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# Physics and metaphysics of the *apparatus*: Mapping and contextualizing the concept in Flusser's published work

"Während nur eines Zungenschlags
gibt es Urknall und Wärmetod
vom roten Riesen bis zum weissen Zwerg
die ganze Skala
Mir fallen kosmische Dimensionen
aus dem Mund…".

Einstürzende Neubauten (1993)[1]

## I. An interpretive micro-apparatus

The word *apparatus* figures among those terms and concepts which, over the past three decades, have remained –on grounds that are anything but insignificant– at the forefront of intellectual and scholarly inquiry, especially within lines of thought of continental origin or inspiration, whether philosophical, epistemological, cultural-critical, historical or otherwise. To suggest that this is merely an academic "trend" would be, at the very least, misleading, as the concept of *apparatus* condenses and defines a cluster of exceptionally important questions concerning the nexus of Western scientific-technological rationality, domination and being. A substantial part of contemporary academic discourse, both within and beyond the humanities, revolves around these questions and is organized through them.

Thus, if we return to the interpretive complexities involved in the term *apparatus* and pose them anew, this is because the term –in its structural relation to certain others, such as "programme"– appears to occupy the position of a master signifier, one that encapsulates the essence of an epoch, "much in the same way that the 16th century is loosely characterized by the term

[1] Opening lines from "Die Interimsliebenden," written by Blixa Bargeld and released by Einstürzende Neubauten on the album *Tabula Rasa* (1993). The English translation quoted here is the official version published on the band's website: "In the space of just one slipped beat of the tongue / there is big bang and total entropy / from red giants to white dwarfs / the whole scale / of cosmic dimensions are falling / out of my mouth…".

"virtue", the 17th by "nature", the 18th by "reason" and the 19th by "progress" (Flusser & Maltez Novaes, 2013, p. XII).

More specifically, it is a term of decisive importance for understanding Flusser's thought on the operations and ontological consequences of scientific-technological rationality and its manifold manifestations – something that has already been approached and explored from a range of perspectives by Flusser scholars such as Guldin (2009 & 2024), Wojnowski (2017), Pedroso (2021), Zhou (2026) and others, whose important contributions will be referred to at relevant points throughout the discussion. The present study builds on these significant contributions while pursuing a broader and more comprehensive (yet by no means complete or exhaustive) mapping of the term itself and of the different conceptualizations it assumes across Flusser's work.

In a certain sense, then, one might say that the present text –like any text of this kind– undertakes to function as a particular interpretive micro-apparatus. Arising within the Flusserian textual mega-apparatus, the interpretive apparatus at hand is set up to trace, locate, apprehend and process certain elements and patterns of thought capable of enabling a fuller understanding – in this case, of a concept and, through that concept, of a mode of thinking and a philosophical, ethical-political stance.

## II. Precautions and delimitations

Mindful of the condition of incompleteness that permeates every interpretive undertaking, the present text seeks to trace and carefully attend, in a necessarily concise manner, to the way –or, rather, the ways– in which Flusser conceptualizes the term *apparatus* at some of the most central and decisive moments in its development. This point is particularly important: what concerns us here is the constitution and semantic articulation of the term as a concept rather than, for example, the metaphorical uses of the term that may occur in Flusser's work (something that could itself form the subject of a separate study). At the same time, this text attempts to highlight the philosophical stance implicit in these conceptualizations towards both the Western metaphysical tradition and the world shaped by scientific-technological rationality.

The conceptual and philosophical inquiry set in motion in the pages that follow is essentially interrogative, at times even aporetic, in tone. This needs to be emphasized in order to guard against the risk that what follows might be understood as a body of certainties or as a set of authoritative interpretive pronouncements.

For reasons of economy, moreover, the present text will not attempt to map or present the possible explicit or latent affinities between Flusser's conceptualizations and other understandings and uses of the term arising from different theoretical contexts (one such possible affinity that

readily comes to mind is that with Giorgio Agamben's elaboration of the term *dispositif*, which he takes up anew from the vocabulary of the late Foucault).[2] However fruitful and tempting a comparative treatment of related uses of the term *apparatus* –together with their specific contexts– may indeed be, particularly as a means of investigating and identifying possible points of convergence and divergence, the present text will resist the temptation to pursue such connections. Such an undertaking lies, on the one hand, outside its stated aims and, on the other, far exceeds its ambitions.

In view of the complexity of the question under consideration, it seems appropriate to begin by "reconnoitering" and delimiting the terrain. Although the figure of the *apparatus*, along with the problematic to which it is structurally coupled, recurs either directly or indirectly throughout Flusser's published *corpus*, we shall, once again for reasons of economy, approach it selectively and by way of example, following a sampling logic. Our discussion will therefore focus on a number of specific passages drawn from four distinct textual *loci*: at a first stage, we shall turn to the lecture text "Le vivant et l'artificiel" (Flusser, 2019), written in French in 1984 on the occasion of an exhibition-symposium. At a second stage, we shall examine his short book *Towards a philosophy of photography* (Flusser, 2000), first published in German in 1983. At a third stage, we shall consider *Into the universe of technical images* (Flusser, 2008), first published in German in 1985. Finally, at a fourth stage, we shall address *Gestures* (Flusser, 2014), first published in German in 1991.

The selection of the specific passages from the specific textual *loci* was guided by the high degree of conceptual density they display, both in their treatment of the term itself and in their elaboration of the broader conceptual and philosophical context within which the term is inscribed (critique of metaphysics, power and scientific-technological rationality). A further reason for choosing these particular textual *loci* is that they enable us to trace the different levels on which Flusser's thought unfolds. In any case, again, what is at issue here is a deliberate selection of textual *loci* of particular significance and conceptual density, not an exhaustive mapping or comprehensive inventory of the term's uses.

