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Ecological Imagination: From Kant to a Complex World

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ABSTRACT. In this paper, I develop the notion of 'ecological imagination' based on a reading of Immanuel Kant's *Critique of the Power of Judgment*. Firstly, my aim is to show how the set of philosophical issues encompassed by this notion, which I define as the capacity to create images that 'make sense' of a complex or ecological world, finds an important historical antecedent in the epistemological reflections of Kant's third Critique. In my reading, this text marks the emergence of a post-mechanistic conception of nature, one that is inevitably bound to an imaginative pursuit of 'sense'. The transcendental problem of making "an interconnected experience" of the world despite its "infinite multiplicity of empirical laws" finds in Kant an aesthetic-epistemological solution. This solution, as Emilio Garroni ties it to the concept of "*sensus communis*", emerges particularly in the third Critique with the transcendental discovery of an "imaginative freedom" not yet conceived in the *Critique of Pure Reason*. Subsequently, following a reference to Goethean developments of these reflections, I turn to the contemporary ecological crisis as a "crisis of the imagination" (Ghosh). Here, I seek to draw on conceptual tools derived from the reading of Kant's text to engage with the idea of 'complexity' – notably the complex interrelatedness of living systems that underpin an ecological conception of the world. I aim to show that an epistemology of complexity refers to a transformative interaction between a 'sense-making' observer and a 'formative'

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or ‘organized’ system. A complex ‘nature’ can thus be approached only through an original synthesis of the aesthetic and the epistemic: a complex system, such as an organism or an ecosystem, is knowable only as far as it ‘makes sense’. Ecological imagination is thus understood as a cognitive disposition that nurtures the dialectic between this subjective striving for sense and the empirical manifestations of forms or principles of organizations within the living world.

1. Introduction

In this paper, I will present some ideas from my current research on the notion of ‘ecological imagination’. The issues on which I will focus are the following: why does the present state of global and epochal danger call us to develop not only new concepts but also, and maybe primarily, new *images* of what until now we have been calling ‘nature’? And how does the idea of ‘complexity’ play a key role in shaping new ways of imagining the ecological world? As I will define it, the problem of ‘ecological imagination’ is centered on the necessity of *making sense of a complex world*.

The arguments I will develop in this paper are part of my doctoral thesis project. There, I suggest that, in the thought of philosophers and scientists such as Kant, Goethe, Novalis, A. von Humboldt and others, scientific-epistemological reflection on living nature is fundamentally linked to an aesthetic reflection, with a pivotal role given to the faculty of imagination.[2] It is in this connection between aesthetics and naturalism, image and biological knowledge, form and lifeworld that I find the essential philosophical insights for the elaboration of what I call ‘ecological imagination’. It could be said, then, that the problem of ecological imagination, as I address it, is originally Kantian and Romantic. However, the issues I turn to in my research – living complexity theory, socio-ecological crises, and so on – are thoroughly contemporary. Therefore, my use of those non-contemporary philosophical sources is not at all historical-philosophical, as evidenced by my use of terms such as ‘complexity’, ‘chaos’, and ‘ecology’ in their distinctly contemporary

[2] In developing this interpretation, the works of contemporary scholars such as L. Dassow Walls (2009), C. Malabou (2016), E. Millán Brusslan (2019), J. Steigerwald (2019) and D. Nassar (2022) have been essential along with others, some of whom will be referenced later in the text.

senses. The reference to late 18th- and early 19th-century thinkers is based on the belief that, during this historical period, an inquiry developed into the conditions for knowing the world of phenomena – particularly those characterizing the living world – conceived in its indeterminate variety, universal interconnectedness and irreducibility to simple mechanical laws.[3] Two fundamental approaches emerge in response to this critical encounter with a nature that is in many respects 'post-Newtonian' and 'post-Cartesian': the necessary turn to an *aesthetic-epistemological perspective*; and the revival of an almost Renaissance or early-modern necessity (albeit now filtered through a persistent trust in the potential of science, or properly modern 'reason') to identify *principles of organization and formativity* entirely within materiality. It is in the recapitulation of these reflections – still fundamentally original, unparalleled and in many respects still not fully understood (though certainly not inconsequential) – that I believe it is both possible and essential to develop an inquiry into the set of aesthetic, epistemological and political issues I refer to as ecological imagination.

