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Human interaction: Dissipative structure and will to power

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Abstract

The main theme of this work is the relationship between entropy and the concept of the will to power, aiming to offer a perspective on the transformation of reality based on the relationship between science and philosophy. This project emerges from the concept of entropy (the second law of thermodynamics) as a quantity that determines the irreversibility of a process and the concept that explains the cause of natural transformation, tending toward a permanent increase in the universe, which underlies the degradation of systems and the convergence toward chaos. As a hermeneutic instrument for interpreting social interaction, this work uses thermodynamics as an argumentative tool framed within a philosophical and epistemological context, seeking to describe the logical construction of social interaction as a dissipative entity within the constant entropic increase of nature.

Keywords: Entropy; chaos; dissipative structure; will to power; social interaction.

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Interacción humana: Estructura disipativa y voluntad de poder

Resumen

El tema principal de este trabajo es la relación entre la entropía y el concepto de voluntad de poder, con el objetivo de ofrecer una perspectiva sobre la transformación de la realidad basada en la relación entre ciencia y filosofía. Este proyecto parte del concepto de entropía (la segunda ley de la termodinámica) como magnitud que determina la irreversibilidad de un proceso y explica la causa de la transformación natural, tendiente a un aumento permanente en el universo, que subyace a la degradación de los sistemas y la convergencia hacia el caos. Como instrumento hermenéutico para la interpretación de la interacción social, este trabajo utiliza la termodinámica como herramienta argumentativa enmarcada en un contexto filosófico y epistemológico, buscando describir la construcción lógica de la interacción social como una entidad disipativa dentro del constante aumento entrópico de la naturaleza.

Palabras clave: Entropía; caos; estructura disipativa; voluntad de poder; interacción social.

Introduction

Chaos manifests itself in all natural effects, and the human being, as a biological consequence of organic transformation, emerges from it, forming a dissipative structure that evolved as an autopoietic transformation (Maturana, 2009). Chaos has not been a topic thoroughly analyzed by science or philosophy, but its concept has emerged since the beginning of religions, being a primordial conformational and constitutive idea in the beliefs of different cultures (Gleick, 2012).

The concept of chaos has not been common in philosophy, possibly because it has started from order and the rational explanation of its formation, even obtaining clear ideas about the emergence of rational order in the human being, possibly omitting the chaotic nature of the human being and, consequently, of its structure of thought. Every rational action that structures a truth is an effect that dilutes the chaos of ignorance and the amorphous nature of the irrational. In other words, philosophical action is indirectly a structure of thought, and every action with an ordered form is the opposite of chaos. Therefore, every action that determines order in thought or consolidates ideas gives logical form to chaos (Valentim, 2022).

Every action of thought traverses the chaotic shadows of the unknown, but at the same time, few interpretations have emerged from chaos as an entity. In other words, chaos has not been the focus of philosophy, despite understanding the concept. Most philosophy has focused on explaining the established order, linear action as an effect of reason, and the structures of thought in human beings (Rojas, 2011; Tapia, 2022).

Chaos can be understood as an ontic entity in reality or as a lack of thought. Therefore, although philosophy does not focus on chaos, this concept has existed in all thought, whether as an object of human interaction with their environment or as a dark presence that exists in the depths of the mind, present as ignorance or as an irrational abstraction of reality (Lombardi, 2001). Chaos is a natural state in both natural and human processes, a consequence of the interaction between the parts of a system, influencing an overall effect developed from the action of each component and the interaction between them. In the case of human interaction, emphasis is placed on interaction according to the capacity for reasoning and the structuring of language (Elizondo, 2020).

The concept of chaos is often associated with disorder and abstraction, but it is

actually a misinterpreted order. Chaos can be interpreted from the regular forms that define it, establishing the state of the system and analyzing how far the system is from equilibrium, since the predictability of chaos depends on the equilibrium conditions of its components (Almarza, 2002). Dissipative structures arise from imbalance and the need to achieve system stability. Complex systems are formed from the homogeneous distribution of energy possibilities and equilibrium conditions, inducing energy minimization and entropic maximization structures that ultimately define the form of an open and complex system, dependent on similar systems or, in some cases, completely autonomous.