## III. Excursion into the origins

Generally speaking, although the term emerges and develops in a non-systematic manner across Flusser's published *corpus* (his books, articles and lectures), its various occurrences nevertheless display a notable degree of interpretive and conceptual consistency. If, before turning to the

[2] The possible relationship between Flusser's *apparatus* and Foucault's *dispositif* has already attracted attention, as evidenced by the discussions of Guldin (2009, pp. 7–8) and Zhou (2026, pp. 11–13). Guldin treats the comparison in terms of points of contact rather than conceptual identity, whereas Zhou draws a distinction between the Foucauldian *dispositif*, constituted through heterogeneous relations of power and knowledge, and the specifically programmatic, automated and "black-box" character of Flusser's *apparatus*.

selected textual *loci* identified above, we were to attempt a very rapid (by no means complete or detailed) overview of the term's appearances, we might say that the intellectual ferment and preliminary conceptual work that prepare the ground for the emergence of the *apparatus* as a concept are already discernible in the writings of Flusser's early period.[3]

One notable example from this early phase of Flusser's work is the fundamental and, in many respects, foundational article entitled "On Programme", published in the Brazilian newspaper *O Diário* in 1966, which is worth considering for a while In this article, Flusser introduces and elaborates the concept of *post-history*, treating it as synonymous with a vast enterprise devoted to the programmatization of the entire spectrum of living. Under post-historical conditions, society is designed and called upon to function according to an apparatic model derived from that of technical devices (photographic, computational and otherwise). What these devices have in common is that they are designed and programmed to operate according to specific rules built into them. Once they cease to comply with these rules, they become inoperative – or, put differently, "dead". The "life" of such devices can unfold only within the unsurpassable limits set and embodied by their rules of operation.

At the level of post-historical society, the human mammal tends to be reduced to a mere "functionary" of automated systems – not only photographic, computational and other technical systems, but also of the social systems and subsystems within which it exists and participates. In doing so, however, it unconsciously contributes to its own gradual transformation into an automated –that is, predictable– device: to the extent that media, in McLuhan's sense, come to function as extensions of the human beings who use them, human beings are, in turn, deconstructed (through technology and technics) into a set of discrete components that function as extensions of the media with which they are coupled. The now dominant functionalist demand for complete transparency and predictability –a demand that permeates every modernizing technocratic political project aimed at optimizing social systems through their extreme functionalization according to built-in rules and their progressive movement towards full automation (the vision of a fully "debugged" society running "on autopilot")– is interpreted by Flusser as the repellent vision of a "technological paradise" in which everything is governed by the law of "the predictable eternal return of the same" (Flusser & Maltez Novaes, 2013, p. XII), a phrase that, it should be noted, bears no relation to Nietzsche's conceptualization (or rather to his doctrine) of the same name.

If, then, the term *apparatus* was already being worked out in Flusser's1966 article, without yet being explicitly named, it appears to have been formulated, defined and conceptually developed

[3] The prehistory of Flusser's use of the concept has already been explored by Guldin, who traces its emergence back to Portuguese texts of the first half of the 1960s and points to a heterogeneous constellation of possible sources, including Kafka's administrative machinery, Čapek's robots and the Prague Golem tradition (Guldin, 2009, pp. 1–7).

from 1983 onwards (it should be recalled that we are referring throughout to Flusser's published *corpus*). Indeed, it seems that *Towards a philosophy of photography* (1983) may be considered as the birthplace of the term, establishing the foundations for its subsequent elaborations. Let us, however, proceed in the order outlined above and turn to the selected passages in which the concept is developed.

## IV. The "subject-object" relation and its complexities

In an attempt to sketch, in broad outline, the present and future of the foundational Western ontological distinction –established as early as Parmenides– between the *natural* (in this case, the animate and living) and the *artificial* (the inanimate and non-living)[4] in the modern and postmodern era, and taking the question of artificial intelligence as his point of departure, Flusser identifies at one point the common source of two dominant tendencies: the programming of non-living objects in the image of the living and the programming of the living in the image of non-living objects. These two tendencies, he argues, are inevitably destined, in the not-too-distant future, to converge towards the total programming of all living and non-living entities. More specifically, he writes: "Elles naissent, toutes deux, du fond de la culture occidentale. L'homme occidental se trouve dans un monde 'transcendable'. Dans un monde qui peut être contemplé et manipulé 'du dehors'. Il peut devenir un monde-objet d'un sujet transcendant. Or cet espace transcendant, occupé à l'origine par le démiurge divin, devient accessible à l'homme. C'est à partir de là que l'homme connaît et manipule le monde. C'est à partir de là qu'il objective le monde, y compris lui-même et sa société. C'est l'espace de la philosophie, de la science, de la technique, de l'art et de la politique. Le projet de la culture occidentale est de tout objectiver, tout connaître et tout manipuler en tant qu'objet. […] Pour notre culture… le sujet s'oppose dialectiquement au monde. Il ne peut se matérialiser que dans l'œuvre. L'ensemble des œuvres, la culture, est la synthèse entre sujet et objet, c'est de la matière spiritualisée et de l'esprit matérialisé" (Flusser, 2019, pp. 199-200).[5]

The core thesis around which the above passage develops is the following: within the context of Western metaphysics, the subject, residing in the world and forming part of it, subjects the

[4] The reference to the Parmenidean ontological distinction is our own alternative philosophical reformulation of Flusser's wording.

[5] Translation by the author: "Both arise from the very depths of Western culture. Western man finds himself in a 'transcendable' world: a world that can be contemplated and manipulated 'from outside'. It can become a world-object for a transcendent subject. Yet this transcendent space, originally occupied by the divine demiurge, becomes accessible to man. It is from this position that man knows and manipulates the world. It is from this position that he objectifies the world, including himself and his society. This is the space of philosophy, science, technology, art and politics. The project of Western culture is to objectify everything, to know everything, and to manipulate everything as an object. […] For our culture … the subject stands in a dialectical opposition to the world. It can materialize itself only through its works. The totality of works –culture– is the synthesis of subject and object: it is spiritualized matter and materialized spirit".

world to theoretical elaboration (the Aristotelian *theorein*), thereby turning it into an object of contemplation and potential management, and henceforth standing in dialectical opposition to it. On the one hand, there is the interiority of subjective perception and, on the other, the exteriority of the objective world, as we might put it in Hegelian terms.

