaptively ineffective or unsuccessful. One such situation is that experienced by astronauts in micro-gravity conditions. *Out there*, it would be impossible to ignore changes in the external space, even if one wished to maintain the same cognitive-relational models. Space and its dynamic embedding/emboding tracings all become (at least potentially) visible and this visibility inhibits and paralyzes—already at a conscious level—the activity of both cognitive and motor/behavioral habits. Something similar can also happen on Earth when conditions change profoundly—for example, from an ecological point of view. Faced with these changes, animals other than humans struggle to adapt, often leading to extinction. Humans have the ability (at least in theory) to symbolically manage environmental change and, therefore, to rewrite the dynamics of possible relationships by developing new semiotic patterns. This implies that they must quickly become aware of the change and, above all, use their ability to manage

<sup>48</sup> For further details on this, please refer to [97].

<sup>49</sup> With specific regard to outer space, in vast literature, see [251].

signs/symbols to understand how to interpret it in an adaptive way, modifying themselves accordingly. The enormous difficulty and slowness that humanity shows in understanding and facing current climate change are both a symptom and an example of adaptive inefficiency. Something that certainly has a political aspect but that stems from cognitive-symbolic rigidity.

To overcome moments of extraordinary change in the surrounding conditions and in the relational means that populate them, previously made transparent by cognitive habits, it is necessary to bring those same means to light, that is, to conscious level. This operation, however, requires an enormous effort because it necessarily involves a reflexive transformation. Making visible the invisible remolds the semiotic landscape in relation to which ends and means are defined: the same means and ends by which that landscape is populated and ultimately shaped as a context where human agency is to unfold.<sup>50</sup> In other words, this process of emergence transforms the relational landscape and, therefore, the operational connections on the basis of which the boundaries of (pre-existing) categories are defined. Of course, it also depends on ends/values which, however, are modified in their meaning by the changing of the means (i.e., the semiotic connections-relationships) by virtue of which the path of their achievement unwinds. The entire sequence of changes described above reshapes the relationships that underlie and underpin the distinctions between inside/outside, body/environment, mind/world, etc. It is within these new relational frameworks that the body, tools, and objects included in operational and adaptive scripts can take shape again: not in an ontological sense but—I believe this is clear at this point—as buoys, reference points for activating the relational dynamics coextensive with the unfolding of experience and life.

These last considerations bring into play the relationship between mechanisms of incorporation, linguistic interactions, and the meaning of experience and what is involved in its unfolding. The body is involved in fluxes of semiotic-pragmatic relationships that mark its existential dynamics and give it rhythm, so to speak, differentiating it in multiple directions and experiential circuits [39, 259]. In this respect, it is almost superfluous to reiterate that, for the human species, these semiotic relationships are mediated by language and its use. In a sense, language, in describing symbolically experiential landscapes, ‘dislocates’ the body into multiple situations, continuously reweaving the dynamic-relational import of its morphological features. To put it in more concise terms, the meaning of the lived body and its morphological components depends on the circuits of semio-pragmatic connections that define lived situations. However, in this regard, an important question arises. What is the relationship between the processes of meaning-making, even the most abstract ones, and the mechanisms through which the mind–body unity dynamically incorporates the external world and excorporates/externalizes into and through it?

Cognitive psychology and its enactivist interpretations have proposed various hermeneutic frameworks in an attempt to explain, from an evolutionary perspective, the existence of a profound link between bodily experience, especially in its spatial-motor aspects, and the processing of meaning. Contributions from cognitive psy-

<sup>50</sup> See [203, 210].

chology<sup>51</sup> and psycholinguistics<sup>52</sup> have provided interesting answers, partly because they are linked to experiments with neuroimaging [50]. The first formulations of this approach tended to identify bodily schemas as the basis of the process of meaning production—both those more concretely connected to motor activity and those more abstract. Through a sort of retrospective analysis of language, they found within it the traces of a collection of fixed patterns closely connected to the positioning of the body in space and the activation of specific topographies in the neural structure. The spatial positioning of the body and the corresponding neural patterns would therefore also be used to describe the relationship between the objects involved in the spatial experience and the relationships between them. Prepositions such as under, behind, below, in front of, right, left, inside, above, over, in, out, inside, outside, etc. would be indicators, somewhat like clues, showing the close connection between the activity of the premotor and primary motor cortex and the basic structures of meaning. In other words, there would be a kind of somatotopy that would act as an interface between neural functioning patterns and the lexical-semantic structures of human language. These theoretical approaches attempt to circumvent the fallacy of the converse (or affirmation of the consequent). Actually, this paralogsism influences many speculations that aim to identify the existence of deep structures underlying the superficial morphological characteristics of phenomena. However, in many cases, these theoretical proposals fail to provide any evidence of the postulated deep structures other than the evidence of what lies on the surface. As mentioned, this objective is considered to have been achieved, at least in part, through neuroimaging [26, 83, 125]. It focuses on the premotor and motor cortex. Experimental observations show that listening to certain words, perhaps paired with certain images, elicits the activation of corresponding areas of the primary motor and premotor cortex in the mind–body unit. This activation would indicate that words and the objects they evoke are embedded in dynamic patterns of activity that determine their relationship with the body. The pragmatic connection between objects and motor modalities is defined as *affordance*, recalling the category proposed by Gibson.<sup>53</sup>

Here, I cannot dwell on describing all the lexical samples that this approach proposes to confirm through its hypothesis of concept incorporation. Obviously, there are first and foremost verbs that indicate movement, but along with them, there are many metaphorical expressions that use them or that, in any case, evoke motor activities or motion in space. More generally, however, the presence of spatial-motor metaphors is recognized in many linguistic uses.<sup>54</sup> According to this psycho-cognitive view, the overall terminological constellation relating to space and time can be traced back to basic metaphors, otherwise defined as cognitive metaphors. The spatialization of time perception [128, 129] is used as an ideal area to give evidence of the pervasive-

<sup>51</sup> In an expanding body of literature, see [128, 129].

<sup>52</sup> See, for example, the insightful research carried out by [132, 133, 243].

<sup>53</sup> See, in an immense literature, [73, 102, 222]. On the relationship between differentiation, affordances and the evolution of cognitive habits according to Mead's pragmatist approach see [6].

<sup>54</sup> In this regard, consideration should be given to the variation in linguistic patterns and corresponding motor patterns included in the metaphorical relationship connected to cultural diversity. See [125]. On dynamic metaphorization and the enactive approach see also [145].

ness of spatial-motor patterns in the categorization of the world. However, even the activity of categorization itself and the categories are considered by this theoretical approach as ‘instantiations’ of the general process of meaning incorporation and spatialization. In this regard, the basic metaphor identified is that of ‘container.’ From this metaphorical source, all logical forms of inclusion/exclusion and aggregation/disaggregation within a category or set of individual elements would stem. In my opinion, the main contribution of this psycho-cognitive proposal lies in bringing categories into experience and its dynamic relationality, stripping categorization of the metaphysical abstraction attributed to it by many philosophical and epistemological tradition (especially Western ones).