Of course, the ambition of this paper is far more modest than the scope outlined above. Here, I will focus primarily on Kant's *Critique of the Power of Judgment*, which I see as the mature expression of a discourse on the living world that highlights the central epistemic role of imagination and, *ante litteram*, establishes the conditions for thinking about a nature that is indeterminate in its variety and universally interconnected. From there, I will extract some foundational philosophical tools to move into a discussion of contemporary issues.

2. Kant: imaginatively confronting ecological complexity

2.1. An 'interconnected experience' of a complex nature

In the published Introduction to the *Critique of the Power of Judgment*, Kant acknowledged the necessity of a "task" for the knowing subject that the critical project had not yet clarified: "the task of making an *interconnected experience* out of given perceptions of a nature that in the worst case

[3] However, these issues can certainly be traced back to mid-18th-century reflections, as demonstrated by Reill (2005).

contains *an infinite multiplicity of empirical laws*" (Kant, 2000, p. 71, my italics). When attempting to develop a conceptual understanding of a phenomenon (whether physical, chemical or otherwise), the subject must proceed with the conviction that the manifestation of that particular phenomenon *fits within* a 'nature' conceived as a system of empirical laws. This implies that the knowledge of the phenomenon is coherent and continuous with other knowledges and forms of knowledge, and that the laws governing the phenomenon are not eccentric, occasional, or impermanent, but rather integrated into a universal system of genera and species, causes and effects, continuity and stability, and so on. In other words, to navigate the world of phenomena – amidst the particular laws, processes and entities, which are potentially infinite and may resist being unified into a comprehensive view that resolves their multiplicity – the subject must rely, in some way, on *the possible interconnectedness of this astonishing variety*. This requires a transcendental grounding, a set of *a priori* conditions that support the subject's *'trust' in the systemic composition of nature*.

The *Critique of Pure Reason* did not provide the subject with sufficient reassurance to tackle this 'task'. There, the understanding was capable of imposing *a priori* laws *only* on nature *in general* (*formaliter spectata*). Lacking intellectual intuition and clairvoyance, the subject is obviously incapable of establishing *a priori* the *empirical* laws that constitute nature in its phenomenal particularity. These laws must instead be obtained through empirical investigation, and are thus established *a posteriori*.[4] However, to make an "interconnected experience" means being able to encounter "a certain order of nature" *in the world of phenomena itself*, in the actual experience of the empirical world, and thus not only at the 'formal' level of the pure concepts of the understanding. Order is no longer sought exclusively within the *a priori* categorial system that sets the general conditions of the experience of nature. Here, the order must be found *by* the experience *within* the particular experience of particular phenomena. What is meant by 'order' is a principle of conformity that unifies, for the purpose of knowledge, the immense variety of forms, processes, and facets through which the world manifests itself. Without this "guideline for an experience of [nature] in all its multiplicity", *chaos* would reign, that is, the fragmentary dis-order of phenomena. It would be impossible to grasp the subordination of specific forms to generic ones,

[4] "Particular laws, because they concern empirically determined appearances, *cannot* be *completely derived* from the categories, although they all stand under them. Experience must be added in order to come to know particular laws *at all*" (Kant, 1998, p. 264)

the connection of different processes to similar principles, to 'trust' the preservation (or the least sudden transformation) of the world into a state similar to the one just observed, and so on. Here, in my words, Kant's critical philosophy acknowledges the essential *complexity* of a nature that he recognizes as capable of manifesting "in infinitely many ways" (Kant, 2000, p. 70).

Natural complexity thus presents the knowing subject with the task of discerning orders, forms, structures, and patterns within it, *despite* the seemingly 'chaotic' appearance of this boundless diversity of phenomena. As Rachel Zuckert argues, the central problem around which the *Critique of the Power of Judgment* revolves – and which may signify the fundamental link between the first and second parts of this work – is the "representation of objects as complex unities (i.e. unities of the manifold)" (Zuckert, 2003, p. 70), that is, the problem of "order among diversity, and of the subjective ability to discern such order" (p. 5). Consequently, again, this raises the question of what *transcendental principle* ensures that the subject does not get lost in complexity, losing balance on the threshold of chaos.