As we are by now in a position to know very well, this distinction between subject and object, conceived as distinct poles standing in a dialectical relation, is inextricably bound up with the origins of *episteme* (*science*), which is established in ancient Greek philosophy and, more specifically, in Aristotle's work as a method for investigating the relations between *particulars* and *universals*. As lucidly explained by the Hegelian philosopher and logician Gotthard Günther, an active participant in the post-war cybernetics programme in the United States and a Research Professor at the Biological Computer Laboratory (BCL), Department of Electrical Engineering, University of Illinois at Urbana, where he worked alongside leading figures in first- and second-order cybernetics such as Warren McCulloch, Heinz von Foerster and Humberto Maturana: "The dominating intent of the philosophy of Aristotle is, as he himself insisted, purely methodological. He starts from the sharp Platonic distinction between Being and Thought or between object and subject, and poses the question: How can Thought ever know Being in a rigorous and communicable way? The method is –according to the Aristotelian logic– found to be in the deduction of the particular from the general. The general, however, is something which bridges the cleft between the objectivity of Being and the subjectivity of Thought. Despite their infinite variety, the particular things that exist in this Universe have something in common that links them ontologically together and that is their ultimate essence: Being, manifesting itself as objective existence. […] Being is an undifferentiated all-pervading universality and the many things and appearances in this world are only the more or less particular manifestations of an underlying general substance or essence, which is the same in everything that exists in this world. If we are looking for distinctions we have to move into the realm of the particular. Being-in-general shows no distinctions. On the other hand, as Aristotle points out, when we think we also try to deal with the relation between the general and the particular by either deducing the particular from the general or by inductively ascending from the particular to the general. Thus, Greek philosophy discovered a common link between subjective Thought and objective Reality" (Günther, 2004).

For the world to be objectified, however, and thereby rendered amenable to knowledge, it must first be apprehended or captured. And in order to be apprehended or captured, it must be delimited and defined – something that, at least at the cultural-technological level of Western rationality, can occur only through an act of linguistic-symbolic-cognitive framing enacted in practice. In fact, it would not be inaccurate to say that Western rationality (along with its metaphysical substrate) is inextricably intertwined with a firmly embedded "framing logic" that has been pervading

our long-established operating thought-system, since the times of Parmenides and Plato and their foundational "framings" of "being" and "reality" in contradistinction to "non-being", "appearances" and "deceptive semblances".

Indeed, hasn't our most central operating thought-system been fundamentally related –to this day– to a will to dominance and mastery, in the sense that knowledge has been mostly interpreted as a process of compartmentalization, as an act or gesture that cleaves a domain, rendering it visible, thus gaining power and control over it? Hasn't this very concept of knowledge always been intrinsically related to a process of "framing", "isolating" and "appropriating" some-thing, whatever that may be, with a view to getting a comprehensive grasp of it?

"To get a grasp of some-thing": Isn't that the very essence and definition of what we traditionally call "knowledge", meaning a practice of "apprehending", "capturing", "arresting", "seizing" and monitoring contingencies, realities, bodies and things? What does it mean to "conceive or capture something" if not a concrete strategic function closely linked to a power relation? Isn't knowledge itself inescapably equivalent to setting up framing techniques and capturing apparatuses destined to strategically impose order and visibility? Isn't knowledge tantamount to strategy, power, dominance and control, by virtue of its very act of framing and making some-thing appear as a thing? Isn't knowledge already, inherently and fundamentally, interwoven with biotechnopolitics?

To cut a long story short, by the term "framing logic" we mean a certain –culturally shaped and transmitted– way of perceiving, reflecting upon and being in the world, based on a formal binary operation, act or gesture of distinction-drawing, whose logico-mathematical as well as onto-cosmological consequences have been superbly explicated by George Spencer-Brown in his short treatise titled *The laws of form* (1969). This operation involves distinguishing between things, separating them, indicating their differences by inserting them into a symbolic sign-system, identifying them as such and such and giving them duration.

However, this framing logic –that has been inherent in our very way of knowing– has a very interesting and, even, paradoxical effect: events or things do not precede the act of framing, but, instead, they are produced by it. Events and things are emergent phenomena. That means that, by performing the act of framing, we do not actually frame something that preexists, but that we actively construct something out of nothing. Events and things do not exist before the act of framing. They, instead, emerge through the act of framing. Perform a framing and something will inevitably appear. Events are antecedent.

A simple example of that process is framing a photographic shot: by doing so, we instantly establish a distinction between a framed "inside" and an un-framed "outside" (which is, henceforth, negatively framed as "unframed"); we severe an undifferentiated plane and, through this severance, we establish a boundary that stands between what is framed and what is not: we create space; we

capture something and through this act of capturing we turn it into something visible, definable and, for that reason, virtually manageable.

This mode of being in the world, along with its implicit framing logic, is not a mere mode among others but, to the contrary, *the* mode of human existence par excellence; it literally permeates every aspect of our human, all too human discursive and non-discursive affairs and practices, be they philosophical, scientific, economic, political, social, geographical or photographic.

To obtain a better, more profound understanding of this overarching framing logic, one needs only consider for a while Nietzsche's analyses of "truth production mechanisms", "interpretation as appropriation", "phenomenalism" and "perspectivism" as well as (though at an entirely different, more general level) Heidegger's all-encompassing conception of technology as "Gestell" (en-framing).[6]

Yet, this condition is not without consequences: for, the very instant we frame something, we also are being framed, processed, captured and conditioned by the very same medium we use in order to do the framing. In fact, it is impossible to frame anything without being already framed by the very logic, technique or apparatus that permits us to do the framing.

To sum up, what makes possible our *opening/relating to* the world is also and necessarily what *ex-cludes* us from it; blindness is our ultimate condition of possibility of vision; *ex-istence* (meaning: standing out of or apart from) is the ultimate condition of our unavoidably technical (or technologically determined) way of being-in-the-world. This world is not *the* world, but only a world, our only possible world: a world of technicity, a world of techno-socio-cultural apparatuses.

