

Anti-Entropic Fields: Art and the Inversion of Time.

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***ABSTRACT.** The present paper aims to verify the relevance of the notion of anti-entropy within visual arts and aesthetics, where the term emerges—or is implied—to describe the artwork's metaphorical capacity to counteract the laws of nature, suggesting a possible transcendence of the principle of entropy. Nevertheless, anti-entropy corresponds to a precise scientific definition. This research will verify the relation between the scientific and aesthetic conceptions through a further specification of the distinction between "anti-entropy" and "negentropy". The key to accessing the concept from a philosophical perspective is to draw on the theories by Bernard Stiegler, alongside recent philosophical inquiries into entropy and energy dissipation. The following discussion will develop this argument through the analysis of the work of three visual artists active since the 1960s: The article considers the body of work of Giovanni Anselmo and Gino De Dominicis, confronted with the already existing theory around Robert Smithson as a dialectic figure for this research. The objective of this study is to elucidate the "anti-entropic" implications of their work, with a particular focus on the paradoxical endeavor to impose a reversal or suspension of the conventional temporal progression, in order to counteract the deterioration of matter.*

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1. Introduction

The principle of entropy, stemming from the second law of thermodynamics and referring to the gradual shift towards disorder and energy loss, has gained increasing significance as an aesthetic subject since the 1960s, particularly after the publication of two pivotal texts: *Entropy and the New Monuments* (1966) by Robert Smithson, and *Entropy and the Arts: An Essay on Disorder and Order* (1971) by Rudolph Arnheim. Over the following decades, various interpretations of the concept have come to reflect an understanding of decay and disorder as essential features of contemporary society, particularly in the context of the intensifying climate crisis marked by the progressive depletion of natural resources (Mussett, 2022). As defined on the website of Tate London: “entropy is the inevitable and steady deterioration of a system or society. The concept is articulated by the Second Law of Thermodynamics (the tendency for all matter and energy in the universe to evolve towards a state of inert uniformity)”.² This conception, involving radical reflections on notions of materiality and time, has been particularly influential in the visual arts field (Lee, 2004; Bretkelly-Chalmers, 2019). Building on this evolving conception, this paper seeks to verify the significance of a secondary notion that emerges from the notion of entropy: that of anti-entropy.

A concept common to both the natural sciences and the humanities, anti-entropy coincides at the same time with an extremely precise and a purely metaphorical meaning. This paper aims to explore the extent to which these two perspectives intersect, representing a preliminary attempt to connect them conceptually and to highlight the relevance of the notion of anti-entropy in the field of aesthetics. It also aims to offer a reconstruction of the main artistic practices and theories that have so far been explicitly linked to the concept. Following an initial exploration of the existing literature, I will

² <https://www.tate.org.uk/art/art-terms/e/entropy>

develop interpretative hypotheses of works of art through the lens of anti-entropy, while also expanding on the anti-entropic role of art itself.

2. Origins of the Concept of Anti-Entropy between Science, Philosophy, and the Arts

The first use of the term anti-entropy appears in an unpublished text by Pierre Teilhard de Chardin in 1951, where the author uses it to describe an effect that “draws a portion of matter in the direction of continually higher forms of structurization and centration”.³ Anti-entropy, though, is now widely recognized as a mathematical principle theorized by Francis Bailly and Giuseppe Longo, which envisages a form of creation connected to the biological organization of complex organisms, which does not counterpose the action of entropy but envisions a form of order increasing in parallel with its action. It can be interpreted as the “opposition to disorganization” and is a physical-mathematical explanation of the biological phenomenon of increasing organization (the complexification of organisms) (Bailly and Longo, 2009).

The definition of anti-entropy necessitates a distinction with the concept of negentropy, which originates primarily from the research of Erwin Schrödinger, and could be summarized as “entropy with a negative sign” (Schrödinger, 1944). Negentropy implies that organisms absorb order from their environment, enabling the creation of “order from order”. An example of such a process highlighted by Schrödinger involves the metabolic processes, whereby humans do in fact “reduce entropy”, as living matter locally opposes entropic decay.⁴

From a philosophical perspective, the notion of negentropy – as well as that of anti-entropy – has been explored by philosopher Bernard Stiegler, who contextualizes such

³ Pierre Teilhard de Chardin, “The Transformation and Continuation in Man of the Mechanism of Evolution” in *Activation of Energy: Enlightening Reflections on Spiritual Energy*, [1951] (Hancourt, 1970).