Dissipative structures arise from the dissipation of energy, which could be thought of as an ordered fabric emerging from the chaos generated by the dispersion of capacities and conditions. They form spontaneously or are assisted by another system, generating order from chaos (Prigogine, 1991).

This paper aims to reflect on the correlation between entropy and chaos in human reality as an interaction with and effect on the natural environment, demonstrating that human effects correspond to dissipative structures that are configured based on natural stability. An example of a dissipative structure is information, a human nature object that evolves as a dissipative structure or as an inexorable increase in dissipation.

1. Hermeneutics of Natural Philosophy: Entropy

Based on Newton's work, the concept of Force defined the conditions of motion for bodies, making it necessary to consider the effect of a set of particles within a container to which heat was supplied, generating expansion and producing work. That is, the concept of force was interpreted as energy, and it was experimentally discovered that it was a conservative physical quantity, leading to the formulation of the first law of thermodynamics: "The energy of the universe is constant".

With the first law of thermodynamics, the concept of Energy was introduced, which, like time, does not have an exact definition, but its understanding is inherent to natural phenomena.

The first law of thermodynamics was discovered by Mayer through his work on recognizing the blood types in the English colonies, concluding that the energy change of a substance depended on its thermodynamic conditions. Mayer's work was later developed by Prescott Joule, who experimentally applied the conversion of mechanical work into heat, ultimately concluding that the energy change of a substance is the arithmetic sum of the forms of energy transferred to the environment. The first law of thermodynamics allowed for the expansion of scientific knowledge, leading to the design and construction of machines during the Industrial Revolution. This, in turn, made the development of heat engines and the evaluation of their efficiency necessary, using combustion as a heat source and a low-temperature environment as a reservoir (Ósipov, 2003).

Starting with the heat engine, Sadi Carnot designed the perfect machine that used a thermodynamic cycle, applying reversibility as its operating principle. The ideal machine, or Carnot machine, operates on an ideal or reversible cycle. Ideal or reversible machines are far from real machines because irreversibility is a natural characteristic of all types of processes—a fundamental effect of nature on all systems in the universe.

Rudolf Clausius, continuing Carnot's work, proposed the second law of thermodynamics, introducing the inherited concept of the efficiency of a heat engine. He also introduced the concept of "entropy", which increased with the irreversibility of a process and measured the loss of energy quality. With the second law of thermodynamics, the concept of "entropy" was established, and it was concluded from the statements of Kelvin-Planck and Clausius that: "The entropy of the universe tends to a maximum value" (Ribeiro et al., 2021).

Unlike energy, entropy is a non-

conservative quantity, which can be interpreted as a quantity that increases indefinitely as the universe transforms its net energy, until it finally reaches its lowest possible quality value. This is known as the heat death of the universe (Silvestrini, 1998).

Since entropy was a strange quantity, as it did not comply with a conservation principle, it was not initially well understood. However, with the work of Ludwig Boltzmann, it became possible to conclude that entropy is defined based on the probability conditions of the system, which for the time created considerable controversy. Boltzmann's work introduced the idea that matter is composed of a set of particles, and the values associated with the macrostates correspond to the average values of the particles, thus bridging the discrete and the continuous (Cherniavsky, 2006).

Entropy is a quantity initially defined by classical thermodynamics, based on Rudolf Clausius's experimental results. This quantity measures the rate of irreversibility and the degradation of the capacities of an active system in the face of energy transfer. In the context of technological reality, the second law of thermodynamics has transcended its initial application in heat transfer to the transfer of information. This shift left aside its original nature, as reality is constituted by social problems, concluding that entropy represents the rate of misinformation in a system. Therefore, the second law of thermodynamics remains an enduring principle of human nature (Ben-Nahim, 2020).

Entropy is not only a quantity that measures the evolution of natural processes, but also a parameter that establishes the most probable configuration in a macrostate, defined from the equilibrium of the microstates that constitute it. From Boltzmann onwards, entropy became a configurational probability function that allows entropy to be viewed not only as a purely physical quantity but also as a quantity that determines the equilibrium conditions and tendency toward stability of a discretized system. With information theory, entropy is defined as a measure of misinformation.