The reference to embodiment means that a *continuum* can be identified between language/symbolic thought and the lived dimension of meanings [6, 55, 74, 83, 222]. It lies between symbolic and bodily mind, between consciousness and perception, between signification and lived experience. However, the tendency to trace the ‘matrix’ of all meanings in the spatial-motor patterns of neural functions encounters certain limitations. The relational concreteness that it bestows on semantic categories and words risks indulging in some excesses of reification or hypostatization. Basic spatial-motor cognitive metaphors do not always seem capable of explaining abstract or emotional language [26, 83, 125]. What appears overly limiting is the explanatory power of reducing the entire linguistic landscape to (pre-)fixed spatial-motor patterns, in which every expression would be nothing more than a transposition/derivation to be understood as a structural metaphor. In particular, from my point of view, what appears least convincing is the attempt to establish a sort of parallelism between the ontogenesis of meaning—as it were—and phylogenetic profiles of evolution. In other words, theorists of embodied meaning sometimes seem to assert that spatial-motor patterns correspond to the most ancient brain structures and that symbolic meaning is an emulative-metaphorical projection of those patterns. The chronological-evolutionary relationship between parts/functions of the neural structure would therefore be symmetrical to that between spatial-motor patterns and all semantic structures elaborated at the symbolic level. All this as if there were a sort of unidirectional determinism between basic spatial-motor patterns and the meanings developed by each communicative or cultural circuit or tradition. Unfortunately, this hypothesis does not seem to be confirmed either experimentally or through the analysis of metaphorical activity in language. On the one hand, even individuals with lesions in the motor and premotor cortex are able to understand linguistic expressions considered to be a close derivation of sensorimotor schemata.<sup>55</sup> On the other hand, metaphorical interpretation does not seem to be limited to the transfer between different domains of spatial-motor body schemata. Sometimes basic spatial-motor schemata do not seem to be involved, while at other times the motor activity itself diversifies and rearticulates according to sequences/connections between means and ends centered on emotional, affective, or abstract elements. The experience of musicians can once again prove useful in this regard.

The way the body is used when playing an instrument is often very sophisticated and cannot be reduced to basic motor patterns. Sometimes it even seems *unnatural*.

<sup>55</sup> See [40].

However, it is guided by the imagination of sound and its production integrated into the relationship between body and instrument. The selection of sounds to be produced, their timbre, is then further guided by communicative practices connected to acoustic values—so to speak—whose meaning is not equivalent to data relating to the physics of sound. With all due respect to Plato<sup>56</sup> and interpreters attracted by the mathematical-numerological aspects of contrapuntal music (e.g., Bach) or dodecaphonic music (Schoenberg), the musical experience—i.e., composition, performance, or listening—is neither genetically nor phenomenologically reducible to the iteration of fixed patterns that can be translated into geometric/arithmetic or spatial relationships of a formal/structural nature. These analyses can only be carried out retrospectively, focusing exclusively on certain aspects and neglecting or considering all others superfluous. However, they are not sufficient to convey the meaning of the musical experience as it is lived and described by human beings. For example, if Bach's fugues were considered exclusively as formal numerical relationships between different sound frequencies and their ordered succession, it would be almost impossible to understand their communicative meaning, their diversity/variety, the need to choose different timbres and speeds of execution depending on the musical phrases, their related *tactus*, their tonality and, above all, their ability to evoke, through emotional/affective means, multiple life experiences and the perceptions associated with them.

More generally, I would like to emphasize that emotional/affective components are the generative core of goals and values. The choice of means, including physical ones, to achieve them is in many cases guided by them. Goal/value-oriented activity shapes its physical and material components. In this way it engenders new situations that are then transformed into action scripts and categories. Each category corresponding, for example, to an object summarizes within itself a relational pattern that is genetically connected to the achievement of adaptive goals. Just as there is no eternal and immutable taxonomy of action schemata—including motor ones—there are no categories or their symbolic equivalents with immutable signification. To briefly return to the psycho-cognitive approach focused on the metaphorization of sensorimotor schemas, it is therefore necessary to consider the bidirectionality or reversibility that exists in the relationship between space-motor categories and other forms of categorization based on goals/values. The interaction with the environment, its objects and subjects are not directly attributable or derivatively and isomorphically assimilable to sensorimotor models connected to spatial motion. On the contrary, basic motor patterns—assuming they can be intended in these absolute terms—are constantly integrated into teleological-experiential circuits that reshape and recombine them, modifying both bodies and space. In this sense, space itself should be considered a semantic category populated by patterns of action that are theologically shaped by culture. This implies that there is no empty space, according to Newton's conception of a vacuum. The space we experience is always and in any case the result of the projection, in most cases within and through it, of potential teleological scenarios. Its 'emptiness' corresponds to a horizon of potential possibilities endowed with both 'semiotic and semantic content.' And this is something perfectly familiar to astronauts who find themselves facing a space deprived of many of the teleologi-

<sup>56</sup> On Plato's theory of music and its eidetic-mathematical approach, see [172].

cal possibilities implicitly integrated into the ‘space culture’ they learned on Earth. The ‘void’ in which they immerse themselves during so-called space walks outside spaceships or space stations is perceived as inherently obstructive and uninhabitable precisely because of the degree of its emptiness, at least when compared with Earthly space.

The overview just outlined leads to interpret bodies themselves as relational components of flows of activity that are theologically oriented according to tasks and purposes determined, in sequence, by communicative relationships, the use of symbolic language, the imaginative projections it allows,<sup>57</sup> in short, by human imagination [39, 259]. Precisely in this sense, experience and its semantic dimension should be grasped as enactive processes, punctuated by sequences of transformative and transactional interpenetration between organism and environment.

Elaborating meanings does not therefore consist in modifying the ‘mind’, the neural and symbolic apparatus, in order to find patterns corresponding to the ‘being of the world.’ Nor is it an activity of modeling the world in order to conform it to the representational and teleological patterns that exist a priori in the human mind–body unity. ‘Signifying’ is instead a comprehensive phenomenon that arises from the relational, mutually transformative, and cumulatively transactional interaction between everything in the world that can function as a ‘sign’, that is, a medium conveying information and, at the same time, a tool for interpreting/processing information. The relational plexuses in which each sign can be involved are potentially infinite. What we call things are only aggregates of signs/relationships that can be broken down and recomposed, relationally, in many ways. It is only the overall relational stability connoting certain ‘environmental situations’ that gives these ‘relational aggregates’ the possibility of being ‘treated’ interlocutorily as individual, single, discrete, apparently distinct, differentiated, and isolated ‘things/items.’

When the relational stability of environmental conditions is (deeply) altered, ‘things fade away’, losing clarity, material and cognitive/categorical independence, and revealing the *continuum* that runs through them as a potentially infinite receptacle waiting to be remapped. The act of “signifying,” when performed under conditions of profound change in “relational situations” that were previously experienced in an adaptive and incorporated manner, makes the boundaries between bodies and between elements of the world fluid [207]. New circuits of experience and therefore new dynamic-spatial patterns and scripts of incorporation must then be elaborated by connecting in a new way elements previously belonging to distinct, separate teleological chains and categorical frames (which in turn were the epitomes of those semiotic-teleological chains). Ultimately, space must be re-signified and therefore re-made. But re-making space, from an enactive perspective, inevitably implies re-making bodies. In the relational *continuum*, it is not possible to ‘re-mold’ the one without re-making the ‘others.’ Of course, this does not imply that the entire physicality/physiology of human beings (including sensorimotor patterns) becomes totally plastic from a bio-morphological point of view. Nonetheless, if relationships change,

<sup>57</sup>An approach that recovers Peirce’s notion of icon by combining it with the theory of embodied simulation, developed from the discovery of mirror neurons, can be found in [50] and further bibliographical references included therein.

the meaning of organic aspects or operational patterns that maintain relative morphological stability inevitably changes as well. In this sense, we can speak of a *semi-otically* intensified exaptation (i.e., the evolutionary tendency to use, for example, pre-existing bio-morphological structures to support new tasks and pursuits). But “apting” is a process and, at the same time, a dynamic space, in which matter itself is a sign that transforms. This must be understood in the sense that what is ‘real’ is not the ‘morphologically identifiable thing in a stable way’ but rather the ongoing connections in which it or its features are dynamically integrated.