Kant finds this principle in the *purposiveness of nature*, which, however, should not be understood as an objective or conceptually understandable purposiveness, but rather as a "subjective principle (maxim)" that drives experience 'from within', so to speak, like a sense of 'hope'. After all, to conceptually hypostatize an absolute Order or Purpose in itself (let alone a rationalist 'pre-established harmony') within the world of phenomena – without it being in any way directly experientially accessible – would constitute a metaphysical move that violates the most fundamental premises of critical philosophy. The possibility of encountering order and form in nature can only appear contingent on our understanding, "as if it were a happy accident which happened to favor our aim" (Kant, 2000, p. 71). Kant's transcendental discourse here takes on an unusual tone: at the level of the conditions for the possibility of understanding nature, the complex yet "systematic unity among merely empirical laws" presents itself to the subject *as if* it 'favors' or 'chooses' them – not conceptually, but through the arousal of a "feeling of pleasure" (p. 73). It is within the "intrinsic contingency" (p. 77) of this pleasure, delight, relief, or admiration (all terms used by Kant) that the attribution of purposiveness to an otherwise chaotic nature is justified. The transcendental guideline for orienting oneself within an infinitely varied and complex nature thus takes on a fundamentally *aesthetic character*. The conceptually impossible unity of a protean world

can only be found at the level of aesthetic representation, and thus in a feeling of pleasure, which – by "mak[ing] us attentive to the purposiveness of nature" (p. 74) – serves as an aesthetic 'anticipation' of nature's knowability.

Thus, Kant's third Critique asks: what *ought we to feel* in order to have the possibility to experience an infinitely varied and intricate nature? And the answer is: we ought to feel that our understanding can move across the world *as if* the world is 'welcoming' toward us, *as if* it 'conforms' to our cognitive capacities.[5] The "agreement of nature with our faculty of cognition" takes on an aesthetic tone: it is something that is ultimately *felt*: "If we succeed in this accord of [the empirical laws of nature] for our faculty of cognition, which we regard as merely contingent [that is, not 'objectively' necessary], pleasure will be felt" (p. 74).

2.2. Making sense of nature

Now, Italian philosopher Emilio Garroni highlights how Kant associates this feeling of subject-world conformity to another notion: the one of 'sense'.[6] Garroni defines 'sense' – as opposed to 'meaning' or 'signification' – as "the feeling of being-in-the-experience, that it *makes sense* to have experiences"; the feeling, in other words, that "we are at home in our experience" (Garroni, 1992, pp. 221-222).[7] In order to have the possibility to know the world or also to just live in it, we ought to be able to *make sense* of it, that is, to *feel* an unconceptualizable *conformity* of the world –

[5] Juliet Floyd discusses a "*mutual* relationship of 'purposiveness' between the structures of our faculties of cognition and the structure of nature" (Floyd 1998, p. 218). See also Hughes (2007).

[6] "In our knowledge, and as a precondition for its actual possibility, there exists an irreducibly aesthetic 'something', a formal and subjective choice that cannot itself be traced back to intellectual principles. Something that, *in itself*, neither presupposes nor produces concepts, yet it remains 'advantageous' for the cognitive faculties. This 'something' is a principle […], but a principle we are aesthetically, not logically, aware of (we are not aware of the principle as such, but rather of its 'effect'). It functions more as an 'ideal' rule (an 'idea') whose only representatives are singular feelings, which – singular but not always individual – can be referred to as 'common feeling'. This *Gemeinsinn* [common sense/common feeling] is something we must postulate for actual knowledge to be possible, even though it neither immediately rests upon nor produces knowledge. It is linked to knowledge as an indispensable condition, yet remains independent from knowledge itself" (Garroni 1998, p. 88, my translation).

[7] "Sense-feeling', of course, but at the same time 'sense' as the indeterminate condition of meaning, of the meaningfulness of experience, of language and of the significance of concepts and words" (Garroni 1992, pp. 196-197, my translation). See also Velotti (2023).

regardless of how 'complex' it may be – to our transcendental equipment.[8] The reference, of course, is to the *Gemeinsinn* or *sensus communis*, which for Kant signifies – in continuity with what I have already outlined – a 'subjective principle' that expresses, not through concepts but rather through a sense of purposiveness, a feeling that something somehow normatively *ought to be* in a certain way (Ginsborg, 2001). Kants understand the *sensus communis* (*aestheticus*) as a cognitive "disposition" towards the world based on a particular "proportion" of the cognitive faculties (pp. 122-123, 173-176). This proportion is one of *imaginative freedom* – yet a freedom always bound to intellectual lawfulness.