[6] It is, indeed, impossible not to read and interpret Flusser's *apparatus* in the light of the Heideggerian critique of modern technological rationality and of the programme of generalized ordering and en-framing (*Gestell*) intrinsic to it. But in what way should this relation be understood? As one of semantic and coneptual identity? Is the *apparatus* to be identified with the *Gestell*? Or should the *apparatus* rather be understood as emerging within the context and horizon of the *Gestell*? The position adopted here as regards this weighty question is that the *Gestell* designates something more general and wider: a specific logic, a specific attitude towards the world, a specific disposition/attunement to the world, a mode of being within it. It would, thus, be hazardous to claim that *apparatus* and *Gestell* are (semantically and conceptually) identical. The reason is that, in Flusser, the concept of *apparatus* does not seem to acquire (at least, explicitly) the same general ontological dimension as a *mode of revealing* or as a fundamental *attunement*. To formulate the point in slightly different, more precise terms: Flusser's conceptualization of the *apparatus* can (and should) indisputably be seen as implicitly pointing towards the problematic of the *Gestell*, without however being explicitly identified with it. As is well known, *Gestell* refers to the essence of modern technology and not to the particular technologies or technological objects themselves (Heidegger, 1977, pp. 20-21). It designates the essence of modern technology not as a mere tool, but as a challenging *way of revealing the world* (Heidegger, 1977, p. 19) through which entities appear as a "standing reserve" (*Bestand*) of exploitable resources for efficient use, that is as resources available for ordering, calculation and use (Heidegger, 1977, p. 17 & Dreyfus, 1995, p. 100). This objectifying, instrumentalizing perspective may be understood as a culmination of Western metaphysical thinking insofar as it reduces nature to resources to be ordered, quantified and controlled (here, "objectifying, instrumentalizing perspective" by no means implies that the subject simply stands outside the world and objectifies it; the subject itself is also drawn into the ordering of the *Gestell* [Dreyfus, 1995, p. 100]. Within the technological understanding of Being, the earlier subject/object relation is transformed into a comprehensive system of availability and ordering). In sum, *Gestell* names the pervasive, challenging claim through which beings are gathered into a unified order of availability and control, and thus the fundamental technological disclosure of the world.

German media theorist Claus Pias has summarized this state of affairs in the following manner: "[T]here is no knowledge without media and there is nothing in our knowledge that we don't know via media. By media I mean all those instruments, institutions, techniques and technologies that make it possible to know something without themselves being an object of knowledge. A library saves and organizes data without being the data itself. If we look at a drawing of a building that follows the laws of central perspective we don't see the rules of central perspective but a building. If we listen to a telephone call we hear someone calling but not the telephone itself. There is a strong tendency for the media to become invisible, to extinct themselves in favor of their 'subject'. Media allow something to appear without becoming an appearance themselves. Media become apparent only when they don't function: if there's noise in the telephone line, if a computer crashes, if the perspective isn't right. Media are the dark, the anaesthetic side of aesthetics. But everything that is stored, submitted or processed by media has to follow the laws of a specific medium. Media always format what they pretend to mediate in an unconcerned way. In Heidegger's terms, media are always 'guilty', trying to eradicate the traces of their deeds" (Pias, 2000).

Doesn't this assertion imply that any act of framing (be it discursive, photographic or other) is doomed by its nature to struggle with this puzzling paradoxy of "framing/being framed" and, consequently, with all that which remains "unframed", "unseen", "latent", "unconscious"? Each framing –further opening up the world– introduces new blind spots and unpredictabilities. The network of framings neither closes nor achieves complete transparency, thus giving rise to endless complementarity, irreducible partiality, unending latency and structural complexity. It is a world of "a radically incommensurable perspectivism with no hope of an overarching coordination of viewpoints" (Rasch, 2002, p. 25); a world made up of an infinite "network of observations that never fully closes the circle, a structure of latency that never achieves complete transparency" (Rasch, 2002, p. 25); a world in which to observe/perceive means to be irreversibly conditioned by what is out of sight, the unobservable/imperceptible. Yet, "unobservable" or "imperceptible" does not mean "immaterial" or "non-existent". What is termed as "unobservable" here is the entire unconscious techno-cultural operating thought-system or framework that renders possible and meaningful the act of observing and framing.

## V. Microscopism, macroscopism and the permeabilization of being

In the opening two paragraphs of the subsection entitled "The apparatus" in his extensive essay *Towards a philosophy of photography* and on the occasion of the photographic apparatus, which is in this case under discussion, Flusser proceeds to a significant and by no means incidental broadening of the term *apparatus*, which he places at the beginning of a general analysis of apparatuses. In the first of the two paragraphs Flusser writes: "Technical images are produced by apparatuses. In saying

this, one presumes that the typical characteristics of apparatuses as such –in a simplified, embryonic form– are also contained within the camera and can be derived from it. To this extent, the camera, as a prototype of the apparatuses that have become so decisive for the present and the immediate future, provides an appropriate starting point for a general analysis of apparatus – those apparatuses that, on the one hand, assume gigantic size, threatening to disappear from our field of vision (like the apparatus of management) and, on the other, shrivel up, becoming microscopic in size so as to totally escape our grasp (like the chips in electronic apparatuses)" (Flusser, 2000, p. 21).

What does Flusser convey here? He proceeds to a very important distinction: he comprehends *apparatus* in the sense of both a perceptible, manageable tool or object (like a photographic apparatus) and a non-manageable, imperceptible, microscopic object (like the chips in electronic apparatuses) or macroscopic arrangement/mechanism (like a governmental or corporate organizational structure).

Accordingly, the term *apparatus* refers not only to an individual device, but also to an organizational pattern or, more precisely, to a broader organization of non-living devices (or of devices coupled with living subjects who have been reduced to the status of the non-living object). One important point here is the emphasis put on the difference of scale, which entails a corresponding difference in perceptibility: apparatuses act upon the human element, rendering it perceptible, apprehensible, observable and malleable, while the human element subjected to these effects is not, reciprocally, in a position to act upon the apparatuses so as to render them perceptible, apprehensible, observable and malleable.

Moreover, this emphasis on scale (microscopic and macroscopic) also indicates something else of great importance: that our lifeworld becomes the object of calculated appropriation in all its dimensions. Nothing remains outside the net of calculation and the effects of the calculative mind: the latter seeks –and tends– to control the entire spectrum of living/being. Calculation operates both outside beings and within them, rendering them (informationally) permeable.