Shannon introduced a relationship between statistics and entropy, deriving an equation from the Boltzmann expression. This development has had enormous relevance in understanding the condensation of information within data (Natal et al., 2021).

Since the second law is a universal postulate, all types of interactions comply with the laws of thermodynamics, from natural phenomena to social interactions, including human behavior as an effect of entropic interaction. For this reason, all human interaction is configured in social states and microstates; that is, entropy, from a human perspective, explains the interaction between individuals and their most probable tendency toward stability (Colom, 2005). The construction of reality is reduced to universal postulates, with the second law of thermodynamics offering a response to all naturally occurring phenomena. Even human behavior must align with the formal logic that establishes the tendency toward maximum entropy, an instance defined as the equilibrium state (Davies & Gribbin, 1996).

It could be said that a state is the instance from which action and, subsequently, reaction begin, undergoing constant changes due to actions. The transformation of a state is quantified by the generation of entropy, which indicates change. In an individual, this entropic increase represents the vital force that drives them to survive in the face of nature and their human environment.

The action of each individual triggers a web of reactions that ultimately establish the state for the social whole, representing for each individual the state of probable reactions toward which their vital force is oriented. Each action performed by a subject is associated with a state transition, considering that actions are carried out with a tendency toward equilibrium. This means that each action triggers a superposition of effects that lead to a final state. For states to change, a new process must emerge, revealed through actions and reactions (Alves et al., 2018).

Every individual is assumed to possess consciousness susceptible to the effects of

reason, which defines a balance between action and power for each being. Power is the state of reflection, a moment in which one becomes aware of reality and in which reason is exercised. The instance of action is considered the effect or materialization of power, performing the act that previous consciousness established as idealization. In other words, the action was once a thought or power, which becomes reality (act) from ideality (power).

Every action performed has a prior elucidation from consciousness, which impacts the actions of those around them. Therefore, each action generates an effect on the subject's surroundings, triggering actions that lead to a net consequence from an action carried out by the consciousness of the subject. The action of each subject has a consequence within the human environment.

As social beings, human interaction is inherently indeterminate. This means that the coexistence of beings impacts a set of effects for the person performing the action, which converge into a consequence or reaction. Each action and reaction develops into an entropic increase, which can be interpreted as an indicator of transformation, affecting the effects of those linked to the same action. This creates a network of impulses and effects that converge into future actions or reactions. Therefore, each action triggers a network of possible responses, and reality is a potential reaction to the present action.

The entropy of the universe increases with every component of physical reality, with each component contributing to this increase in its dimensions. This applies to all types of systems. The second law of thermodynamics is not a random effect imposed as a management regulation; it is a reality inherent to nature, arising from the very constitution of human beings. Thus, it governs known reality, and everything that involves a component of the universe contributes to this postulate. Entropy constitutes a quantity or variable that defines a system and also acts as a sign of reality, which can even be interpreted as a specific effect or consequence. Despite its complexity, nothing

made of energy can prevent its degradation and transformation (Prigogine, 2002).

The symbol of transformation is entropy. Therefore, every change in a system is associated with an entropic change. Based on the symbolic charge of physical reality, conclusions can be drawn that contribute to the various types of transformations. However, the interpretation of reality cannot ignore its inexorable nature; thus, the form of the symbol must conform to entropic components or transformation entities inherent to the phenomenon (Popovic, 2018).

Entropic forms manifest themselves inexorably in nature, even affecting the behavior inherent to the transformation of social and human processes, that is, entropy manifests itself in each physical interaction, generating dissipation in each natural event and creating a manifestation of transformation at each moment in time.

2. Irreversibility as a manager of reality

As a subject, the thermodynamic effect of reality corresponds to an isolated entity that generates entropic traits from its human reality, subject to physical effects and transcending time. This can be interpreted as a permanent transformation over time, directly related to the increase of entropy. Irreversibility is a factor in this increase, as the generation of entropy is the irreversible effect of reality. The theoretical increase in entropy means that each entity contributes to this increase, especially through the action of inhabiting a reality that extends over time (Potter, 2006).