In the ‘outer space’ conditions, what is, then, the nature of bodies and what is the nature of space? Is it possible to distinguish it from culture, that is, from human activity oriented toward ends and developed through the interpretation and remodeling of the ‘semiotic stuff’ coextensive with the cosmos? Space and bodies, external and internal, nature and culture, environment and organism, being and ought-to-be: in such circumstances, are these divides not caught up in a potentially infinite and omnidirectional multiplicity of chiasmatic transformative interpenetrations? If the answer is affirmative, the question that the discourse on human rights in space finds lurking in itself is therefore: what about the universality and implicit naturalness/immutability of human rights in outer space? Can they be the basis for schemes of regulating interactions between human beings if they cannot avoid presenting themselves as the result of those interactions? How can this circularity be reconciled with the need to attribute meaning to them? And, more generally, is there even the possibility of configuring the existence and plausibility of meanings outside this circularity? What if it were instead the very ‘home’ of meaning? Should we perhaps conclude that ‘earthly meanings’, ‘the meaning on Earth’, often understood as an unconscious stable remedy for this circularity, are the ‘*stuff as dreams are made on*’? Or, instead, that dreams do not exist in themselves, but are only a reflection, the flip side, of the search for stability and certainty that has always characterized human culture (especially in the Western tradition)? The same compulsive search that has led human beings to recognize as ‘real reality’ only that which appears (more) permanent in their existential contingency and which, against all evidence and wisdom, is self-deceptively passed off as eternal?

I am aware that some may consider these questions to be an implicit plea for post-humanism. Before proceeding, I think it is right to clear the field of any misunderstanding. I will not address here the dialectic between humanism and post-humanism, which is also present in some of the literature dealing with extraterrestrial human activities, both present and future.<sup>58</sup> The reasons for my detachment are mainly theoretical. I believe that discussing post-humanism is simply a rhetorical and, in many ways, ideological exercise. I contend that human beings became post-human from the moment they first integrated tools into their activities of adapting to the environment. And by ‘tools’ I mean both material and symbolic or noetic ones. Words are formidable operational tools. Just as, thanks to words, the discovery of the ‘I/Self’ must be considered the invention of the most powerful and multifunctional meta-tool that the human species has developed, modifying itself and, consequently, the

<sup>58</sup> Interesting passages on this subject can be found—to limit ourselves to the field of cognitive psychology and its approach to embodied knowledge—in [81: p. 49 ff., 67 ff., 82].

surrounding environment in an extraordinarily profound way. To put it succinctly, human beings have almost always been the ‘post-’ of themselves.

### 3 From the Changing Nature of ‘Being Human’ to Rights, and Back Again

In human experience, the relationship between body and language is mediated by the activities they perform and the situations in which they occur. The bodily patterns (e.g. the sensorimotor schemata) traceable at the neural level influence linguistic structures and the way they function as compasses or instruments in supporting adaptation to the environment. Conversely, symbolic instruments—including words—allow us to treat the material components of experience—and therefore both environmental factors and the individual organism—in a varied way, establishing novel dynamic operational relationships between them. These new relationships cumulatively alter the material relationships between the environment and organisms, and therefore their respective meanings, giving rise to evolutionary processes of varying duration that also modify previously extant morphology and functional structures both inside and outside individual bodies. Describing the interactions between mind–body units and the environment as dynamic-operational relationships between (and conveyed by) signs implies that the use of language functions as an interface for incorporating the world and externalizing the activity, both cerebral-noetic and psycho-physiological, internal to the body. From this point of view, both the expressions ‘embodied language’ [83, 128, 129] and ‘linguistic bodies’ [72] should be assumed as chiasmatic formulas that encapsulate the inherently interpenetrative nature of the relationship between body and language in relation to the bi- and multi-directional processes of interaction and adaptation that interconnect human organisms and environment. These processes take shape at both the phylogenetic and ontogenetic levels. Thanks to the semiotic action conveyed by symbolic-linguistic activity, humans are able to develop operational chains of means–ends patterns capable of shaping reactions to environmental stimuli based on a combination of factors that semiotically refer to and semantically presentify what is remote in both space and time. In other words, the interaction between symbolic imagination and memory allows environmental factors and organic elements to be treated in a diversified and sophisticated way as tools/vehicles aimed at achieving situations/objectives placed beyond the here and now. This means that in order to analyze human activity and its inherent ‘signify-*ing*,’ it must be assumed that both are mediated by imagination and therefore by culture. Thus, for example, a single movement of an individual’s body in the here and now may be aimed at achieving goals that involve elements remote in both space and time.

For illustrative purpose only, consider one of the gestures that people perform almost daily today, namely sending communications via messaging applications conveyed by the Internet. The movements of the fingers on the mobile keyboard are means aimed at shaping messages intended for subjects located at great distances, both spatial and perhaps even in time (namely, they may receive the message even days after it was sent). In turn, the reception of the message could be functional to the achievement of goals shared with the sender, to be carried out through activities to be

performed in places and times remote from both the sender and the recipient of the first message considered here. The meaning of the precise movement of the sender's fingers is driven and even molded—one might say—by something present or simply imaginable but nevertheless distant both in time and space. In general, the very habit of typing on a phone keyboard and the physical attitude that it implies when performed brings together, in an experiential and semantically unified situation, elements that are potentially placed at great distances in space and time. Although this is the result of cultural activity, it is anything but foreign or extraneous to the vital needs of the individual organism. Consider, in this regard, the gesture of sending an urgent message to a medical center to request an ambulance to rescue a person who has been hit by a car and seriously injured. Many things that are conveyed and made possible by technology today have become part of the (considered) 'ordinary' dynamics of survival. In this sense, especially if we take into account the ubiquity of the places where daily food is produced, we cannot avoid admitting that human bodies have normalized the incorporation of many distant 'elsewheres' (both from a spatial and chronological point of view) [101, 203–205].

Today, what is done or not done by individuals in the immediate surroundings depends largely on what is assumed and expected to come from several other places. Without adopting a semiotically informed hermeneutic perspective, it can be difficult to understand contemporary experience—but perhaps also the entire history of human beings as 'naturally cultural' animals. The human body, especially when observed in relation to the activities it performs, is similar to a map that refers to and includes and synthesizing operationally many spatial and chronological 'elsewheres.' Those 'elsewheres' are all incorporated, just as individual bodies are operationally incorporated into them. The phenomenology of bodies depends on these semiotic-teleological connections/relationships. Without taking them into account, we would remain blind to the real living space that hosts the activity of those bodies and their very existence, its past and future. This blindness to semio-phenomenal spaces is in fact the same as that which underlies the tendency to see the world as an archipelago of circumscribed places or spaces populated by 'things' identified on the basis of morphological features and (allegedly) perceptible by the senses through them. Exchanging these representations based on the perception of certain sensory stimuli for the 'real meaning' of those things overlooks the fact that their appearance is always integrated into processes distributed and spread across time and space. A portion of these processes is integrated into brain activity itself, even if not at the conscious level. This does not mean, however, that it is not part of the habits activated by individual organisms. 'Invisibility,' understood in a broad sense as non-presence with respect to sensory consciousness, does not imply non-existence or irrelevance on a semantic level.<sup>59</sup> In many cases, for reasons of brain function efficiency and mental activity, many aspects of experience are managed and processed below the level of consciousness.