This gesture which bears a strong Heideggerian resonance, is followed by an (equally Heideggerian in character) recourse to etymology (followed by an expressed precaution that "etymology on its own is not sufficient to define a term"), intended to disclose something essential about the being and functioning of apparatuses. He writes: "The Latin word *apparatus* is derived from the verb *apparare* meaning 'to prepare'. Alongside this there exists in Latin the verb *praeparare*, likewise meaning 'to prepare'. To illustrate in English the difference between the prefixes 'ad' and 'prae', one could perhaps translate *apparare* with 'pro-pare', using 'pro' in the sense of 'for'. Accordingly, an 'apparatus' would be a thing that lies in wait or in readiness for something, and a 'preparatus' would be a thing that waits patiently for something. The photographic apparatus lies in wait for photography; it sharpens its teeth in readiness. This readiness to spring into action on the part

of apparatuses, their similarity to wild animals, is something to grasp hold of in the attempt to define the term etymologically" (Flusser, 2000, pp. 21-22).

Viewed in this light and allowing ourselves a certain leap, might not the very history of human beings and their worlds, of their functions and dysfunctions, be understood as the history of the successive or discontinuous (that is, conflicting) apparatuses which, in each historical epoch, undertake to gather, apprehend, capture, invest with meaning and organize into a unifying whole the bodily-motor, perceptual, psycho-intellectual, affective and other functional components of the human, thereby conferring upon them a unified, historically determined form? Isn't the very form of the "human," as we know it within the context of Western culture, the outcome and product of such a process of gathering and shaping the human element? In this sense, would it be too daring to say that apparatuses constitute a kind of macro-historical Lacanian "mirror stage," through which humanity derives, in each historical epoch, its determination, its identity, an image of itself?

Could we not argue that *Dasein* is culturally technologized and programmed from the outset, in the sense that, long before it becomes explicitly interconnected with all those striking technological objects and environments that constitute its modern, postmodern and contemporary post-postmodern reality, it is already, from the very beginning, a synthetic –that is, historical– rather than a natural entity (long live Hegel!)? Could we not also argue that there is no such a thing as a stable and immutable, pre-technological and culturally uncontaminated nature of *Dasein*, and that what we call human nature is always already the product of the apparatuses, cultural technologies and media that are specific to each historical period? Might it be, in fact, that the human being has no form from the outset? Might this form, instead, be historically conferred through an act of apprehension and gathering, carried out by means of apparatuses that undertake to arrange and organize the human element in space and time?

## VI. The tyranny of entropy and thermodynamic resistance

*Into the universe of technical images* (1985) quite literally teems with occurrences of the term *apparatus*, a fact that makes it –to remain faithful to Flusser's own language– a text replete with informational improbability. To verify this, one need only revisit the chapters "To make concrete", "To signify" and "To instruct", where it soon becomes apparent that the book offers a veritable paradise of apparatological elaborations.

Here, however, we shall focus on the first of these three chapters, "To make concrete", in which apparatuses are understood not only as individual devices, such as the camera, but also as broader systems for the calculation, production, storage, processing and distribution of information. Such systems are constructed in order to be deployed as means of resisting and controlling

the universe's tendency towards disorganization and the loss of information – in other words, as means of holding back the mounting tendency towards entropy and death (Flusser, 2011, pp. 17–30). In the context of this expanded cosmological conceptualization of the term, technical images are understood as an artificial reservoir of information, whose purpose is to serve the preservation and extension of life within (and against) a background of thermodynamic disintegration.

Yet, a certain degree of caution is required at this point. However straightforward these matters may sound –or precisely because they sound straightforward– it is necessary to introduce a few clarifications which may help us arrive at least at a basic understanding of the highly complex arguments developed in the pages of this chapter of *Into the universe of technical images*. A fuller understanding of these arguments would require broad familiarity with fundamental questions drawn from Gibbsian–Boltzmannian thermodynamics, Claude Shannon's information-theoretical conception of entropy (Shannon & Weaver, 1949), as well as from first-order cybernetics (Wiener, 1948 & 1989) and Léon Brillouin's theory of negentropy (Brillouin, 1953), the latter constituting a major source for Flusser's understanding and conceptualization of entropy.

The key to deciphering what is at stake at this point lies in the following paragraph, in which the references to information theory and thermodynamics are direct and explicit: "'Probable' and 'improbable' are concepts from informatics, in which information can be defined as an improbable situation: the more improbable, the more informative. The second law of thermodynamics suggests that the emerging particle universe tends toward an increasingly probable situation, toward disinformation, that is, to a steadily more even distribution of particles, until form is finally lost altogether. The last stage, heat death, is a probability bordering on the inevitable" » (Flusser, 2011, pp. 17). Here, Flusser's formulation appears to align closely with the Gibbsian–Boltzmannian theoretical line that also underpins Wiener's cybernetic theory (Wiener, 1948 & 1989), from which the following passage is drawn. In it, entropy is interpreted as a measure of a system's disorganization, and information as its negative – that is, as a measure of organization: "[…] Gibbs had a theory that this probability tended naturally to increase as the universe grows older. The measure of this probability is called entropy, and the characteristic tendency of entropy is to increase. As entropy increases, the universe, and all closed systems in the universe, tend naturally to deteriorate and lose their distinctiveness, to move from the least to the most probable state, from a state of organization and differentiation in which distinctions and forms exist, to a state of chaos and sameness. In Gibbs' universe order is least probable, chaos most probable" (Wiener, 1989, p. 12).