⁴ The edition that has been taken into consideration is the following: Erwin Schrödinger, *What is Life?*, 14th ed. (Cambridge University Press, 1967).

reflections by inserting them into the more complex frame of the Anthropocene (Stiegler, 2018).⁵ Stiegler's work is of particular significance in the translation of such scientific concepts into philosophical ones. He was able to intuit the centrality of the conceptual relationship between entropic forces and the gradual destruction and abuse of natural resources on our planet, evidenced by his definition of the term "Entropocene".⁶ In a collaborative essay with Maël Montevil, Giuseppe Longo, Ana Soto, and Carlos Sonnenschein, Stiegler explores the intricacies of translating such concepts, interweaving them with the disciplines of information theory, economic analysis, and philosophy.⁷ Here, anti-entropy finds its humanistic equivalent in the notion of *anti-anthropy*, defined as the extension of anti-entropy to social organizations.⁸ The employment of the term is explained by the necessity of curtailing the deleterious effects of technology towards the evolution of human subjectivities, by contrasting it with local actions of *noesis* – extensions of human "work" as the invention of a novel configuration of senses – which encompasses artistic activities.⁹

The authors of the essay *Anthropocène, Exosomatisation et Néguentropie* (2020) establish the foundational point of intersection between the scientific and humanistic conceptions of anti-entropy. However, this intersection does not enter the realm of art theory and history, opening the possibility of proposing an interpretation of their intersection within a broad philosophical framework. But what happens if we explore the literature of the visual arts in order to seek an alternative perspective, starting from works of art and their subsequent interpretations?

A point of departure for such an investigation could be found in the literature on Robert Smithson's work, which has already been mentioned for its central role in demonstrating

⁵ Further argumentation could be found in: Rasmus Sandnes Haukedal and Nikolaos Mylonas, *Entropy and Negativity: The Ecological Implications of Dialectics*, Technophany Vol.2 No.2, 2023.

⁶ Stiegler states how "The theory of entropy – deriving from thermodynamics some thirty years after the advent of industrial technology and the beginning of the organological revolution that lies at the origin of the Anthropocene, that is, after the steam engine – redefines the question of value, given that the relation entropy/negentropy is really the question of life par excellence. It is with respect to such perspectives that we must think, organologically and pharmacologically, what we should in fact call the Entropocene and neganthropology", Bernard Stiegler, *The Neganthropocene* (Open Humanities Press, 2018).

⁷ Maël Montevil, Bernard Stiegler, Giuseppe Longo, Ana Soto, Carlos Sonnenschein. "Anthropocène, Exosomatisation et Néguentropie", in Bernard Stiegler, *Bifurquer Il n'y a pas d'alternative*, (Les Liens Qui Libèrent, 2020).

⁸ Ibid.

⁹ Ibid.

the influence of entropy in the arts. In his text *Entropy and the New Monuments*, Smithson reflects on how “the awareness of the ultimate collapse of both mechanical and electrical technology has motivated these artists to build their monuments to or against entropy”.¹⁰ The term “against entropy” appears to imply a conception of time and progress as something that could be potentially reversed. As highlighted by the philosopher Olivier Schefer, Robert Smithson “opposes to the entropic ravages [...] the countermodel of a time which is together timeless and eternal”.¹¹ In this context, the opposition to entropy activates and unsettles the central notion of time, revealing how a “negative” relation to entropy within the field enters, above all, a paradoxical dimension—one that departs from philosophical and scientific rigor and instead takes root in the visionary perspective enabled by its own language. In fact, as we will subsequently observe, the term rather emerges within the arts to describe the artwork’s metaphorical capacity to counteract the laws of nature, suggesting its possible transcendence of the principle of entropy (Rewakowicz, 2014). It is evident that Robert Smithson has been profoundly influenced by science fiction, as this counter-entropy seems to rely on fictional and metaphysical tenets, including the inversion of the arrow of time, the cessation of energy dispersion, and the ultimate triumph over mortality. The critical reading of the selected artworks aims to enhance their potential perspectives, offering possible rereading of the intersections of art, energy, and temporality in addressing contemporary challenges.

3. Anti-Entropy at the Intersection with Visual Arts: The Case Study of Gino De Dominicis (1947-98) and a Parallel with Robert Smithson (1935-73)

Among the artists whose body of work constantly and poetically struggles with the defeat of the second law of thermodynamics, Italian artist Gino De Dominicis stands at the forefront. In his oeuvre, the artist offers unconventional perspectives permeated with a profound sense of spirituality, which develops in parallel with an obsession with immortality. These concerns are exemplified in his *Letter on Immortality* (1970), which

¹⁰ Robert Smithson, “Entropy and the New Monuments”, in *Artforum*, June 1966.

¹¹ Olivier Schefer, *Sur Robert Smithson. Variations dialectiques* (La Lettre volée, 2021), 192. Translated by the author, original version: “en opposant aux ravages entropiques [...] le contre-modèle d’un temps intemporel et éternel”.

starts as follows: "Dear...I think that things do not exist [...] to truly exist, things should be eternal, immortal. Only then would they not be mere verifications of certain possibilities, but truly things. In fact, by constantly changing, they are used by 'nature', which verifies all the possibilities at its disposal through their transformations".¹² The distinction between the "thing" as existing, or as being a mere device of nature, is for the artist the condition of its immutability, the capacity of escaping its transformation and, consequently, its decay. Entropy is therefore defined as the property of non-existing things, namely, the force that corrupts them.