Considering a system that carries out actions irreversibly over time, its evolution corresponds to the cycle carried out to fulfill its condition of effect. That is, the iteration of the phenomena makes the changes in the system evident. According to thermodynamics, returning to the initial condition would imply that the state is repeated. However, in reality, the final state is far from the initial one. Therefore, the transformation of the process is made

possible by the difference, as transcendence in time is not reversible. Each transformation adjusts to a variation with respect to the initial condition, since the evolution of systems is marked by the irreversible nature of their effect on entropic generation.

Assuming that the initial condition corresponds to an instance at time , the evolution of the system, after completing a cycle, would reach a state similar to the initial one. However, there exists a state 2 such that the conditions of both states are not identical, as the inherent irreversibility of the process ensures they differ. Mathematically, this can be represented as:

$$\ln(\Omega_1) \approx \ln(\Omega_2)$$

Since state 2 is slightly different due to the irreversibility inherent to real processes, it must satisfy:

$$\ln(\Omega_1) \approx \ln(\Omega_1 + d\Omega)$$

This shows that the entropy value between both states is not equal, and this entropic increase can be represented as $d\Omega/\Omega_1$, indicating that the evolution of the system through life cycles over time involves transformations. These transformations highlight the relevance of irreversibility, as without the generation of entropy, systems cannot transform or evolve (Durán, 2019; Peña, 2021).

In natural processes, time increases and systems follow a cycle that gradually transforms due to the irreversibility of the implicit developments in the actions of the system's components. This influences a return oriented toward transformation for any entity, generating entropy in each cycle and transforming its physical form. This also influences its ontological conception of reality. The transformation of nature occurs in irreversible cycles, which, over time, generate transformations and thus transcend evolution. In turn, these form dissipative structures of active systems that follow cycles, which are now eternal irreversible returns. Therefore,

changes would not have occurred in evolution if nature had followed the same steps and the processes had been reversible. Thus, the eternal return of natural processes presents a transformation of the system (Briggs & Peat, 2013).

The transformation conditions of a system depend on the probability conditions of the system's components, allowing the structuring of reality based on the most probable effects, that is, the effects with the greatest entropy, adjusting to physical reality or specifically to the second law of thermodynamics.

3. Human Interaction as an entropic effect

The existence of human beings is based on a trace of reality, adjusted to a natural expression of energy transformation, as the subject is a being with mass, subject to gravitational effects and the laws of thermodynamics. The characteristics of human existence correspond to universal postulates, such as the laws of thermodynamics, including the second law, which clarifies that reality corresponds to a description of entropy. The second postulate of thermodynamics states that entropy in the universe tends toward a maximum. This is interpreted as a non-conservative quantity that increases as the processes of energy transformation occur, a factual phenomenon of systems in the universe (Sometband, 1999).

Entropy is defined from its macroscopic description as a measure of "disorder", but it is really a quantity that transcends disorder. It is involved in all natural effects and their consequences, permeating all instances where a system can be transformed or capable of evolving. The rate of increase of entropy can be expressed as:

$$\frac{dS}{dt} = \sigma$$

Where σ is the entropic generation. This equation is valid as a macroscopic expression,

but if the definition of entropy is taken from Boltzmann's work, then it can be expressed as:

Which is equivalent to:

$$\ln\left(\frac{\Omega}{\Omega_0}\right) = \sigma t$$

Where the entropy generation corresponds to the Lyapunov coefficient λ a measure of chaotic behavior (Briggs & Peat, 2013). From this, we can conclude that human interaction is an active and dynamic system, requiring the irreversible transformation effect (σ) as an effect of reality.