While it remains true, as in the *Critique of Pure Reason*,[9] that every imaginative synthesis must be oriented toward intellectual knowledge – and thus even the most radical imaginative creativity, at least in the case of a sound mind, will never be delirious or rule-breaking but will always be bound to the transcendental 'production' – it is equally true that, in the *Critique of the Power of Judgment*, imagination is granted the (still pre- or pro-epistemic) ability to "schematize without a concept" (p. 167). In the first Critique, what imagination 'produces' is a schema, which is "the representation of a general procedure of the imagination for providing a concept with its image" (Kant 1998, p. 273). To recognize the imagination's newly acknowledged 'freedom' in its ability to "schematize without a concept" means thus granting it the capacity to *create images of sense that are not anchored to specific conceptual determinations*[10]: representations of indeterminate conformity, imbued with feelings; "originary disclosures" that create fields of affinity between the subject and the world by affectively "enlivening" in the former a sense of familiarity with the latter (La Rocca, 2003, p. 245-266).

[8] A reading in continuity with that of Garroni – also focused, though in a different manner, on the notion of 'sense' – is the one of Eric Weil, who writes: "It is the fact of sense, of perception, even of the creation of sense, that is at the heart of Kantian thought". (Weil, 1970, p. 73, my translation). See also Hughes (2006, p. 568), when she writes: "Kant's aesthetics seeks to uncover something that is all too easily missed, namely that we stand in relation to empirical nature only in so far as we are capable of presupposing that, at least in principle, it will make sense to us".
[9] For an agile overview of the role of the faculty of imagination in the first Critique, see Ferrarin (1995).
[10] For an interpretation that emphasizes the distinctly 'creative' nature of this imagination, see Kneller (2007).

2.3. The human's strive for sense and nature's formative power

In order to 'make sense' of nature, the subject mobilizes imagination.[11] In other words, sense is an image that orients us in the world, or an imaginative disposition that is the affective and representational source of all possible schemes of conceptual knowledge. Now, in the second part of the third Critique, a subjective principle such 'sense' is made necessary for a scientific understanding of living nature that goes beyond a merely mechanistic view. What we called, after Garroni, sense, that is an aesthetic-imaginative principle, gains a structural – even though not constitutive, but merely regulative – naturalistic value: notably, it gains the role of a "guideline for the observation" (Kant, 2000, p. 248). The empirical evidence of order and organization in nature leads to the analogically derived maxim that "everything in the world is good for something, […] nothing in it is in vain; and by means of the example that nature gives in its organic products, one is justified, indeed called upon *to expect* nothing in nature and its laws but what is purposive in the whole" (p. 250, my italics). This purely subjective and *still* universally necessary 'expectation', this both sensitive and transcendental 'trust' in the purposiveness of nature, that is, in the idea that even this impossibly complex and multifaceted empirical world 'makes sense', has a properly aesthetic-imaginative character. The observation of complex and singular physical phenomena – not to mention the teleologies and purposiveness that seem to characterize the phenomena of the living world – induces in the subject a distinctly aesthetic sense of "admiration", occasioned by the sense that there is "something lying beyond those sensible representations" (p. 238; cfr. p. 74). This 'something' does not stem from an uncomfortable metaphysical speculation about a platonically supersensible idea or a third rational entity. Rather, this 'something' is much simpler and more 'critical': it is an epistemically necessary and aesthetically inflected principle of synthesis or unity, serving solely *to totalize the multiplicity of real phenomena "beyond" their mere sum*. This is what Kant, in a striking phrase (though certainly not coined with citation in mind), refers to as the principle of the "advantageousness of one thing for another" (p. 241). The surprising fact is that,

[11] Through a different approach, Fiona Hughes reaches a similar interpretation of Kantian imagination when she asserts: "Synthesis, thus, is the subjective capacity through which we presuppose that mind and nature are in harmony" (Hughes, 1998, p. 190).

within this web of 'things', within this ecological interplay of advantage and conformity that seems to constitute the world, also the knowing human subject *ought to* be included, as we shall see shortly.