Among the artworks more explicitly oriented towards the perspective of the defeat of entropy, the artwork-event *Cocktail party to celebrate the overcoming of the second principle of thermodynamics* (1972) is particularly noteworthy. The event formed part of the project *Roma, Mappa 72*, a series of events taking place at Palazzo Taverna in Rome curated by Achille Bonito Oliva, within the Incontri Internazionali d'Arte directed by Graziella Lonardi Buontempo. Moved by an entirely paradoxical intent, the event consisted of a genuine cocktail party, marked by the cutting of a cake, which bore the date 2085.¹³

But what is particularly meaningful within the context of De Dominicis' production is a work that directly addresses anti-entropy, namely *Anti-Entropic Chandelier* (1980), which was exhibited at Galleria Pio Monti in Rome. The following excerpt, taken from the critical catalogue on the artist, describes the genesis of the piece, while providing an insight into the cultural context of Rome in the 1980s:

On May 16, 1980, the opening of Gino de Dominicis' solo exhibition was announced at the Galleria Pio Monti in Rome, on Via Principessa Clotilde. The artist asked for his canvases, brushes, and paints to be brought to the gallery, where he had chosen to remain locked away for several days. Everyone expected a painting extravaganza. He remained locked in the gallery alone until late in the evening; only around 10 p.m. did he allow the public to enter, who found themselves facing an empty space dominated by a single work consisting of all the canvases he had

¹² Gino De Dominicis, *Letter on Immortality*, 1970.

¹³ *Incontri 1972* (Arnoldo Mondadori Editore, 1979. Quaderno n. 3 del Centro d'Informazione Alternativa), Centro Archivi MAXXI Arte, Fondo Incontri Internazionali d'Arte, AIIA/AT/AI/008.

painted, destroyed, and assembled into a solid form hanging from the ceiling like a chandelier. He called this work Anti-Entropic Chandelier because it stored all the energy that the artist had poured into the painted canvases and concentrated energy, conserving it rather than dispersing it.¹⁴

It can be posited that anti-entropy is here indicative of an interruption of the energy flux and, consequently, of the dissipation of matter, through the prevention of light dispersion, which becomes the material and visual manifestation of the energy itself. From a closer examination, one could read this work by De Dominicis as a concrete counterpart to the anti-anthropic function described by Stiegler, in which the local manifestation—the artwork—appears capable of generating a new order that counters the broader tendency toward disorder, and ultimately toward entropy itself, as he noted in his Letter on Immortality. As Giulio di Gropello states:

According to Gino, art is one of the vehicles that can enable humans to overcome their limitations: the limitations of the laws of nature. The anti-entropic character is present in all works: according to Gino, a work of art is only such when the energy used to create it is less than the energy that the work of art gives back to you. And it is obvious that the final judge of this will be time. In my opinion, almost all artists struggle on this front, even if only Gino has clearly made this his manifesto.¹⁵

This excerpt offers a precise understanding of how, even when viewed from a strictly metaphorical standpoint, the role of energy was key to Gino De Dominicis and remained anchored in something physical and measurable: the action of the artist and the actual energy expended in producing the artwork. Within this line of reasoning, matter remains essential, allowing us to ground an abstract discourse in a concrete form and enabling us to consider the issue of energy exhaustion from another angle – that of ruin. This perspective appears particularly relevant in the study of entropy, where once again a parallel with the work of Robert Smithson could provide a valuable critical point of comparison. Olivier Schefer discusses how the notion of “ruin in reverse” in Smithson “is inseparable from the concept of entropy, which refers not only to the inevitable decline of

¹⁴ Italo Tomassoni, *Gino De Dominicis. Catalogo ragionato* (Skira, 2011), p. 307.

¹⁵ Laura Cherubini and Giulio di Gropello, “He Systematically Destroyed any Proof that any Particular Work of Art Had Been Made by Him”, in *Flash Art*, May 16, 2017.

all things, as described by the second law of thermodynamics, to a zero degree of sensitivity, but also, and perhaps above all, to his conception of time as a process of reversal".¹⁶ From this perspective, when De Dominicis' and Smithson's work is considered together, the role of ruins and destruction appears to be conceived in opposite senses. De Dominicis' ruin involves the sacrifice of the work as a means to generate an energetic field that stores energy and avoids its dispersion. Smithson, on the other hand, seems to envisage the dispersion as the condition for the energy to flow, where there is no actual interruption of time; rather, the flow of time extends in two directions, either forwards or backwards. The concept of deep time, referring to a geological dimension, is central to Smithson's work as it attempts to align human action, which is carried out arbitrarily and over a limited time, with natural forces that rely on the unpredictability of atmospheric events and the long timescales of their sedimentation.