It is of particular interest to note the considerable conceptual affinity between the above passage by Flusser and the passage from Wiener quoted immediately below, both in their

terminology and in the broader theoretical configuration they articulate.[7] Indeed, if we wish to remain faithful to the letter and spirit of Flusser's account, we must point out that statements –of a rather general character– such as "'probable' and 'improbable' are concepts from informatics" point more towards a broader onto-cosmological and ethical perspective (like Wiener's) than towards Shannon's strictly technical-mathematical one. It would be extremely unlikely to encounter in the latter's work general definitions and pronouncements bearing the ontological and cultural significance they acquire within the context of Flusser's reading.[8]

Indeed, any broader probabilistic concerns do not belong to Shannon's mathematical theory (Shannon & Weaver, 1949). On the contrary, they appear to correspond –if not entirely, then at least to a considerable degree– to Wiener's style and mode of thinking, which very often tends to treat the physical-mathematical and the onto-metaphysical-ethical dimensions as an indivisible whole, placing each in an inextricable relation to the other (two outstanding representative examples of this mode of thinking and discourse are *Cybernetics and society: The human use of human beings* and *God & Golem, Inc.: A comment on certain points where cybernetics impinges on religion*).

Whether Wiener's example (insofar as it involves the production, in the twentieth century, of a novel form of discourse in which the probabilistic schema is inscribed within a wider-angled discourse that places physical-mathematical science under the perspective of onto-metaphysical philosophical (even theological) thought, while placing onto-metaphysical philosophical thought under the perspective of science) constitutes a kind of genealogical "precedent", a kind of *a priori* that helped pave the way for the emergence of cases such as Flusser's, that is a question which certainly requires further investigation.

In any case, however, what we can say with a certain –not inconsiderable– degree of confidence is that, on the basis of the passage from Flusser cited above (Flusser, 2011, p. 17), improbability, as understood by information theory and subjected to philosophical elaboration, appears to

[7] The affinity proposed here should not be understood as implying that Flusser's conception of entropy or negative entropy derives directly from Wiener. There is, nevertheless, documented evidence that Flusser was familiar with at least one of Wiener's works: the German edition of *God & Golem, Inc.*, which formed part of Flusser's library (Guldin, 2009, p. 3). More recent scholarship also points to Flusser's broader familiarity with Wiener's cybernetic thought. Pedroso, for instance, states that Wiener's cybernetic theory was known to Flusser and suggests that Flusser initially tended towards Wiener's perspective (Pedroso, 2021, pp. 11–12). The cybernetic background should, however, also be understood in relation to Flusser's sustained intellectual exchange with Abraham Moles. Pedroso presents cybernetics as a common theoretical substrate for both thinkers and argues that Moles played an important mediating role, particularly with regard to Shannonian information theory, its conjunction with *Gestalt* theory and its extension beyond the so-called "hard" sciences (Pedroso, 2021, pp. 10–14).

[8] Something similar appears to hold for the conceptualization of the term "entropy". It would, indeed, be somewhat hazardous to claim that the second law of thermodynamics –which concerns the thermodynamic evolution of physical systems– demonstrates that social systems are subject to the same law: that all societies become increasingly uniform, that all images become dull and repetitive and that all human systems are inevitably driven towards a loss of meaning and ontological necrosis. These are, rather, extensions and secondary elaborations and interpretations that draw on the physical-mathematical model of entropy in order to extend it and apply it as an interpretive tool to domains of reality not ordinarily treated within the framework of the physical and mathematical sciences. Yet, this in no way means that such extensions lack internal consistency.

acquire for Flusser an aesthetic and creative value, or even to become identified with them: the informational is that which is non-redundant, unpredictable, that which introduces a new form – or, better, a difference. This is a schema that lies closer to the thermodynamic-cybernetic conceptualization of entropy and negative entropy than to Shannon's strict use of entropy as a measure of the uncertainty of a source. Although it displays a certain compatibility with the Shannonian relation between probability and informational value, Flusser's conceptualization of the term retains more immediate affinities with the post-war cybernetic theory of information and its transmutations, extending the mathematical schema into thermodynamic, biological, aesthetic and cultural categories.

However, although Wiener had already established a fundamental relation between information, probability and entropy within the emerging cybernetic framework, the more specific conceptual source for Flusser's understanding of information as negative entropy appears to be Brillouin, giving this relation a more explicit thermodynamic and epistemological formulation, coining the term *negentropy* and conceiving information as a negative contribution to entropy. [9] Flusser adopts this conceptual association but extends it beyond its original scientific context, linking negentropy to the production of improbable and informative configurations in cultural and technical processes and, by extension, with questions of life, death and freedom. In this sense, the concept becomes part of a broader constellation connecting information, probability, programme, apparatus and the production of technical images in direct relation to being.

How, then, are the terms "entropy" and "information" related to the terms "probable" and "improbable"? How are they translated into terms of "probability" and "improbability"? As follows: the increase of information within a system works against the system's entropic tendency (which is nevertheless inevitable and irreversible). This means that the more improbable states are produced within a system (the more information is produced), the more the element of internal differentiation and organization within the system is strengthened. This production of the *improbable* functions as an anti-entropic or negentropic process. Conversely, the more probable states are produced within a system, the more entropy –that is, the tendency towards internal homogeneity and disorganization– increases.

Here, however, we must proceed with caution and introduce certain fundamental distinctions that will help us understand Flusser's thought more clearly. By probable and improbable

[9] Wojnowski (2017, p. 14) and Guldin (2024, p. 5) explicitly argue that Flusser's recurrent understanding of information as negentropy, or "reversed entropy", derives from Brillouin's formulation of information as a "negative contribution to entropy": "In his book *What is Life?* Erwin Schrödinger (2014), first published in 1944, introduced the concept of 'negative entropy'. This was later shortened by the French physicist Léon Brillouin to 'negentropy'. Flusser starts using the notion of 'negentropy' in the course of the 1970s which means that he most probably came across the concept after his return to Europe in 1972. Negentropy negates disorder, it negates negation. Negentropy is a negativity of the second degree, turning negation to positive ends…" Guldin (2024, p. 5).

states, we do not mean, in a general and indeterminate sense, states that "may/might" or "may not/might not" occur within the system, but states that have a greater or lesser probability of arising within a given field of possibilities, as defined by the rules of the programme governing the system. The probability or improbability of a state arising is entirely dependent on these rules. It is precisely the programme that defines the range of the system's field of possibilities. The more contingent and unexpected the combination of elements from which a state arises, the more improbable that state will be considered. Conversely, the more common and recurrent the combination of elements from which a state arises, the more probable that state will be considered.