This aesthetic or qualitative epistemology of living nature – which, on an analogical-affective ground, declares the objectivity[12] of a principle of 'advantageousness of one thing for another' – preaches the transcendental ability to spontaneously produce and trust an image of nature as manifesting *a tendency toward order or form*, or what Kant, after Blumenbach, calls a "formative power" (p. 246). I suggest that this *formative power* can be thought of as the objective correlative of the subjective *strive for sense*: while confronting the complexity of nature, the 'task' of acknowledging a *system of experience* and/as a *system of nature* cannot but project this systematicity through a transcendental mirroring between an 'internal' sense of purposiveness and an 'external' observation of order.[13]

2.4. Kant, Goethe, and the (imaginative) premises for an ecological view of the world

It is thus possible to argue that the challenging dialectic in Kant's third Critique between *an imagination free to produce schemas beyond conceptual constraints* and *a complex, living nature shaped by non-mechanical formative forces* starts to characterize what we might call an ecological view of the world.

Scientists named 'ecology' the idea that the world is not formless, atomistic or linearly mechanistic (Odum, 1963; Bateson, 1979). We can define ecology as the investigation of forms or structures that constitute complex, organistic, apparently teleological and often non-linear relational patterns among different individuals, species, environments, and so on. Ecology is the

[12] As is well known, in the third Critique this objectivity takes on an explicitly regulative character. However, the organicist reflections in the *Opus Postumum*, as Mathieu (1989) explains, suggest a degree of dissatisfaction with this solution and a perhaps post-critical (though ultimately incomplete) attempt to grant 'natural ends' a constitutive status.

[13] Although it is well known that establishing such *traits d'union* between the first and second parts of the third Critique is made challenging by Kant's careful phrasing, we may perhaps identify in the two Introductions to the work the most favorable textual space for interpretative experimentation in this direction.

science that emerges from the idea that *form and organization actually exist* and shape reality, beyond mechanistic and reductionist causal chains. Using a morphological lexicon, we can say that an ecosystem, such as a forest, for instance, is a complex stage of affective and expressive relationships among all the organized and organizing 'forms' that compose it – including the life forms that inhabit it, the chemical configurations of the environment, the morphology of the terrain, the form of life of the proximate human communities, and so forth.

It might be said that Kant contributed to establishing the critical premises for conceiving such an eco-morphological conception of nature. The world is neither pure chaos nor a mere mechanistic universe, as we *ought to* be able to experience organization. Nature ought to make sense; it ought to manifest a systematic configuration that facilitates the observer's necessity to find forms within it. In nature, *we expect* to find principles of recursive agreement between the whole and its parts, harmonization between distant elements and contexts, a tendency towards order and organized development, and so on. In Kant, the discovery of *this* nature does not occur metaphysically, but *aesthetically*: the formative power that 'animates' the world and welcomes the systematizing gaze of those who observe or experience it, is not a concept but an idea, that is, *an image that guides my reason by enlivening my feeling of conformity*.[14]

Therefore, a "formative power" determines a conception of nature as always already imaginatively/synthetically organized or *felt as making sense*. On the one hand, the subject intuits, imagines, and models the systematic organizations of things. But, on the other hand, the subject sees their own horizons of sense *re-shaped*. As claimed by Catherine Malabou (2016), the diversity of existing forms modifies the transcendental: the observation of the polymorphic patterns of reality transforms the very sensibility and imaginative disposition of the subject. Goethe, who followed and radicalized Kant's morphological approach and ecological imagination, best accounted for this plastic or epigenetic character of the observer of an ecological reality. First, Goethe argues that,

[14] The use I make here of the notion of 'idea' refers – without ambitions of philological rigor in textual interpretation – to the 'aesthetic ideas' discussed by Kant in the *Critique of Judgment*. Kant defines aesthetic ideas as follows: "by an aesthetic idea, however, I mean that representation of the imagination that occasions much thinking though without it being possible for any determinate thought, i.e., *concept*, to be adequate to it, which, consequently, no language fully attains or can make intelligible. – One readily sees that it is the counterpart (pendant) of an *idea of reason*, which is, conversely, a concept to which no *intuition* (representation of the imagination) can be adequate" (Kant, 2000, p. 192).