For example, when we are engaged in other activities, we are not aware that we have a stomach. We realize how much it is integral to us and our psycho-physical equilibrium when we have a stomachache. As trivial as it may seem, this example

<sup>59</sup> For literature on this topic, I refer to [203].

serves solely to illustrate how ecological relationships (in a broad sense) that are semantically relevant to the life of the body can remain hidden, whether they are internal or external to the morphological boundaries that are normally assigned to body morphology. Nevertheless, it is sufficient for the overall relationships, coextensive with the processes that sustain conscious activity, to fail for the silent, the invisible, and the imperceptible to suddenly begin to reveal their presence and relevance. But this is exactly what happens to astronauts outside Earth and what would happen to any human being who had to deal with the experience of being in an environment different from the one their body has incorporated because of both phylogenetic/ontogenetic, biological, and cultural factors/reasons.

Analysis of the reports made by astronauts on the space station, and therefore in microgravity conditions, provides a vivid description of how the same sensorimotor patterns that enact the incorporation of object manipulation in those conditions must be rearticulated. This means that even the parts of one's body and their adaptive management are subject to reconfiguration or new setups, so to speak. These reconfigurations are possible and are processed fairly quickly by virtue of the functionalization/orientation of body movements in relation to the achievement of imagined goals/objectives. Both the neural schemata and pragmatic scripts triggered by similar environmental stimuli and activated operationally by the brain on Earth must be modified. Thus, for example, gestural sequences that on Earth would have catastrophic effects on the achievement of a specific goal or on the overall maintenance of the organism's vital balance may be perfectly functional and appropriate in microgravity conditions, and vice versa. These are true metaphorical transpositions/translations. However, it would be a mistake to think that metaphorical transposition can change the means while keeping the ends constant, immune to transformation. Every end is the summary of the means. It qualifies them but, in turn, is the result of their cumulative, relational, and synthetic integration. The 'meaning' of the end, in other words, is the outcome of the processive combination of the means. The goals achieved in outer space, if translated back into their terrestrial equivalents, would necessarily have to be re-metaphorized, probably giving shape to a third dimension that corresponds to neither one nor the other circuit of experience: *a third humanity*.

However, imagining ends in this way requires the use of language, and yet the use of language is consistent with communication/interaction. In the adaptation of astronauts in outer space, we can clearly see at work the so-called 4E articulation of the mind—or rather, according to the semiotic perspective proposed here—of the body-mind unity.<sup>60</sup> According to this psycho-cognitive approach, the mind is Embodied, Embedded, Extended, and Enacted. From a semiotic perspective, these features can also be attributed to the body. Diversifying the activity of the body according to purposes that serve as organizational criteria for operationally integrating environmental and interoceptive factors makes the entire noetic-pragmatic process oriented by them necessarily embodied, embedded in environmental relationships, enacted through experiential activity projected into space and extended to many *elsewheres*, including the mind-body units of other human beings. In outer space, human goals, even the simplest and most biologically necessary ones, require the integrated activity of mul-

<sup>60</sup> On 4E cognition see, for a comprehensive overview, [175].

multiple individual minds and bodies to be achieved.<sup>61</sup> On Earth, some vital purposes/functions can be successfully processed even by individuals in total solitude, thanks to the average permanence of certain boundary conditions integrated into the vital patterns and operations of the mind–body unit of each organism. Those same purposes/functions—think of the simple act of breathing oxygen—in outer space require the establishment of chains of means built and maintained intentionally by individuals who have operated or continue to operate at great time/space distance. Each individual object is made meaningful insofar as it is inserted into chains of adaptive and therefore teleologically oriented interactions, often shared by multiple individuals and in any case generalized/universalized communicatively through language. The very selection of the denotative and connotative elements that define its semantic/categorical spectrum is guided by values/ends that genetically mark the morphological boundaries of the category. To the extent that in outer space the means of achieving the goals integrated into the categorization of objects vary, the morphology of the categorical framework will also change and, consequently, the meaning of individual objects will also transmute.

From a semiotic and legal point of view, this semantic change linked to the relationship between categories and chains of means/ends integrated into the process of categorization and meaning production has significant implications. As a sign, each means integrated into a categorical framework is potentially endowed with extra-categorical relevance. This means that that signs can be integrated into different relational circuits depending on the ends that define their related semiotic-pragmatic frameworks [205].

Thus, for example, if breathing in space implies the predisposition of instrumental plexuses different from those necessary on Earth, its meaning will change and with it the corresponding categorical boundaries. Elements excluded on Earth will enter the category of ‘extraterrestrial breathing.’ However, since each activity is relationally intertwined in a network of other collateral or potentially competing activities, this can lead to the modification of other categorical frameworks. This change, in turn, will affect the values/purposes that underlie the selection of what is inside or outside each categorical spectrum. But that is not all. Inevitably, the last change will produce new modes of coordination and interpenetrative intertwining between the different ends/values, the respective categorical frameworks, and the means/ends chains underlying the achievement of each of them. Not even the logical schemas according to Lakoff and Johnson, determined by basic sensorimotor schemata, seem to resist the change in the semiotic-relational landscape imposed by the environmental conditions

<sup>61</sup> In light of this data from experiences outside Earth, I believe that the perspective labeled by [57] as the “intersubjective turn” takes on even greater significance. I believe that her words regarding the cognitive aspects of participatory sense-making in the enactive approach apply perfectly to astronauts and, as if in a mirror, to all human beings: “Relating with and understanding each other and the world together is then not in the first place a question of figuring out each other’s mental states. It is a rather a matter of participating in the creation and transformation of meaning together, between persons who each have their limited but inherently meaningful, evolving perspectives on the world, each other, and themselves, through acting and interacting.” [57: p. 454]. See also [131]. From an anthropological perspective, see [186]. In close connection with a semiotic-enactive approach, I have proposed an agentive-generative interpretation of human dignity (rather than an ontological-descriptive one) [208], which also applies to the experience in outer space and the chiasmatic relationship between nature and culture that it brings to the fore.

of outer space. So, for example, in conditions of microgravity or weightlessness, the logical/spatial categorical schema of ‘container,’ derived from embodied experience, would seem to no longer function with the same cognitive pervasiveness attributed to it by the two authors. Actually, can it be said that open containers are capable of performing their function of ‘containing’ in the absence of gravity? Anything placed inside them could easily escape their confines—think of water in a glass. Even closed containers, however, could present similar problems. Although physically unable to escape their walls, the items contained within them could affect their movement in space, thus neutralizing their function as ‘storage space.’ Think of a little dog in a carrier—a common experience for those who travel by plane. In the absence of gravity, much of the containment and isolation function performed by the carrier would be negated by the dog’s movements.