What has just been said above of systems in general and at an abstract level also applies to apparatuses: first and foremost, they are constructions conceived, designed, produced and put into operation by a being marked by a fundamental (constitutive, formative and, for reasons that need not concern us here, fortunate and liberating) unhappiness: the unhappiness inherent in self-awareness. Possessing a biological substratum that enables it to develop functions such as consciousness,[10] the human being gradually comes to develop another form of consciousness as well – what we call self-consciousness –[11] which reaches one of its culminations, perhaps its most significant one, in the awareness of its own finitude, that is, in the awareness that, from the moment of birth, it's on its way towards (thermodynamic) death. This dual –biological and at the same time post-biological (that is, historically and culturally formed)– system called the "human being", which is subject, without exception, to the same inexorable law of entropic disorganization and ultimate thermodynamic decomposition as every other system in the world, from the most insignificant and humble to the greatest (the universe itself)[12], resorts to the construction of apparatuses, which it deploys, as noted above, in its struggle against the loss of information, the entropic tendency of the universe and of life, and, ultimately, death. This means that –contrary to the dominant, at least superficial, understanding of our time, which conceives of technology simply as a set of means and practices placed in the service of an end to be achieved– apparatuses are fatefully bound up with the very metaphysical foundation of the human being that constructed them and its existence in the world. They are not simple and neutral things, stripped of all existential content, but

[10] Traditionally, beginning with Aristotle and *De anima*, consciousness is defined as the state in which a living system is aware of objects located outside its own system of awareness.

[11] Self-consciousness is not awareness of objects, but awareness of the awareness of objects (a reflexive feedback loop) located outside the system of awareness (an innovative discovery credited to Aristotle and *De anima*).

[12] Perhaps this constitutes a fourth –and perhaps the greatest– narcissistic humiliation, one that should be added to Freud's well-known triad of the three great humiliations suffered by Western humanity and its culture: the Copernican cosmological humiliation, the Darwinian biological humiliation and the psychological humiliation inflicted by Freud himself.

metaphysically charged objects –bearers of a primordial and inescapable ontological anxiety– with which the human being equips itself in its struggle against the forces of oblivion and finitude.[13]

As such finite constructed objects, apparatuses cannot but operate ("run") on the basis of a programme (a set of rules pre-installed within the system of the apparatus), which defines a field of possibilities realizable by the apparatus. Their operation consists in calculating and recomposing elements that cannot be determined or apprehended by the Cartesian *res cogitans* (particles, quanta, photons and so forth) into technical images, thereby rendering, in Flusser's formulation, the ungraspable graspable, the invisible visible and the unthinkable thinkable.

If, as stated above, information is equivalent to the realization of a relatively improbable possibility, then apparatuses are programmed to realize such improbable states –that is, to produce information– always in strict dependence on the *a priori* normative programme built into them. Here, however, a paradox arises and it is this paradox that constitutes the source of the internal tension characterizing Flusser's argument: it is precisely the programmed and repetitive production of such states that renders them probable, predictable and ultimately redundant. To put it differently, because apparatuses realize these improbable states in a programmed and automatic manner, it is for this very reason that those states become predictable. Thus, what is initially inscribed in their programme as negative entropy (that is, as an increase in information) ultimately becomes, from the recipient's point of view, entropy. The paradox lies precisely in this transformation. The apparatus therefore produces information by rendering the improbable probable; yet, precisely because it renders it probable, it risks destroying its informational value – a vicious circle that Wiener described and identified as the physical-mathematical equivalent of what is defined as "evil" in the Augustinian theological *corpus*. Just as media, for the Roman Catholic McLuhan, are intended to function as supplements completing the imperfect human substance, so too apparatuses are intended to serve as supplements to its essential completion. Or, in Wiener's own words, slightly paraphrased: "[The] recognition of a fundamental element of chance in the texture of the universe itself [is] close to the tradition of St. Augustine. For this random element, this organic incompleteness, is one which without too violent a figure of speech we may consider evil; the negative evil which St. Augustine characterizes as incompleteness…" (Wiener, 1989, p. 11).

The core of Flusser's argument does not consist in a schema of the following kind: the machine initially produces order, but, over time, as a result of wear, malfunction or other factors, eventually comes to produce disorder. A practical example offered by Flusser is that of the photographic apparatus and the photographer who operates it: the programme built into an apparatus

[13] Guldin likewise places this vocabulary related to negentropy within a broader existential constellation. Negentropy thus becomes more than a borrowed scientific term; it names the necessarily provisional resistance through communication and cultural production to dissolution, forgetting and death (Guldin, 2024, pp. 4–5).

makes possible the production of images (that is, information in the form of images) which, in relation to the operation of the apparatus called the "physical universe", are improbable. As the apparatus repeatedly produces the same images, however, they eventually become predictable and hence probable and redundant, thereby losing their informational value. As for the photographer, although he may operate the apparatus by subjecting it to his will, his operations, decisions and intentions depend exclusively on what the apparatus is programmatically capable of doing. In other words, within the present context of the dialectical relation between photographer and photographic apparatus, the photographer is neither merely a passive component nor capable of acting outside the programme and the field of possibilities it prescribes. His activity unfolds, materializes and takes shape within the range of possibilities afforded by the machine. If the photographer wishes to work outside and beyond the limits and rules prescribed by the programme built into the apparatus, he must "hack" it; in other words, he must cease to use that particular apparatus as it stands.

From this also follows the progressive autonomization of apparatuses. Unlike the "physical universe," whose source code we have not yet succeeded in entering and which therefore remains beyond human oversight and command, humanly constructed technical apparatuses are subject to human command – a condition, however, that cannot be maintained indefinitely: apparatuses tend to become autonomous and to free themselves from human will. This, of course, does not occur because apparatuses acquire consciousness or a will of their own, but because their operation becomes increasingly automatic and because the speed and complexity of the calculations they perform exceed the limits of human oversight, thereby making possible the production of unforeseen and undesirable outcomes. If this process is not brought under control, the capacity to produce informational significance is weakened, while the abundance of outcomes turns into redundancy. The apparatus then produces forms as expected executions of the programme – much like a wild animal governed by its instincts and drives.