4. Inverting the Geological Time: the work of Giovanni Anselmo (1934-2023)

This vision of geological time is best realized through the use of natural elements, particularly minerals, which have accumulated through sedimentation over a long period of time and which ontologically represent the resulting outcomes of a distant past. Among these, we can find a work by Giovanni Anselmo, one of the leading Arte Povera artists: *Trecento Milioni di Anni* (1969), part of the collection of the Musée d'Art Moderne de la Ville de Paris. The sculptural piece consists of a block of anthracite juxtaposed with a light bulb, a metal sheet, and a piece of metal wire that supports the lamp, with the metal elements fastened to the lithic block. The artwork poetically reflects on the possibility — or rather the impossibility — of inverting the process of geological sedimentation through the action of the energy produced by the light of the small lamp. According to the artist's intentions, the energy produced by the lamp reverses the sedimentation process and returns the block of anthracite to its original form. As the artist states, that the block "was once a plant or a reptile, or in any case something organic and animate, before the

¹⁶ Olivier Schefer, "Ruines à l'envers Robert Smithson et quelques fantômes contemporains", in Olivier Schefer, Miguel Egaña, *Esthétique des ruines: Poïétique de la destruction*, Presses Universitaires de Rennes, 2015, p. 44. Translated by the author, original version: "L'idée de ruine à l'envers [...] s'avère donc indissociable du concept d'entropie, lequel renvoie non seulement à l'inéluctable déclin de toutes choses, propre à la seconde loi de la thermodynamique, à un degré zéro de la sensibilité, mais aussi, et peut-être avant tout, à sa conception du temps comme processus d'inversion".

transformations of the Earth's crust buried many aspects of life and also removed them from the light".¹⁷ In this way, he continues, it "cancels out the time that has passed between us and what, precisely, this material could have been then..."¹⁸. Such an intuition fits well with the "paradoxical" anti-entropic interpretation emerging within inquiry into the visual arts. Moreover, it also appears to evoke the Freudian pull from the organic to the inorganic, commonly known as the death drive. Further interpretation of the work within this framework reinforces the proposed reading, where the anti-entropic function is closely linked to the ability to interrupt, or rather restore, the flow of time. As in *Anti-Entropic Chandelier* by Gino De Dominicis, the action of light manifests the vital energy that redirects the entropic orientation of the piece. While in Anselmo, the light is a utopian force that opposes the evolution towards the inorganic, in De Dominicis it becomes the manifestation of the flow of life itself, interrupted by the resistance of the destroyed canvas, which stands as a metaphor for contemporary ruins.

5. Conclusions

The article set out to verify possible intersections between scientific, philosophical, and artistic conceptions of anti-entropy, while also clarifying their peculiarities in order to provide a preliminary survey of the main literature on the topic. Examining these intersections seems particularly valuable as a means of reflecting on how the interdisciplinary perspective provides new tools for interpretation, allowing for a different reading of already established and widely debated authors and artists. This approach proves particularly productive when considering energetic processes and their transformations, a topic which is increasingly compelling not only for artistic research, but also for addressing to the socio-cultural challenges of our time.

¹⁷ Suzanne Pagé and Daniel Soutif, *Giovanni Anselmo*, [exposition, 27 juin-22 septembre 1985, A.R.C, Musée d'art moderne de la Ville de Paris], (Paris: Association Paris-Musées, 1985), p. 7.

¹⁸ Ibid.

Methodologically, rather than forcing unlikely associations, the article opted to propose focused studies on the different fields, highlighting pre-existing connections where they emerged (Montevil, Stiegler, Longo, Soto, Sonnenschein, 2020) and acknowledging philological grounding to articulate further hypotheses, as in the case of works by Gino De Dominicis and Giovanni Anselmo. Though the anti-entropic properties of the works by De Dominicis have been thoughtfully discussed by authors such as Achille Bonito Oliva, Laura Cherubini, and Giulio di Gropello, they haven't been contextualized in an interdisciplinary reflection. As such, the proposed interpretation of Anselmo's work presented here is a new contribution.

The article also reiterates the importance of recognizing the specificity of the artistic field: namely, the possibility of setting aside strictly philological interpretations in favor of intuition, as well as acknowledging the formal and poetic autonomy of the artwork, as the essential precondition for any rigorous interdisciplinary exploration.

In conclusion, although the proposed analysis has focused on already historicized artists, the interdisciplinary perspective outlined could be further expanded through research on living artists, given the growing entanglement of art, technology, and science today. This line of inquiry will be further developed in studies stemming from the present one, with the aim of better highlighting the social and political implications of this field, especially in light of the environmental crisis.

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