In the same vein this spatial-categorical remapping would also influence the respiratory activity mentioned above. If and to the extent that it depends on networks of intentionally designed and activated individual behaviors, can it still be said that it is an action internal to the individual body of the person breathing? The relationships between breathing and the activities of others displaced in space and time create a bridge between the external and the internal, between the psycho-physical self of the breathing individual and that of other individuals. This means that the freedom to breathe conditions the freedom of others to act. Breathing would acquire the meaning of a collective activity, in a certain sense ‘common’ and transindividual. The boundaries of the individual body should also be redefined.<sup>62</sup> What would an isolated human body be if breathing could no longer be considered an autonomous activity that can be configured and managed in a solipsistic way? What would remain of the idea of the ‘universal nature of the human body’—not to mention its metaphorical categorization as a ‘container’—if its breathing were distributed along a *continuum* of transindividual and collaborative activities? What would become of the idea of freedom, as well as its modern derivation in terms of ‘ownership of one’s own body,’ if every individual were deprived of that part of *dominium sui* (of Franciscan memory)<sup>63</sup> that also corresponds to breathing? Similar considerations could be applied to the principle of equality, as well as to human dignity. In outer space, the interpenetration between the world of facts and the world of values, between the empirical-categorical dimension and the axiological/teleological dimension, is almost uncontrollable and omnidirectional. The entire landscape of experience and the fabric of its signifying seem to reveal, in that different environment, a close resemblance to that of a multi-colored tapestry. Pulling a thread on one side implies the unstitching and chromatic remodeling of other parts, perhaps distant from the first. Transposing bodies, minds, activities, and meanings into outer space seems almost to impose the unstitching of all the threads that make up the tapestry of earthly experience and its recompo-

<sup>62</sup>As for the metaphor of the ‘container’, its metaphorical extension to categorical boundaries, and its inappropriateness from a relational-semiotic point of view, there is a pragmatist-transactional essay that has been unjustly overlooked but which, in my opinion, is of considerable relevance, not least because of its emblematic title “The Human Skin: Philosophy’s Last Line of Defense”: [12]. From a phenomenological perspective, see also [24], unsurprisingly criticized as aporetic by those who do not intend to abandon a ‘conceptualist’ epistemological perspective [185]. By the same author see [23].

<sup>63</sup>See [98, 255].

sition according to new assemblages, new chains of couplings, intersections, and connections.

Re-weaving the tapestry of human experience in outer space, as well as on other planets—should we ever manage to settle there—would imply reshaping all its figures, including that of ‘natural’ corporeality. In all likelihood, the ‘natural’ should undergo a thorough review/renewal, inevitably based on cultural or ‘un-natural’ premises/criteria, in order to ultimately be ‘renaturalized’ (if one can speak of ‘an ultimate step’ in proper terms). However, this ‘re-naturalization’ would be nothing more than the outcome of a process of semiotic-material re-universalization, insofar as it would have to interpenetrate both language/culture and the factual/empirical dimension of human experience, of the world as lived and ‘understood.’

If, in light of this last consideration, someone were to ask whether nature is conceivable only insofar as it is ‘culturalized,’ I would immediately add that my answer to such question is affirmative. Unless one wants to refer to a noumenal nature—which is the most artificial and metaphysical thing imaginable—I do not believe that there is ‘nature’ as an object of knowledge that is not semantized and, therefore, involved in cultural experience. In this regard, I can admit that the word ‘nature’ is used as a support for a sort of absolute metaphor, so semantically vague that it functions as a sort of cognitive and pragmatic horizon destined (like all horizons) to shift infinitely. In this sense, every step forward in the knowledge/culturalization of nature contributes to determining the extent and direction of that shift. On the other hand, this argument also applies to ‘human nature,’ which is implicitly or explicitly included in the expression ‘human rights.’ In the outer space, the ‘natural’ content of these rights, considered in its very core meaning, depends and will depend on how cultural activities will re-make nature itself. And, according to a sort of circular connection, what human beings will be able to do culturally will also be the effect of how they have transformed their bodies, their mind-brain units, understood as a crossroads of semiotic-environmental relationships. What is happening and will happen in space, however, is only a particularly obvious, explicit, and eloquent example of what is happening at a slower pace on Earth, where the conditions surrounding the human cultural experience are more stable.

Understanding, in relation to the interpretation of human rights—for example, the right to health—what the nature of water is, what the meaning of the word and the ‘thing water’ is in outer space, would require the rearticulation of all the contextual processes underlying and surrounding this element and its inclusion in human existential experience. In this sense, we should have a ‘verbal-dynamic’ understanding of the thing and the word water, rather than an ontological-morphological one. Individual access to water in outer space involves the implementation of a series of environmental preconditions and activities that profoundly alter its meaning. To be clear, a given quantity of H<sub>2</sub>O would be inconceivable as being directly connected to the body. The weight and importance of the intermediate activities required to make it available for assimilation would be so semantically and pragmatically relevant that it could not be overlooked or taken for granted [194, 210].

I understand that someone might observe that ‘at the end’ of the process there would always be that amount of H<sub>2</sub>O and a body that assimilates it. The point, however, is that ‘this end/final stage,’ which would also be a ‘purpose/end,’ will epitomize

a chain of situations/means such as to completely change its meaning.<sup>64</sup> There is no doubt that, observed and semantized only chemically, a quantity of Au (gold) located in an underground vein is the ‘same’ as that kept in a bank safety vault. However, the meaning of the ingot and the gold under the mountain are very different, and the experiential implications of the gold vein under the mountain—and therefore its meaning—are a consequence of those implied in the production and use, i.e., in the past and future, of the ingot. Being ‘Au’ is only a small, albeit important, part of the ‘gold thing’ inserted into the flow of existential relationships and its own transformations (think of its use in many technological artifacts, as a conductor of electricity, as jewelry, as a medical device in aerotherapy or in related nanotechnological applications used in dentistry, oncology, and throughout the diagnostic sector, etc.). Similarly, access to water in outer space involves a tangle of relationships and processes that affect both the political and biological aspects of the dynamic coexistence between the bodies and minds of different individuals. The meaning of water as a ‘thing’ could ultimately only be generalized/universalized as an epitomizing and forward-looking, retrospective and prospective, synthesis of all these changes.