while confronting with complex living realities, the observer must be able to 'visualize' *ideas* (Goethe, 1988, p. 20, pp. 28-29, pp. 33-34). Goethe believes that ideas are visible realities, or at least have a *constitutive* character rather than a regulative one. Ideas, or images of universal conformity, do not merely serve as guidelines for observation, as in Kant's view, but more fundamentally provide evidence of *an ontological connection implied in a visual harmony*. Let us imagine, for example, a scientist like Goethe, in the public garden of Palermo, meticulously observing every leaf of every plant, comparing all of them with each other (Goethe, 1982, p. 251-252). While he focuses his sight on a particular leaf of a particular plant, his peripheral vision can still be captured by the luxurious variety of the garden as a whole. In this visual and imaginative tension and oscillation between the singular element and the overall environment, a sufficiently detailed and prolonged comparison of numerous and diverse plants allows an *Urpflanze*, a perceptible idea of a plant, to appear before the observer's eyes. This idea, when it suddenly and *aesthetically* appears after a careful observation of an empirical reality, restructures the very conditions of observability of the world, since what Goethe calls the observer's 'eyes of the mind' now reconstruct the botanical world, the garden, in the image of the *Urpflanze*, which is an idea, *a new horizon of sense*. Accordingly, the goal of the subject that confronts themselves with natural complexity is to "form an amalgam [with the object of observation] in a rational way" (Goethe, 1988, p. 25). This rational amalgamation is a (critical) immersion in the living complexity of the world: an aesthetic-epistemological solution to the problem of working out synthetic perspectives, or images of sense, despite the infinite diversity of a complex reality. This implies, according to Goethe, that the principle of metamorphosis must first and foremost concern the observer. Nature imposes an affective and intellectual transformation on the very observer of a complex and polymorphic reality: "Every new object, clearly seen, opens up a new organ of perception in us" (p. 39).

3. The contemporary quest for an ecological imagination

Therefore, what I call ecological imagination – which refers to the emergence of a new, non-mechanistic and morphological conception of nature, inevitably tied with an imaginative search for

sense – was initially conceived by authors such as Kant and Goethe in the awareness of a confrontation with the two seemingly contradictory goals: on the one hand, the aim to acknowledge nature's diversity, and, on the other, the aim to demonstrate that all elements of nature are closely related (Nassar, 2022, p. 5). Kant and Goethe – but also, in different ways, authors such as Novalis and A. von Humboldt – addressed this issue of the paradoxical coexistence of the diversity of nature and its universal relatedness through aesthetic-epistemological solutions, highlighting the role of imagination in producing a synthesis, that is, a "system of experiences" or an image that allows us to feel at home in this world despite the infinite heterogeneity of the perspectives it can be viewed from.

I will now attempt to examine in what way the ecological crisis represents the critical point at which it proves epistemologically necessary to recover and develop the originally Kantian and Goethean insights.

Amitav Ghosh (2017) famously stated that the present ecological crisis is a "crisis of the imagination". If we consider 'imagination' as the faculty of a pre-epistemic 'making sense' of the world, we can say that our contemporary imaginative crisis is due to the fact that our modern images and imaginaries of 'Nature' fail to make sense of the complexity of ecological worlds. We can attribute the persistent unpreparedness of institutions to anticipate or respond to disasters such as floods, droughts, and heatwaves, to a deeply rooted inability to picture complex causal networks. These networks encompass climatic, environmental, and so-called 'natural' factors, as well as anthropogenic or 'social' factors like urbanization and carbon emission. The dualisms and linearizations that have characterized both intellectual and political practices have fueled the disastrous fantasy of a human society abstracted from the complex networks of interdependencies that make the world inhabitable. As a result, the socio-ecological dialectics cease to make sense. We don't feel at home in this world anymore.

While acknowledging the crisis of imagination discussed by Ghosh, we must develop practices that can conceive and nurture new post-dualistic, non-simplifying images of the socio-ecological networks. A new ecological imagination requires us to perceive the interplay of *polymorphic diversity* and *universal relatedness* that appeared to Kant and his contemporaries as a paradox to address by aesthetic-epistemological means, an apparently paradoxical nexus that is

now defined by the natural and social sciences as 'complexity' (Prigogine, Stengers, 2018; Gell-Mann, 1994; Cilliers, 1998; Mainzer, 2007; Ladyman, Wiesner, 2020). Despite a seemingly chaotic molecular, cellular or environmental composition, complex systems such as organisms, ecosystems and societies manifest, using a Kantian expression, a formative power (Solé, Bascompte, 2006). The core of the notion of complexity is well grasped by this formulation by Marilyn Strathern: "the relation always summons entities other than itself" (1998, p. 28). Fully grasping or predicting the entire process of con-formation of an organic, societal, or ecosystemic structuration is impossible, as each attempt at understanding one aspect of the system unravels others. As already understood in the third Critique, complex morphogenetic processes imply a seemingly teleological and *ultimately inscrutable* dialectic between the part and the whole, so that paying attention to only one or some elements cannot keep track of the innumerable networks of relations in which those elements are taken, and this often results in what, to the limited eyes of a finite observer, are nonlinear and nonsensical outcomes. This establishes the centrality of the *situatedness* of the observer, and so a strict epistemological and ontological interdependence between the observer and the system (Morin 1992).