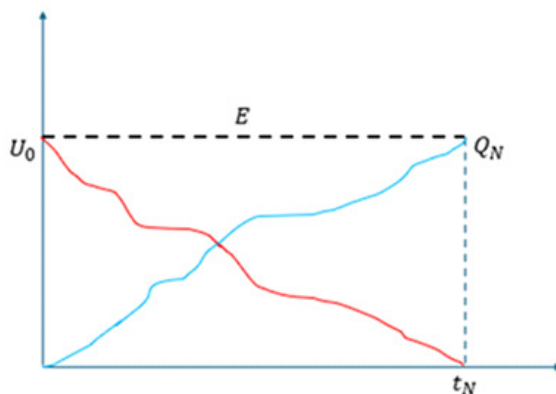
The consideration of probable states is described as state conditions that impact the possibilities of transformation, that is, the entropy generated by the components of the system affects the probability conditions, thereby demonstrating that the relationship between entropic generation and time corresponds to a chaotic relationship, which can be interpreted as the effect of previous events on future events due to entropic generation over time.

4. Physical construction of reality: Dissipative structures

Starting from a system that encompasses a set of components in its initial condition, one might assume that the available capacity is optimal, with the available energy being the maximum possible value $E = U_0$. As the system evolves, it undergoes transformations over time. Therefore, the system's energy, as a constant value E , is transformed internally, converting from useful energy U to useless energy Q . Its total value can be expressed as:

$$E = U + Q$$

Over time, as the system transforms, the distribution of energy between useful and wasted energy follows the second law of thermodynamics, ensuring the system's energy will gradually tend toward a state of greater entropy. Such that, after the final dissipation time t_N has elapsed, the system's energy degrades to the value Q_N . Initially, the useful energy available to the system is maximum and optimal for U_0 , and by the end of the final transformation, the system converts its useful energy into useless energy. This idea can be illustrated in Figure I, where the variation in net energy, as well as the useful energy U and useless energy Q , can be estimated as a function of time, assuming the invariant relationship of the total energy E .



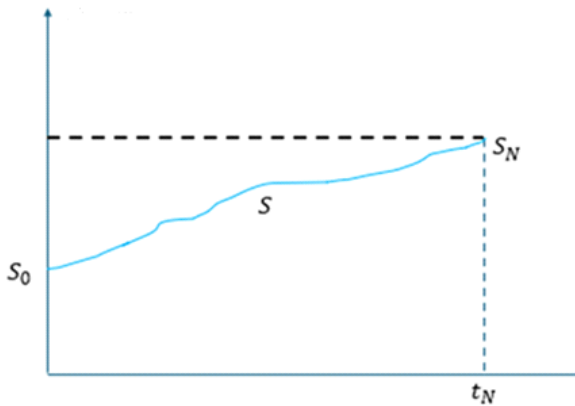
Source: Own elaboration, 2024.

Figure I: Capacity of composite and isolated system with constant energy

According to the diagram, it can be assumed that as the useful energy degrades, increasing the dissipated energy, while maintaining an invariant total energy value for the isolated system. The concept of energy is considered in order to understand the system's capabilities based on its arrangement conditions, highlighting that both the principle of conservation of energy and the principle of

entropy increase are present.

Similarly, the entropy of the system, unlike energy, increases toward a maximum value, which is associated with the entropic generation inherent in the transformations within the system. Figure II presents a schematic representation of the main idea behind the entropic increase in an isolated system.



Source: Own elaboration, 2024.

Figure II: Scheme of entropy increase in an isolated system due to internal transformations of its components

Entropy increases, starting from an initial value S_0 , as the system transforms its energy from useful to useless, with the maximum entropy reached when all the available energy of the system is dissipated in Q_N , corresponding to the maximum entropy generation σ_{max} . According to the net change in entropy, we have:

$$\sigma_{max} = S_N - S_0$$

The dissipation of capacities within the system transforms into an entropic increase over transcended time, which demonstrates the principles of entropy for a system composed of active elements that are internally transformed due to energy degradation and an irreversible entropic increase.