The re-semantization process described above could not be carried out except in a pluralistic and polyphonic manner through linguistic-pragmatic interactions between multiple individuals. To wit: in outer space, there is no solitary individual who approaches the river—which already exists regardless of human activity—to drink. Out there, water—both as a word and as a ‘thing’—is tremendously and deeply intertwined in a web of interactive ends/values/practices that make it explicit, visible, and semiotically not underestimated. Each of these activities or situational circuits is connected to multiple teleological and axiological frameworks that must be recombined with each other to establish what should be included or excluded from the spectrum of semiotic/semantic implications—and therefore categorical in a broad and reticular sense—of the word/thing water. The result of all this, in short, is the need to initiate a process of re-semantization/re-universalization of the meaning of the word/entity water and, consequently, of the existential and pragmatic relationships that derive from it. The meaning of water, and therefore also its very existence, will depend on what we decide to do based on the values/goals set as the horizon of action and the cognition that supports it. However, the triad of knowledge, decision/evaluation, and action will also redetermine the phenomenal being of water and

<sup>64</sup> Moreover, this semiotic change also affects other living beings’ access to water, which in turn is closely linked to human survival. A concrete example concerns plants and their cultivation in conditions of microgravity—for example, on the space station—using the technique of aeroponics. This technique allows plants to grow in conditions of zero and low gravity, thus circumventing the problem of poor water distribution among the roots caused by the different gravitational coefficient of the environment compared to Earth. Aeroponic cultivation eliminates the soil substrate for the roots, conveying the absorption of water and nutrients to the plants through hydrogel solutions or through the vaporization of water solutions in which the same nutrients are diluted [99]. Despite the persistence of certain morphological characteristics, under these conditions the relationship between water and botanical water receptors—namely, these plants bereft of Earth/soil—changes profoundly. However, the change does not only affect these two ‘actors’ in the situation. From a semiotic point of view, it is not difficult to understand how the meaning of ‘water’ and ‘plants’ embodies networks of dynamic relationships with the environment and its inhabitants (including humans) that are profoundly different from those (usually) existing on earth. Aeroponic solutions are also designed for soils where regolith is predominant, such as on the Moon or Mars. See, in this regard, [43].

everything that comes into relation with it—including, therefore, human beings and their bodies ‘made of water.’ To the extent that this process involves goals/values and affects the coordination of the activities of many human beings, it inevitably also brings into play the law and its axiotelic and normative fabric.<sup>65</sup> Human rights, also due to their transnational and transcultural scope, are at the forefront of this dynamic of mixing facts and values. Bodies, objects, and actions that make up the descriptive part of legal provisions change meaning along with the recombination of ends and values. The means and values/ends, as I have tried to show above, processively interpenetrate each other and, along this path of mutual transformation, the categorical boundaries and semantic frameworks also are inevitably involved in the change. This means that the meaning and scope of expressions such as ‘freedom,’ ‘equality,’ ‘dignity,’ ‘right to health,’ ‘freedom of movement,’ etc. will have to undergo a phase of re-semanticization and re-universalization. In this regard, to remain at least dumbfounded, one need only ask: free to do what? Equal in relation to what? Endowed with dignity in what respect? Healthy in relation to which body and which ways of satisfying its vital biological needs [8] ? The metamorphoses that each ‘what’ nestled in the list of these questions would undergo would generate many others in a multidirectional way with reference to countless other values/ends, objects, and behaviors whose meaning cannot be predicted through preventive speculations that can be developed aprioristically.

To draw the strands of the interdisciplinary discussion developed so far, as I approach the concluding section of this article, I would like to take a step back and briefly re-graft the considerations made in the first part regarding onto the argumentative fabric just proffered.

All in all, I would argue that off-Earth human beings are not the same as those living on the planet from a material or axiological point of view, nor from a factual or legal one. And they are not the same because the evolutionary relationship between nature and culture that shapes their ‘being’ on Earth transforms them deeply and inherently.<sup>66</sup>

I fully understand that this observation could easily and immediately be countered by an objection related to the so called ‘naturalistic fallacy.’ Why—someone could contend—should *natural/empirical* changes alter the dimension of what ought to be and, therefore, of rights? Should we perhaps think that rights, what ought to be, are caused by the natural dimension? Thinking that the dimension of rights is the realm of freedom opposed to that of natural constraints and causal determinants does not depend, however, on what is identified with ‘nature’ and on the inevitably cultural character of this identification. The circularity between nature and culture is recognized by both ecological and anthropological thinking.<sup>67</sup> What I would like to draw attention to, however, is the impossibility of inserting a semantic pause between being and ought to be within the same language of rights. From human rights to more

<sup>65</sup> In this regard I refer to [199, 200, 204] and the bibliography included therein.

<sup>66</sup> In light of the above, this is yet another reason why I believe that the debate over whether astrobiology can be distinguished from astrobioethics (see nt. 12) should be viewed within the context of the chiasmatic perspective mentioned earlier.

<sup>67</sup> See, with regard to outer space, [181].

specific provisions concerning property, types of crime, etc., legal language and legal propositions always presuppose—for the most part implicitly—a state of affairs that overdetermines the meaning of legal provisions. Even when the natural law character of rights is denied, it is the language of rights, its necessary belonging to the *modus of possibility*, that integrates into its horizon of meaning natural conditions that are stable and pre-existing to those pursued by legal provisions. Without these ‘natural’—or even presumed as preemptively extant—prerequisites, the means/ends relationship between human actions and concrete situations transformed into deontic/legal ends would be altered and even eliminated from every horizon of possibility and plausibility. Becoming ‘bereft’ of those preconditions—which might be dubbed ‘conditions of earthiness’—is precisely the experience that human beings will inevitably be doomed to undergo outside the Earth. Under such conditions, the spatial alliteration of the legal principles and rules in force on Earth would inevitably lead to a heterogenesis of ends. This would happen, however, not because of external limits—namely natural ones—to the meaning of human ends, to the goals of freedom, or to the practical scope of duties; or, at least, not exclusively. In my view, transfiguration already takes place within the language of rights, in the sphere of freedom and culture.<sup>68</sup> And precisely in this regard, I would like to propose the following remarks.

That something is invisible, blurred, not subject to conscious representation, does not in any way make it belong to the ‘natural’ dimension. Natural and unconscious are not synonymous, nor are they coextensive. Legal language, especially in its descriptive or constative parts, is floating on a sea of cognitive/behavioral habits and empirical contexts that are not mentioned at all in regulatory provisions. However, they are an integral part of the meaning of what is expressly provided for within the dimension of ‘ought to be.’ Even if not stated, what is implicitly included can also be the result of a cultural activity. This is not only because humans pragmatically modify the external environment and what constitutes it. Even looking at and categorizing visual experience involves a process of selection, focusing, and culling among the elements that are involved in the flow of experience. Many times—maybe too many times—humans forget and put aside their contribution to the creation of what they perceive and mean in the (presumed) outside world, transforming the stability of their relationship with it into objectivity. The experience of outer space disrupts this stability and the certainties that go with it. When included in legal norms, the meanings of terms relating to objects, places, events, and behaviors are not independent of their relationship with ends and values. What is or is not a road, a knife, or a glass; what should be included or excluded from the checklist of a category or a categorical set: all of this depends on axiological and teleological assessments. Within legal systems, to be more precise, these choices rely on their compatibility with the values/purposes at the top of the chain of legitimacy of the legal systems and their rules.

As the relational tapestry through which human experience unfolds undergoes deep turmoil, also due to radical environmental changes, the relationships between means and ends, as well as between empirical and teleological elements, inevitably change as well. And they change not only, as I already stressed, for external rea-

<sup>68</sup> ... just to recall a book by John Dewey that remains astonishingly relevant today, titled ‘Freedom and Culture’ [70].

sons, but also because the universe of meanings relating to the world and enclosed in legal language readjusts itself: in a sense, it is compelled by intrinsic reasons to find another situation of equilibrium. More specifically, achieving a new equilibrium in the means/ends relationship changes the meaning of empirical or constative terms enclosed in legal rules. This is because—as observed above—every ‘signified object’ is the epitome of the overall relationships that underlie its morphological appearances, both retrospectively and prospectively. When these relationships change, involving other unprecedented aspects, both the axiological-teleological import of an object, event, or behavior and its categorization will change. In strictly legal terms, these changes in the characteristics of what is subject to legal qualification will also affect its rules, principles, purposes, and values, differentiating their semantic scope. This overall change in the profiles of semantic-axiological relevance will generate new ways of articulating the legitimacy/illegitimacy dichotomy and, therefore, also the methods of categorization and interpretation of the terms included in the normative language.