In order to understand the structure and chains of symbiotic relationships that constitute, for example, a coral reef, and in order to intervene in this ecosystem to favor its survival, we cannot expect to be able to only count on abstract know-how. Rather, the scientist and the activist must every time familiarize themselves with the *singularities* that characterize that particular reef and must do so on multiple scales: the genetic one, the geographic one, the political-economic one, and so on. The intersection of all these scales, ranging from the molecular, to the organism, up to the logics of global economic and ecological systems, do not allow them to all be linearly and hierarchically maintained in a single and simultaneous overall view (NAS, 2019; Bellwood et al., 2019).

Thus, the observer, in order to know or intervene in a complex system, must make choices about what it *makes sense* to do and understand, and what does not. They must be *sensitive* to the manifestation of the most relevant scale and dimension, *while* necessarily creating structural blind spots (Maturana, Varela, 1998, pp. 241-242). And a point arrives when – at the end of any necessary generalization and application of abstract schemes or rules – the observer, on the basis of their past

experiences, present feelings, and non-conceptualizable intuitions, must in turn be able to conceive an image of the system that renounces the pretence of an overall view and *just* behave as a synthetic whole, *just* makes intellectual and practical sense in orienting knowledge and action, despite the potentially limitless set of alternative images or perspectives that could have been produced on that system (Audouin et al., 2013).

An *epistemology* of complexity is therefore always an *imaginative sensitivity* toward complexity: a dialogue or a transformative co-affection between the observer and the system that aims at performative and situational sense-making rather than at the establishment of universal and timeless conceptualizations.

The subject, by renouncing to any pretence of totality or cosmic uniformity, must be able to make sense of a complex world through a synthesis or image that aesthetically enlivens their cognitive connection to a world that would otherwise appear hopelessly chaotic. What is generated by the nexus between image and nature, unity and diversity, feeling and system, is the possibility of a complex nature, where 'complexity' means *an immeasurable but imaginable proliferation of forms*, and not formless chaos.[15] A complex nature cannot be approached except in an original mixture of the aesthetic and the epistemic: a complex system, such as an organism or an ecosystem, can be known only in the premise of 'sense'.

The experience of an ecological reality implies a conception of knowledge as a space of constant mutual reshaping between the subject's eyes *and* the manifest picture of reality – as the example of the Goethean *Urpflanze* makes clear. The observer of an ecological reality should be conceived as a subject capable of critically immersing themselves in a zone of indistinction between image and reality, between feeling and knowability.

[15] Indeed, as observed by René Thom: "Whatever is the ultimate nature of reality (assuming that this expression has meaning), it is indisputable that our universe is not chaos. We perceive beings, objects, things to which we give names. These beings or things are forms or structures endowed with a degree of stability; they take up some part of space and last for some period of time" (2018, p. 1).

4. Concluding remarks

The strive for sense is an infinite and never conclusive imaginative operation, and therefore *there is always a need to rediscover, to explore the horizons of what 'makes sense'*, *a need to continually produce new images* of what we want to know or deal with intellectually and pragmatically. The proposal for an aesthetic-epistemological framework that I have presented under the name of 'ecological imagination', points to the impossibility of separating feeling and knowledge, sense and meaning, image and concept in the encounter of complex realities such as endangered ecosystems, socio-ecological risk zones and, in general, all those risky interweavings of society and nature, all those post-dualist "metamorphic zones" (Latour, 2017) that, according to Ghosh, the modern imagination has not yet been able to represent appropriately. If complex realities require that we remain both sensitive and rational, then it is through what Kant called the 'free play of imagination and understanding' that we must build the barriers for the non-sense that constantly threatens to make us no longer feel at home on this Earth. Awareness of complexity opens up the way for sense-making practices – amidst the arts, sciences, political actions, etc. – that can only occur in maintaining a living oscillation between *aisthesis* and *episteme*.

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