If we evaluate the energy dissipation

condition (see Figure I), we find that the useless energy resulting from the transformation of the system is expressed as a proportion between the transformed energy δQ and the increment of time δt , such that:

$$\frac{\delta Q}{\delta t} = \frac{Q_N}{t_N}$$

The degradation of capabilities depends on the transformation time. As the system evolves, each state change mathematically corresponds to:

$$\delta Q = \left(\frac{Q_N}{t_N} \right) \delta t$$

As the system's capabilities degrade and useful energy is transformed, the total

transformation of the system progresses, increasing entropy over time, which, according to mathematical language, would be:

$$dS = \left(\frac{\sigma}{t_N} \right) \delta t$$

This relationship, previously analyzed in Figures I and II, suggests that entropy in a system encompassing a set of entities in transformation manifests as an entropic increase over time. This is associated with the decrease in capacities due to the emergence of chaos inherent in the trace of the irreversibility of temporal cycles.

Considering that the isolated system consists of active components, defined as open systems, which transfer matter and energy, they exhibit permanent transformation over time. This is demonstrated by the generation of entropy as a result of energy consumption (Ben-Nahim, 2011). The explanation for the entropic increase over time corresponds to the transformation of the system's components due to energy transfer through flows driven by potentials or phenomenological driving forces. Each potential between components induces a flow due to an excess or lack of potential. This type of flow is inherent to the phenomenon, establishing the fundamental principle of entropy generation.

The transformation of the components or open systems that make up the whole or total system is associated with non-equilibrium. There is no equilibrium because each component evolves over time without reaching a fixed state, which underlies the chaotic manifestation of the interaction within the system, sustained by the set of flows. From the thermodynamic perspective, the open system, before the transfer associated with the transformation, is based on the principles of entropy generation through the Onsager equation. This equation shows the generation of entropy from flows driven by a driving force associated with a gradient of effects between the components that consolidate the entire system. The Onsager equation is expressed as:

$$\sigma = \sum X_i J_i$$

Where σ is the entropy generation within the entire system due to the transformation of components or open systems, X_i is the potential or driving force of the diffusion of effects within the system, and J_i represents the managing flow of the net chaotic turbulence within the system. The generation of entropy is the sum of the mathematical products between potentials and flows, which is associated with the conformation of an increase in entropy and, in turn, the constitution of open systems. These systems are components that generate order out of equilibrium by transferring flows, implying that despite the chaotic nature of turbulence caused by the set of flows, order structures or dissipative structures are generated within the complete system.

This system generates entropy up to a maximum entropy value σ_N , when the degradation of available energy takes the form Q_N , and all in the set of time instances reach an ultimate value t_N . The transformation of the components of the complete system describes the ordered structuring, but despite this, the conditions of the universe reflect the possibility of potential impossibility, with the tendency toward maximum entropy σ_N (Montoya et al., 2023).

Onsager's relationship allows us to understand that entropic generation optimizes the conditions of a system, using the dispersion of others for its evolution. That is, the transformation of effects with greater potential for change resorts to systems capable of denaturing to reduce their entropy and thereby comply with the entropic increase of the macrostate or universal system. The evolution of systems over time requires the contribution of others for their transformation.

5. The human as the will to power

Nietzsche proposes a driving force for each individual called the "will to power," summoning a call for creativity, courage,

and moral concepts to transform reality. This process influences an inexorable chaos following the transformation of the individual and, in turn, their interaction with others, generating forces that ultimately create a structuring of values and ways of thinking about themselves as living beings (Nietzsche, 2011).

Nietzsche's work (1983) is a call to transformation, urging human action toward freedom, the unification of the natural and the human, employing a romantic framework that expands the vitality of the human like a seed that germinates despite formal reality. The will to power is chaos; it is the capacity for transformation from the human, the vital force that drives permanent change. As an interaction between forces, a set of actions of will are constituted, unleashing the chaos that shapes reality.

For Nietzsche (1983), the world is not an ordered machine that can be predicted as an ordered object, it is chaos that is contaminated by vital forces that expand through their interaction, emancipating themselves as free beings that unleash their deep nature until establishing a balance of superior beings, this superiority being associated with the ability to transform without fear of the unknown, that is, of what is all too human.