What is particularly interesting about the above semiotic/semantic readjustment within the legal universe in outer space (or off-Earth situations) is that it has a much greater impact on the so called ‘factual’ experience than it does on Earth. And this is not only because ‘being’ and ‘ought’, at least asymptotically, imply a horizon of mutual attunement, even if not actual coincidence. In outer space—which is still a truly unknown pragmatic dimension—the gap, the asymmetry between planned experience and actual experience is inevitably very high. In conditions of zero gravity or on other celestial bodies, the generative co-implication between nature and culture is and must be linked to the fact that much more than what is taken for granted on Earth must be intentionally and artificially—if this word still makes sense—elaborated. Human beings and their empirical-existential relationships are not biologically stable, pre-assured. Being living humans in outer space is the result of continuous adaptations gauged on intentionally targeted goals and values. In other words, the chiasm between nature and culture, between being and ought, is drawn into a dynamic spiral as soon as humans leave Earth and its environmental conditions behind. Nature and phenomenal instantiations are the result of the values and ends that human beings qualify as guides for their actions. Objectives, goals, and values cannot be divorced from the framework conditions to which human action itself contributes enactively. The resulting circularity occurs at the semiotic level, i.e., it crosses both the noetic and material dimensions and determines their continuous and mutual transformation. In other words, law and nature are interpenetratively co-implied in the production of experience, both in its material and noetic components. *À la Protagoras*, one could argue that in outer space human beings will be, and will not be, what they decide they must be—at least in part.

All this seems to suggest that a presumed immutable human nature as well as its culturally determined characteristics, which are silently involved in the discourse on human rights, cannot avoid becoming ‘un-natural’ and even ‘un-human’ in extra-terrestrial conditions. This is because the only anthropological strategy for remaining human out there is to become something different from ourselves [252–254].

From this perspective, anthropology and law<sup>69</sup>—and specifically human rights—can be considered as two sides of the same coin, neither of which can be understood as opposites or static, but rather as mutually in-the-making. My work in the intercultural field,<sup>70</sup> straddling different cognitive/experiential universes has led me over time to believe that the circularity between nature and culture, between being and ought-to-be, is a constant phenomenon even on Earth. The experience in outer space, with its putting in brackets of many basic existential conditions, is capable of bringing out with particular immediacy the co-implication between thought and matter, noetic and empirical dimension.

Becoming aware of the dynamic naturalness of authentic human experience in outer space can be a powerful epistemological tool for understanding the implicit limits of the current interpretations, conceptions and uses of human rights on Earth. Unfortunately, what is occurring in the transnational political debate seems to be going in exactly the opposite direction. In most cases, human beings think of themselves and their activities in space with their ‘head on Earth.’ In this way, they do nothing more than shift/alliterate their identity with themselves and, above all, with their limitations, their idiosyncrasies, their blindness to anything that is Other, including the unknown part of themselves, in the off-Earth elsewhere(s).

This situation is entirely echoed by both the political debate on the economic exploitation of celestial bodies and by the emerging regulatory provisions in this area.<sup>71</sup> The ‘anthropological diversity’ of the experienced world outside Earth seems to be completely outside the *visual range* of those involved in the political and legal debate on these issues. The close links between proxemics, meaning, and the teleological behavior of human beings<sup>72</sup> seem to be completely ‘evicted’ from the cognitive horizon of international political and legal discourse and its idiomatic and blind ways of conceiving, for example, appropriation and economic activities outside Earth.

For example, the debate on so-called ‘commons’ also reveals something surreal when referring to extraterrestrial items. The question, once again, is: ‘Commons for whom?’ What is ‘common’ outside Earth? In reference to which human beings should one speak of ‘common’? [206]. Answering these questions cannot ignore the issue that triggers the need to re-semanticize human rights when displaced and re-adapted to off-Earth environmental conditions and the related transformations. The ‘human’ or whatever one wishes to understand by it included in the expression ‘human rights’ can only be named on condition that a renewed process of intersubjective ‘universalization’ is set in motion.

From a certain point of view, the ‘alienness’ of extraterrestrial living conditions provides a sort of ideal situation for reactivating—as in a sort of experiment—the

<sup>69</sup> ...although perhaps it would be better to say, ‘anthropological and legal imagination’.

<sup>70</sup> See [203].

<sup>71</sup> In this regard I refer to [206] for bibliographical references and more generally the considerations professed.

<sup>72</sup> See [34, 155, 156, 231, 250]. In my view, the perspective offered by [35] regarding the dynamic relationship between the body and work in outer space—and its cognitive and socio-political implications—is of great significance.

process of universalization that underlies the production of language and its meanings. Adopting a deeply anthropological outlook, the cognitive and practical shock generated by being orphaned from ‘earthliness’ undermines all the epistemic and behavioral habits that, on Earth, are ‘laced’ with injustice, power, and the desire for domination. In other words, everything that human history has generated alongside and to the detriment of the genuine practices of producing the experience of intersubjectivity and universalization indispensable to the invention of language could be relativized. When it comes to the unknown, the uncharted, which denote experience in space, every human being is decentralized, marginalized, regardless of their position of power. These are precisely the ideal situations for interaction processes capable of producing universalization, since the willingness to activate them is prompted by reasons of necessity and, at times, even survival. All this obviously presupposes that the relationship between cognition, meaning, and rights is fundamentally rethought with respect to the conservative and guarantee-based interpretations that characterize the logic and hermeneutics of human rights themselves.

#### **4 In the End: Fear and Future**

My hope is that this article can give a critical contribution to the debate on issues relating to ‘outer space’ that affect ‘the idea of ‘human,’ even if only by raising public awareness of a crucial issue: who is and who will be the human being outside Earth? Virtually none of the legal categories that give rhythm to everyday life in different cultures on Earth could remain unchanged when transferred into space. As repeatedly emphasized, this is because the implicit anthropological and ecological assumptions that underpin the meaning of those categories will transmute. Along with these categories, human rights and their meaning will also transfigure, and this goes far beyond the problems (undoubtedly very harmful and a source of enormous iniquity both locally and globally) that are associated with the relationship between universality and diversity on Earth.

On the other hand, I fully understand that the prospect of having to semantically and pragmatically re-universalize the meaning of ‘human’ can be frightening. After all, human rights have been ‘invented’ and ‘invoked’ throughout history in an attempt to build a barrier against power and violence. The way these rights were presented invoked the ‘naturalness’ of the prerogatives and lived situations that constituted their content for the purpose of guaranteeing them. Although in many cases the discourse on human rights has been aimed at revolutionary purposes, at subverting existing social conditions, this aspect of guarantee, stabilization, and untouchability of something taken for granted has always characterized both its spread and its acceptance as a successful political device. It is also true, however, that it was precisely this conservative inclination that allowed the identity of the most powerful among those who claimed human rights to be passed off as universal. The instrumental and exclusionary use of these rights that ensued has rightly been the subject of criticism against the entire philosophical-political project that supported their national and international

institutionalization.<sup>73</sup> Despite criticism, however, even peoples who have been victims of discriminatory and misleading interpretations of human rights have gradually shown that they do not want to give up a discursive platform that is abstractly open to embracing processes of universalization.<sup>74</sup> This is all the more true today, at a time when some jokers, who until recently exploited human rights and the logic of liberalism, think they can happily and recklessly declare that they no longer exist, that they are worthless simply because... they no longer serve their particular interests. Faced with all this, I realize that abandoning a conservative and rights-based interpretation in favor of processes aimed at re-universalizing their content could, in the minds of many, give rise to an uncertain future, if not one prone to catastrophe.