## VII. Living subjects, non-living objects, processes and practices in the service of complex functional assemblages

A further and equally significant broadening of the term *apparatus*, complementary to the preceding one yet developed on a different plane, occurs in *Gestures* (Flusser, 2014) and, more specifically, in the chapter "Beyond machines", which contains several passages of considerable conceptual importance. There, the term is extended beyond the meaning of an individual technical device in order to designate complex functional assemblages whose component operations are synchronized, mutually determined and capable of being connected to other apparatuses. What transforms a mere

aggregate of heterogeneous machines, mechanisms, human functionaries and institutional frameworks into an apparatus is their functional organization and relational composition: machines, mechanisms, human functionaries and institutional frameworks are connected and synchronized, becoming interrelated functions within a unified system. This marks a pivotal moment in Flusser's conceptual elaboration of the term, since it now acquires the status of an arrangement, a complex functional assemblage in which objects, living functionaries, codes, programmes, practices, processes and recursive relations of interdependence begin to operate as a single organized system. Flusser locates the historical condition that made possible the transition from individual machines to the apparatus in the Industrial Revolution, which "accumulated machines very quickly, synchronized them with complex switching mechanisms, and so turned them into 'apparatuses'" (Flusser, 2014, p. 15).

If, then, we wish to remain faithful to the letter of Flusser's conceptualization as developed in "Beyond machines", we must draw a rigorous distinction between the apparatus and the machine. If the machine is, to begin with, an object constructed to overcome the resistance posed by the world out there and to perform a specific task (to kill, cultivate and so forth); if it is conceived within a teleological relation (that is, in relation to an intended result); and if, finally, in the world of the machine, the human element occupies the position of the "constant", while the machine occupies that of the "variable" (that is, of the replaceable means), then the apparatus must be understood as synonymous with the system. It is not simply a more complex machine, but a system within which heterogeneous elements (including machines) are integrated as interdependent functional components. In the world of the industrial and post-industrial apparatus, these terms are reversed: the new constant is the mechanical-functional structure, while the new "variable" (that is, the replaceable element) is the human being. The latter no longer simply uses the machine, but is transmuted into an attribute, variable or function of the apparatus. From this point onwards, the human being is never "outside" the apparatus; on the contrary, it constitutes one of its internal elements.

Here, Flusser appears to confer upon the apparatus the status of a technological *a priori* – one that, beginning with the Industrial Revolution, has come to determine ever more comprehensively and ever more radically the human mammal's mode of being-in-the-world. Precisely because this mammal's mode of existence is that of *Dasein* and precisely because *Dasein* is, as the word itself makes clear, not only structurally, biologically and thermodynamically coupled to, but also metaphysically grounded in, a place, a "here and now" –that is, because it is spatiotemporally determined– its entire existence in the world cannot but unfold within an environment (one that is at once natural and increasingly technological-apparatic).

Contaminating Alfred Korzybski's well-known systems-theoretical formula (Korzybski, 1950; Bateson, 1972) with a touch of Heideggerian idiolect of authenticity (something that would very likely have horrified them both), we might say that there is not, on the one hand, *Dasein* and, on the other, its environment (or, alternatively put, its surrounding lifeworld), conceived as two distinct poles standing in a dialectical relation, but rather "Dasein + its environment" as a single reality, from which neither term can be taken in isolation from the other.

This inextricable attachment of the *Dasein* to the environments it constructs in order to protect itself from natural entropy and death has an unavoidable consequence: it cannot simply step outside the apparatuses it has constructed and judge them from a safe distance. More than this, any attempt to gain critical distance from the apparatic environments that make its existence –and, by extension, its acts of observation– functionally possible can take place only through a new apparatic environment capable of enabling second-order observation. This is especially true in an age such as ours, in which visual, tactile and other apparatuses are almost grafted onto our ocular tissues, our sensory organs and our nervous system itself – in other words, in an age in which critical distance from our apparatic environments is becoming ever more difficult to achieve. Under such conditions, the expectation of an exit into a realm beyond apparatuses appears as a messianic dream-fantasy. The human being cannot move beyond its apparatic environments because those very environments constitute the condition of possibility for its perception and its existence in the world: the human being does not inhabit the world directly, but always within and through an environment. A major consequence of this is that apparatuses cannot be approached or judged as objects simply external to *Dasein*.

Here, it should be noted that the terms "environment" and "apparatic environment" do not belong to Flusser's vocabulary in *Gestures*. They are additions of our own, introduced in the course of our attempt to probe more deeply into the conceptual implications of the questions at hand. Yet, although Flusser nowhere in this particular chapter of *Gestures* offers anything resembling a formal definition of the apparatus as an environment, such an interpretation is not entirely arbitrary. Indeed, insofar as the apparatus exceeds the status of a mere technical dependency and assumes that of a material-technical condition, an onto-technological *a priori* beyond which we cannot live, it is by no means groundless to suggest that, in Flusser, the apparatus acquires the character of an environment: it is not simply an object within the world, but the functional framework within which objects can appear (and be perceived), including ourselves in our capacity as subjects.

And while apparatuses, together with the environments they compose, are initially necessary/inescapable for survival and for resistance to entropy, they become, over time, intolerable and restrictive; while they were conceived and constructed in order to release possibilities, they

gradually become constraining; the original positivity of their *positing* is historically transformed into negativity. How and why does this happen? Is this an inherent property and tendency of apparatuses or is it the result of the way they are used by those who construct, operate and function within them? What about free will metaphysics and traditional idealist freedom? How can they be reconceived and reinvented within a programmed world in which even sovereign choice, refusal and opposition may already be (and actually are) inscribed within the apparatus? What does the shift from a traditional idealist conception of freedom to realistic playing with probabilities entail? Does such a practice imply an escape from ideology, or does it remain embedded within ideologically and programmatically structured fields? These are particularly significant matters of a bio-ethico-political order which, however, require a more sustained investigation, one that lies beyond the scope of the present text and must therefore be reserved for future treatment.[14]

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[14] A theoretical basis for these questions is provided by Wojnowski through his discussion of programmed choice, the mechanization of decision-making, chance and the production of improbable outcomes (2017, pp. 5–9).

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