The will to power is chaos, and its action on the human being transcends their vital space, as a transformative management of the established order, propelled by vital forces (potential forces) into the world (a dissipative structure), changing it through each seed of the will to power or transformative chaos (Araldi, 2007).

Life opens its way, and chaos consumes it through its expansion, transcending autopoietically and evolving in all environments. Life is the will to power and, at the same time, is chaos, fueling the transformation of nature and all its beings, including the human species. Despite reason, instinct defines the most animal aspect of the human being, and its will to power transforms it from its human state, tending toward superhumanity. It is unafraid of hitting

rock bottom and emancipating itself from the established order, immersed in a Dionysian and chaotic state- a state of high entropy and, at the same time, of enormous contribution as a being that transcends the human (Nietzsche, 2023).

Nietzsche (2011) makes a permanent call in his work to emancipation, to the search for the chaos that resides in each being, in order to expand it through creative expressions and provided with life, which allow the constitution of a scale of values that lead to freedom that converges with nature, calling not to be enslaved by submissive attitudes to injustices and the Apollonian forms of established dogmatic structures.

In this sense, Nietzsche (2011) invites us to restructure morality, formed from the deepest conditions of the human and the ascent to the superman, through a transition that does not incur in a repetition of boredom but a path that allows us to achieve the revitalizing and forging steps of the best essence of the human, he proposes in each text to let the chaos of the will to power flow, a call to rebel against the order established by things that oppress the most beautiful of the human being: his conscience of freedom.

The philosophy of the will to power questions what is morally stipulated, suggests an emancipatory attitude towards imposed spirituality, glimpses a homogeneous reality lacking in humanity and activates, from his work, a transformative concept, such as "will to power" in the direction of permanent transformation. Nietzsche proposes a resurgence from the human to the most human, driving from the force of will towards the constitution of moral values and a creative consolidation towards the evolution of the "superman".

From a natural perspective, the dissipative structure is shaped by the entropic increase and, in turn, the ordering of form. This can be understood as the evolution of natural forms transcending the universe's tendency toward dilution, given that dissipative structures are formed as systems of social interaction within human nature.

As a dissipative structure, the human being transcends its essence through the forces that define it, flowing through the essential fabric that encompasses it, transforming itself as a will to power.

Conclusions

With the work of Ilya Prigogine, the positions of certainty from the natural sciences are transformed, making it necessary to search for an understanding of the second law of thermodynamics, highlighting the importance of entropy as a fundamental concept to explain transformations in natural and human phenomena, being in turn the measure of dissipation associated with the irreversible or chaotic effects that arise through iterations over time. Chaos is a manifestation of natural processes, and entropy is a way of measuring the level of chaos in a temporal instance (natural state), their relationship being fundamental to understanding the nature of transformation and the trait that existence leaves behind through its temporality.

From a thermodynamic perspective, Prigogine presents the possibility of integrating the natural sciences with the spiritual sciences into a unified concept, transcending time and offering an explanation for biological and, by extension, human phenomena. Entropy acts as both a driver of change and an inherent parameter of chaos.

Understanding transformations in a system means understanding the effect of existence, which corresponds to the postulates of thermodynamics, since every system in the universe is subject to fulfilling these postulates, that is, the conservation of energy and the permanent increase of entropy in the universe. The entropic increase manifests itself through every set of active components, and this increase is linked to the continuous flow through the dissipative structures that comprise it. The flows within the entire system (whether it is the world or the universe) are driven by transformative forces that emerge from potentials or gradients. In nature, these

flows arise due to changes in thermodynamic properties, whereas, in social systems, these flows may be linked to the flow of violence driven by economic disparities or gradients related to social classes.

As active systems that form a whole, interaction is the result of the flows created by the potentials between them, leading to an exchange of forces. In Nietzsche's framework, this can be interpreted as an exchange of wills to power. Life, as an autopoietic construct, creates an ordered system within dissipative structures, but as Nietzsche suggests, it is also a turbulent chaos driven by wills to power. The creation of structures arises as a consequence of chaos—a result of the generation of entropy through transformations that occur over time, or what Bergson might refer to as the set of “dureé” times (Durán, 2019).

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