Nevertheless, stubbornly clinging to the past without trying to understand why something—in this case, human rights—no longer works has never protected anyone from danger, but rather has contributed to increasing it and making it more imminent. Beyond the political arrogance of certain national and international actors, the malfunctioning of human rights may also depend in part on the inability to update the patterns of understanding and categorization of the phenomenal world that give content to their practical implementation. I believe that the example of water and its significance in outer space provided above is very useful as a paradigm for analyzing the human rights crisis on Earth and its causes.

The relationship between humans and water is crucial for the concrete assurance of the enjoyment of many human rights, simply because without access to water, humans themselves are structurally compromised. Climate change, related ecological alteration, and human consumption habits are increasingly exacerbating the scarcity of water resources and the difficulty of accessing them for a growing number of individuals on the planet. The meaning of the ‘word/thing’ water is simultaneously changing. Some do not hesitate to metaphorically rename it ‘blue gold.’ The range of human activities prompted by the need to ensure access to water in the new overall environmental conditions is extraordinarily vast and varied in content. Much of what could previously be considered normal or taken for granted suddenly becomes the subject of intentional, teleologically oriented activities in a complex way. In retrospect, our awareness and understanding of the relationship between humans and water resources in the past is also changing, making evident and pragmatically salient (if not even polarizing) what until recently was so obvious/implicit that it remained almost ‘unknown.’ [194].

Today, it is increasingly clear that it is almost impossible to distinguish water itself from its hydro-affordances [210]. This is because contact with drinking water, for example, by most humans is the result of a series of activities, tools, hydraulic devices, pipes, and containers, which make the ‘liquid that can be drunk or used for other purposes’ a product that embodies long chains of interactions between mind–body units and the environment. Therefore, saying ‘water’ implies all these interactions in a semantic sense, both retrospectively and prospectively. However, from an anthropological point of view, the alteration of the conditions of access to and consumption of water is still slow to become a ‘common’ element of the cognitive and

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<sup>73</sup> See [203].

<sup>74</sup> I refer to [198].

behavioral habits of most human beings. The reticular, if not magmatic [207], nature of the implications of water with respect to the entire semiotic universe coextensive with the cosmos of human action and life/survival itself has yet to be explored in depth. It would be sufficient to consider the *hydro-legal* connections underlying the enjoyment of human rights to understand how much the lack of ‘water knowledge’ and its semiotic-pragmatic projections can be converted into a polarizing, dialectical, and even conflictual invocation of the ‘right to water’ and all rights—first and foremost the right to health—that are related to, if not dependent on it [194, 210]. It is precisely in these situations that the propensity for violence compensates for or immediately follows the lack of ‘intelligence’ in the phenomena unfolding through the environment. Those who declare that human rights are in crisis or no longer exist fail to realize the semantic-pragmatic tidal wave that would be produced if this assertion were taken to its extreme consequences. To defuse the catastrophic implications of the ‘denial of human rights’ on a global scale, it is necessary to activate what lies at the basis of the processes of semantization, of language creation, namely the universaliz-*ing* interaction that supports intersubjectivity. This is a semiotic task that only an adequate awareness of the signical character of life experience can manage with a planning and self-reflexive attitude attentive to the relationship between means and ends.

Precisely in the perspective just proposed, the experience of outer space, with its apparent exceptionality—i.e., its ability to suspend many of the boundary conditions that exist on Earth—can function as a mirror in which we can *reflexively* learn to understand the invisible side of Earthly normality. I do not think it is an exaggeration to say that the spatial transposition of human experience would, if it were to expand, trigger the need for a constant commitment to intercultural translation between the *un-human* outside Earth and the *human* on Earth. Those who go into space—as we can see in the accounts of many astronauts—embody, in both a noetic and material way, the being and becoming of the other than Self, which in this case is even materially the other of one’s own Self. The ‘I,’ by virtue of its involvement in this particular self-alienating reflection, makes immediately graspable the relational and symbolic nature of identity with ‘I(t)self.’ In saying this, I am referring to its inevitable constitution as a third instantiation that emerges from the continuous flow of translation between the Self and the Other. A thirdness gushing out from the stream of semantic-categorical universalization that it itself generates and that is constantly renewed by the conscious and environmentally responsive use of language. The other (human) extraterrestrial and the other from oneself on Earth would thus draw a sort of orthogonal cognitive plane. Its operational function would integrate the dependence of human beings on ongoing universalization processes without which there would be neither language nor (human) corporeality. Something that humans themselves live and experience—albeit with colossal syncopations, as it were—already in the current evolutionary phase, by virtue of the dynamic interpenetration, mediated by technology, of both the linguistic and bodily phenomenal instantiations of their ‘being human.’

The conclusion of the above arguments is that the human species cannot avoid constantly reinventing/re-semantizing the content of human rights cognitively. This is because outside Earth, as on Earth, they are naturally what they decide or do not

decide to do with the environment and with themselves. The practically infinite responsibility that comes with this condition is coextensive with the indispensable, infinite willingness to be responsive that it requires. This combination is symmetrical to the nature/culture chiasm and, however paradoxical it may seem, places the yardstick of responsibility not in the past, in what has already been, but makes it coincide with what lies in the future [117, 221, 233].

The issue of human rights in outer space dramatically raises the question of whether humans are capable of living up to their own potential. The current trend emerging on a global scale of leaving decisions about the present and future in the hands of individuals who lack foresight and are compulsively focused on achieving immediate goals does not bode well. Human rights themselves, dismissed and underrated in public planetary discourse, risk, at the same time, being increasingly exploited in a conflictual manner, in direct proportion to their formalistic rigidity and their backward-looking, exclusively conservative and guarantee-based interpretations. This is a tremendously worrying predicament because the more the conditions of experience both outside and on Earth change, the more the semantic rigidity in the interpretation of human rights will become a weapon to be used against others, to the point of determining their total negation.

Failing to understand how much the ‘unprecedented nature’ of our first steps in outer space unveils about our present and failing to seize the opportunity to implement it in our plans for the future could leave us bereft of human rights. But remaining orphaned of human rights means risking being left without the words we need to ‘name’ ourselves, to know ‘who’ or ‘what’ we humans are in front of our fellow *human animals*.

In all fairness, witnessing the ubiquitous proliferation of national regulations that attempt to establish para-terrestrial boundaries for the economic exploitation of outer space and its resources is a disheartening sight. Humans are still ‘crawling’ out of Earth, and they are already trying to transfer the worst of themselves there. I would like to conclude by underscoring that, nevertheless, this is not a moral or political catastrophe, but rather a tragic cognitive bankruptcy with unpredictable evolutionary implications. I can only hope that ‘human nature’, the same nature invoked as the ontological premise of human rights, will, through an epoch-making human awakening, become ‘wisely unnatural’ so as to avoid the otherwise inexorable advent of a sidereal Babel.

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